Afterschool Matters

CORRECTION

In the Fall 2015 issue, the article on afterschool mentoring by McDaniel, Yarbrough, and Besnoy references the Young Women Leaders Program on page 42. The citations and reference for the study of that program are incorrect. The correct source is:

Lee, J. M., Germain, L. J., Lawerence, E. C., & Marshall, J. H. (2010). "It opened my mind, my eyes. It was good": Supporting college students' navigation of difference in a youth mentoring program. *Educational Horizons, 89*, 33–46.

Photo Credits

Photo on page 1 compliments of BOKS (Build Our Kids' Success). BOKS is a before-school physical activity program with the mission to promote the profound impact of physical activity on a child's mind, body, and community. BOKS is powered by communities and empowers parents, teachers, schools, and local volunteers to give kids a body and brain boost that will set them up for a day of learning. BOKS launched in October 2009, when founder Kathleen Tullie rallied a small but dedicated group of passionate moms armed with a mission, a simple idea, and whistles. Today BOKS, alongside Reebok, has grown to more than 1,200 schools and counting in 48 U.S. states and six countries.

Photos on pages 28 and 33 compliments of the ARC summer program of the Ashland Recreation Department in Ashland, MA. During summer 2015, the Ashland Recreation Department offered ARC, a summer program for pre-school through seventh-grade children designed to give all children the ability to participate in a wide variety of activities and events with the opportunity to make new friends. Each day the children had the opportunity to plan their own day, selecting from activities such as letter boxing, edible art, crafts, Legos, sports, swimming, and more. The Ashland Recreation Department offers a wide variety of programs year round for children and adults throughout the community.

See the inside back cover for the call for papers for future issues of Afterschool Matters.

table of **contents**

WELCOME

March is Women's History Month. This recognition traces its origin to the observance of International Women's Day (March 8)—a day to "celebrate the social, economic, cultural, and political achievement of women."[1] The National Institute on Out-of-School Time (NIOST) is privileged to make our home at Wellesley College, a premier educational institution that has championed women's intellectual and social development and autonomy for over 100 years.

Consistent with this focus on gender, NIOST began a project in 2014 to investigate the critical points in the academic and social development of girls that lead to their pursuit of science, technology, engineering, and math (STEM) in post-secondary education and careers. Our research team interviewed women majoring in STEM fields to document what those students saw as influences on their interest in STEM at home, at school, in the community, and in out-of-school time (OST) programs.

The findings highlighted themes in the girls' STEM experiences that may help to shape OST program approaches:

- A large proportion (71 percent) of respondents attributed their STEM interest to experiences that encouraged collaboration and hands-on work.
- More than half (54 percent) still held some stereotypes about the kinds of people who do STEM, even though they were themselves pursuing STEM degrees.
- Almost all (96 percent) recalled specific teachers or mentors who sparked their interest in STEM, made learning fun, voiced confidence in their abilities in STEM, or encouraged them to pursue STEM fields.

Growing a strong and talented STEM workforce requires increasing the participation of girls and women in the STEM pipeline. Women hold less than a quarter of STEM jobs, even though they occupy almost half of all jobs in the U.S. economy. This underrepresentation has persisted over the past decade, even as women's share of the college-educated workforce has increased.[2]

Since this spring issue of *Afterschool Matters* is being published during Women's History Month, we are pleased that the opening article calls attention to the ways OST programs can positively affect girls' views of themselves in science.

The researchers, engineers, chemists, and astrophysicists of the future are showing up in OST programs every day. As a field, we may need to do things differently to help girls develop STEM identities and to inspire them not only toward STEM pathways, but toward STEM leadership. As Wellesley's values statement says, "There is a growing recognition that women's empowerment and leadership are crucial to their own advancement and to worldwide societal change."[3]

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1 http://www.internationalwomensday.com
2 Beede, D., Julian, T., Langdon, D., McKittrick, G., Khan, B., & Doms, M. (2011). *Women in STEM: A gender gap to innovation*. ESA 04-11. Washington, DC: Economics and Statistics Administration, U.S. Department of Commerce.
3 http://www.wellesley.edu/about/missionandvalues

"I Could See Myself as a Scientist"

The Potential of Out-of-School Time Programs to Influence Girls' Identities in Science

Kelly Riedinger and Amy Taylor

"The activity where we collected organisms was a good influence 'cause I could see myself as a scientist. I got to do the actual thing." These words from Celeste, a girl who participated in the Coastal Ecology program at the Chincoteague Bay Field Station on the Eastern Shore of Virginia, are not unique. Other girls who participated in the program offered similar input, suggesting that engaging in science in this out-of-school time (OST) setting enhanced their identity and sense of self as learners of science.

OST programs like the Coastal Ecology science camp can positively influence science identities, particularly for youth from groups historically underserved and underrepresented in science, technology, engineering, and math (STEM). OST STEM programming gives youth opportunities to learn science outside the formal classroom in such settings as afterschool programs, science camps, outreach programs, internships, and scouting. OST science programs often do not formally assess participants or assign grades. They provide opportunities for authentic, meaningful learning that may be more comfortable for some youth than school curricula (National Research Council, 2009; Rennie, 2007, 2014). Further, OST programs may give youth access to resources and to scientific practices and tools not typically available in classrooms (Luehmann, 2009). This access may be especially important for youth from underresourced schools.

Many programs allow youth to explore science in ways that support their identities. Our study explored how the Coastal Ecology science camp helped participants, specifically girls, develop science identities. We

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also studied how the girls' social interactions supported their identities as learners of science.

Underrepresentation in STEM

The historical underrepresentation of women, people of color, and persons with disabilities in STEM has not abated. A recent report published by the National Science Foundation (2013) suggested that, although more girls and people of color are taking science courses and pursuing degrees and careers in areas such as life sciences, notable discrepancies persist, particularly in physics, chemistry, and engineering. White males still dominate the science and engineering workforce; women of color constitute only about one in ten employed scientists and engineers (National Science Foundation, 2013). The statistics are similarly problematic for persons with disabilities; individuals whose disability occurred between birth and 29 years of age comprise only about 10 percent of scientists and engineers.

Although policies have been put in place to address these gaps, they have had minimal effect on the participation of girls and women, particularly those from nondominant backgrounds. This continuing gap has been attributed to many factors: girls' perception that science is masculine, science instruction that does not align with girls' interests, the persistence of historical stereotypes of who can do science, girls' lack of access to support in science, and a lack of role models and mentors (Archer et al., 2012; McCreedy & Dierking, 2013).

The inequalities in STEM fields may contribute to girls' perceptions of who does science and to their own views of themselves as science insiders or outsiders. In order to participate in science, a girl has to see herself as the type of person who knows about, uses, and sometimes contributes to science. Archer and colleagues (2012) contend that "the development and cultivation of science aspirations requires girls to engage in considerable identity work" (p. 982).

OST programs that seek to provide motivating and memorable experiences in science may be one way to address the underrepresentation of women, people of color, and people with disabilities in science. Tan, Barton,

> In order to participate in science, a girl has to see herself as the type of person who knows about, uses, and sometimes contributes to science. Archer and colleagues (2012) contend that "the development and cultivation of science aspirations requires girls to engage in considerable identity work" (p. 982).

Kang, and O'Neill (2013) argue that "while decades have been spent addressing the academic achievement gap between girls and boys, very little time has been spent addressing the "*science identity gap*" (p. 1144). Building strong identities in science among girls may influence their interest in and motivation to pursue science, their self-efficacy and confidence in science, and their ability to persist when presented with challenges. OST programs that develop positive identities may be particularly relevant during adolescence, a significant period of identity formation (Osborne & Dillon, 2008) during which youth make critical course choices that affect their later careers (Adams, Gupta, & Cotumaccio, 2014; Barton, Birmingham, Sato, Tan, & Barton, 2013).

Identity Development and OST Science Learning

Identity is a reflexive process; it is both how individuals view themselves—their sense of self—and how they are perceived by others. Identity development is an ongoing process that is influenced by experiences across settings as well as by everyday moments (Bricker & Bell, 2014).

Earlier studies have suggested that participation in OST science learning results in a number of identity-related outcomes, such as broadening youths' views of science and what counts as science (Gonsalves, Rahm, & Carvalho, 2013; Wheaton & Ash, 2008). After participating in OST science programs, youth demonstrated more positive attitudes toward and interest in science (Bhattacharyya, Mead, & Nathaniel, 2011; Farland-Smith, 2010; Riedinger, 2011, 2015) and exhibited greater confidence in their science skills (Bhattacharyya et al., 2011; Riedinger, 2011, 2015; Tan et al., 2013). OST science programs have also been demonstrated to influence youths' career choices (Bhattacharyya et al., 2011; Farland-Smith, 2012). An OST science camp program for African-American high school students in Louisiana was shown to positively influence participants' attitudes toward science careers (Bhattacharyya et al., 2011).

Coastal Ecology Science Camp

Coastal Ecology is an OST science camp offered at the Chincoteague Bay Field Station. The field station is also a marine science learning center that provides multidis-

ciplinary education and research opportunities. It uses as its classroom the bays, marshes, beaches, maritime forests, dunes, and offshore waters of the coastal areas surrounding Chincoteague Bay.

Coastal Ecology is a four-day residential science camp in which youth engage in field-based, hands-on science activities designed to mirror the research practices of professional marine scientists, ecologists, and oceanographers. Most youth participate in Coastal Ecology with their school or scout group, accompanied by their classroom teacher or scout leader and adult chaperones. Typical science activities include research cruises, lectures, laboratory activities, and organism collection and maintenance. Youth also participate in leisure activities intended to create a sense of community. During our study, the science camp instructors were predominately women; they were experienced educators with STEM degrees.

Influence of the Science Camp on Girls' Science Identities

To explore how girls developed science identities in the Coastal Ecology program, and specifically how their social interactions supported their identity development, we used a collective case study approach. During the summers of 2011 and 2013, we collected data from five school and scout groups who visited the Chincoteague Bay Field Station to participate in Coastal Ecology. With each group, we videotaped observations of all science camp activities, conducted pre- and post-camp focus group interviews with youth participants and their teachers or chaperones, and collected youths' responses to daily reflective journal prompts. For example, one prompt asked youth to reflect on the day's activities and consider how the experience influenced how they thought about themselves in science.

The 12 girls included as cases in this study were all in middle school. This article highlights responses from six of the girls: Addison, Gabriella, and Gretchen, white seventh graders; Brynn and Hannah, white eighth graders; and Celeste, an African-American seventh grader. The collective case study approach enabled us to identify similarities across cases while noting differences. This process guided us in identifying themes and drawing conclusions.

> The field station is also a marine science learning center that provides multidisciplinary education and research opportunities. It uses as its classroom the bays, marshes, beaches, maritime forests, dunes, and offshore waters of the coastal areas surrounding Chincoteague Bay.

Our exploration of girls' participation in the Coastal Ecology science camp provided evidence that an OST program can offer positive experiences that help girls to see themselves in science. The themes that emerged from our study reveal characteristics of the Coastal Ecology program that positively influenced girls' science identities:
- Authentic opportunities for active learning
- Novel learning experiences in the outdoors
- A comfortable and personally meaningful setting
- Use of multiple types of language
- Opportunities for social interaction

These characteristics both support and extend findings from earlier studies. The social interactions in which girls engaged at the OST science camp enabled the girls not only to develop a shared understanding of the science content but also to negotiate aspects of their identities, author new identities, and have others recognize these identities.

Authentic Opportunities for Active Learning

Celeste, whom we quoted at the beginning of this article, developed her identity in science through active engagement in learning that mirrored the practices of scientists. Celeste was a student at a rural public school in the mid-Atlantic. Before she came to the science camp, Celeste's identity as a learner of science was largely framed by the rules and norms of school science. During the pre-camp focus group, she said that her teachers and peers saw her as "a good worker in science." She explained that she was good in science because she "took a lot of notes," but she also noted that some topics in science made her "sorta lose my interest."

The OST science camp gave Celeste opportunities to engage actively in organism collection, which she believed was the work of scientists. Her participation in these authentic activities enabled Celeste to "see myself as a scientist." Her case illustrates how participating in authentic science activities can prompt youth to re-envision themselves in science, thereby positively influencing their identities.

Novel Learning Experiences in the Outdoors

Another theme that emerged in our data was that learning in new ways and in a novel setting, the outdoors, influenced the girls' identities. Hannah particularly noted this aspect of the science camp program. She felt that the science camp helped her to be more assertive and "take risks." She explained:

> It's just so much fun being away from school and somewhere new, not having everybody in the classroom around you in the outdoors.... It's just amazing to learn the things you never would have before, about the ocean, the tides, and plankton.

The science camp introduced Hannah to novel topics that she had not yet learned in school.

The novelty of the setting also influenced Hannah's views of science. One of the program's field experiences was a trip to an undisturbed dune ecosystem located on a military base to which the general public does not have access. The fact that the girls got to visit a place that they could not otherwise have experienced was exciting to Hannah.

> … my favorite part was going on the private beach and collecting the shells. We combed the part of the beach. But that was one of my most favorite parts 'cause it was basically untouched, and we'll never get to go back there again. And that was just so amazing.

These novel experiences helped Hannah to view science as "fun": "I didn't even realize I was learning." She said, "This experience really changed my perspective of the science field."

Comfortable and Personally Meaningful Setting

Another theme that emerged from our data was that the opportunity to learn science in a comfortable and personally meaningful way positively influenced the girls' identities. Gretchen, who identified as being on the autism spectrum, particularly benefited from this aspect of the program. In school, Gretchen explained, her teachers would see her as "inattentive" because she did not look at them during instruction. She commented, "I don't necessarily need to look at them to know, to learn stuff." Her mother, who attended the OST science camp as a chaperone, added that Gretchen often struggled with interactions in the classroom. Though she had an inclination toward science coupled with a strong interest in animals, Gretchen

These novel experiences helped Hannah to view science as "fun": "I didn't even realize I was learning." She said, "This experience really changed my perspective of the science field."

feared that her teachers and peers would judge her.

After the Coastal Ecology program, both Gretchen and her mother noted that Gretchen felt "safer" at the OST science camp. Her mother commented, "This is nice here, because I don't think she fears that anybody is going to be like, 'No, Gretchen, that's stupid.' … I don't think she was as intimidated as she sometimes is with kids in a classroom situation."

The OST science camp program also gave Gretchen many opportunities to work with animals in ways that were personally meaningful to her and that aligned with her interests. Gretchen explained that she enjoyed collecting and learning about organisms: "I liked doing the stuff out in the field better than just sitting in a boring old classroom all day, just sitting and writing." According to Gretchen's mother, the science camp was "more her thing"; Gretchen enjoyed interacting with animals because "the animals aren't going to criticize her, so she's more receptive to them, and she doesn't fear them at all…. She relates to animals better than she does people." For Gretchen, the OST science camp offered a space for learning science where she felt comfortable. The program also aligned with her interests, specifically her love of animals. Through this experience, she came to see herself as a capable science learner, in contrast to her experiences at school.

Use of Multiple Types of Language

The fact that use of multiple types of language was encouraged at the OST science camp appeared to influence aspects of the girls' identities. The types of language we observed included the academic language common in the classroom, the scientific discourse that is the norm in scientific fields, and the everyday language of the youth. Participants in the science camp were encouraged to use everyday language to make sense of scientific terminology. In turn, their growing ability to understand scientific terminology and use it appropriately encouraged the girls to see themselves as capable science learners. Further, in appropriating scientific discourse, they began to align their talk with that of scientists—another important component of their identities in science.

Brynn was described by her classroom teacher during the pre-camp interview as "goofy." The teacher said that Brynn sometimes engaged in science, but only if nothing

more exciting caught her attention. When Brynn thought a science task was too challenging, she disengaged and relied on her peers to complete the task. Brynn echoed these characterizations of her identity before the program, saying, "Science is not my overall strength."

During the science camp, we saw Brynn using everyday language to make sense of scientific concepts. After observing a plankton under a microscope, Brynn described her observation: "I saw the thing on the sides hang out to the sides." She accompanied her words with hand motions demonstrating how "the thing[s] on the sides" waved back and forth. Jocelyn, the field station instructor, recognized and encouraged Brynn's use of gestures and everyday language. Copying Brynn's gesture, she explained that the things Brynn observed in the microscope are called "cilia." Using this new knowledge, Brynn correctly—and excitedly—identified the plankton as "an Atlantic crab!" She then described her observation using the correct scientific terms, "plankton" and "cilia." Jocelyn's support for Brynn's use of everyday language and gestures helped Brynn understand and appropriately use scientific terminology. Brynn's excitement at identifying the plankton illustrates how experiences of success can influence girls' science identities—in contrast with Brynn's pre-camp comment that science was not her "overall strength."

Opportunities for Social Interaction

A second aim of our study was to understand how social interactions during the OST science camp offered a space for the girls to engage in identity work. Verbal and nonverbal communication in OST settings can help youth to develop a shared understanding of science content while also learning about the members of their group. As identity development is a reflexive process, we were interested in how social interactions enabled the girls to negotiate their identities, author new identities (that is, see themselves in new ways), and have these identities recognized and accepted by other youth in their social group. Our iterative analysis of social interactions in the science camp showed that the girls used social interactions both to position themselves relative to others in their social group and to align their behavior with scientific practices and discourse.

Positioning refers to the ways that youth present themselves as science insiders and how they view themselves in relation to other group members. For instance, Brynn po-

sitioned herself as a scientist during one of the organism identification tasks. Offered the opportunity to hold a hermit crab, the other girls refused, indicating that they were scared of the crab or found it "gross." Brynn, in contrast, indicated through her social interactions that she is the type of person who is not afraid of organisms and is willing to touch a hermit crab.

> **Paula:** Look at it, look at it. Oh my god. [Raises her hands and turns away.] That is the grossest thing I have ever witnessed. [Brynn pulls out the hermit crab. Paula flips her hair over her face and covers her eyes with her hands.] *Oh no! No!*
>
> **Brynn:** *It's just a hermit crab!* It's not going to eat you. [She holds up the crab for others to see.]
>
> **Paula:** Oh my god. [Gets up and stands away from the crab.]

Brynn used both verbal and nonverbal interactions to position herself as the type of person who is interested in organisms and willing to interact with them as a scientist might. In contrast to other youth in her social group, Brynn made what appears to be a strategic decision to hold the crab that others found "gross." This identity move was recognized by her classroom teacher as well as the other members of her group. The teacher commented, "Brynn used to be afraid of this, and now she's comfortable." Similarly, the other girls asked Brynn to hold the crab for them to see, thereby recognizing her positioning of herself as someone who acts like a scientist. These exchanges were important in Brynn's development of her identity as a science learner.

Girls at the science camp also used social interactions to enact identities as science learners by aligning their behaviors with scientific practice and discourse. For example, during the field trip to the intertidal ecosystem, the youth collected and analyzed data such as pH and temperature. Across the groups we observed, youth used scientific discourse; for example, they would say that they had to "complete three trials" in testing the water samples. During the research cruise, when the group was measuring water quality data, Addison and Gabriella used such scientific terminology as "Celsius," "creosol read," "refractometer," "dissolved

> Participants in the science camp were encouraged to use everyday language to make sense of scientific terminology. In turn, their growing ability to understand scientific terminology and use it appropriately encouraged the girls to see themselves as capable science learners.

oxygen," and "density." They were using social interactions to convey their identity as science insiders.

Encouraging Girls in Science Through a Focus on Identity

Our exploration of girls in the Coastal Ecology program provided evidence that OST programs can offer positive experiences to help girls see themselves in science. Throughout the science camp, the girls were working in the field as scientists, engaging in authentic science practices and using the actual tools of scientists. These opportunities helped the girls to see themselves as scientists and fostered positive science identities.

These positive experiences address the factors identified in the research as limiting girls' identification with science. For instance, our findings provided evidence that such experiences as field trips and organism collection aligned with girls' interests. Moreover, being able to learn science by collecting and maintaining organisms may have challenged the girls' perception that science is a masculine pursuit. The science camp also offered female science educators from diverse racial and ethnic backgrounds as role models and mentors. Further, the Chincoteague Bay Field Station is an active science research lab; the girls could see and interact with practicing scientists, including many female scientists. These experiences helped to challenge stereotypes of who does science.

Because identity work is an ongoing process that develops over time and across contexts, OST programs have the potential to positively affect girls' views of themselves in science. As McCreedy and Dierking (2013) note:

> [L]earning is the process and product of a series of cascading influences. Ideally, informal STEM learning experiences for girls, along with experiences they have at home, school, university, and the work place, build upon one another, as well as connect to and reinforce the countless other experiences in a woman's lifetime. (p. 3)

They go on to claim that, "informal STEM programs can give rise to memorable experiences that cascade over time" and that affect women in many ways (p. 3).

Based on our findings, we advocate for strategically designing OST science learning programs to nurture girls' science identities, connecting to and building on other life experiences. Specifically, OST science programs should be designed to:

1. Solicit girls' input in designing curricula and activities to ensure that they are personally meaningful, relevant, and aligned with girls' interests.
2. Provide a comfortable and safe learning environment where girls can try new things, consider themselves in new ways, and build confidence in themselves as capable science learners.
3. Offer opportunities for girls to share their expertise and to have ownership of their learning tasks. Such opportunities will help girls visualize themselves as people who have something to share with others and point out that all participants are valued for the knowledge they bring to the group.
4. Encourage and support girls' use of multiple types of language, including the everyday language and dialects with which they are familiar.
5. Include opportunities for active learning and authentic tasks that mirror the activities of scientists.
6. Foster social interactions in which girls can engage with others. Our study suggests that, through these social interactions, the girls were able to negotiate and author new identities and to have those identities recognized by others.

Following these data-driven design principles can enable OST programs to give girls ongoing opportunities to engage in science identity work. The Coastal Ecology program is aligned with many of these ideas; it provided the girls in our study, some of whom came from nondominant backgrounds, with positive identity-building experiences. Building on these principles, OST programs can continue to provide memorable science learning experiences for girls.

References

Adams, J. D., Gupta, P., & Cotumaccio, A. (2014). Long-term participants: A museum program enhances girls' STEM interest, motivation, and persistence. *Afterschool Matters, 20,* 13–20.

Archer, L., DeWitt, J., Osborne, J., Dillon, J., Willis, B., & Wong, B. (2012). "Balancing acts": Elementary school girls' negotiations of femininity, achievement, and science. *Science Education, 96,* 967–989.

Barton, A. C., Birmingham, D., Sato, T., Tan, E., & Barton, S. C. (2013). Youth as community science experts in green energy technology. *Afterschool Matters, 18,* 25–32.

Bhattacharyya, S., Mead, T. P., & Nathaniel, R. (2011). The influence of science summer camp on African-

American high school students' career choices. *School Science and Mathematics, 111*(7), 345–353.

Bricker, L. A., & Bell, P. (2014). "What comes to mind when you think of science? The perfumery!": Documenting science-related cultural learning pathways across contexts and timescales. *Journal of Research in Science Teaching, 51*(3), 260–285.

Farland-Smith, D. (2010). Exploring middle school girls' science identities: Examining attitudes and perceptions of scientists when working "side-by-side" with scientists. *School Science and Mathematics, 109*(7), 415–427.

Farland-Smith, D. (2012). Personal and social interactions between young girls and scientists: Examining critical aspects for identity construction. *Journal of Science Teacher Education, 23*(1), 1–18.

Gonsalves, A., Rahm, J., & Carvalho, A. (2013). "We could think of things that could be science": Girls' refiguring of science in an out-of-school-time club. *Journal of Research in Science Teaching, 50*(9), 1068–1097.

Luehmann, A. L. (2009). Students' perspectives of a science enrichment programme: Out-of-school inquiry as access. *International Journal of Science Education, 31*(13), 1831–1855.

McCreedy, D., & Dierking, L. D. (2013). *Cascading influences: Long-term impacts of informal STEM experiences for girls.* Philadelphia, PA: Franklin Institute.

National Research Council. (2009). *Learning science in informal environments: People, places, and pursuits.* Washington, DC: National Academies Press.

National Science Foundation. (2013). *Women, minorities, and persons with disabilities in science and engineering: 2013.* Washington, DC: Author.

Osborne, J., & Dillon, J. (2008). *Science education in Europe: Critical reflections.* London, UK: Nuffield Foundation.

Rennie, L. J. (2007). Learning science outside of school. In S. K. Abell & N. G. Lederman (Eds.), *Handbook of research on science education* (pp. 125–167). Mahwah, NJ: Lawrence Erlbaum.

Rennie, L. J. (2014). Learning science outside of school. In N. G. Lederman & S. K. Abell (Eds.), *Handbook of research on science education, volume II* (pp. 120–144). New York, NY: Routledge.

Riedinger, K. (2011). *Identity development of middle school students as learners of science at an informal science education camp* [Unpublished doctoral dissertation]. University of Maryland, College Park.

Riedinger, K. (2015). Identity development of youth during participation at an informal science education camp. *International Journal of Environmental & Science Education, 10*(3), 453–475.

Tan, E., Barton, A. C., Kang, H., & O'Neill, T. (2013). Desiring a career in STEM-related fields: How middle school girls articulate and negotiate identities-in-practice in science. *Journal of Research in Science Teaching, 50*(10), 1143–1179.

Wheaton, M., & Ash, D. (2008). Exploring middle school girls' ideas about science at a bilingual marine science camp. *Journal of Museum Education, 33*(2), 131–141.
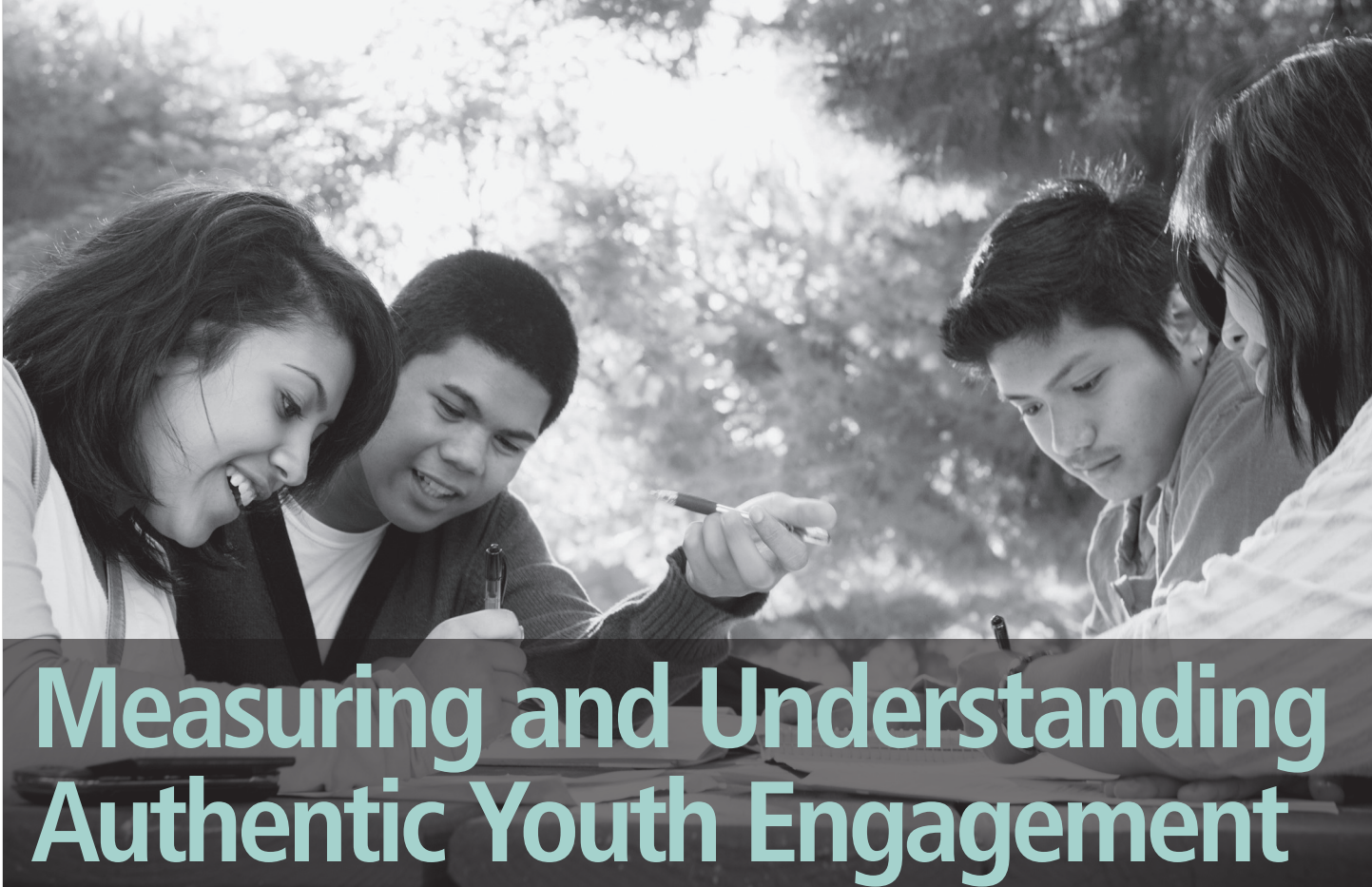
Measuring and Understanding Authentic Youth Engagement

The Youth-Adult Partnership Rubric

Heng-Chieh Jamie Wu, Mariah Kornbluh, John Weiss, and Lori Roddy

Commonly described as *youth-led* or *youth-driven*, the youth-adult partnership (Y-AP) model has gained increasing popularity in out-of-school time (OST) programs in the past two decades (Larson, Walker, & Pearce, 2005; Zeldin, Christens, & Powers, 2013). The Y-AP model is defined as "the practice of (a) multiple youth and multiple adults deliberating and acting together (b) in a collective (democratic) fashion (c) over a sustained period of time (d) through shared work (e) intended to promote social justice, strengthen an organization and/or affirmatively address a community issue" (Zeldin et al., 2013, p. 388). Unlike traditional OST programs, in which youth are viewed as service recipients, the Y-AP model emphasizes that youth serve in meaningful leadership roles in the organization or program. Studies show that programs using a Y-AP model have offered youth such diverse and meaningful roles as being youth council members, activity leaders, or program representatives in community events (Zeldin, Camino, & Mook, 2005). Research has also found that these experiences facilitate the development of

youth autonomy (Akiva, Cortina, & Smith, 2014), which is a critical developmental need for adolescence. These leadership roles also contribute to youths' empowerment and civic engagement, develop social-emotional skills,

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and bring about positive changes in communities (Akiva et al., 2014; Ferguson, Kim, & McCoy, 2011; Larson & Angus, 2011; Wong, Zimmerman, & Parker, 2010; Youniss & Levine, 2009).

Although the concept of Y-AP has been well received, implementing it without clear guidelines can be challenging. Zeldin and colleagues (2013) reviewed Y-AP practices in community settings (Camino, 2005; Larson & Angus, 2011; Van Egeren, Wu, & Kornbluh, 2012) and connected its roots to developmental theories such as Dewey's (1938) experiential learning, Erikson's (1968) identity development in adolescence, Bronfenbrenner's (1995) ecological human development,

> In their definition, the Y-AP model consists of four critical elements: (a) authentic decision making, (b) natural mentors, (c) reciprocal activity, and (d) community connectedness
> (Zeldin et al., 2013).

and Li and Julian's (2012) work in developmental relationships. They then put forth a theoretical framework to define and operationalize Y-AP. In their definition, the Y-AP model consists of four critical elements: (a) authentic decision making, (b) natural mentors, (c) reciprocal activity, and (d) community connectedness (Zeldin et al., 2013). This theoretical framework provides an invaluable starting point for elaborating and concretizing the concept of Y-AP and highlighting essential guidelines.

Program quality and fidelity in implementation ensure that youth receive the intended benefits of program participation. To achieve quality and fidelity, various organizations have developed youth program quality assessments; see Yohalem, Wilson-Ahlstrom, Fischer, and Shinn (2009) for a summary of the available tools. These measures tap some aspects of Y-AP, such as youth leadership, relationships, staffing, and community linkages; however, no single tool, until now, captured the full complement of Y-AP core elements. Furthermore, most current assessments of Y-AP underlying constructs rely on self-reports from staff or youth surveys (Jones & Perkins, 2005; Zeldin, Krauss, Collura, Lucchesi, & Sulaiman, 2014). The lack of a Y-AP assessment tool hinders quality assurance, professional development, and documentation of empirical evidence on Y-AP impacts (Zeldin et al., 2013). We therefore developed a rubric for observing and assessing Y-AP quality, using the theoretical framework of Zeldin and colleagues (2013). We hope that this rubric will help promote Y-AP standards, program fidelity and assessment, and professional development of youth workers.

Development of the Y-AP Rubric

With support from an Edmund A. Stanley, Jr., research grant from the Robert Bowne Foundation, in spring 2014, this article's authors—researchers from Michigan State University's (MSU) Office of University Outreach and Engagement and directors from the Neutral Zone, a community-based center—formed a project team to co-develop the rubric. The Neutral Zone is a nonprofit organization serving teens in Ann Arbor, Michigan. Established in 1998, it is known for its youth-driven model: Youth take leadership roles in all levels of the organization. The center also disseminates youth-driven practice by training and coaching staff from other organizations.

To develop the Y-AP rubric, we built on a sustained researcher-practitioner partnership established in a previous project on disseminating youth-driven practices (Van Egeren, Wu, Rana et al., 2012). We developed an initial observation rubric based on the Y-AP literature and our years of experience. Building on the theoretical framework of Zeldin and colleagues (2013), we divided the rubric into four categories of Y-AP work:

1. Authentic decision making
2. Natural mentors
3. Reciprocity
4. Community connectedness

The rubric divides program content into two categories: meetings and activities. Each has distinguishable behavioral markers.

Following standard principles for developing measurement tools in general (Kline, 2005; Pedhazur & Schmelkin, 1991) and observation rubrics in particular (Newell, Dahm, & Newell, 2002), we established rating scales from 1 (low) to 5 (high), with specific descriptions for scores 1, 3, and 5 and additional scores of 2 or 4 when observed criteria fell between the described scores. We also provided an option of "N/A" for items that are not applicable in a given program.

After developing an initial draft, the two researchers from MSU conducted two pilot observations at Neutral Zone programs, in which we achieved satisfying consensus on initial revisions. To test the applicability of the rubric in diverse contexts, the same researchers then observed 10 Neutral Zone programs, which varied in youth demographics, program activities, and focus, in March–April 2014. As shown in Table 1, the programs varied

Table 1. Observation Sample

Type	Program Theme	Adult: Youth Ratio
Activity	Hip-hop writing, recording, and rhymes	2:7
Meeting	Teen advisory council	2:12
Activity	Music event planning	1:3
Activity	Music recording studio	1:2
Meeting	Community event planning	3:10
Meeting	Leadership	1:6
Activity	Art production	1:10
Meeting	Diversity training	1:4
Meeting	Girls' empowerment group	1:4
Meeting	Organization board meeting	15:4

greatly, ranging from activities such as music production, visual arts, and leadership training to organizing meetings. Table 1 also lists the number of youth and adults in each observed program. The racial composition of the youth and adults largely represented the Neutral Zone's population: about half white and half people of color.

All 10 observations were conducted by the two researchers from MSU. After each observation, the observers met to discuss the ratings, reflect on whether each item in the rubric could be applied, and determine whether the rubric needed modification. We also used these observations to provide examples and suggest specific user instructions in the rubric guidelines. Following these procedures, the rubric items underwent several rounds of revision. After we had conducted observations in half of the programs, the rubric had achieved strong fidelity in capturing the Y-AP elements in various program contexts. No further revisions were needed in the remaining five observations. In this process, we had accumulated a shared knowledge of the rating scales that established inter-rater reliability, as demonstrated by a high level of rating agreement and satisfying Cohen's kappa scores.[1]

Because the goal of the project was to establish a meaningful rubric that captures the concepts and practices of Y-AP, the whole project team then held a focus group with seven Neutral Zone staff and two youth to ensure the content validity of the rubric. These participants, who had extensive experience with the Y-AP approach, provided feedback on the wording, examples, and concepts of the rubric items. After incorporating this feedback, we finalized the rubric.

As the rubric was intended to be a suitable tool for peer or self-assessment and data collection by youth workers, administrators, and evaluators, its format went through a series of technical modifications and passed the user-friendly and accessibility tests required by MSU policy. The interactive form of the rubric allows easy data entry and automatic calculation of dimension scores. Users can also save and erase entries with easy-to-use buttons. The rubric was officially launched in November 2014 as a freely available resource at http://cerc.msu.edu/yaprubric. We have since used the rubric in several staff development workshops and disseminated it through professional networks such as the Michigan After-School Partnership newsletter, the Michigan Afterschool Collaborative Conference, and Wisconsin Cooperative Extension.

Based on extensive field notes and actual implementation of the rubric, we set the following appropriate context for the use of rubric: "Any settings that involve multiple youth and adult(s) working together with extensive dialogue for a common goal" (Wu, Weiss, Kornbluh, & Roddy, 2014). These settings could be school programs, afterschool programs, camps, or other programs in which youth and adults interact.

Elements of the Y-AP Rubric

Each of the four dimensions of the Y-AP rubric has a number of specific items for observers to rate, as shown on the next page and described on the following pages. The observation rubric provides details of behaviors that embody each rating and gives examples.

Dimension 1: Authentic Decision Making
Definition: Youth are involved in meaningful decision making.

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1 Average Cohen's kappa was .84 for authentic decision making (five items), .88 for natural mentors (eight items), .80 for reciprocity (four items), and .86 for community connectedness (three items).

Youth-Adult Partnership Rubric

	AVERAGE	
Dimension 1: Authentic Decision Making—Youth are involved in meaningful decision making	**AVERAGE**	
1.1 Youths' voices are shared and valued.		
1.2 Youth participate in authentic decision making.		
1.3 Youth have key leadership roles or responsibilities.		
1.4 All youth fully participate in the conversation.		
1.5 The organization's culture or by-laws supports youth governance.		
Dimension 2: Natural Mentors—Adults intentionally support relationships with youth to help them develop	**AVERAGE**	
2.1 Adults support youth with appropriate boundaries.		
2.2 Adults are intentional in utilizing tasks to enhance youths' experiences and skills.		
2.3 Adults are able to work with youth to maintain an organized, inclusive, and collaborative environment for all.		
2.4 Adults are resourceful and intentional in enhancing youths' social capital.		
2.5 Adults are active listeners; youth reflect and develop own ideas.		
2.6 Adults help youth think through the complexity of issues and respect whatever conclusions they reach.		
2.7 Adults help youth think about goals and possibilities for the future and identify steps to achieve them.		
2.8 Adults celebrate youths' progress, strengths, and successes.		
Dimension 3: Reciprocity—Youth and adults work together as partners	**AVERAGE**	
3.1 Youth and adults create a mutual agenda.		
3.2 Youth and adults exchange ideas as supportive peers.		
3.3 Youth and adults work collaboratively as supportive peers.		
3.4 Youth and adults are co-learning partners.		
Dimension 4: Community Connectedness—Youth are engaged in communities	**AVERAGE**	
4.1 Youth develop a sense of community through program involvement.		
4.2 Youth are active contributors to the community.		
4.3 Youth gain essential social capital through program involvement.		
Total: The average of four dimension scores	**%**	

Zeldin and colleagues (2013) note that youth voice is not simply about young people expressing themselves or sharing their views. Rather, in Y-AP settings, adults recognize young people as valuable producers of knowledge, and youth are actively involved in decisions that affect their lives. This dimension's five items assess the extent to which youth participants are involved in high-stakes decisions in their program or organization.

1.1 Youths' voices are shared and valued. For this item, the highest level (5) means that youth bring in new perspectives and their inputs are valued. The lowest level (1) refers to scenarios in which adults largely lead conversations, assign tasks to youth, tell youth what to do, or heavily rely on what has been done in the past without encouraging youth to bring in new perspectives (Lenzi et al., 2014). In practice, we have found that techniques such as imposing "NATT" ("no adult talk time") for parts of a meeting are helpful in encouraging youth voice.

1.2 Youth participate in authentic decision making. One effective way to examine the level of youth involvement in decision making is to look at how decisions actually are made. In most programs, decisions have already been made for youth (level 1), or youth are allowed to make decisions on low-stake items such as the food they want to order (level 3). Having youth participate in decisions in high-stake areas by, for example, serving on a hiring committee or developing strategic plans for the organization in partnership with adults (level 5) requires adults' intentional support and youths' willingness.

1.3 Youth have key leadership roles or responsibilities. At level 1 on this item, youth have no specific roles other than being participants. At level 3, they may take on low-stake leadership roles such as leading icebreakers or taking meeting notes. At level 5, youth serve as meeting facilitators. In activities, they may lead conversations, give demonstrations, or co-teach with adults. They are also given higher-stake tasks like meeting with community partners to set up events. Giving youth key leadership roles often requires pre-meetings between the youth leaders and adult advisors in order to properly prepare youth for their responsibilities.

> Zeldin and colleagues (2013) note that youth voice is not simply about young people expressing themselves or sharing their views.

1.4 All youth participate fully in the conversation. Youth vary in the degree to which they are vocal; some want to dominate the conversation, while others tend to be more quiet and reflective. Sometimes adults are not aware of such inequalities or don't take action to balance them out (level 1); at other times, they try to balance contributions but cannot (level 3). To encourage full participation from all youth, adult staff ought to be intentional and strategic in ensuring that everyone can participate (level 5).

1.5 The organization's culture or bylaws support youth governance. In traditional settings, youth often have no explicit role beyond being participants (level 1), or they may lead specific activities though nothing is written or formalized (level 3). Our experience and the research (Van Egeren, Wu, & Kornbluh, 2012; Zeldin et al., 2005) both indicate that sustaining high-stake youth voice depends on whether youth governance is supported by the organization's bylaws and culture (level 5).

Dimension 2: Natural Mentors

Definition: Adults intentionally support relationships with youth to help them develop as leaders.

Y-AP requires high-quality adult mentorships, in which adults intentionally and strategically develop strong, supportive relationships with youth and purposively scaffold youths' development as leaders (Zeldin et al., 2013). The rubric highlights eight aspects of adults' roles as natural mentors to youth.

2.1 Adults support youth with appropriate boundaries. Most adult staff have a genuine desire to help youth, but supporting them with appropriate boundaries can be difficult (Avolio & Gardner, 2005). Facing youths' diverse needs, adults are sometimes too overwhelmed to provide sufficient support (level 1), or they may overreact or overreach themselves to solve problems instead of supporting youth from behind (level 3). Supporting youth with appropriate boundaries means that youth feel heard, are able to make and act on their own decisions, and know where to find resources to further support their goals (level 5).

2.2 Adults are intentional in utilizing tasks to enhance youths' experiences and skills. Youth need hands-on experiences in order to grow. At level 1 on

this item, adults do not intentionally encourage youth to take on challenging tasks that enable them to build new skills or networks. At level 3, adults are intentional in this area but fail to provide enough support to enhance youths' experiences and skills. An example of the highest level of using tasks to enhance youths' growth would be encouraging youth to facilitate a focus group instead of just recruiting participants. The adults would need to help youth practice their facilitation skills, identify focus group questions, and decide on strategies for navigating potential pitfalls.

2.3 Adults are able to work with youth to maintain an organized, inclusive, and collaborative environment for all. This rubric item examines the quality of the meeting or activity context. When the context is constantly chaotic, disorganized, or dysfunctional (level 1), or when things go off track periodically (level 3), youth face challenges in learning and collaborating. Adults and youth need to work together to ensure an organized, inclusive, and collaborative environment for all (level 5) so they can focus on reaching their goals (Zeldin et al., 2005).

2.4 Adults are resourceful and intentional in enhancing youths' social capital. Successful mentors bring in resources to benefit youth. Some adults do not think about how their resources can benefit youth (level 1); others may be aware but not take action (level 3). Mentors at level 5 take intentional steps to help youth extend their networks, such as inviting community leaders to program events (Larson & Angus, 2011).

> Y-AP requires high-quality adult mentorships, in which adults intentionally and strategically develop strong, supportive relationships with youth and purposively scaffold youths' development as leaders.

2.5 Adults are active listeners; youth reflect and develop own ideas. Because adults are used to leading groups, they often do most of the talking (level 1) or ask youth to talk but eventually take over the discussion (level 3). At level 5 for this item, adults intentionally step back, encouraging youth to reflect on issues and develop their own ideas (Larson et al., 2005).

2.6 Adults help youth think through the complexity of issues and respect whatever conclusions they reach. The issues youth face today can be complex and

multifaceted. In strong Y-AP settings (level 5), adults guide youth to navigate the complexities without making decisions for them. Adults instill confidence in youth and support the conclusions they reach. If youth fail, adults will be there to help them reflect on and grow from the experience (Larson & Hansen, 2005). Some adults find this role difficult to uphold, so they bounce between letting go and inserting their opinions (level 3); others may analyze everything and ask youth to follow their advice (level 1). Even with good intentions, adults at these lower levels can hinder opportunities for youth to learn how to make and be responsible for their own decisions.

2.7 Adults help youth think about goals and possibilities for the future and identify steps to achieve them. Another aspect of quality mentorship is helping youth envision their future and take steps to achieve their goals (level 5). This support is especially important to enable vulnerable youth to develop life skills and resilience (Avolio & Gardner, 2005). At level 1, adults dismiss opportunities for youth to envision their goals; at level 3, adults don't help youth identify steps to achieve their goals.

2.8 Adults celebrate youths' progress, strengths, and successes. Although reflecting on mistakes can help youth improve, adults often forget to recognize the strengths youth have developed (level 1) or fail to structure time for youth to reflect on their progress (level 3). Giving youth the opportunity to reflect on and celebrate their own successes (level 5) can promote intrinsic feelings of accomplishment, increase self-confidence, and help develop the "grit" that sustains perseverance and passion for long-term goals (Duckworth, Peterson, Matthews, & Kelly, 2007; Jennings, Parra-Medina, Messias, McLoughlin, & Williams, 2006).

Dimension 3: Reciprocity

Definition: Youth and adults work together as partners.

Reciprocity is a critical aspect of partnerships. In the Y-AP model, learning is not unidirectional. Youth do learn from adults, but adults also learn from youth. The differences in perspectives and experiences between youth and adults can contribute to a richly collaborative

environment. The rubric highlights four aspects of reciprocity in a Y-AP setting.

3.1 Youth and adults create a mutual agenda. One simple way to look at reciprocity between youth and adults is to identify who creates the agenda. If meeting or activity agendas are largely created by adults (level 1) or involve minimal youth input (level 3), youth have little opportunity to develop leadership skills or partner with adults to design their own programs. By contrast, when youth share in setting the agenda or activity content (level 5), their partnership with adults is strengthened, and they are more prepared to facilitate meetings or lead authentically (Mitra, Serriere, & Kirshner, 2013).

3.2 Youth and adults exchange ideas as supportive peers. Another way to examine reciprocity is to observe how ideas are exchanged. If youth and adults rarely draw on one another's ideas (level 1), or if they don't really integrate their ideas together (level 3), their partnership remains underdeveloped. When youth and adults can seek one another's opinion comfortably and then build on these ideas (level 5), the whole program benefits from the different strengths each generation brings (Akiva et al., 2014).

3.3 Youth and adults work collaboratively as supportive peers. Observing how youth and adults work is another way to identify reciprocal relationships. If youth and adults tend to work separately (level 1), or if they work collaboratively only on occasion (level 3), then their partnership is still developing. High-quality Y-AP settings make no clear division between adult tasks and youth tasks; rather, youth and adults work collaboratively to achieve common goals (level 5).

3.4 Youth and adults are co-learning partners. At level 1 on this item, adults are like teachers or authoritarians; they are presumed to be more knowledgeable than youth and therefore responsible for answering questions. At level 3, youth may be encouraged to share some ideas or make specific contributions, yet social norms often dictate that adults know better and therefore are responsible for teaching youth. At level 5, everyone, including youth, can contribute to the knowledge base. Adults are not presumed to be more knowledgeable and are not re-

sponsible for answering questions. Youth and adults recognize their capacity to teach and learn from one another; they gain new perspectives and skills through their collaboration (Jennings et al., 2006; Wong et al., 2010).

Dimension 4: Community Connectedness
Definition: Youth are engaged in communities.

The last dimension of Y-AP encompasses community connectedness. Research stresses the importance of Y-AP working toward a larger collective goal (Checkoway & Richards-Schuster, 2006). Challenges that adults struggle to tackle often can more effectively be addressed when youth bring their perspectives (Zimmerman, Stewart, Morrel-Samuels, Franzen, & Reischl, 2011). The rubric captures three aspects of how program participation can increase young people's connection to the larger community.

4.1 Youth develop a sense of community through program involvement. Youth, especially those from disenfranchised, at-risk neighborhoods, often feel disconnected from their communities or local institutions. When adults intentionally help youth expand their networks and build connections within the program (level 5), youth can develop a sense of belonging and deepen their engagement in their program and in the larger community (Conner & Strobel, 2007). Programs at level 1 do not provide youth with the opportunities to build ongoing relationships; those at level 3 offer such opportunities, but not to the extent that will enable youth to build a strong sense of group membership.

> In the Y-AP model, learning is not unidirectional. Youth do learn from adults, but adults also learn from youth.

4.2 Youth are active contributors to the community. Most program activities are designed to benefit participating youth only (level 1); some may have an effect on the program or organization as a whole (level 3). At the highest Y-AP level, activities position youth as contributors to the wider community. Partnerships with adults and activities that enable youth to navigate real-world issues give youth opportunities to think through the critical challenges facing their community and help lead efforts to promote social change (Reischl et al., 2011).

4.3 Youth gain essential social capital through program involvement. In many programs, activities pro-

vide no (level 1) or minimal (level 3) opportunities for youth to engage with communities outside of the organization. When program activities connect youth to the broader community through meaningful collaborations, such as working with business owners or leaders from other organizations to plan a community event (level 5), youth can gain essential social capital that not only enhances their sense of belonging to the community but also supports their future career or educational goals (Jennings et al., 2006).

Considering the Dimensions

The dimension of our Y-AP rubric that has the most items is natural mentors, with eight items. This finding is consistent with prior research highlighting the complexity of the critical roles adult support plays in the development of Y-AP (Zeldin et al., 2014). During the development process, we found that the dimension of natural mentors is highly correlated to the dimension of reciprocity. Ideally, these are two distinguishable concepts; more empirical data is needed to further examine the relationship.

The most difficult dimension to achieve may be involving youth in authentic decision making. It requires intentionally bringing in youth voice, examining the quality of decision-making experiences, and reviewing the organization's structure. Our own experience and prior research (Camino, 2005; Van Egeren, Wu, & Kornbluh, 2012) suggest that gaining administrator buy-in and embedding youth decision making in the organization's mission might be the most effective ways to promote sustained and high-level youth governance.

The fourth dimension, community connectedness, manifests the ultimate goal of Y-AP: cultivating youths' civic engagement and giving them opportunities to become engaged leaders. This dimension's three rubric items capture ways that programs can promote youths' community connectedness. However, these efforts might not be fully visible during specific observation times. To get a more holistic picture, observers may need to ask youth or adults additional questions about community engagement opportunities.

Implications for Research and Practice

The primary limitations of the rubric in its current form are that its psychometric properties have not been statistically validated and that all the observed programs, even though they varied in Y-AP levels, were from the same organization. During development and testing of the rubric in 10 observations, we undertook a series of revisions that expanded the rubric's applicability in various program contexts. However, the small number of observations from one source, along with the subsequent revision of the items, limited the possibility for psychometric testing. Our future research agenda includes collecting quantitative data across different youth organizations or programs to validate the psychometric properties of the rubric. We then hope to establish norms and Y-AP models that would enable different types of youth-serving organizations to consider their own potential. We also plan to revisit the Y-AP theory behind the rubric and re-examine the rubric elements based on the statistical results. Doing so will give the field a fully validated concept and measure of Y-AP practices.

Bearing in mind the lack of validation, the Y-AP rubric can nevertheless be useful in both research and practice. Researchers can use the rubric for internal and external assessments of Y-AP practices. The rubric can facilitate either cross-sectional comparisons on the impacts of Y-AP practices across programs and socio-demographic contexts or longitudinal studies on how Y-AP practices evolve over time within the same context. The rubric's detailed instructions and the interactive form are designed to ease the process of data collection.

Afterschool practitioners can use the rubric as a manual and a self-assessment tool to support implementation of high-quality Y-AP practices. Even programs that are not ready to adapt the full Y-AP model can use the rubric to strengthen specific dimensions of Y-AP, such as adult mentorship or youth leadership in decision making. The descriptions and examples for each rubric item can help practitioners comprehend the levels of implementation and then reflect on their own and their colleagues' behaviors. The average scores, automatically calculated by the interactive form, quantify the presence of Y-AP dimensions and allow easy comparisons across sites or observations. The four Y-AP dimensions have been identified as critical factors contributing to desirable youth outcomes and program engagement (Akiva et al., 2014; Mitra et al., 2013; Wilson-Ahlstrom, Yohalem, DuBois, Ji, & Hillaker, 2014). Afterschool programs can strengthen their youth development practices by using the rubric for program evaluation and improvement and for professional development.

References

Akiva, T., Cortina, K. S., & Smith, C. (2014). Involving youth in program decision-making: How common and what might it do for youth? *Journal of Youth and Adolescence, 43*(11), 1844–1860. doi:10.1007/s10964-014-0183-y

Avolio, B. J., & Gardner, W. L. (2005). Authentic leadership development: Getting to the root of positive forms of leadership. *Leadership Quarterly, 16*(3), 315–338. doi:10.1016/j.leaqua.2005.03.001

Bronfenbrenner, U. (1995). Developmental ecology through space and time: A future perspective. In P. Moen, G. Elder, & K. Lüscher (Eds.), *Examining lives in context: Perspectives on the ecology of human development* (pp. 619–647). Washington, DC: American Psychological Association.

Camino, L. (2005). Pitfalls and promising practices of youth-adult partnerships: An evaluator's reflections. *Journal of Community Psychology, 33*(1), 75–85.

Checkoway, B., & Richards-Schuster, K. (2006). Youth participation for educational reform in low-income communities of color. In P. Noguera, S. Ginwright, & J. Cammarota (Eds.), *Beyond resistance: Youth activism and community change. New democratic possibilities for policy and practice for America's youth* (pp. 319–330). New York, NY: Routledge.

Conner, J. O., & Strobel, K. (2007). Leadership development: An examination of individual and programmatic growth. *Journal of Adolescent Research, 22*(3), 275–297. doi:10.1177/0743558407299698

Dewey, J. (1938). *Experience and education.* New York, NY: Collier.

Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology, 92*(6), 1087–1101. doi:10.1037/0022-3514.92.6.1087

Erikson, E. H. (1968). *Identity, youth, and crisis.* New York, NY: Norton.

Ferguson, K., Kim, M. A., & McCoy, S. (2011). Enhancing empowerment and leadership among homeless youth in agency and community settings: A grounded theory approach. *Child Adolescent Social Work Journal, 28,* 1–22.

Jennings, L. B., Parra-Medina, D. M., Messias, D. K. H., McLoughlin, K., & Williams, T. (2006). Toward a critical social theory of youth empowerment. *Journal of Community Practice, 14*(1–2), 31–55. doi:10.1300/J125v14n01

Jones, K. R., & Perkins, D. F. (2005). Determining the quality of youth-adult relationships within community-based youth programs. *Journal of Extension, 43*(5). Retrieved from http://www.joe.org/joe/2005october/a5.php

Kline, T. J. (2005). *Psychological testing: A practical approach to design and evaluation.* Thousand Oaks, CA: Sage.

Larson, R., & Hansen, D. (2005). The development of strategic thinking: Learning to impact human systems in a youth activism program. *Human Development, 48,* 327–349.

Larson, R. W., & Angus, R. M. (2011). Adolescents' development of skills for agency in youth programs: Learning to think strategically. *Child Development, 82*(1), 277–294.

Larson, R., Walker, K., & Pearce, N. (2005). A comparison of youth-driven and adult-driven youth programs: Balancing inputs from youth and adults. *Journal of Community Psychology, 33*(1), 57–74.

Lenzi, M., Vieno, A., Sharkey, J., Mayworm, A., Scacchi, L., Pastore, M., & Santinello, M. (2014). How school can teach civic engagement besides civic education: The role of democratic school climate. *American Journal of Community Psychology, 54*(3–4), 251–261. doi:10.1007/s10464-014-9669-8

Li, J., & Julian, M. M. (2012). Developmental relationships as the active ingredient: A unifying working hypothesis of "what works" across intervention settings. *American Journal of Orthopsychiatry, 82*(2), 157–166.

Mitra, D., Serriere, S., & Kirshner, B. (2013). Youth participation in U.S. contexts: Student voice without a national mandate. *Children & Society, 28,* 292–304. doi:10.1111/chso.12005

Newell, J. A., Dahm, K. D., & Newell, H. L. (2002). Rubric development and inter-rater reliability issues in accessing learning outcomes. *Chemical Engineering Education, 36*(3), 212–215. Retrieved from http://users.rowan.edu/~newell/Publications/16%20Rubric%20Development.pdf

Pedhazur, E. J., & Schmelkin, L. P. (1991). *Measurement, design, and analysis: An integrated approach.* Hillsdale, NJ: Erlbaum.

Reischl, T. M., Zimmerman, M. A., Morrel-Samuels, S., Franzen, S. P., Faulk, M., Eisman, A. B., & Roberts, E. (2011). Youth empowerment solutions for violence prevention. *Adolescent Medicine: State of the Art Reviews, 22*(3), 581–600.

Van Egeren, L., Wu, H.-C., & Kornbluh, M. (2012). *Evaluation of the youth-driven spaces project final report.* East Lansing, MI: Michigan State University.

Van Egeren, L., Wu, H.-C., Rana, M., Kornbluh, M., Duddy, A., & Weiss, J. (2012, March). *The creation of youth-driven spaces through organizational intervention: Benefits reported by*

youth. Paper presented at the 14th Biennial Conference of Society for Research on Adolescence, Vancouver, Canada.

Wilson-Ahlstrom, A., Yohalem, N., DuBois, D., Ji, P., & Hillaker, B. (2014). *From soft skills to hard data: Measuring youth program outcomes.* Washington, DC: Forum for Youth Investment.

Wong, N. T., Zimmerman, M. A., & Parker, E. A. (2010). A typology of youth participation and empowerment for child and adolescent health promotion. *American Journal of Community Psychology, 46*(1), 100–114.

Wu, H. J., Weiss, J., Kornbluh, M., & Roddy, L. (2014). *Youth-adult partnership rubric: A tool for professional development and program evaluation in youth settings (Version 1.0).* East Lansing, MI: Michigan State University.

Yohalem, N., Wilson-Ahlstrom, A., Fischer, S., & Shinn, M. (2009). *Measuring youth program quality: A guide to assessment tools* (2nd ed.). Washington, DC: Forum for Youth Investment.

Youniss, J., & Levine, P. (2009). *Engaging young people in civic life.* Nashville, TN: Vanderbilt University Press.

Zeldin, S., Camino, L., & Mook, C. (2005). The adoption of innovation in youth organizations: Creating the conditions for youth-adult partnerships. *Journal of Community Psychology, 33*(1), 121–135. doi:10.1002/jcop.20044

Zeldin, S., Christens, B. D., & Powers, J. L. (2013). The psychology and practice of youth-adult partnership: Bridging generations for youth development and community change. *American Journal of Community Psychology, 51*(3–4), 385–397.

Zeldin, S., Krauss, S. E., Collura, J., Lucchesi, M., & Sulaiman, A. H. (2014). Conceptualizing and measuring youth-adult partnership in community programs: A cross national study. *American Journal of Community Psychology, 54*(3–4), 337–347. doi:10.1007/s10464-014-9676-9

Zimmerman, M. A., Stewart, S. E., Morrel-Samuels, S., Franzen, S., & Reischl, T. M. (2011). Youth empowerment solutions for peaceful communities: Combining theory and practice in a community-level violence prevention curriculum. *Health Promotion Practice, 12*, 425–439. doi:10.1177/1524839909357316
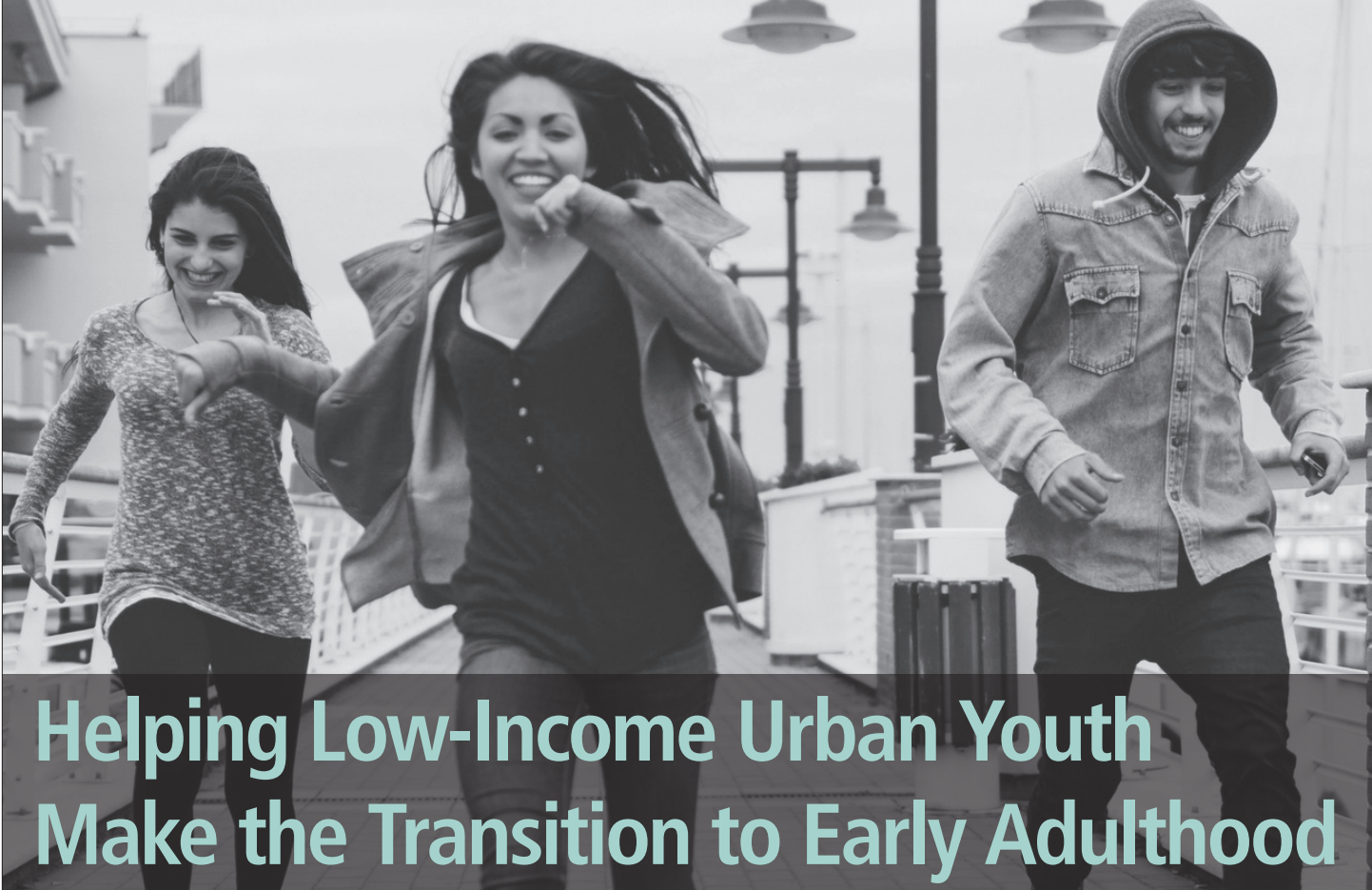
Helping Low-Income Urban Youth Make the Transition to Early Adulthood

A Retrospective Study of the YMCA Youth Institute

Julie O'Donnell and Sandra L. Kirkner

Young adulthood, typically defined as between the ages of 18 and 25, is a critical period of growth during which young people acquire the education and training that serve as the basis for their later occupations and income (Arnett, 2000). The successful transition from adolescence to early adulthood requires youth to have the skills and resources to graduate high school and then go to college or enter the workforce (Fuligni & Hardway, 2004; Lippman, Atienza, Rivers, & Keith, 2008). To accomplish these tasks in advanced urban societies, young adults need a wide range of social, cognitive, psychological, and technological skills and supports: academic and critical thinking skills, a sense of purpose or a vision or plan for the future, social and interpersonal competence, knowledge of how to access college and financial resources, social support and capital including mentors who emphasize the need for college and workforce skills, civic engagement, and workforce and technology skills (Hamilton & Hamilton,

2009; Lippman et al., 2008; Warschauer & Matuchniak, 2010).

Low-income urban youth of color often face challenges in their transition to early adulthood. High school out-of-school time (OST) programs that promote positive youth development may help youth to better negotiate this period (Fuligni & Hardway, 2004). However, little research exists on the long-term impact of such programs on young adults. We conducted a pilot qualitative study to explore the perspectives of young adults on the effect of their participation in the YMCA of Greater Long Beach Youth Institute. Respondents indicated that the program positively influenced their life choices and their ability to pursue higher education and enter the workforce. Our findings suggest implications for other high school OST programs.

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Vulnerable Youth and the Transition to Adulthood

Both directly and indirectly, poverty can make the transition from adolescence to early adulthood difficult (Berzin, De Marco, Shaw, Unick, & Hogan, 2006). Low-income youth are at risk for low academic achievement and school dropout, often because of family, school, and community challenges associated with poverty (Lacour & Tissington, 2011; Reardon, 2011). Students from high-income families are five to seven times more likely to graduate from high school than those from low-income families (Chapman, Laird, Ifill, & KewalRamani, 2011; Snyder & Dillow, 2010). Low-income youth are also less likely to have college readiness knowledge and skills (Hooker & Brand, 2010; Roderick, Nagaoka, & Coca, 2009) and are much less likely to attend college (Kim & Nunez, 2013). Once low-income youth enter an institution of higher education, they are less likely to graduate (Elliott, 2013; Muraskin, Lee, Wilner, & Swail, 2004). In 2009, 8 percent of youth from families in the lowest income quartile had graduated from college by the age of 24, compared to 82 percent of those in the highest quartile (Postsecondary Education Opportunity, 2010).

This continuing disparity between low-income and higher-income youth is problematic because, in the near future, about two-thirds of all U.S. jobs—including almost all jobs in the fastest-growing, highest-wage areas—will require some postsecondary education (Carnevale, Smith, & Strohl, 2010). Strong technology skills are also highly valued in the workforce; unfortunately, low-income youth have lower levels of technology access and skill, both of which are critical for productive adult employment (London, Pastor, Servon, Rosner, & Wallace, 2010; Warschauer & Matuchniak, 2010). Although high school work opportunities may reduce dropout rates and smooth the transition into the adult workforce, low-income teens have fewer employment opportunities than their higher-income counterparts (Sum, Gillis, & Palma, 2012).

High School OST Programs

Participation in high-quality OST programs may increase the likelihood of a successful transition to adulthood for low-income youth (Gardner, Roth, & Brooks-Gunn, 2008). Such programs positively influence the healthy development of low-income youth by helping them to develop diverse skills and support networks (Barr, Birmingham, Fornal, Klein, & Piha, 2006). OST programs that promote education and instill a sense of belonging and competence may develop characteristics that help youth make the transition to young adulthood (Daud & Carruthers, 2008). Strong mentoring connections to positive adults can also contribute to positive outcomes for vulnerable youth (Hines, Merdinger, & Wyatt, 2005). OST programs that promote positive youth development may be especially beneficial, since many aspects of positive youth development overlap with college and workforce readiness (Lippman et al., 2008). However, research on the long-term impact of positive youth development programs, particularly with adolescents transitioning to adulthood, is very limited (Barcelona & Quinn, 2011).

Effective high school OST programs are comprehensive, offer diverse program components, allow flexibility in how youth choose to be involved (American Youth Policy Forum, 2006) and integrate positive youth development principles (McKay, 2011). Components of effective OST programs include academic support and engagement in learning (Barr et al., 2006; Pittman, Irby, Yohalem, & Wilson-Ahlstrom, 2004), technology integration and project-based learning (Donner & Wang, 2013), workforce skill development or paid internships (Halpern, 2006), service learning (Schneider-Muñoz & Politz, 2007), and diverse, relevant learning opportunities (Barr et al., 2006). Research also stresses the importance of hiring committed, accessible staff who are capable of forming strong relationships with teens and using these bonds to encourage youth to develop competencies (Jones & Deutsch, 2011; The After-School Corporation, 2007).

The YMCA Youth Institute

The YMCA of Greater Long Beach Youth Institute is a year-round OST program that uses technology to promote positive youth development and enhance the academic success and career readiness of low-income high school students of color. The goals of the Youth Institute (YI) are to:

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- Improve the technology, career, leadership, and decision-making skills of youth to promote readiness for higher education or career entry after graduation
- Improve academic achievement and stimulate interest in higher education
- Promote bonding to pro-social adults and community attachment among low-income urban high school youth

The YI recruits youth by partnering with area schools and community organizations to distribute program information. Many youth learn about the program from YI alumni. Youth must submit an application to join the program. The selection process is structured so each cohort is diverse in gender and ethnicity. To ensure that vulnerable youth are served, selection is based in part on responses to an application question about adversity the applicant has faced. Almost all participating youth come from poverty. New cohorts begin each summer (Coe-Regan & O'Donnell, 2006). The number of entering youth varies by year, depending on funding, but typically is between 35 and 40 youth.

The program has two components: an intensive summer technology program and a year-round academic support program. On program entry, youth participate in an eight-week summer program, 35 hours per week. The first week is spent at a wilderness retreat. Participants are assigned to project teams, mixed by gender and ethnicity. Initiative games and a low-ropes course promote group cohesion and leadership skills such as problem solving and communication. Cultural awareness and tolerance activities are integrated throughout the week (O'Donnell & Coe-Regan, 2006).

During the rest of the summer, youth engage in projects to learn technology skills. The technology content is constantly evolving to include the latest software for animation, graphic design, web design, video editing, and music creation. All technology classes have a curriculum covering the pedagogical approach and the skill sets to be learned. Projects, which are completed in teams, include animated logos, movies, and a teen magazine. All projects are linked to school content standards and are designed to promote literacy, math, and higher-level thinking skills. Youth are paid a stipend for the summer program, which culminates in a film festival for family and community members (Coe-Regan & O'Donnell, 2006).

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Upon graduation from the summer program, youth become YI alumni and can voluntarily participate in year-round activities during high school and college. Involvement opportunities vary, but they typically include daily digital art labs and homework assistance, academic and personal advising, community service, equipment check-out, field trips, weekend leisure activities, community leadership positions, and social work support (Coe-Regan & O'Donnell, 2006). Staff members assist youth with high school course selection, take them on college field trips, and help them with college and financial aid forms. Alumni can also apply to receive stipends to be mentors for new YI cohorts or work as paid interns with Change Agent Productions, a multimedia social enterprise associated with the program (O'Donnell, Tan, & Kirkner, 2012). Opportunities after high school graduation include young adult retreats, holiday events, paid staff positions, or volunteer activities with the YI or the YMCA. All YI staff have extensive training and past experience with positive youth development practices; most have digital media or technology degrees. The program designers believe that the youth development skills are most important, because specialized technology skills are easier to teach.

In past evaluations, YI participation has been linked to improvements in leadership and technology skills (O'Donnell & Coe-Regan, 2006) and to significantly higher high school standardized test scores and grades, as well as somewhat fewer absences than matched comparison youth (O'Donnell & Kirkner, 2014).

Methods

Due to the exploratory nature of the study, we used focus groups to gain insight into participants' experiences with the program and their perceived long-term outcomes.

Data Collection and Sample

YI staff gave us contact information for alumni who were over the age of 18 and no longer in high school. Invitations to participate in focus groups were extended by telephone, e-mail, and Facebook. Of the 102 alumni for whom contact information was provided, 34 participated in one of seven focus groups. Thus, this analysis is based on a small convenience sample.

Participants signed consent forms, and the study was approved by our institutional review board. Because

we have long evaluated the program and have personal relationships with the program developer, we hired two outside master's level professionals to facilitate the focus groups. These researchers used a structured interview guide. All sessions were audio-recorded and transcribed verbatim, with identification numbers substituted for participants' names so that we could not know their identities. Participants were given food and a $10 gas card to thank them for their time.

Participants ranged in age from 18 to 25, with an average age of 22. Twenty-four (71 percent) were male. Latinos (56 percent) were the largest ethnic group, followed by Asian Americans/Pacific Islanders (29 percent), Whites (12 percent), and African Americans (3 percent). Compared to the whole group of YI alumni, this sample had a higher proportion of males, Latinos, and Asian-American/Pacific Islanders, so the findings might be more representative of these groups than of YI alumni as a whole.

Data Analysis

We analyzed the data inductively using a modified grounded theory approach (Corbin & Strauss, 2008). First, we reviewed the data to identify preliminary categories and themes. Next, we separately coded each response line by line. We then met to resolve any coding differences and add new categories as needed to accurately represent the data.

Focus Group Responses

Following prompts from the structured interview guide, focus group respondents offered insights on their continued YI involvement as young adults, the benefits of YI involvement, the skills and lessons they learned, and the ways in which the YI prepared them for higher education or the workforce. They also offered suggestions for improvement.

Continued Program Involvement as Young Adults

Almost all participants (92 percent) were still involved with the YI; most noted multiple ways of staying involved. Working and volunteering for the YMCA were the most frequent types of involvement. Many partici-

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pants said they felt a sense of responsibility to remain involved. One said, "A lot of us took the quote, 'Much has been given to us and much is expected,' to heart. That's why we're still here giving back to the community and youth." Almost three-quarters of respondents had kept in contact with YI peers and staff or participated in the young adult program. One said:

> If I am having troubles in my life and need someone to talk to, I can go to any of the staff. I mostly come to see old faces and catch up, but I've done multiple retreats and volunteer activities. You always stay connected and are pulled back.

A couple of the young adults still used YI technology resources, including computers and cameras, because access to these things is expensive.

Benefits of YI Participation

Many participants had difficulty answering the question about the benefits they had gained from the YI because they saw their lives and themselves as being completely different because of their involvement.

> They gave me a job, a future, and hope. This program taught me how to be, psychologically and socially as a person. It helped me in my career and in the decision to go to college. If I wasn't here, I'd be pregnant or already have a kid. It totally changed my life.

Participants said that the most meaningful benefits of the YI were the community service and travel opportunities, which allowed them to see beyond their neighborhoods and to believe that they could make a difference.

> I probably would not be involved with the community if I did not join this program. We had to volunteer for projects at a school. It shaped what I wanted to do for my career, how I wanted to help people. It definitely changed my view on how much I can shape the place and people where I live.

Participants also reported that the relationships they had established with peers and staff had positively influenced their lives. These relationships appeared to be critical, as many had not previously had strong, positive supports.

> The biggest benefits are the people you meet. After ten years, I still come back because I enjoy and love

the people here. It's like a family. The support system is a fundamental part of my life. That support helps me move forward and be motivated about my goals.

Skills and Lessons Learned

When asked to identify the most important skills and lessons they had learned in the YI, participants frequently mentioned interpersonal and communication skills such as teamwork, public speaking, leadership, and comfort with diversity. They saw these skills as contributing to their later academic and workforce success.

> One of the biggest skills was learning to work with different people; how to be confrontational in a healthy way, especially with difficult people; and how to communicate to find a consensus or to meet a goal. I definitely learned how to be in a leadership position or in any position working with people.

Participants also frequently indicated that technology access and the skills they gained from the program were valuable. Many, as youth—and some even now—could access technology only at the YI. For some, technology skills helped them perform better on high school or college assignments. For others, working with technology gave them skills and a passion for their future careers.

> I took my YI background in animation software and creating models into an engineering class. I got a perfect score. The software was the same as I had been working with since I was 14. That made it easy.

Some participants said that the YI had helped them to tap their own creativity or to think in different ways. They often mentioned that the program's project-based learning was quite different from the way they typically learned in school.

> In contrast to school, where you get lectured and turn in homework, [YI staff] give you one lecture, and then you get a project and learn by creating a product. There is a lot of room for creativity. That had a huge impact because I learned how to think when I was younger.

Some participants indicated that they had become more resilient and better able to adapt and persevere. One said, "We learned to adapt and overcome. We were thrown into situations outside our comfort zones. That's an important skill in school and life." Another made a similar point: "I'm not afraid to try different things and to make mistakes. The program taught me to not give up and do what I can to the best of my abilities."

Preparation for College and Work

Participants who had attended or were attending a college or technical school appreciated the tangible help the YI provided with college applications, financial aid forms, and recommendations, as well as high school assistance such as tutoring and guidance on class selection. First-generation college students, who often described themselves as "lost" in the college process, particularly valued this help.

> It was because of the YI that I even went to school. They helped me with everything. They brought in people from the university and wrote letters of recommendation for my bachelor's and master's programs. They were instrumental to me going to college.

> The day I got accepted into college, I called the people who were super-important to me. The YI staff and peers were more excited than my parents. I got more college support from the YI than from my family, who did not know about college.

Another contribution respondents frequently mentioned was that the program had encouraged them to consider higher education.

> This program put me in college. The people I was close to didn't like doing homework, didn't like teachers, and got into trouble. But, in this program, there were a bunch of kids determined to win a scholarship and search for the college that was right for them. All the staff tells kids, "You should go to college because it gives you more opportunities in life." Having the staff check my grades in high school helped me know they had my back. I felt I had to represent them. These connections pushed me into going to college, something I am grateful for.

YI participation also helped some to decide on their career choices or college majors.

> They changed what I wanted to do in my career. When I first came, I wanted to do something like construction. As soon as I touched a computer, I was in love with it: the problem solving, fixing, building, and anything that has to do with technology. When I entered college, I knew what classes I needed to take and the requirements.

Participants thought the technology skills they had developed in the YI were beneficial in both high school and college. The equipment they could access at the YI also helped some to perform better academically. One

said that, when asked to make a presentation, "The fact that I could make a movie impressed the teacher and got me an A."

Almost one-third of respondents reported they had learned critical thinking or organizational skills in the YI that helped them to be successful in college. One participant summarized this view: "You are introduced, at an early age, to life skills like critical thinking, time management, and group problem-solving skills. These are skills you absolutely need. Those are the most important skill sets I took to college."

Focus group participants who had not chosen to pursue higher education or who were working while in college or after college graduation described the workforce skills they had developed in the YI. One summed up the categories of workforce skills: "The relational skills, the media skills, the organizational skills that we learned—I use them every day in my work." Respondents most frequently said they used technology skills in the workplace, regardless of whether their jobs were technology-related. A few also reported that the YI taught them to be organized, self-directed, and hard working. For example, one respondent commented, "One thing that was drilled into me was being thorough, methodical, and meticulous." Another said, "The YI taught me how to be self-directive: getting and taking care of an assignment, and then helping others accomplish their goals." Some respondents also indicated the program had given them opportunities to network with professionals in their fields—opportunities that sometimes even led to employment.

Program Components

When asked to name the most important components of the YI, one participant echoed a common sentiment: "I don't know if I could single out any one key factor. They all are very important and vital." Participants most often cited the wilderness retreat as valuable because it helped youth to bond with one another and staff members, build team and communication skills, gain exposure outside their neighborhoods, and understand other cultures.

> The wilderness retreat was the most impactful. It takes you out of the norm and exposes you to new things. You connect to people on a personal level, bonding you to staff and peers. We got to know each other per-

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sonally: our strengths, our weaknesses, and what we shared in common. What we experienced together on that week makes you want to keep coming back. That is a part of what makes this program so successful.

Many participants thought the staff was the most important aspect of the program. Staff members established supportive relationships with participants—relationships that often extended into their young adult years. In particular, participants saw the positive environment the staff created, the role modeling they provided, the relationships they developed, and the youth development principles they implemented as critical. As one said, "You need to have staff members who really believe in working with youth and know what youth development is about. Without that, you have a program that doesn't mean anything." Another said:

> It's impactful for teenagers to go through this because they know there will be someone to pick them up when they fall. It offers a great support system with caring adult role models who really exemplify what it means to be a youth leader and a caring adult.

Some also noted the benefits of community involvement or travel opportunities. Both experiences helped them to further develop their leadership skills while exposing them to the larger world. One respondent had served as chair of the Long Beach District Youth Council: "Through that, I gained a strong sense of my leadership skills, and a commitment to service and advocacy." Another said:

> The traveling helped me because, before the program, I had never gone outside the city. It's important to visit places to know there are bigger and better things outside these city walls. Those experiences helped me create my identity and find out who I was.

Many young adults appreciated that they could work at Change Agent Productions or be employed by the YI or YMCA. Although of course they saw the money as useful, they appreciated even more the opportunities to travel, network, and improve their job skills.

> What I took most out of the YI was the experience of working. As a high school student, you can't

find a good work environment to grow profession-ally. Here, you are put into a leadership position that challenges you to grow. They teach you how to work, to live, to be successful.

The technology focus was viewed as a valuable pro-gram asset as well. One said, "The YI prepares you for college, employment, or trade school. There are a lot of valuable technology aspects that you learn and technol-ogy jobs are growing in our economy. But, in any job, someone is always behind a computer."

Suggestions for Improvement

Participants were extremely happy with the YI as it was currently structured. As one said, "The pro-gram is just great. I see it improving every year. They definitely assess what the needs are and evolve to meet the needs of the participants." The most frequent suggestion was to expand the program to serve more youth or communities. These alumni were also very vocal about the need to have more trips and cultivate diversity to expose youth to a larger world. In response to the question about how to strengthen the program, one respondent said:

> More trips, because you get exposed to life. Being low-income, underprivileged youth, we didn't get exposed to the things the Youth Institute ex-posed us to like snowboarding and snorkeling. It exposed us to life and forced us to bond with each other. We were exposed to other cultures, what makes us different and similar. That helps us in the real world when we work with other ethnicities. We learned, here, the world is not one race.

Additional suggestions for program enhancement in-cluded providing college scholarships, having tutoring more available, partnering with businesses to establish apprentice programs, and providing transportation.

Several respondents also suggested ways to improve the YI program for college-age alumni. The most com-mon was to develop electronic mechanisms, such as email, Facebook, newsletters, or an alumni section on the website, to keep all alumni apprised of opportunities and events. A few said that having more trips or other activities for college-age youth would be useful and pro-vide needed ongoing support.

Implications for High School OST Programs

This pilot study explored young adults' perceptions of whether and how the YI prepared them for young adulthood. Participants reported the YI helped them develop social and interpersonal competence and tech-nology skills, all of which have been found to be use-ful in the transition to higher education and the work-force (Lippman et al., 2008; Warschauer & Matuchinak, 2010). The program also appears to have helped these low-income urban youth to do better in high school and to in-crease their educa-tional aspirations. It gave many the knowledge needed to apply to college and access financial aid. Respondents per-ceived the ongoing, positive relationships they established with staff and peers as in-tegral to their lives, providing support, encouragement, and a network to call on when financial, edu-cational, and person-al challenges arose.

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The fact that so many continued to rely on these relation-ships, even as young adults, reinforces the notion that vulnerable youth may require additional social supports to successfully transition into young adulthood (Fuligni & Hardway, 2004; Hamilton & Hamilton, 2009).

Although our results strongly suggest that well-designed high school OST programs can help low-income urban youth develop the knowledge, skills, and supports needed to transition into higher education and the workforce, the fact that it used a small, non-representative convenience sample limits the ability to generalize the findings. It is possible that alumni who participated in the study were more involved in the YI

than those who did not respond to the invitation; thus, their outcomes may be different from the outcomes of youth whose participation was more limited. Researcher bias and social desirability may also have influenced the findings. Future studies should incorporate a larger, more representative sample or include a comparison or control group to better understand the impact of high school OST participation on the life trajectories of young adults.

Nevertheless, the feedback we got from YI alumni is consistent with studies suggesting that comprehensive high school OST programs can contribute to positive outcomes in young adulthood (Gambone, Klem, & Connell, 2002; Gambone, Yu, Lewis-Charp, Sipe, & Lacoe, 2006). Respondents identified multiple program aspects as beneficial. The high regard for the wilderness retreat suggests that this type of activity may be critical. It established the bonding necessary to keep older teens involved, while building their leadership, communication, and diversity skills. Participants also saw academic support, community service opportunities, trips, project-based learning, technology, and internships as important to developing skills for higher education and work. Participants also saw the use of a youth development framework as a vital program component.

The YI provided these young people with mentors who contributed to their vision of the future or their belief that they could accomplish things. These beliefs have also been linked to college and workforce readiness and are thought to ease the transition into early adulthood (Daud & Carruthers, 2008; Hamilton & Hamilton, 2009). Thus, our findings echo research suggesting that high school OST programs must hire highly qualified staff who can be strong role models and who can establish positive and trusting relationships with youth while still holding them to high expectations (Daud & Carruthers, 2008; Jones & Deutsch, 2011).

Many have suggested that civic engagement prepares youth for a successful transition to adulthood (Flanagan & Levine, 2010; Philanthropy for Active Civic Engagement, 2010). Participants in our study supported this concept, frequently noting the importance of giving back to the community; community service helped some discover a career path. High school OST programs that require community service or create career pathways within their organizations can help young people develop important skills. Participants also suggested that high school programs need to expand horizons, helping youth from low-income neighborhoods to see beyond their boundaries: introducing the possibility of higher educa-

tion, identifying diverse career paths, and showing youth the long-term benefits of both. Internships that allow youth to better understand careers while helping them to develop workforce skills may be particularly useful. Trips may also help low-income urban youth envision more positive futures.

Many study participants noted that the technology skills and access they gained in the YI had helped them in college and were highly valuable in the workforce. Participants reported that their technology skills gave them an advantage in both settings. Integrating technology into high school programs may help engage youth and can provide access and skills that low-income youth often lack but need for the 21st century (London et al., 2010). In addition, the use of project-based learning, especially in programs with a technology focus, might help youth to develop important critical-thinking skills.

The YI is designed to serve high-school-age youth, yet many of these college-age alumni still considered themselves part of the program or in need of continuing support. High school OST programs might explore ways in which they can continue to connect with and support their graduates. This practice can help both the young adults and the youth-serving organization, as graduates may be a good source of volunteer labor or staff.

Our findings echo previous research suggesting that high-quality programs for diverse high school youth should be multi-faceted to meet the young people's diverse needs and desires (Strobel, Kirshner, O'Donoghue, & McLaughlin, 2008; The After-School Corporation, 2007). Other high school OST programs may want to implement some of the successful elements of the YI in their own efforts to help urban teens successfully transition to young adulthood.

References

American Youth Policy Forum. (2006). *Helping youth succeed through out-of-school time programs.* Washington, DC: Author. Retrieved from http://www.aypf.org/publications/HelpingYouthOST2006.pdf

Arnett, J. J. (2000). Emerging adulthood. *American Psychologist, 55*(5), 469–480. doi:10.1037/0003-066X.55.5.469

Barcelona, R. J., & Quinn, W. (2011). Trends in youth development topics: An integrative review of positive youth development research published in selected journals between 2001–2010. *Journal of Youth Development, 6*(3), 20–39. Retrieved from http://www.nae4ha.com/assets/documents/JYD_110603final.pdf

Barr, S., Birmingham, J., Fornal, J., Klein, R., & Piha, S. (2006). Three high school after-school initiatives: Lessons learned. *New Directions for Youth Development, 111,* 67–79. doi:10.1002/yd.183

Berzin, S. C., De Marco, A. C., Shaw, T. V., Unick, G. J., & Hogan, S. R. (2006). The effect of parental work history and public assistance use on the transition to adulthood. *Journal of Sociology and Social Welfare, 33*(1), 141–162. Retrieved from http://hhd.fullerton.edu/msw/documents/JSSWArticle-TransitiontoAdulthood.pdf

Carnevale, A. P., Smith, N., & Strohl, J. (2010). *Help wanted: Projections of jobs and education requirements through 2018.* Washington, DC: Georgetown University Center on Education and Workforce. Retrieved from https://cew.georgetown.edu/wp-content/uploads/2014/12/fullreport.pdf

Chapman, C., Laird, J., Ifill, N., & KewalRamani, A. (2011). *Trends in high school dropout and completion rates in the United States: 1972–2009* (NCES 2012-006). Washington, DC: National Center for Education Statistics. Retrieved from http://files.eric.ed.gov/fulltext/ED524955.pdf

Coe-Regan, J., & O'Donnell, J. (2006). Best practices for integrating technology and service learning in a youth development program. *Journal for Evidence-Based Social Work, 84*(3–4), 377–385. doi:10.1300/J394v03n03_14

Corbin, J., & Strauss, A. (2008). *Basics of qualitative research techniques and procedures for developing grounded theory* (3rd ed.). Thousand Oaks, CA: Sage.

Daud, R., & Carruthers, C. (2008). Outcome study of an after-school program for youth in a high-risk environment. *Journal of Park and Recreation Administration, 26*(2), 95–114. Retrieved from http://js.sagamorepub.com/jpra/article/view/1324

Donner, J., & Wang, Y. (2013). Shifting expectations: Bringing STEM to scale through expanded learning systems. *Afterschool Matters, 17,* 51–57. Retrieved from http://www.niost.org/Afterschool-Matters/afterschool-matters-spring-2013

Elliott, W. (2013). The effects of economic instability on children's educational outcomes. *Children and Youth Services Review, 35,* 461–471. doi:10.1016/j.childyouth.2012.12.017

Flanagan, C., & Levine, P. (2010). Civic engagement and the transition to adulthood. *Future of Children, 20*(1), 159–179. Retrieved from https://www.princeton.edu/futureofchildren/publications/docs/20_01_08.pdf

Fuligni, A. J., & Hardway, C. (2004). Preparing diverse adolescents for the transition to adulthood. *Future of Children, 14*(2), 99–119. Retrieved from http://files.eric.ed.gov/fulltext/EJ795836.pdf

Gambone, M. A., Klem, A. M., & Connell, J. P. (2002). *Finding out what matters for youth: Testing key links in a community action framework for youth development.* Philadelphia, PA: Youth Development Strategies and Institute for Research and Reform in Education. Retrieved from http://www.ydsi.org/ydsi/pdf/whatmatters.pdf

Gambone, M. A., Yu, H. C., Lewis-Charp, H., Sipe, C. L., & Lacoe, J. (2006). Youth organizing, identity-support, and youth development agencies as avenues for involvement. *Journal of Community Practice, 14,* 235–253. doi:10.1300/J125v14n01_14

Gardner, M., Roth, J., & Brooks-Gunn, J. (2008). Adolescents' participation in organized activities and developmental success 2 and 8 years after high school: Do sponsorship, duration and intensity matter? *Developmental Psychology, 44*(3), 814–830. doi:10.1037/0012-1649.44.3.814

Halpern, R. (2006). After-school matters in Chicago: Apprenticeship as a model for youth programming. *Youth & Society, 38,* 203–235. doi:10.1177/0044118X06288912

Hamilton, S. F., & Hamilton, M. A. (2009). The transition to adulthood: Challenges of poverty and structural lag. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology, volume 2* (3rd ed.), pp. 492–526. New York, NY: Wiley. doi:10.1002/9780470479193

Hines, A. M., Merdinger, J., & Wyatt, P. (2005). Former foster youth attending college: Resilience and the transition to young adulthood. *American Journal of Orthopsychiatry, 75,* 381–394. doi:10.1037/0002-9432.75.3.381

Hooker, S., & Brand, B. (2010). College knowledge: A critical component of college and career readiness. *New Directions for Youth Development, 127,* 75–85. doi:10.1002/yd.364

Jones, J., & Deutsch, N. (2011). Relational strategies in after-school settings: How staff-youth relationships support positive development. *Youth and Society, 43*(4), 1381–1406. doi:10.1177/0044118X10386077

Kim, D., & Nunez, A. (2013). Diversity, situated social contexts and college enrollment: Multilevel modeling to examine student, high school and state influences. *Journal of Diversity in Higher Education, 6*(2), 88–101. doi:10.1037/a0033231

Lacour, M., & Tissington, L. D. (2011). The effects of poverty on academic achievement. *Educational Research and Reviews, 6*(7), 522–527. Available from http://eric.ed.gov/?id=EJ936666

Lippman, L., Atienza, A., Rivers, A., & Keith, J. (2008). A developmental perspective on college & workplace readiness. *Child Trends.* Retrieved from http://www.childtrends.org/wp-content/uploads/2013/04/Child_Trends-2008_09_15_FR_ReadinessReport.pdf

London, R. A., Pastor, M. Jr., Servon, L. J., Rosner, R., & Wallace, A. (2010). The role of community technology centers in promoting youth development. *Youth and Society, 42*(2), 199–228. doi:10.1177/0044118X09351278

McKay, C. (2011). The resilient community: Implications for out of school programming. *Child and Adolescent Social Work Journal, 28,* 357–373. doi:10.1007/s10560-011-0240-2

Muraskin, L., Lee, J., Wilner, A., & Swail, W. S. (2004). Raising graduation rates of low-income college students. Washington, DC: Pell Institute for the Study of Opportunity in Higher Education. Retrieved from http://files.eric.ed.gov/fulltext/ED490856.pdf

O'Donnell, J., & Coe-Regan, J. (2006). Promoting youth development and community involvement with technology: The Long Beach YMCA CORAL Youth Institute. *Journal of Technology in Human Services, 24*(2–3), 55–82. doi:10.1300/J017v24n02_04

O'Donnell, J., & Kirkner, S. (2014). Effects of an out-of-school program on urban high school youths' academic performance. *Journal of Community Psychology, 42*(2), 176–190. doi:10.1002/jcop.21603

O'Donnell, J., Tan, P. P., & Kirkner, S. L. (2012). Youth perceptions of a technology-focused social enterprise. *Child Adolescent Social Work Journal, 29,* 427–446. doi:10.1007/s10560-012-0268-y

Philanthropy for Active Civic Engagement. (2010, November). *Civic pathways out of poverty and into opportunity.* Retrieved from http://www.pacefunders.org/publications/CivicPathwaysPaper.pdf

Pittman, K., Irby, M., Yohalem, N., & Wilson-Ahlstrom, A. (2004). Blurring the lines for learning: The role of out-of-school programs as complements to formal learning. *New Directions for Youth Development, 101,* 19–41. doi:10.1002/yd.71

Postsecondary Education Opportunity. (2010, November). *Family income and educational attainment, 1970 to 2009.* Retrieved from http://www.postsecondary.org/last12/221_1110pg1_16.pdf

Reardon, S. F. (2011). The widening academic achievement gap between the rich and the poor: New evidence and possible explanations. In R. Murnane & G. Duncan (Eds.), *Whither opportunity? Rising inequality and the uncertain life chances of low-income children* (pp. 91–116). New York, NY: Russell Sage Foundation Press.

Roderick, M., Nagaoka, J., & Coca, V. (2009). College readiness for all: The challenge for urban high schools. *Future of Children, 19*(1), 185–210. Retrieved from http://files.eric.ed.gov/fulltext/EJ842068.pdf

Schneider Muñoz, A., & Politz, B. (2007). Advancing global citizens: Afterschool and out of school time as common ground for civil society. *New Directions for Youth Development, 116,* 23–33. Available from http://onlinelibrary.wiley.com/doi/10.1002/yd.231/pdf

Snyder, T. D., & Dillow, S. A. (2010, April). *Digest of education statistics 2009* (NCES 2010-013). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://nces.ed.gov/pubs2010/2010013_0.pdf

Strobel, K., Kirshner, B., O'Donoghue, J., & McLaughlin, M. (2008). Qualities that attract urban youth to after-school settings and promote continued participation. *Teachers College Record, 110*(8), 1677–1705. Available from http://eric.ed.gov/?id=EJ825744

Sum, A., Gillis, D., & Palma, S. (2012). *The continued crisis in teen employment in the U. S. and Massachusetts: The absence of any teen job growth in the recovery from the great recession, low income and minority youth fare worst.* Boston, MA: Northeastern University, Center for Labor Market Students and Massachusetts Workforce Association Board. Retrieved from http://www.rebhc.org/wp-content/uploads/2012/05/March-262012TeenEmploymentReport.pdf

The After-School Corporation (2007). *Meeting the high school challenge: Making after-school work for older students.* New York, NY: Author. Retrieved from http://www.expand-edschools.org/sites/default/files/meeting_high_school_challenge_making_afterschool_work_for_older_students.pdf

Warschauer, M., & Matuchniak, T. (2010). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education, 34,* 179–225. doi:10.3102/0091732X09349791

Math Is Like a Scary Movie?

Helping Young People Overcome Math Anxiety

Margaret Kulkin

One day, as I was working with a student after school on a problem involving division with decimals, I told him which number goes in the "division house." Suddenly the student blurted out, "That is not what my teacher told me, and I hate math!" I knew I had not yet found the key to helping this student. Was I addressing how he felt about math? Should I put the problem away and start over with the beauty of decimals, those smaller-than-one numbers that enable us to measure the speed of an Olympic athlete, the diameter of a pinhead, or the exact length of a ladybug? Teaching afterschool allows for such inner dialogues. As a learning support specialist providing academic support services both during school time and after school, I had the opportunity to dig deep.

I decided to find out how my other students felt about math. The emotional worry in some of their statements surprised me. They voiced intense, passionate feelings: "Math is boring … slow … hard for me." "Fractions are hard. They burn like lava!" "Math is like a scary movie."

My background as a certified classroom teacher and my work with students after school inspired me to explore new ways to help students learn math. Despite my lack of background in STEM (science, technology, engineering, and math), I have always been fascinated by the myths that plague the teaching and learning of math.

I want my students to make the meaningful connection to math that I myself was able to make only as an adult. In school, I struggled to remember complex math procedures. As my attention slipped away, the teacher at the front of the classroom became a blur, like a prolonged fade in a movie. Math started to make sense to me only later, when I went back to school as an adult and drew on my experience as a dancer. I noted that balancing equations was similar to feeling balanced physically in the studio. Math and dance also share other common

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ingredients, such as steps and patterns. Just as I would close my eyes to visualize myself completing a particularly hard set of dance steps, so I could visualize steps and recognize patterns in math. I treasure these connections. When I sense student attention slipping away, I return to the recognition that math ideas are connected to problems that students are naturally interested in solving.

Afterschool teachers who tutor students or provide homework help have a unique opportunity to help students overcome the social or emotional barriers that so often block learning. We can embrace a creative and investigative approach to math learning. My interest in being a math attitude "myth-buster" led me to apply to a STEM-focused National Afterschool Matters Practitioner Fellowship, an 18-month professional development opportunity offered by the National Institute on Out-of-School Time. During that fellowship, I developed and administered a student survey, developed new student-centered curriculum, and conducted the case studies that inform this article.

My quest was to chip away at the "math is hard" idea to show students that math is accessible to all. Jung, Kloosterman, and Mc-Mullen (2007) suggest that children have an inborn sense of how to solve problems: "Mathematics is a science of patterns and relationships, and young children have far more ability to see those patterns than we may think" (p. 50). Math learning starts early, as children discover quantity and measurement by filling up and pouring out containers, create patterns by drawing pictures, or explore numbers by counting days on a calendar. We need to continue to nurture this math potential, grounded in real-life experience, as children grow older. My research with my own students helped me find ways to help them overcome math anxiety by creating learning opportunities based on their interests.

Where Does Math Anxiety Come From?

Buckley and Ribordy (1982) define math anxiety as an "inconceivable dread of mathematics that can interfere with manipulating numbers and solving mathematical problems within a variety of everyday life and academic situations" (p. 1). Common characteristics of math anxiety include "rigid thinking, lack of perseverance, poor or inconsistent performance, avoidance, and a resistance to monitoring one's thinking about math" (Furner & Gonzalez-De Hass, 2011, p. 228). Recognizing math anxiety

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as a problem, the National Council of Teachers of Mathematics (NCTM, 1989) recommended that teachers assess their students' mathematical dispositions.

The need is urgent, as Furner and Gonzalez-DeHass (2011) point out: "Clearly, mathematics anxiety is not the sole reason for low math achievement in this country; nevertheless, it is a critical academic problem" (p. 227). Furthermore, NCTM (2000) emphasizes as a "first principle" the importance of keeping opportunities to excel in math open to all students, including those who struggle with it.

Much of the research on math anxiety focuses on causes. Jackson and Leffingwell (1999) list causes including "[c]ommunication and language barriers, quality of instruction, evaluation methods, and difficulty of materials" (p. 88). Other causes of math anxiety include the negative attitudes that can be inadvertently communicated by teachers and parents who are themselves afraid of math (Kutner, 1992). An *Education Week* blog (Heitin, 2015) even suggests that "the beginnings of math anxiety in students can often be traced to the day they go to school and learn about fractions." After all, fractions (like decimals) are much harder to visualize or find in real life than are whole numbers (Heitin, 2015).

My own practice suggests that strict emphasis on procedures and facts reinforces math anxiety. When teachers focus on performance, emphasizing grades or acquisition of specific skills, students come to believe that their performance depends on their ability—and that their ability is not sufficient (Furner & Gonzalez-De Hass, 2011). Instead of setting performance goals, Furner and Gonzalez-DeHass (2011) suggest, teachers can better serve their students by focusing on mastery goals. "In a mastery goal classroom, success is defined by improvement, value is placed on effort and the process of learning, satisfaction is gained from working hard and learning something new" (p. 236). Performance goals are often met in a climate of competition that prizes speed, memorization of facts, and acquisition of specific skills. In contrast, mastery goals emphasize real-world application and problem solving. Though students do need to perform procedures and understand concepts, they have achieved mastery when they can successfully apply concepts to such tasks as solving problems and predicting outcomes.

In the real world, the heart of math is problem solving. Artists consider proportion in composing their creations. Carpenters take exact measurements to ensure that their fi-

nal products come out straight and solid. Setting up math problems in such everyday contexts motivates students to develop their mastery. Driven by the desire to answer meaningful questions, students can overcome math anxiety.

Inquiry: How Do Students Feel About Math?

I often wondered how I could align real-life experience to student mastery of specific math concepts and procedures. To find out, I started by gathering data from my students. Drawing on work on measuring math attitudes by Tapia and Marsh (2004), I developed a survey and gave it to five of my students, grades 4–6, who struggled with math. The survey asked students to respond to a set of statements on a scale of 1 to 5, with 5 indicating complete agreement and 1 indicating total disagreement. For example, one statement was "When I hear the word *math*, I feel excited." Two students gave this statement a 1, two gave it a 2 or 3, and one gave it a 4. By contrast, three students agreed or strongly agreed with the statement, "Math stresses me out," though two students rated this statement 1 or 2. Perhaps these students weren't aware of their stress or simply weren't stressed despite their struggle.

Three students out of the five disagreed with the statement, "I like solving math problems in a group." These same students disagreed with the statement that they could see themselves doing math their whole lives. I wondered whether these students were reluctant to solve math problems in a group because they were not confident in their ability to communicate with peers about increasingly hard-to-picture concepts such as decimals or fractions.

My survey also included open-ended questions, which elicited the comments I cite in the introduction of this article. For case studies of my new approach to math instruction based on real-life problem solving, I chose students who clearly had a high degree of math anxiety: "Terry," who said that math "is like a scary movie," and "Avery," who said that math "burns like lava." (The names are pseudonyms.)

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Case Studies in Mastery Through Problem Solving

Since I work with students individually, I already understood a great deal about these two students' math confusions, but I knew I could learn more. For both students, I intentionally created open-ended problem-solving activities that would require them to use math concepts to make or construct something. Each project took two to four of our once-a-week sessions. The problems I chose were based on the preferences and interests that the students had listed on intake forms or that I had observed.

Parachutes and Decimals

Terry was a sixth-grader with a definite inner intensity. He loved speed, including finishing his homework in record time, and liked sports. He needed to work on decimals, so I designed activities, based on his interests, that would require calculating with decimals and finding averages.

One day, when Terry arrived for his session, I sprang the news: "We are going to do an experiment today, and one of us will need to stand on my giant stool." Terry look puzzled, which was perfect. "First, though," I said, "you need to make some parachutes."

Terry seemed pleased that my usual mantra about "diving into decimals" had been back-burnered for the day. He was a ball of action and words. "Where's the stool? Where are the parachutes? What will be attached? A Lego man? Cool! How about a hippo? Let's try a giraffe! Which one will hit the ground faster? Let's just tie them all together and watch them all crash into the ground at once!" The experiment began with a flurry of materials: tape, yarn, Lego characters, hole punch, and plastic bags. Terry was moving at the speed he loves most: fast!

The math investigation would require Terry to calculate the average time it took for two different kinds of parachutes to reach the ground with the courageous Lego man. I was the one who got to stand on the giant stool. (I didn't want to explain to his parents how Terry sprained his ankle while learning math.) I dropped the parachutes while Terry timed the drops to the thousandth of a second, using a computer-generated stopwatch, and then recorded the times. Finally, he computed average times for the two different parachutes.

In another session, I challenged Terry to continue exploring decimals with an investigation based on another of his expressed interests: baseball. I found an activity on the Exploratorium website—a wonderful resource for creative, hands-on science and math activities—in which the student "hits" the ball thrown by a virtual pitcher and then records the reaction time to a hundredth of a second. Terry hit four times and calculated his average. His times were 0.25, 0.26, 0.20, and 0.21, so his average was 0.23 second. Then he asked, "What do I need to do the next time I'm up to bat to get an average reaction time of 0.22 second?" He wrote his answer: "My average is 0.23 of a second, so my average reaction time will need to improve by 0.01. My next hit will need to be 0.18 to improve my average by 0.01."

As Terry worked on this second investigation, he took the reins and displayed real confidence, apparently fueled by his success with the parachutes. He was less worried about his performance and more focused on mastering the core math ideas. He completed his decimal calculations with a sense of purpose. I let him work without comment, hoping that this shift would stick. I loved the way he had a dialogue going, asking and answering his own questions. Terry had learned a new math equation: an unsolved but achievable math challenge equals creativity, questioning, and discovery.

Fractions and Fabric Design

When I first started working with Avery, her teacher emailed me, "I've noticed Avery's biggest problem is self-confidence in math.… She also does not have a firm grasp with naming fractions using diagrams. For example, if you have a circle with 15 parts and three are missing, she'll say the fraction is 3/12." (personal communication, April 2013).

Avery had shared her love of design on many occasions; she was interested in patterns in clothes and jewelry. Based on the teacher's comments and my own observations, I thought Avery might learn about fractions by solving problems based on quilt squares. I wanted to demonstrate how math is often embedded in design, especially when decomposing patterns and shapes into smaller, fractional parts.

I showed Avery some quilt designs. Then we looked at a quilt template I downloaded from the Riverbend Community Math Center (www.riverbendmath.org). I pre-cut

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shapes of different sizes for Avery to arrange on the quilt block. The problem was to design a quilt square, divided into nine parts, and then use varying shapes and sizes to cover all nine parts so they add up to one whole square. I showed Avery the shapes: triangles, rectangles, and trapezoids of various sizes. We classified them on a chart by their fractional proportion of a whole square: 1/2, 1/3, 1/6, 1/9, or 1/18. The next step was arranging the shapes on a square template. Then Avery added all of the fractional pieces by converting all the fractions to a denominator of 18 to make sure that they added up to 18/18 or 1. I noticed that Avery was engaged with the activity, and her conceptual grasp of fractions was already improving.

The next problem was the Quilt Square Challenge from the Mathwire website (Kawas, n.d.). The challenge is to match a complex black and white quilt square design using only black and white triangles that are all the same size. Avery wrote how she found the solution: "Figure out that the triangles were in the rectangle and to match up the triangles with the pattern." We extended this challenge to create fraction problems comparing the number of black triangles with the number of white triangles.

This kind of spatial awareness, seeing how bigger shapes were made up of smaller pieces, enabled Avery to see the beauty of the whole as well as the pattern created by the smaller parts. These activities addressed Avery's struggle with spatial organization and fractions. The combination of math and design allowed her to begin to overcome her math anxiety. Like Terry, she became more interested in understanding the underlying concepts and less worried about simply getting the problem right. She was shifting her focus away from performance and toward mastery. Her teacher emailed about Avery's progress: "She is finally asking questions in class. She is at least able to voice her concerns. Before she didn't even know where to begin to ask for help" (personal communication, May 2013).

Changes in Attitudes About Math

There was never an "Aha!" moment with either of these students. However, the experience of success and the exhilaration of completing their math investigations mitigated their fear. As Terry and Avery shifted their focus from performance to mastery, the undercurrent of anxiety that had governed their relationship with math was lessened.

I confirmed this finding when I administered my survey a second time. Terry, who had previously compared math to a "scary movie," now compared math to a "book with many surprises." He agreed that he enjoyed discussing math with peers and that he could see himself doing math his whole life. Similarly, Avery no longer thought that math "burns like lava." After her quilt investigations, she said that, although math was difficult, it could also be "fun or easy like pie."

I have continued to work with Avery. She still has difficulty putting math concepts into words. However, one day when I asked her to compare two fractions, she surprised me by drawing a beautiful picture that clearly depicted a well-grounded understanding. When we moved into area and perimeter, Avery cheerfully suggested designing a zombie park!

Implications for Practice

Terry and Avery have not finished their stories. Someday, they may find that challenging their fear of math helped them develop some of their greatest strengths, such as curiosity, confidence, and initiative. Any teacher or youth leader, in or out of school, knows that our best moments come when our "unreachable" participants get back in the game, building confidence with each new success. When students formerly blocked by fear change their trajectory, obstacles become stepping stones.

To achieve this result, we have to appreciate the role of emotions in learning. The point is not just to present students with fun activities. We have to address their anxiety to help them find their inner mathematicians. Once their emotional block is addressed, students are less likely to impose self-limiting beliefs that they don't "fit the math mold" or can't learn math. Using real-world experiences to teach math concepts will help them shift their focus away from anxiety about their performance so they can engage in learning. As Furner and Berman (2003) have said, "Educators can play an instrumental role in fostering an environment that focuses on numeracy, and help reduce students' feelings of inadequacy and lack of confidence when working with mathematical ideas" (p. 173).

I recently team-taught a workshop on the benefits of STEM learning after school. I cannot describe the fun I had watching the teachers design the "perfect" carrier to bring a Lego character down a zip line. Some of the carriers failed, but we all laughed when the Lego people spilled to the floor. This activity had many embedded math problems: How fast were the carriers traveling? How did their size affect their speed and the distance they traveled? Adults who want to help students with math will be richly rewarded if they choose to entice students with problems that relate to everyday life. The excitement generated by even one positive math experience may turn some of our math-shy participants into the creators, designers, and problem solvers of the future.

References

Buckley, P. A., & Ribordy, S. C. (1982, May). *Mathematics anxiety and the effects of evaluative instructions on math performance.* Minneapolis, MN: Midwestern Psychological Association.

Furner, J. M., & Berman, B. T. (2003). Math anxiety: Overcoming a major obstacle to the improvement of student math performance. *Childhood Education, 79*(3), 170–174.

Furner, J. M., & Gonzalez-DeHass, A. (2011). How do students' mastery and performance goals relate to math anxiety? *Eurasia Journal of Mathematics, Science & Technology Education*, 7(4), 227–242.

Heitin, L. (2015, February 10). "Fraction phobia": The root of math anxiety? [Blog post]. Retrieved from http://blogs.edweek.org/edweek/curriculum/2015/02/fraction phobia_the_root_of_mat.html

Jackson, C. D., & Leffingwell, R. J. (1999). The role of instructors in creating math anxiety in students from kindergarten through college. *Mathematics Teacher, 92*(7), 583–586.

Jung, M., Kloosterman, P., & McMullen, B. (2007, September). Young children's intuition for solving problems in mathematics. *Young Children*, 62(5), 50–57.

Kawas, T. (n.d.). Quilt square challenge. Retrieved from http://mathwire.com/quilts/qschallenge.html

Kutner, L. (1992, August 13). Teachers and parents who are afraid of math can pass that anxiety to the next generation. *New York Times,* pp. B4, C12.

National Council of Teachers of Mathematics Commission on Standards for School Mathematics. (1989). *Curriculum and evaluation standards for school mathematics.* Reston, VA: Author.

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics.* Reston, VA: Author.

Tapia, M., & Marsh, G. E. (2004). An instrument to measure mathematics attitudes. *Academic Exchange Quarterly, 8*(2), 16–21.

Jumpin' Jaguars

Encouraging Physical Activity After School

Heather E. Erwin, Stephanie A. Rose, Sarah R. Small, and Jay Perman

The U.S. government's *Physical Activity Guidelines for Americans* suggest that children should engage in moderate to vigorous physical activity for 60 minutes per day (U.S. Department of Health and Human Services [U.S. DHHS], 2008). However, recent data indicate that children in the U.S. are not accumulating enough physical activity (Centers for Disease Control and Prevention, 2014). The concern is deepest for youth of lower socioeconomic status and youth of color (Moore, Davis, Baxter, Lewis, & Yin, 2008; Singh, Kogan, Siahpush, & van Dyck, 2008). As a result, professionals in a variety of fields have pushed for physical activity promotion for youth (Pate et al., 2006).

Schools are promising locations for promoting physical activity; most American children attend school, and schools have the infrastructure to accommodate physical activities (U.S. DHHS, 2000). First Lady Michelle Obama has endorsed physical activity and nutrition for all youth through the Let's Move campaign (Let's Move, n.d.). Let's

Move Active Schools outlines the role schools can play in promoting physical activity. Its Comprehensive School Physical Activity Programs include five components: physical education, physical activity during school, staff involvement, family and community involvement, and physical activity before and after school (Let's Move Active Schools, n.d.).

Afterschool programs, because they are attended by 10.2 million youth for an average of eight hours per week, are vital settings for promoting physical activity and health (Afterschool Alliance, 2014). Currently, 14 state-level afterschool organizations have adopted physical activity policies (Beets, Wallner, & Beighle, 2010).

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Those policies vary greatly. Some simply advocate for providing daily play time; others offer more specifics, such as devoting 20 percent of program time to moderate to vigorous physical activity (Beets, 2012). None of the policies either were based on data collected in afterschool environments or include accountability measures (Beets, 2012). Although policies are important, they may not be effective if they are not evidence based or cannot be enforced.

National recommendations would have afterschool participants engaging in moderate to vigorous physical activity for at least 20 percent of program time or 30 minutes, whichever is more (Wiecha, Gannett, Hall, & Roth, 2011). Moderate-intensity activity requires a person to work hard enough to raise the heart rate and break a sweat; vigorous activity significantly increases an individual's heart rate (World Health Organization, 2015). Recent studies have found that afterschool programs contribute between 13 and 24 minutes of moderate to vigorous physical activity for youth (Beets, Rooney, Tilley, Beighle, & Webster, 2010; Trost, Rosenkranz, & Dzewaltowaki, 2008). Other studies suggest that afterschool programs provide less than one-third of the daily physical activity recommended for children (Beets, 2012). Although these figures are disappointing, they show that afterschool programs have a lot of potential to encourage physical activity.

Many afterschool physical activity programs and curricula are available, but evaluation of their effectiveness is needed (Beets, 2012). Well-marketed programs such as the Child and Adolescent Trial for Cardiovascular Health (CATCH) Kids Club have shown limited effectiveness in increasing physical activity for participants in comparison to control groups (Kelder et al., 2005; Sharpe, Forrester, & Mandigo, 2011). However, other afterschool programs increased the amount of time children spent in physical activity by up to 17 percent (Beets, Beighle, Erwin, & Huberty, 2009). Effective strategies for increasing physical activity in afterschool programs include, for example, allocating time specifically for physical activity and providing professional development to help staff foster physical activity among youth and participate themselves in physical activity (Beets, 2012).

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To add to this discussion of the effectiveness of afterschool physical activity programs, we developed, implemented, and studied a physical activity program called Jumpin' Jaguars for elementary-aged children. This paper describes the implementation of Jumpin' Jaguars in one school, outlines our findings on its physical activity outcomes, and offers recommendations, based on our findings, for improving physical activity levels in afterschool programs.

Context

Researchers from the University of Kentucky collaborated with an elementary school in Lexington to develop and implement Jumpin' Jaguars in the 2011–2012 school year. This physical activity and nutrition education program consisted of twice-weekly 90-minute sessions in which the participants engaged in physical activities and ate nutritious snacks provided by local grocery stores.

The physical activity lessons, typically 60 minutes long, were usually led by the school's physical education teacher. A local dance studio provided Zumba classes once a month, and the YMCA provided swimming lessons two afternoons a month.

On a typical afternoon, Jumpin' Jaguars participants shared a healthy snack and then went to the school gym for 60 minutes of physical activity programming. On swimming days, they went by bus to the YMCA, which was located close to the school. Zumba was offered in the school gym.

On days when regular physical activities were offered in the gym, the instructor would turn on music for warm-up activities. Next, the instructor led the children through the fitness segment of the lesson, which engaged them in such cardiovascular activities, as running, jumping, galloping, and skipping during tag games. This segment might also work on flexibility or offer innovative ways of doing strength exercises such as push-ups and sit-ups. Most of these activities were offered circuit-training style: Students would do an activity for 30–45 seconds and then rest or stretch for 30–45 seconds. The final portion of the activity session involved a game. Often the game was some form of tag, in which children were eliminated once they were tagged and had to sit on the edge of the playing area. In the sessions we observed,

the game was played several times, so participants were not sitting for long periods of time.

Methods

We studied Jumpin' Jaguar activities and participants to see how successfully the program engaged students in moderate to vigorous physical activity.

Participants

The school from which we recruited study participants was a K–5 elementary school in which 90 percent of students qualified for free or reduced-price meals. The school was 16 percent white, 67 percent African American, 12 percent Hispanic, and 5 percent other. The school ranked in the sixth percentile in the state in accountability performance; it had a classification of "needs improvement."

Jumpin' Jaguars was offered to all students in grades 1–5. The first 40 students who provided parental consent were allowed in the program. However, due to drop-outs and absences, 37 students participated fully. Of these, 38 percent were male. Based on their body-mass index, 24 percent of the children were classified as being of normal weight, 35 percent were overweight, and 41 percent were obese.

Data Collection

To measure the physical activity levels of participants and the context of the physical activity lessons, we utilized a widely used systematic observation system. System for Observing Fitness Instruction Time (SOFIT) is a momentary time sampling and interval recording system designed to quantify factors believed to promote healthy physical activity (McKenzie, Sallis, & Nader, 1991). Following the SOFIT protocol (McKenzie, 2009), a researcher observed program activities in 10-second increments, followed by a 10-second increment for recording. Two researchers observed some sessions to establish observer reliability. Before the start of each session, the observer randomly selected four students to observe that day and watched them in a sequential pattern.

The observations were classified in three areas: physical activity, lesson context, and teacher activity-promoting behavior. The activity, context, or teacher behavior coded was the event taking place when an audio "record" prompt began the 10-second observation interval.

Physical activity was classified by intensity level for one of the four randomly selected students at a time during each 10-second observation interval. The five-point scale coded 1 for lying down, 2 for sitting, 3 for stand-ing, 4 for walking, and 5 for vigorous activity, defined as anything more strenuous than ordinary walking. The category of vigorous activity did not consider body position so that, for example, push-ups and sit-ups could be included.

Lesson context had six possible codes (McKenzie, 2009):

- **Management:** time devoted to general content not intended to be physical education, such as transitions, breaks, and behavior management
- **Knowledge:** time focused on student acquisition of knowledge related to physical education
- **Fitness:** time spent on activities whose purpose was cardiovascular endurance, strength, or flexibility
- **Skill practice:** time spent on practice with the primary goal of developing skills
- **Game:** time spent in application of skills in a game or competitive activity
- **Other:** free play time

The third category was teacher activity-promoting behavior. There were three options for this category: promoting physical activity within the lesson, promoting physical activity beyond the lesson, or no physical activity promotion. Promoting physical activity within the lesson meant that the teacher verbally encouraged students, for example, "Jump in there and try to tag him, Johnny!" Promoting activity beyond the lesson would include verbal prompts to be active outside the afterschool program, such as "You can try this at home with your siblings or friends."

We observed eight afterschool physical activity lessons, randomly selected from throughout the school year. Swimming days were excluded. Of the eight selected lessons, six sessions were led by the school's physical education teacher and two by the Zumba instructor.

To analyze the data, we calculated frequency counts for each category and then compiled percentages.

Observation Findings

Our findings for physical activity levels across all eight days of observation are summarized in Figure 1. Jumpin' Jaguar participants spent the highest percentage of time standing (41 percent), followed by walking (31 percent) and sitting (16 percent). The total time spent in moderate to vigorous physical activity, which includes walking, was 42 percent of the physical activity time, or about 25 minutes each day.

As shown in Figure 2, the most common contexts of the afterschool physical activity lessons were games (39 percent) and fitness (29 percent). Manage-

Figure 1. Levels of Physical Activity

Lying down (0.93%)
Sitting (16.42%)
Standing (40.58%)
Walking (30.66%)
Vigorous (11.41%)
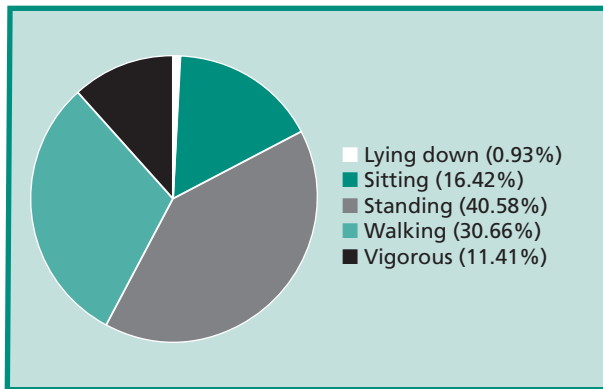
ment took up almost 19 percent of the time. Skills were emphasized about 10 percent of the time, while knowledge (direct instruction) was rarely observed.

Figure 2. Lesson Contexts

Management (18.95%)
Knowledge (3.07%)
Fitness (29.23%)
Skills (9.69%)
Games (39.06%)
Other (0.00%)
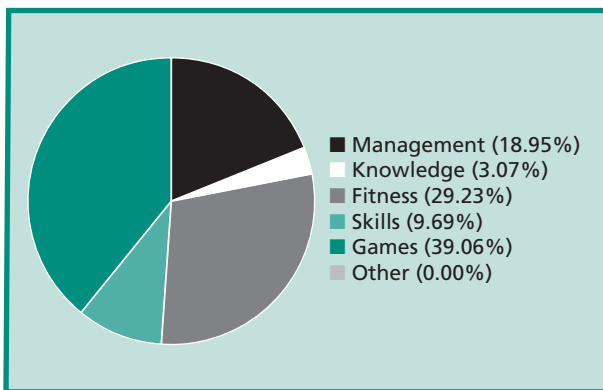
Our findings on teacher behaviors related to promotion of physical activity are shown in Figure 3. Only about 10 percent of observations found the teacher promoting physical activity during the afterschool program. We observed no prompts for participants to be active beyond the afterschool program.

The limitations of our study included the fact that we worked with a small sample of participants who were selected on a first-come, first-served basis. This possible bias is not likely to have affected the outcomes because the participant sample was representative of the entire school population Another limitation was the fact that the program was offered only two times per week. Findings should not have been affected, since we collected data only when youth were actually participating in the program. However, future studies should investigate the effects of afterschool physical activity programs that are offered for different numbers of days each week.

Figure 3. Teacher Activity-Promoting Behaviors

In-class physical activity promotion (9.84%)
Out-of-class physical acitivty promotion (0.00%)
None (90.16%)
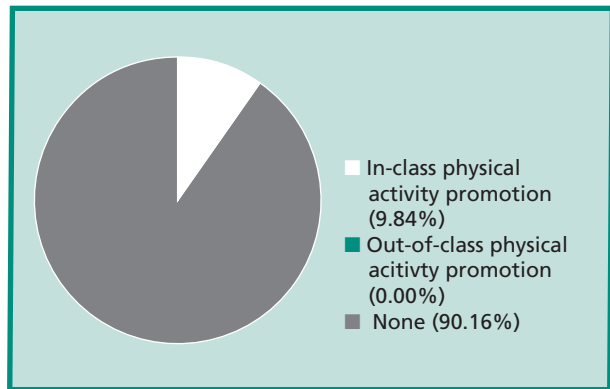
Opportunities to Add Physical Activity Time

Participants spent about 30 minutes, or about 42 percent, of Jumpin' Jaguar program time in moderate to vigorous physical activity, leaving room for improvement during more than half of the time.

Our findings on intensity of activity showed that children spent quite a bit of time standing and sitting. Children do benefit more from short, frequent bouts of intense physical activity followed by short rests (Pangrazi & Beighle, 2016) than from sustained activity. Still, decreasing sitting time would likely have a positive effect on physical activity outcomes. Accomplishing this goal would require training staff so they know how to manage youth in a physical activity setting and can modify activities to maximize physical activity, as described in the box on page 37.

In terms of the lesson context, the fact that approximately 19 percent of the time was used for management offers another area for improvement. Only 3 percent of time was spent providing participants with knowledge that they might use in physical activities outside of the afterschool program. Among the motor activity contexts—fitness, skill practice, and games—the activity that occupied the highest percentage of time is games, at 39 percent. Different games offer different amounts of physical activity for participants. Modifications can be made to games—and to fitness and skills practice activities—to improve physical activity levels, as outlined in the box Strategies for Maximizing Physical Activity Time.

A final strategy for improvement would be increasing teachers' activity-promoting behaviors. In our observation, instructors prompted participants to be active only 10 percent of the time. More prompts throughout the session would be likely to increase the amount of time spent in moderate to vigorous activity. Furthermore, instructors should promote physical activity beyond the afterschool program. Although research has not examined the effect

STRATEGIES FOR MAXIMIZING PHYSICAL ACTIVITY TIME

Our findings, coupled with a large body of research conducted with YMCA programs (Weaver, Webster, & Beets, 2013), suggest strategies for increasing moderate to vigorous physical activity in afterschool programs.

1. **Form smaller teams and provide more equipment.** Instead of one game with two large teams, afterschool staff can set up multiple games with small teams so children don't have to stand or sit while waiting their turn.

2. **Eliminate elimination games.** Children should not sit out if they are tagged. Instead, staff could have them do a quick, fun activity to reenter the game or have two games going on simultaneously, so that children who are "out" in one game can continue in the other.

3. **Modify the space, equipment, or rules.** Staff can change activities with which they are already familiar to make them more active. For example, in traditional Duck Duck Goose, most children sit in a circle, and only two are active. Instead, children can play in pairs, facing each other and saying "duck, duck, duck…" until one of them says, "goose." That player then chases the other to a line at the side of the activity area. This variation keeps all the children active.

4. **Reduce management time by fostering positive relationships.** When staff make personal connections, youth are more likely to be engaged and respectful. Staff can get to know students individually, make them feel valued, and preserve their dignity by, for example, disciplining them privately rather than in public. Mutual respect will go a long way toward decreasing management time and thereby allowing for more activity time.

5. **Encourage staff to be active themselves.** Studies have demonstrated that children who are encouraged by staff to be active during recess are in fact more active (Huberty et al., 2011). A "no-sitting" rule for staff may encourage them to interact with the children and thereby elicit more physical activity.

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of teacher prompts beyond the immediate learning environment, participants need to see the value of being active beyond the afterschool setting in order to transfer what they learn to their lives outside the program.

Promoting Lifelong Fitness

Afterschool programs can provide a safe environment for children to engage in much-needed physical activity. As organizations rise to meet providers' demands for guidelines and resources, barriers to implementation, such as untrained staff or the push to address academic standards after school, are becoming more surmountable (After School Programs Office of the California Department of Education, 2009). With a minimal amount of training, afterschool staff can deliver physical activity curricula like CATCH Kids (Kelder et al., 2005) to help children accumulate at least half of their recommended 60 minutes of moderate to vigorous physical activity.

Afterschool programs cannot be expected to end childhood obesity, but they can contribute to decreasing it through a multifaceted approach (Moore, 2008).

As in any other behavioral endeavor, consistency is the key. Wherever children are, they should receive a consistent message that physical activity is an important part of their wellbeing. They should be able to enjoy activities in a supportive and safe setting that promotes lifelong physical activity. Afterschool programs that make physical activity an essential component of the program greatly increase the odds that physical activity will persist from childhood into adulthood (Motl, Dishman, Saunders, Dowda, & Pate, 2007). Afterschool staff can adapt our recommendations to their own needs in order to influence children's physical activity levels not only during the program but also beyond.

References

After School Programs Office of the California Department of Education. (2009). *California after school physical activity guidelines*. Sacramento: California Department of Education.

Afterschool Alliance. (2014). *America after 3 PM: Afterschool programs in demand*. Washington, DC: Author.

Beets, M. W. (2012). *Policies and standards for promoting physical activity in after-school programs. A research brief.* San Diego, CA: Robert Wood Johnson Active Living Research.

Beets, M. W., Beighle, A., Erwin, H. E., & Huberty, J. (2009). Impact of after-school programs to increase physical activity and fitness: A meta-analysis. *American Journal of Preventive Medicine, 36*(6), 527–537.

Beets, M. W., Rooney, L., Tilley, F., Beighle, A., & Webster, C. (2010). Evaluation of policies to promote physical activity in afterschool programs: Are we meeting current benchmarks? *Preventive Medicine*, *51*(3), 299–301.

Beets, M. W., Wallner, M., & Beighle, A. (2010). Defining standards and policies for promoting physical activity in afterschool programs. *Journal of School Health*, *80*(8), 411–417.

Centers for Disease Control and Prevention. (2014). Youth risk behavior surveillance: United States, 2013. *Morbidity and Mortality Weekly Report, 63*(SS-4).

Huberty, J. L., Siahpush, M., Beighle, A., Fuhrmeister, E., Silva, P., & Weld, G. (2011). Ready for recess: A pilot study to increase physical activity in elementary school children. *Journal of School Health, 81*(5), 251–257.

Kelder, S., Hoelscher, D. M., Barroso, C. S., Walker, J. L., Cribb, P., & Hu, S. (2005). The CATCH Kids Club: A pilot after-school study for improving elementary students' nutrition and physical activity. *Public Health Nutrition*, *8*(2), 133–140.

Let's Move! (n.d.). *About Let's Move.* Retrieved on December 4, 2015, from http://www.letsmove.gov/about

Let's Move Active Schools. (n.d.). *Roadmap for creating an active school.* Retrieved from http://www.letsmoveschools.org/s/15-16-LMASFramework-10-19-15.pdf

McKenzie, T. L. (2009). *SOFIT (System for Observing Fitness Instruction Time) generic description and procedures manual.* San Diego, CA: San Diego State University.

McKenzie, T. L., Sallis, J. F., & Nader, P. R. (1991). System for observing fitness instruction time. *Journal of Teaching in Physical Education*, *11*, 195–205.

Moore, J. B. (2008). The built environment and physical activity: Influencing physical activity through healthy design. *Journal of Public Health Management Practice, 14*(3), 209–210.

Moore, J. B., Davis, C. L., Baxter, S. D., Lewis, R. D., & Yin, Z. (2008). Physical activity, metabolic syndrome, and overweight in rural youth. *Journal of Rural Health, 24*(2), 136–142.

Motl, R. W., Dishman, R. K., Saunders, R. P., Dowda, M., & Pate, R. R. (2007). Perceptions of physical and social environment variables and self-efficacy as correlates of self-reported physical activity among adolescent girls. *Journal of Pediatric Psychology, 32*(1), 6–12.

Pangrazi, R. P., & Beighle, A. (2016). *Dynamic physical education for elementary school children* (18th ed.). San Francisco, CA: Benjamin Cummings.

Pate, R., Davis, M. G., Robinson, T. N., Stone, E. J., McKenzie, T. L., & Young, J. C. (2006). Promoting physical activity in children and youth: A leadership role for schools. *Circulation, 114*(11), 1214–1224.

Sharpe, E. K., Forrester, S., & Mandigo, J. (2011). Engaging community providers to create more active after-school environments: Results from the Ontario CATCH Kids Club implementation project. *Journal of Physical Activity and Health*, *8*(1), S26.

Singh, G. K., Kogan, M. D., Siahpush, M., & van Dyck, P. C. (2008). Independent and joint effects of socioeconomic, behavioral, and neighborhood characteristics on physical inactivity and activity levels among U.S. children and adolescents. *Journal of Community Health, 33*(4), 206–216.

Trost, S. G., Rosenkranz, R. R., & Dzewaltowski, D. (2008). Physical activity levels among children attending after-school programs. *Medicine and Science in Sports and Exercise, 40*(4), 622–629.

U.S. Department of Health and Human Services. (2000). *Healthy people 2010: Physical activity and fitness.* Washington, DC: Author

U.S. Department of Health and Human Services. (2008). *Physical activity guidelines for Americans.* Washington, DC: Author..

Weaver, R. G., Webster, C., & Beets, M. W. (2013). LET US Play: Maximizing physical activity in physical education. *Strategies, 26*(6), 33–37.

Wiecha, J. L., Gannett, L., Hall, G., & Roth, B. A. (2011). *National Afterschool Association standards for healthy eating and physical activity in out-of-school time programs.* Retrieved from http://naaweb.org/images/HEPAStandards8-4-11final.pdf

World Health Organization. (2015). *Global strategy on diet, physical activity and health.* Retrieved from http://www.who.int/dietphysicalactivity/physical_activity_intensity/en/

Afterschool Matters

Call for Papers

Afterschool Matters is a peer-reviewed journal dedicated to promoting professionalism, scholarship, and consciousness in afterschool education. Published by the National Institute on Out-of-School Time with legacy support from the Robert Bowne Foundation, *Afterschool Matters* serves practitioners who work with youth in out-of-school time (OST) programs, as well as researchers and policymakers in youth development.

We are seeking articles for future issues of the journal, beginning with Spring 2017. Scholarly or practice-based work on all aspects of OST programming for children and youth, from a variety of disciplines and academic perspectives, will be considered. We welcome submissions that explore practical ideas for working with young people in OST programs. Personal or inspirational narratives and essays are appropriate for our section "Voices from the Field."

All articles, whether scholarly or practice-based, should connect theory to practice and should be broadly applicable across the field. Articles must be relevant and accessible to both practitioners and academic researchers.

We invite you to discuss possible topics in advance with us. A broad variety of topics will be considered, including the following:

- Innovative program approaches
- OST programs and civic engagement, social and emotional development, arts development, or academic improvement
- Research or best-practice syntheses
- OST program environments and spaces
- Key aspects of program leadership and administration
- OST system-building, such as cross-city and statewide initiatives
- Expanded or extended learning time and the OST hours
- School-community partnerships that support OST programming
- Physical activity and healthy eating
- STEM (science, technology, engineering, and math) program delivery or STEM staff professional development
- Special needs youth, immigrant and refugee youth, or other vulnerable populations in OST
- Youth-centered participatory action research projects
- Gender-focused research and policy initiatives related to OST

Submission Guidelines

- For consideration for the Spring 2017 issue, submit your article no later than May 15, 2016, to ASMsubmission@wellesley.edu.
- Submissions should not exceed 5,000 words.
- Submit your article electronically in Microsoft Word or rich text format. Use 12-point Times New Roman font, double-spaced, with one-inch margins on all sides. Leave the right-hand margin ragged (unjustified), and number pages starting with the first page of text (not the title page, which should be a separate document).
- Include a separate cover sheet with the manuscript title, authors' names and affiliations, and the lead author's phone number and e-mail address.
- The names of the authors should not appear in the text, as submissions are reviewed anonymously by peers.
- Follow the *Publication Manual of the American Psychological Association, 6th Edition* (2009), for reference style guidelines. Present important information in the text and do not use extensive footnotes.

We welcome inquiries about possible article topics. To discuss your ideas, please contact:

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