

Movement by Design: Creating Outdoor Play Spaces that Promote Young Children's Motor Skill Development and Physical Fitness

Sherry L. Schweighardt, Ph.D.¹ & Kiran Paek, M.F.A.²

¹The College of New Jersey, Ewing, NJ; ²Lawrence Montessori, Pennington, NJ contact: schweigs@tcnj.edu

Rationale

- National physical activity guidelines specify that young children get:
 - 120 minutes to several hours of active play daily
 - Outdoor play fostering basic movement skills
- However, preschoolers' typical daily activity consists of:
 - 15 minutes of moderate-to-vigorous physical activity
 - 6 hours of sedentary time
- Recent studies show that some features of traditional, built playgrounds are more likely to be associated with moderate-to vigorous physical activity, but alternative play settings have not been studied.

Purposes of the Study

- Identify the characteristics of playground features that most contribute to
 - Moderate-to-vigorous physical activity
 - Motor skill diversity
- Compare the features of non-traditional outdoor prepared environments and traditional playgrounds in facilitating physical activity
- Determine the extent to which young children self-regulate their interactions with features during unstructured outdoor play



Project Design

- 17 preschoolers, ages 3-5 years
- 12 sessions
- Children played in 4 outdoor settings for 16 minutes each
 - Nature area
 - Traditional playground/fixed climber
 - Adventure/loose parts playground
 - Garden
- Adults did not interact with children during play sessions
- Data collection instruments:
 - ActiGraph GT3x accelerometers
 - System for Observing Play and Recreation in Communities (SOPARC)

Open spaces and large fixed and movable features were most associated with beneficial physical activity



Large, fixed or movable features requiring full body contact were associated with the greatest variety of motor skills



Features placed to encourage incidental movement through open spaces resulted in the most moderate-to-vigorous physical activity (MVPA)



Moving large objects through open spaces increased both MVPA and motor skill diversity

Nature Setting



 Best Gross Motor Activities

Traditional Playground



 Good Locomotor Activities
...but...Most Sedentary Time

Adventure Playground



 Best Upper Body Activities

Garden



 Best Fine Motor Activities

Practice and Policy Implications

- Montessori teachers and administrators would benefit from knowledgeable guidance in designing outdoor play spaces and continually adapting play features to best promote children's motor skill learning.
- Montessori administrators can facilitate children's physical development by explicitly including modules in preparing the outdoor environment for motor skill development in teacher training programs.
- Playscape designers can create and install the types of play settings and features most conducive to high-intensity activity and physically diverse motor skills.



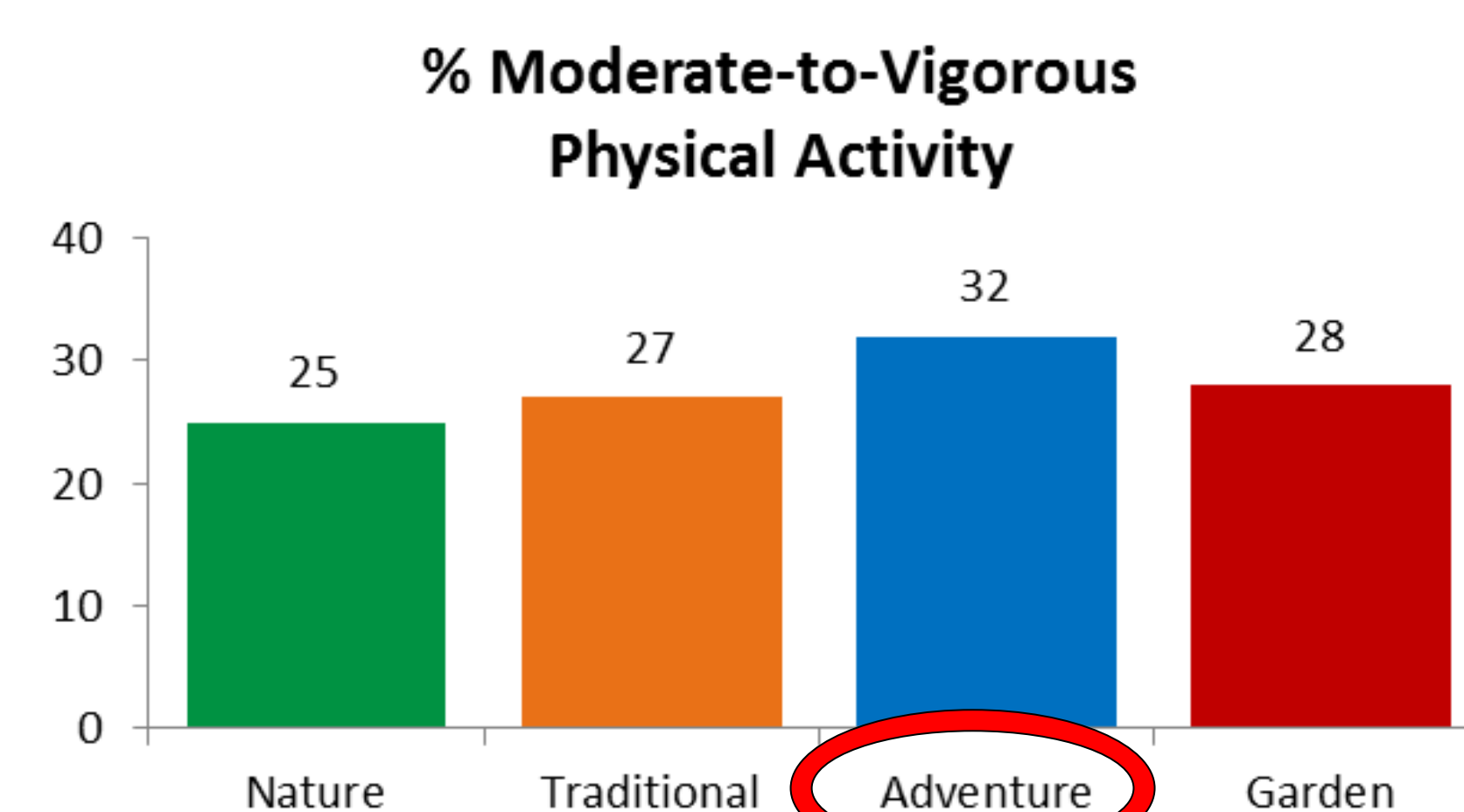
Acknowledgments

Thank you to the American Montessori Society and the U.S. Forest Service Philadelphia Urban Field Station for providing grant funding for this study.

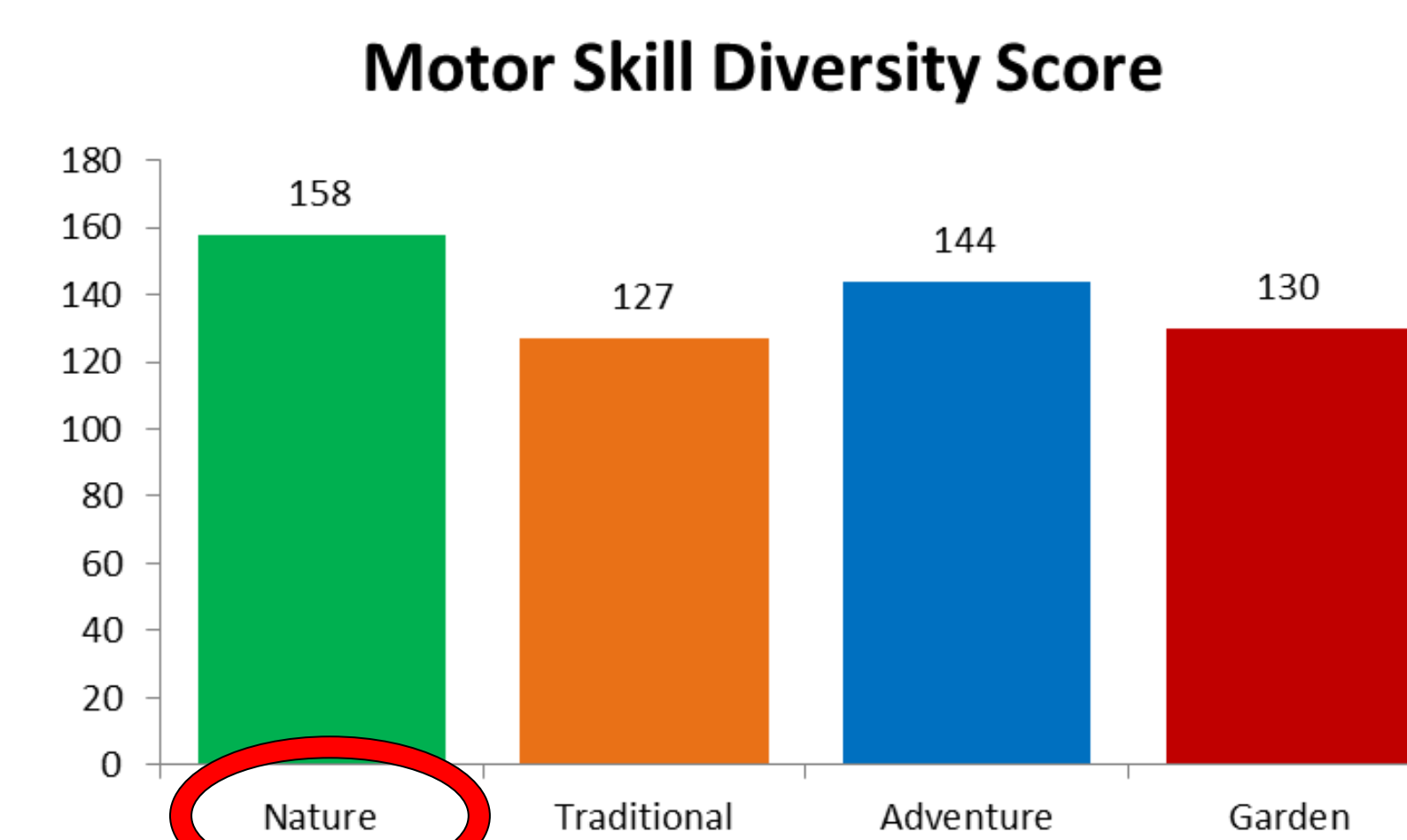
References

- ActiGraph GT3X+ [Apparatus and Software]. (2013). Pensacola, FL. ActiGraph Corporation.
- Birch, L. L., Parker, L., & Burns, A. (Eds.). (2011). *Early Childhood Obesity Prevention Policies*. National Academies Press.
- Hustiy, K. M., Normand, M. P., Larson, T. A., & Morley, A. J. (2012). The effect of outdoor activity context on physical activity in preschool children. *Journal of applied behavior analysis*, 45(2), 401-405.
- McKenzie, T. L., & Cohen, D. A. (2006). *SOPARC (System for Observing Play and Recreation in Communities) Description and Procedures Manual*.
- National Association for Sport & Physical Education. (2009). Active start: A statement of physical activity guidelines for children from birth to age 5, 2nd ed. Reston, VA: NASPE.
- Nicaise, V., Kahan, D., & Sallis, J. F. (2011). Correlates of moderate-to-vigorous physical activity among preschoolers during unstructured outdoor play periods. *Preventive Medicine*, 53(4), 309-315.
- Reilly, J. J. (2010). Low levels of objectively measured physical activity in preschoolers in child care. *Medicine & Science in Sports & Exercise*, 42(3), 502-7.

Moderate-to-vigorous physical activity was highest on an Adventure Playground



Step counts and multi-directional movement were highest in a Nature Setting



Young children demonstrated excellent self-regulation during unstructured active play

Of 5864 observations...

10 interactions with adults (<1%)
(exclusive of restroom requests)

4 safety/rule infractions

1 injury requiring First Aid