Section 3

Collaborative Research

Chapter 7

The HOPE Lab

An Interprofessional Approach to Researching and Promoting Healthy Outdoor Play and Exercise

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Introduction

A timely concern is that people have limited access to nature, and in some cases are so connected to digital technology that it can interfere with their health and well-being (Louv, 2005). Several disciplines have attempted to address these concerns, but often without formal interprofessional collaboration. Park and recreation professionals and planners, for example, have demonstrated the health benefits of providing and enhancing public outdoor spaces (Thomsen et al., 2013). Exercise scientists and physical educators have developed innovative ways to encourage physical activity across the lifespan (Sallis, 2015). Health care providers have recommended nature exposure and outdoor movement to enhance physical health and promote overall well-being (Wessel, 2017). Public health practitioners have helped the public recognize the positive benefits of physical activity in outdoor settings (APHA, 2013). These discipline-centric approaches are enhanced when silos are taken down and efforts are made to develop interprofessional relationships.

The HOPE Lab was founded on a shared interest in developing both an interdisciplinary (Duerr & Herkommer, 2015) and interprofessional (Hall, 2004) approach to research that would provide best practices to promote health across the lifespan through spending time outdoors. The Lab was initially focused on enhancing Park Prescription (PP) programs, involving health care providers collaborating with community partners to "prescribe" or encourage patients to visit parks or public lands (James et al., 2019). Partners in the Lab recognized that research on PP programs was

limited and complicated due to the nature of various disciplinary perspectives as well as having multiple desired outcomes (e.g., developing healthy habits, creating awareness of public spaces as health spaces or fostering stewardship of natural spaces). PP programs were also situated in multiple fields (parks and recreation, exercise science, health care providers) as well as promoted by several institutions/organizations (state and national Parks, National Recreation and Park Association, and the American Public Health Association). While the excitement was high for implementing Park Prescriptions programs across the United States, what was needed was an interprofessional collaboration that would provide shared meanings/terms, evidence and critical thought on park prescription programs.

Purposeful interdisciplinary relationships developed through early PP projects have provided a foundation for the vitality and future growth of the HOPE Lab. Lab partners have broadened their research, enhanced access to a variety of stakeholders, and facilitated additional interprofessional relationships. This case study examines the development of an interprofessional research team to conduct interdisciplinary research and describes how the partnership expanded beyond its original interest in PP programs.

HOPE Lab Origins

To demonstrate the HOPE Lab's interprofessional development, we must explore its beginnings and development of shared culture from different professions. The HOPE Lab had its origins in 2010 with researchers from exercise science and recreation sharing a common interest in promoting outdoor physical activity for children. The researchers created a research initiative called the Outdoor Research Cluster to investigate the topic of "outdoor play and its relationship to health and wellness, the environment, and human development" with internal support and funding provided by their university. During this three-year project, scholars from many different disciplines (psychology, marketing, student affairs, theater, government studies, recreation, exercise science, and health promotion) participated in reviewing literature and conducting research. The group recognized, in addition to interdisciplinary research, they needed to look at ways to get information out to the community. In the third year, the Outdoor Research Cluster created an event within the community utilizing the campus mascot Yosef, and called it Unplug Yosef and Get Outside. This event encouraged the campus community to unplug from technology on one day for a minimum of four hours. During this time, volunteers provided passive (e.g., hammocking) and active (e.g., field games, outdoor group fitness classes) programs at numerous public outdoor spaces. The research and public programming activities of the Outdoor Research Cluster laid the foundation for the interdisciplinary work of the HOPE Lab team.

Moving toward an Interprofessional HOPE Lab

In 2014, Dr. Christiana, a public health scholar, who was interested in increasing youth's outdoor physical activity, joined Drs. Battista (exercise science) and James (recreation) to develop research. Building on work from the Outdoor Research Cluster, discussions began regarding ways to encourage outdoor physical activity within the rural mountain community. With an understanding that health care providers (HCPs) are often seen as a knowledgeable source when it comes to health-related

topics, the team brainstormed ideas on ways to engage HCPs to discuss with patients ways to increase physical activity. One exciting national-level interprofessional initiative considered for research and implementation in the rural surrounding community was the Park Prescription program. These programs encourage HCPs to "prescribe" parks to patients promoting these natural spaces as a place to get and stay healthy. At that time, there was limited research on park and outdoor activity prescription programs, specifically within rural regions. The research team began writing grants and conducting seminal research on prescription programs for children in rural areas (Christiana et al., 2017a; Christiana et al., 2017b). Quickly the team realized while they were all focused on the same topic, each profession worked from a different paradigm and professional culture (Hall, 2005). The team began sharing insights and clarifying language from the different disciplines, which led to the development of a common language used to define the problem from multiple angles. This, in turn, led to the team seeking out other stakeholders (within and outside their institution) to further develop research projects using other professional expertise (i.e., a geographer at the College of William & Mary who had created the Park Champion Prescription program for campus) and organizations (e.g., Park Rx America, The Institute at the Golden Gate) across the nation working with prescription programs. These connections increased the investigators' capacity to share knowledge and research ideas.

HOPE Lab Established

By the fall of 2016, the team officially formed the HOPE Lab to facilitate a more formalized collaboration within the university as well as with stakeholders nationwide. Initially the HOPE Lab's focus was on encouraging outdoor physical activity for youth reflecting the team's interest. Ultimately due to research findings, it became clear the focus should be expanded from the cradle to grave and include mental well-being. The current mission of the HOPE lab is to investigate the role of outdoor physical activity, exercise, and play on health, the environment, and human development. The vision of the HOPE Lab is to continue developing the scientific foundation for promoting and supporting outdoor physical activity, exercise, and play through interdisciplinary research.

In order to meet the mission and vision, the team realized more disciplinary perspectives and professional expertise were needed. The lab began to seek and invite colleagues to join it in hopes of furthering an interprofessional understanding of interdisciplinary research. In 2018, Dr. Towner, a physical education scholar, joined the team. This addition expanded the HOPE Lab's focus on youth out-of-school experiences to school-related experiences allowing the lab to address both structured and unstructured outdoor play.

HOPE Lab Research Themes

Since the HOPE Lab was part of an academic institution, it was important to involve students in the work. Undergraduate and graduate students in a variety of disciplines who assisted in research projects as well as conducted honors and master's theses became team members. As the faculty and students conducted research, the team began to see some emerging themes related to the lab's mission:

1. Family is important to children's physical activity. While the research and mission were initially focused only on increasing children's physical activity it became apparent that this research was also impacting the family's physical activity.
2. Expanding its scope of research beyond children. Two HOPE Lab graduate student research projects investigated a prescription program for college students and elementary school counselors' use of ecotherapy. These projects began to move the HOPE Lab in the direction of mental health as well as conducting research from a lifespan perspective.
3. Not just about physical activity in the outdoors. Threats to mental well-being were presenting an increased burden to these populations and research was showing that time spent outdoors was also important to mental health (Kaplan, 1995; Mutz & Müller, 2016; Pearson & Craig, 2014; Preuß et al, 2019).
4. Getting the message out about outdoor physical activity! While knowing the research was showing benefits to outdoor physical activity the message was not getting out or being heard by our colleagues, college and university administrators, or the greater public. This would become an important next step for promoting the HOPE Lab mission.

HOPE Lab Evolves

Informed by its research experience, the HOPE Lab needed to broaden its scope to be more impactful. The Lab needed to address the benefits of outdoor physical activity on both physical and mental health (Christiana et al., 2017b) throughout the lifespan. Additionally, the researchers wanted to enhance the marketing of the work, recruit other disciplines and seek resources to help the HOPE Lab meet its mission. Academics tend to promote their work in their respective discipline's professional organization as well as own departments and less likely university-wide. Due to the nature of the HOPE Lab's work, the team often felt no one "got" or valued the work academically. This impeded the Lab's ability to access resources to further its work. The team recognized its own college could offer more support (e.g., access to HPCs, funding, etc.) but the HOPE Labe was not gaining the recognition needed to garner resources.

In 2019, the HOPE Lab team presented its work to the dean of the Beaver College of Health Sciences (BCHS), who then invited the Lab to present to the Beaver College of Health Sciences Advisory Council, and all its department chairs. From these presentations, the word was getting out about the lab's efforts as well as beginning to gain recognition for interprofessional work. The department chairs shared the HOPE Lab's recruitment invitation to college faculty. From this promotion, two new HOPE Lab team members joined bringing an expertise to help research mental health and the medical field: Dr. Broce, from social work and Dr. Venrick, a family nurse practitioner. At its heart, the HOPE Lab continues to build interdisciplinary partnerships and collaborations within and outside the university to tackle the issue of physical and mental health through being physically active in public outdoor spaces.

HOPE Lab Interprofessional Partnerships and Research

The HOPE Lab's interprofessional approach is the foundation to conducting research that is applicable and meaningful to society. With its approach to developing

partnerships for Appalachia and rural prescription programs, the HOPE lab has distinguished itself as a resource nationwide. To demonstrate the significance of developing an interprofessional research lab, the following discussion will describe initial research and partnerships. Additionally, discussions regarding how the interprofessional interactions influenced and broadened the scope of the researchers will be presented.

Initially, the research focus was on the growing movement toward health care providers prescribing public outdoor spaces outdoors to patients to improve health. The HOPE Lab focused on partnering with health care providers to investigate this prescription approach. At the time, outdoor and park prescription programs had not been well researched in terms of implementation strategies and effectiveness in changing behavior. During 2015-2016, the HOPE Lab conducted a pilot study of pediatrician-written prescriptions and counseling interventions for outdoor physical activity (Christiana et al., 2017b) and a qualitative study to understand the perspectives and insights of children's health care providers on prescribing nature and outdoor activity (Christiana et al., 2017a). These studies were some of the first to be conducted in this area and provided valuable insight to implementing park and outdoor physical activity prescription programs. The results of the qualitative study of health care provider perspectives led to a collaboration with another institution to create a survey to be distributed to health care providers to assess their current physical activity counseling practices and interest in outdoor and park prescriptions (study results currently in review for publication). The pilot study was conducted with the sole pediatric office for the county. Half of the physicians wrote prescriptions for their patients and discussed the importance of outdoor physical activity for children with patients and parents while half of the physicians acted as a control group.

One of the most important aspects learned from these initial studies with HOPE Lab collaborators was the need to provide health care providers with targeted resources. One of these resources was an online database of local public outdoor spaces that health care providers could use both when talking to patients and parents as well as for patients and parents to use at home to locate places for outdoor physical activity. This led to a collaboration with the Washington D.C.-based Park Rx America (www.parkrxamerica.org), "a non-profit whose mission is to decrease the burden of chronic disease, increase health and happiness, and foster environmental stewardship, by virtue of prescribing Nature during the routine delivery of health care by a diverse group of health care professionals" (https://parkrxamerica.org/about.php). The result of the Park Rx America partnership was the design and creation of a website where health care providers and patients in the High Country Region could search for places for outdoor physical activity close to where they live and know the amenities and facilities available at each location (www.parkrxamerica.org/highcountrync). With a larger internal grant from the Appalachian State University, the HOPE Lab assessed public outdoor spaces to put into the first rural Park Rx database for western North Carolina, which is now available for use on the ParkRx America website (https://parkrxamerica.org/). This database allows health care providers to provide resources to their patients on where to go locally to engage in outdoor physical activity. Evidenced by earlier research, we learned resources were a critical component for health care providers.

HOPE Lab Research Partnerships

Several of the HOPE Lab's ongoing research projects are in collaboration with an outdoor physical activity resource, Kids in Parks (www.kidsinparks.com). Kids in Parks "offers an expanding network of family-friendly outdoor adventures called TRACK Trails." TRACK Trails consist of self-guided brochures and signs along existing trails that create a fun and exciting experience for children. Kids in Parks is funded through the Blue Cross Blue Shield North Carolina Foundation has been widely praised and awarded by numerous organizations across the country for its innovation. The HOPE Lab is working with Kids in Parks to evaluate a new system of TRACK Trails to be installed throughout South Carolina with funding from the Blue Cross Blue Shield of South Carolina Foundation. This will consist of assessing whether the installed TRACK Trail enhancements are effective in increasing the number of trail users, time on the trail, and physical activity levels.

Another ongoing collaborative research project with Kids in Parks is to evaluate the TRACK Trail prescription program. This program consists of a network of children's health care providers in areas with TRACK Trails that prescribe the trails and other outdoor activities to patients. Patients can log their activities online through the Kids in Parks website to receive prizes in the mail while providers can track their progress and send reminders. The HOPE Lab designed a survey to be conducted with patients and parents to assess how the prescription and website tracking system has improved their physical activity levels and mental health.

The HOPE Lab team works with local health care providers, parks and recreation agencies, schools, and the University to conduct studies and plan future research. College is a time where young adults begin to develop long-lasting behaviors. This is also a time when physical activity levels are low (Peterson et al., 2018) and when mental health is impacted (Pedrelli et al., 2015). Knowing the physical and mental health benefits of being active outside, the HOPE Lab developed and supported an Exercise Science Graduate student thesis for an Outdoor Prescription Program (modeled after College of William & Mary's Park Champion Prescription program for campus) utilizing a peer-to-peer mentoring network where college students provided park prescriptions to peers. Upperclassmen were recruited and trained to become Student Outdoor Champions (SOC), and were asked to meet with participants, promote outdoor physical activity, and provide a park prescription utilizing the database created with Park Rx America. SOC provided follow-up messages with students to encourage participation in their prescribed parks. While the project was designed to determine if this sort of program was feasible, some improvements in physical activity occurred. From a more long-term perspective with guidance from the HOPE Lab, a new student organization was established to provide these opportunities to other students.

Programs that promote outdoor physical activity can be especially beneficial for persons with intellectual disabilities because of increased risk for chronic diseases and lack of access to opportunities for exercise. A university-funded diversity grant was received to increase access by targeting an SOC toward students in the Scholars with Diverse Abilities Program (SDAP). SDAP provides students with mild to moderate intellectual disabilities access to a 2-year inclusive college educational experience. This project investigates if SDAP participants will independently engage in outdoor physical activities after the SOC referral. Participants will receive a specific parks re-

ferral with follow up from a trained outdoor champion, participate in a series of field trips, track their activity levels, and end with a celebration.

As a result of the partnership with Kids in Parks, an opportunity to conduct research with the Appalachian State University Homeschool Physical Education Program presented itself. The project is utilizing the Kids in Parks website and incentive program as a physical activity option outside of the Homeschool Physical Education Program. This project will study physical activity and mental health in response to participating in an outdoor physical activity incentive program.

The HOPE Lab, due in part with previous Kids in Parks work was poised to conduct research on physical distancing on greenways within six weeks of COVID-19 pandemic shutdown. This was an unprecedented time encouraging people to get outdoors as well as to physically distance. In partnership with investigators from another institution in the Appalachian region, video cameras were put up on local greenway (NC) and rails to trail (WV) to determine if signage interventions encouraged physical distancing.

Summary

These interprofessional partnerships and research distinguish the HOPE Lab at its university as a working interdisciplinary lab. What began as a way to study PP programs from different professional lenses has not only grown into other research projects but enhanced the Lab's ability to be responsive to conducting research during a pandemic! As individual researchers, the scope of opportunity was limited to professional discipline. As a HOPE Lab team, the scope of opportunity has been broadened in the university and nationwide!

In addition to the team's research and developing connections across the United States, the work of the interdisciplinary team had some unforeseen advantages to the scholars themselves. For example, two professors, as more senior and tenured faculty, began to mentor an assistant professor in the tenure process. In reverse, this assistant professor brought a new level of opportunity and grant writing expertise to the research that was needed to propel the interprofessional work forward. As individuals, each scholar was successful in their ability to publish but as a team their scholarship productivity increased! The camaraderie, diverse skill sets, and different positions in academia, all contributed to determining ways to better leverage research into practice and application.

Another example of an unforeseen advantage of the interprofessional research team was the lab's ability to include undergraduate and graduate students (studying exercise science, public health, counseling and recreation) as team members. The students were exposed to the interdisciplinary research process (ups and downs), collected and analyzed data, assisted with writing up and presenting the research. They were witness to the interprofessional discussions, working through different discipline paradigms to create a common language and effectively conduct research. Many research labs with a Carnegie classification of Doctorate - Granting - Very High Research have had such success but what makes the HOPE Lab unique besides its interprofessional organization is that Appalachian State University has a Carnegie classification of Master's - Larger Programs, Master's L. The HOPE Lab works with little to no funding from the university other than seed grants and has been able to accomplish significant contributions to the literature and practice. We believe it is the interprofessional

nature of the relationships that has led to its success compared to larger, well-funded institutions.

Continuing to work within the Appalachian community to investigate the role of outdoor physical activity on health, the environment, and human development will remain at the center of the HOPE Lab's purpose. In alignment with The HOPE Lab's purpose, the team has conducted research projects with experts across the country, presented as experts on prescription programs, and authored professional and peer-reviewed publications. Through each research project and partnership formed: a concept was learned, a new question was raised, and an idea was developed. Focusing on evidence to guide the next steps is critical to the continuation of any program. As the trend continues to move toward holistic system level approaches, involving a variety of disciplines, engaging key stakeholders, and sustainable partnerships will provide the HOPE Lab continued success.

References

American Public Health Association (APHA). (2013, November 5). *Improving health and wellness through access to nature*. https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/08/09/18/improving-health-and-wellness-through-access-to-nature.

Christiana, R. W., Battista, R. A., James, J. J., & Bergman, S. M. (2017a). Pilot study of pediatrician prescriptions for outdoor physical activity among children. *Preventative Medicine 5*, 100–105. doi:10.1016/j.pmedr.2016.12.005

Christiana, R. W., James, J. J., & Battista, R. A. (2017b). Prescribing outdoor physical activity to children: Health Care Providers' Perspectives. *Global Pediatric Health, 4,* 1–7. doi: 10.1177/2333794X17739193

Duerr, F., & Herkommer, A. (2015). Why interdisciplinary research matters. *Nature, 525*(7569), 305–305. doi:10.1038/525305a

Hall, P. (2005). Interprofessional teamwork: Professional cultures as barriers. *Journal of Interprofessional Care, 19*(Sup1), 188–196. doi:10.1080/13561820500081745

James, J. J., Christiana, R. W., & Battista, R. A. (2019) A historical and critical analysis of park prescriptions, *Journal of Leisure Research*. doi: 10.1080/00222216.2019.1617647

Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology, 15*(3), 169–182. https://doi.org/10.1016/0272-4944(95)90001-2

Louv, R. (2005). *Last child in the woods: Saving our children from nature-deficit disorder.* Algonquin Books of Chapel Hill.

Mutz, M., & Müller, J. (2016). Mental health benefits of outdoor adventures: Results from two pilot studies. *Journal of Adolescence, 49,* 105–114. https://doi.org/10.1016/j.adolescence.2016.03.009

Pearson, D. G., & Craig, T. (2014). The great outdoors? Exploring the mental health benefits of natural environments. *Frontiers in Psychology, 5,* 1178. https://doi.org/10.3389/fpsyg.2014.01178

Pedrelli, P., Nyer, M., Yeung, A., Zulauf, C., & Wilens, T. (2015). College students: Mental health problems and treatment considerations. *Academic Psychiatry: The Journal of the American Association of Directors of Psychiatric Residency Training and the Association for Academic Psychiatry, 39*(5), 503–511. https://doi.org/10.1007/s40596-014-0205-9

Preuß, M., Nieuwenhuijsen, M., Marquez, S., Cirach, M., Dadvand, P., Triguero-Mas, M., & Zijlema, W. (2019). Low childhood nature exposure is associated with worse mental health in adulthood. *International Journal of Environmental Research and Public Health, 16*, 1809–1827. https://doi.org/10.3390/ijerph16101809

Sallis R. E. (2015). Exercise is medicine: a call to action for physicians to assess and prescribe exercise. *The Physician and Sportsmedicine, 43*(1), 22–256. doi: 10.1080/00913847.2015.1001938

Tho*msen, J., Powell, R. B., & Allen, D. (2013). Park health resources: Benefits, values, and implications. Park Science, 30*, 30–36.

Wessel, L. A. (2017). Shifting gears: Engaging nurse practitioners in prescribing time outdoors. *Journal for Nurse Practitioners, 13*(1), 89–96. https://doi-org.proxy006.nclive.org/10.1016/j.nurpra.2016.06.013