

CHILDREN, YOUTH ENVIRONMENTS

A journal of research, policy and applications

Volume 32
Number 3
2022

Special Issue
COVID-19
Issue 2



Children, Youth and Environments Network
University of Cincinnati

CHILDREN, YOUTH ENVIRONMENTS

EDITORS: **Dr. Victoria Carr**, **Dr. Rhonda Brown**, and **Dr. Vikas Mehta**, University of Cincinnati

MANAGING EDITOR: **Dr. Leslie Kochanowski**, University of Cincinnati

ASSISTANT MANAGING EDITOR: **Ann Rossmiller**, University of Cincinnati

FIELD REPORT EDITORS: **Dr. Sue Elliott**, University of New England and **Dr. Daniela DiGiacomo**, University of Kentucky

BOOK + MEDIA EDITORS: **Dr. Catherine Volpe**, University of New England and **Dr. Ozlemnur Ataol**, Eindhoven University of Technology

COPY EDITOR: **Dr. Jennifer Steffel Johnson**, University of Colorado

ADVISORY BOARD:

Louise Chawla, University of Colorado; **Roger Hart**, City University of New York; **Lynn Liben**, Pennsylvania State University; **Robin Moore**, North Carolina State University; **Fahriye Sancar**, University of Colorado; **Willem van Vliet**, University of Colorado.

EDITORIAL ADVISORY BOARD:

Nicole Ardoin, Stanford University, USA; **Mark Blades**, University of Sheffield, UK; **Caitlin Cahill**, Pratt Institute, USA; **Sudeshna Chatterjee**, Action for Children's Environments, India; **Yolanda Alicia Corona-Caraveo**, Universidad Autónoma Metropolitana Xochimilco, Mexico; **Debra Cushing**, Queensland University of Technology, Australia; **Victoria Derr**, California State University, USA; **Janet Dymont**, University of Tasmania, Australia; **Ingunn Fjærtøft**, University of South-Eastern Norway; **Claire Freeman**, University of Otago, New Zealand; **Enakshi Ganguly**, HAQ Centre for Child Rights, India; **Jorgelina Hardoy**, Int'l Institute for Environment & Development, Argentina; **Laurie Harmon**, University of Wisconsin, USA; **Harry Heft**, Denison University, USA; **Lia Karsten**, Universiteit van Amsterdam, Netherlands; **Isami Kinoshita**, Chiba University, Japan; **Kevin Lalor**, Dublin Institute of Technology, Ireland; **Jill Litt**, University of Colorado, USA; **Janet Loebach**, Cornell University, USA; **Laura Malinin**, Colorado State University, USA; **Lorraine E. Maxwell**, Cornell University, USA; **Barry Percy-Smith**, University of Huddersfield, UK; **Edith Phaswana**, Thabo Mbeki African Leadership Institute UNISA, South Africa; **Gina Porter**, Durham University, UK; **Sharon Ergetta Sutton**, Parsons The New School, USA; **Nancy Wells**, Cornell University, USA

The *Children, Youth and Environments* journal disseminates knowledge and stimulates discussion in support of inclusive and sustainable environments for children and youth everywhere. CYE has a global community and connects the worlds of research, policy and practice.

The *CYE* journal is a peer-reviewed, multi-disciplinary, online journal, highlighting the physical environments where children and youth live, learn, work and play. The journal values the capacity of children and young people to meaningfully participate in the processes that shape their lives, and publishes papers from distinct viewpoints, varied approaches, and diverse cultures and regions around the world. The journal offers researchers a high-quality, refereed outlet for sharing work pertaining to the physical environments that impact the lives of children and youth around the world. The journal publishes papers in the form of research articles, field reports and book/media reviews ranging from quantitative and qualitative empirical research; theoretical, methodological, and historical investigations; critical literature reviews; design analyses; post-occupancy evaluations; policy studies; and program assessments.

Children, Youth and Environments appeared as a print journal from 1984-1995 as *Children's Environments Quarterly* and *Children's Environments*. In 2003, it was revived as an online journal, which now reaches readers in more than 160 countries. Readers and authors include researchers and practitioners in education, childhood studies, geography, sociology, child and youth development, child welfare, child rights advocacy, development studies, architecture, landscape architecture and design, urban design, and planning. CYE is endorsed by UN-Habitat and guided by a distinguished Editorial Advisory Board.

For more information visit <https://www.cyenetwork.org>

Cover image from the field report [Implementing a Play-Based Forest Classroom Following the Onset of COVID-19 \(CYE 32, 1\)](#) by Kevin Stinehart, Jill Shelnut, Meghan Chandler, Barry A. Garst, and Stephanie P. Garst. Photograph by Kevin Stinehart.

As we publish our second special issue on COVID-19, many are optimistic that the pandemic is nearing an end. However, as we asserted in our first issue, the real longitudinal impacts of COVID-19 on children, youth, and society are unknown. Current and future waves of infections caused by coronavirus variants and sub-variants make clear that the pandemic is not yet over; the virus will continue to naturally progress. Yet, as CYE goes to press, the World Health Organization is considering whether the pandemic is still an international public health emergency and governments are seeking ways to provide new bivalent vaccines to all its citizens and streamline its COVID-19 guidelines to accelerate a return to normal life activities. Travel has resumed, increasing the potential for contracting COVID-19, schools are in session face-to-face with virtual forms of education that may be enduring, and workers are negotiating new approaches to fulfilling their job duties. Yet, worldwide effects on children and youth are evident as reported across our two special issues and within others' research and the public media. Bronfenbrenner's (1979) ecological systems theory with its concentric circles of complex relationships visibly frames the impact of the pandemic -- from government mandates to the closing of businesses and schools, to family health care and financial struggles, to children's play, learning, and life experiences. Articles in this special issue focus on how activities for children and youth had to yield to those impacts - changing venues, utilizing virtual media, and altering transportation modes. This issue also provides insight into family and youth perspectives on caregiving and pandemic-related socio-ecological contexts.

Inside this issue, you will find diverse scholarly work that spans across the globe focusing on the impacts of COVID-19 where children live, learn, and play. We first head to Europe where Percy-Smith and coauthors sought to understand how the pandemic brought about new opportunities in terms of young people's personal development, social actorship and political agency, in spite of its detrimental impacts across seven different countries. Next, we make our way across the Atlantic and arrive in Canada where Larouche and coauthors assessed parent-perceived changes in active transportation and independent mobility among 5- to 17-year-olds since the outbreak of COVID-19 through two nation-wide surveys. We then wander south to the United States where Li and coauthors describe the implementation of a multiplatform science learning program that was originally developed for an in-person, formal learning environment and describe modifications made to the program based on infrastructure, preparations, and resource availability to meet the needs of distance learning in formal and informal learning environments due to COVID-19. Staying in the States, Izenstark and Sharaievska examined fathers' perceptions on how their children's outdoor recreation changed during COVID-19, and differences between rural and urban participants' outdoor experiences to reveal that due to sweeping lifestyle changes, fathers reported increased time spent outdoors and the development of new outdoor family routines as a way to promote children's health, fulfill caretaking responsibilities, and promote family relationships. Additionally, urban fathers reported more outdoor restrictions due to local policies whereas rural fathers reported engaging in a larger variety of nearby outdoor activities.

Richmond and coauthors examined how COVID-19 affected the summer activities and environments of children from high- and low-income homes in the United States to show that youth from high-income homes had access to more enriching activities both before and during the pandemic, even though COVID-19 restricted access to programming for all youth. The authors also identified how work-from-home arrangements and virtual programming that arose during the pandemic could help bridge the opportunity gap moving forward. Ending our tour, we arrive in Illinois where

CHILDREN, YOUTH ENVIRONMENTS

Children, Youth and Environments

Vol. 32 No. 3 2022
COVID-19 Special Issue 2
ISSN 1546-2250

Owens and Adkins explore the intentional design and building process of a camp community in an online program for six programs when that format was not the organizations' original delivery mode and revealed distinct components that comprise a camp-specific community with pertinent considerations for youth development organizations seeking to create a feeling of community in their online programs. We wrap this issue with a field report from Huber and coauthors who describe and discuss their experiences with Playgroup at Home LIVE, a group of children (birth-5 years) and their parents who meet regularly to play and socialize the transitioned to virtual meetings during COVID-19. Happy reading!

Once again, we would like to remind our readers that we are delighted to announce that *Children Youth and Environments* has signed a new deal with University of Cincinnati Press (<https://ucincinnati.uc.edu>). Our backlist will continue to be available through JSTOR. The University of Cincinnati Press is committed to publishing rigorous, peer-reviewed, leading scholarship accessibly to stimulate dialog between the academy, public intellectuals and lay practitioners. The Press works with authors and editors to erase disciplinary to address common problems in our global community. UC Press looks for projects across the humanities, social sciences and STEM fields focusing on social justice and community engagement.

Brofenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard University Press.

Table of Contents

Articles

- Growing up under COVID-19: Insights into Impacts and Young People's Responses to Changing Socio-Ecological Contexts as a Result of the Pandemic
Barry Percy-Smith, Sara Rizzo, Chermaine Tay, Enrica Lorusso, Laurie Day, and Leanne Monchuk 1-24
- Parent-Perceived Changes in Active Transportation and Independent Mobility among Canadian Children in Relation to the COVID-19 Pandemic: Results from Two National Surveys
Richard Larouche, Sarah A. Moore, Mathieu Belanger, Mariana Brussoni, Guy Faulkner, Katie Gunnell, and Mark S. Tremblay 25-52
- Pivoting an In-Person Multiplatform Science Program to a Virtual Program during a Pandemic: Lessons Learned
Linlin Li, Momo Hayakwa, Joan Freese, Beth Daniels, Gary Weiser, Kim Luttgen, Mai Chue Lor, Megan Schneider, Chun Wei (Kevin) Huang, and Emily Jensen 53-81
- Changes in Outdoor Recreation among Rural and Urban Children during the COVID-19 Pandemic: Fathers' Perspectives
Dina Izenstark and Iryna Sharaievskia 82-99
- Differential Impacts of COVID-19 on Summer Activities and Environments for Children from High- and Low-Income Families
Dan Richmond, Rachel McGovern, Taylor Wycoff, Michael Froehly, Meagan Ricks, and Jim Sibthorp 100-123
- Exploring Camp Community in Online Summer Camp Programs during COVID-19
Megan H. Owens and K. Dale Adkins 124-142

Report from the Field

- Physically Distanced but Socially Connected: Interactive Playgroup Sessions Delivered Remotely during the COVID-19 Lockdown
Brittany Huber, Joanne Tarasuik, Nancylee Merzel, and Deborah Njegac 143-154

Growing up under COVID-19: Insights into Impacts and Young People's Responses to Changing Socio-Ecological Contexts as a Result of the Pandemic

Barry Percy-Smith

*Just Futures: Centre for Child, Youth, Family and Communities Research
University of Huddersfield, UK*

Sara Rizzo

Chermaine Tay

Enrica Lorusso

Laurie Day

Ecorys, UK

Leanne Monchuk

*Just Futures: Centre for Child, Youth, Family and Communities Research
University of Huddersfield, UK*

Citation: Percy-Smith, B., Rizzo, S., Tay, C., Lorusso, E., Day, L., & Monchuk, L. (2022). Growing up under COVID-19: Insights into impacts and young people's responses to changing socio-ecological contexts as a result of the pandemic. *Children, Youth and Environments*, 32(3), 1-24.
<http://www.jstor.org/action/showPublication?journalCode=chilyoutenvi>

Abstract

Many studies about the impacts of the COVID-19 pandemic on young people have focused on them as victims or villains in the crisis and with a predominant emphasis on their schooling. This paper draws on participatory action research (PAR) with young people in the UK, Italy, Singapore and Lebanon to provide insights into the impacts of the pandemic and the changes it brought into young people's everyday personal, familial and social worlds. Using Bronfenbrenner's socio-ecological framework, the paper provides a more balanced view of the impact of the pandemic on young people, including examples of how it brought about new opportunities for young people's personal development, social actorship and political agency, in spite of the pandemic's detrimental impacts. We apply the concept of "affordances" to understand how young people have creatively, critically and reflexively responded to changes to the socio-ecological contexts that frame their lives. These are manifest through new social roles, identity development and a heightened sense of communitarianism, political awareness and active citizenship. The paper raises

questions about what young people need in terms of nurturing environments to grow up in and highlights key considerations in safeguarding young people's rights in future public health crises and post-COVID rebuilding.

Keywords: COVID-19, young people, socio-ecological contexts, affordances, family, political, personal development, participatory action research

Introduction

COVID-19 has had significant impacts on young people across the world (Gupta & Jawanda, 2020; Lundy et al., 2021). There is now a considerable evidence base documenting the effects of the pandemic on different areas of their lives. Academic and news media reports have placed considerable emphasis on the far-reaching disruptions to young people's education (Vuorikari et al., 2020; Di Pietro et al., 2020; OECD, 2021; Engzell et al. 2021; Blaskó & Schnepf, 2021). While young people across the world have had their education disrupted as a result of the pandemic, Blaskó and Schnepf (2021) highlight the extent to which COVID-19 compounded inequalities in educational experience and outcomes, giving rise to what Van Lancker and Parolin (2020) refer to as a social crisis in the making. Breaking down these differential impacts on young people's education, Rotas and Cahapay (2020) document how, for example, many young people have struggled with remote learning; similarly, Vuorikari (2020) highlighted the differential ability of families to support education at home.

In parallel with concern about impacts of the pandemic on young people's education, an increasing number of studies underline the impact on young people's mental wellbeing (Ford et al., 2021; Loades et al., 2020; Duan et al., 2020; Gadermann et al., 2021; Young Minds, 2021) highlighting in particular the impact of loneliness and isolation on children and youths' mental wellbeing (Loades et al., 2021). Echoing trends in the socially differential impacts of the pandemic on young people's education, inequalities in impacts on their mental health have been similarly reinforced and exacerbated. Global examples include Gadermann et al.'s (2021) study examining the impacts of the COVID-19 pandemic on family mental health in Canada, Young Mind's 2021 study in the UK, and Duan et al.'s (2021) work highlighting the unequal impacts on vulnerable groups in China. Impacts on young people's mental health in turn affect other areas of their lives including education, for instance due to "Zoom fatigue" resulting from spending considerable time online (Bailenson, 2021).

Evidence suggests that impacts of the pandemic on children and youth are not simply the result of causal influences, but instead are mediated by the contextual circumstances that shape young people's lives (Bronfenbrenner, 1979). Bronfenbrenner's (1979) socio-ecological model is now well known and involves a series of socio-ecological dimensions that shape (young) people's lives: the immediate *microsystem* of the family, peers, and school; the *mesosystem* which links these together through community relationships and interactions; the *exosystem* of wider social factors and socio-structural position; and the *macrosystem* of national culture, political economy, and virtual worlds. This model is useful for understanding the way in which social events such as the pandemic affect young people's lives.

A key microsystem that has impacted young people during the pandemic is family life (Biroli et al., 2020; Branquinho et al., 2020; Lebow, 2020; Cluver et al., 2020). While some studies have reasserted the significance of social inequalities in understanding the worsening plight of some families and young people during the pandemic (Blaskó & Schnepf, 2021; OECD, 2021; Bamba et al., 2021), including

those in specific situations such as temporary accommodation (Rosenthal et al., 2020), others have highlighted how the pandemic can place strain on family life even in middle- and high income families (Carroll et al., 2020) and parenting (Cluver et al., 2020) with consequential impacts for young people's wellbeing. There is also stark evidence that it is often young people with pre-existing vulnerabilities, including those in families experiencing poverty or violence and young people with special educational needs and disabilities, who have most felt the effects of the crisis (Crawley et al., 2020; Gupta & Jawanda, 2020; Imran et al., 2020; Rosenthal et al., 2020; Thorisdottir et al., 2021), with studies by Hawke et al. (2021) and Paceley et al. (2021) highlighting the mental health impacts on particularly vulnerable groups such as young people from the LGBTQI+ communities.

Faced with these multiple impacts a number of scholars underline the importance of hearing the voices of young people on their own terms in order to understand the unique ways they have been impacted and to safeguard their human rights (Cuevas-Parra & Stephano, 2020; Lundy et al., 2021; Branquinho et al., 2020).

However, young people are not solely passive victims of the negative impacts of COVID-19 on their education, health, and wellbeing. While young people have undoubtedly been impacted by the pandemic, sociological studies of childhood and youth assert the extent to which young people are competent social actors able to demonstrate a degree of resilience in navigating social change. Young people readily demonstrate resilience in managing as well as positively navigating difficult situations (see for example Berridge, 2017; Ray, 2010), including the pandemic (see for example Paceley et al., 2021, with respect to LGBTQ young people).

Although there is growing literature on how COVID-19 has affected young people, little attention has been paid to its more nuanced psychosocial impacts on young people in terms of their changing sense of self, coping strategies, personal development, agency and contribution as citizens. This paper fills this gap by revealing the extent to which many young people responded creatively, critically, and reflexively in diverse ways to the pandemic, through, for example, new social roles, personal and identity development, and a heightened sense of communitarianism, political awareness, and active citizenship. While these types of changes also occurred in pre-pandemic contexts, this research illuminates that young people recognize that these are significant outcomes from the pandemic.

Scholarly work concerning children's environments commonly draws on Gibson's idea of "place affordances" (Gibson, 1979), referring to the opportunities young people can derive from different contexts. In a similar way, we applied the concept of "affordances" to our analysis of young people's experiences to understand how, despite the pandemic's detrimental impacts, it also brought about new possibilities for young people. By understanding the complex ways in which the pandemic changed the socio-ecological contexts in which young people lived and their responses to this, we can gain valuable insights into young people's views of the world in which they are growing up.

The overall aim of the research on which this paper draws was to understand how young people are experiencing and responding to the COVID-19 crisis, and to make suggestions for how to promote young people's wellbeing and rights during and after the pandemic. To achieve this aim, the researchers worked with young people as co-researchers to understand:

- 1) How is the COVID-19 crisis affecting young people's everyday lives and those around them, and how are they responding to the situation?
- 2) What are young people's perspectives about how the COVID-19 crisis is being managed, how it is talked about in the media, and the measures that are put in place?
- 3) To what extent are young people's needs and circumstances being considered, and what is the actual and potential contribution of young people as active citizens?
- 4) What do young people think about the attitudes, values, and behaviors of others, and the positive and negative consequences of the COVID-19 crisis for society?
- 5) What do young people perceive as the priorities for the recovery, for rebuilding society and young people's roles in the recovery process?
- 6) What messages do young people have for decision makers about managing future crises, and safeguarding young people's rights in the future?

In this paper, we draw on qualitative evidence gathered by young people, including outcomes from their own research, observations, interviews and diary extracts to elaborate a more nuanced understanding of young people's experiences and responses to the pandemic. In so doing, we reflect on what young people's experiences, values and actions signal for policymakers and practitioners in developing more nurturing environments for children and youth to grow up in in the future.

This paper is framed by sociological studies of childhood and youth (James & Prout, 1997) and children's rights that acknowledge childhood and youth as periods in the lifecourse in their own right rather than perceiving them in developmental terms as "human becomings" (Uprichard, 2008). We also argue that personal and social development and change are equally characteristic in other phases in the lifecourse and as such should not be used solely to define adolescence. In this context we respect the integrity of young people's diverse everyday life experiences shaped by variable and changing socio-cultural contexts and influences over time (James & Prout, 1997) and echo authors elsewhere who argue for the importance of hearing the voices of children and youth and their experiences of the pandemic (Lundy et al., 2021; Cuevas-Parra & Stephano, 2020). Accordingly, the value of the evidence in this paper is important for understanding the influence of this major public health crisis on changes in young people's lives according to their own terms of reference and in ways that may not have happened otherwise.

Understanding Young People's Lives during the Pandemic: Methodological Approach

The Nuffield Foundation funded research¹ on which this paper is based adopted a longitudinal ethnographic action research approach supporting 70 young people (ages 14-18) in seven countries (Italy, Lebanon, Singapore, England, Scotland, Northern Ireland, and Wales) in documenting and making sense of their own experiences and views on political decisions for managing responses to the pandemic. Young people worked in seven research panels, including four mixed-UK groups of young people from the four home nations, each supported by an adult researcher.

The approach drew on principles of participatory action research (PAR), involving young people in exploring and reflecting on the pandemic from their own perspective, generating questions to explore in dialogue with others, engaging in collaborative sense-making, generating key messages for decision-makers and identifying possibilities for their own social action in response to their learning. This approach is not about systematically comparing young people's responses to adult questions or assessing prevalence. Instead, PAR is a participatory alternative for enabling young people to research their own lives according to their own research questions and priorities (Reason, 1988) and valuing the integrity of those experiences in their own right rather than solely giving them value through scientific abstraction. This approach to post-positivist research is not subject to the same notions of rigor as conventional scientific research, but instead is given value by the meaning and value ascribed to the findings in context by those involved (Gibbons et al., 1994). Carr and Kemmis (1986, p. 162) hence articulate action research as "simply a form of self-reflective enquiry undertaken by participants in social situations in order to improve... their own practices, their understanding of these practices and the situations in which the practices are carried out." Young people in this study decided how and with whom they documented the COVID-19 crisis. This allowed the possibility for both formal research methods such as semi-structured interviews, surveys, and media discourse analysis, as well as informal diary and arts-based methods.

Recruitment was via social media, NGOs, public authorities, and organizations representing specific groups, including Black Asian Minority Ethnic (BAME) young people, LGBTQI+ young people, and young carers², and participant selection was guided by the need to ensure sufficient maturity and independence to carry out an action research project online over time. The researchers selected participants with an emphasis on diversity, and to include representation from those who faced specific forms of adversity during the COVID-19 crisis, such as health issues, family issues, or socio-economic challenges.

The adult research team trained and supported the young people as co-researchers to undertake their own research according to their own interests and situations,

¹ Grant reference WEL/FR-000022571

² Young carers are young people who take on responsibilities of providing care for their siblings and or parents

alongside keeping journals of their own observations about the pandemic. The training took place online and included discussing different methods the youth participants might consider using including interviews, diaries, group work, surveys, etc. and discussing how they might use these to investigate issues further and find out more information. The adult researchers designed a research guide and a research toolkit specifically for the project. Research training included talking through the aims, research questions and the socio-ecological framework developed for the research as a way of helping young people think about the varying spheres of influence on different areas of their lives. During the training sessions, adult and youth researchers discussed different areas of young people's lives as possible foci for their research including family, friends/peers, work/income, access to services, education, health and wellbeing, identity, communication, and civic and social participation (Figure 1).

Figure 1. Key themes (1): Implications of COVID-19 for young people's lives

1. Family <ul style="list-style-type: none"> • family roles and relationships • family routines and traditions • emotional support and caregiving • privacy and personal space 	2. Friends and peer relationships <ul style="list-style-type: none"> • leisure activities • friendship groups and personal and social networks • intimate relationships
3. Work and income <ul style="list-style-type: none"> • work, remuneration and family responsibilities • financial or material support • poverty and hardship 	4. Access to services <ul style="list-style-type: none"> • access to food, medicines, sanitation and other essentials • access to professional support • access to information
5. Education <ul style="list-style-type: none"> • schooling and educational resources • formal and non-formal learning (incl. validation of learning under lockdown) • parental engagement in education • effects of missed education/ transition to school or work 	6. Health and wellbeing <ul style="list-style-type: none"> • physical health and exercise • social and emotional wellbeing • health-related vulnerabilities and their impact • personal safety
7. Identity and freedom of expression <ul style="list-style-type: none"> • outlets for personal or creative expression (culture, music, art) • observation of religious or cultural practices • political expression during the crisis (e.g., blogs/vlogs, social commentary) 	8. Civic and social participation <ul style="list-style-type: none"> • Getting out • informal support within the local neighborhood • participation in organized activities (e.g., youth councils, NGO affiliation, or fund-raising activities) • Helping others
9. Crosscutting themes <ul style="list-style-type: none"> • Mobility and freedom of movement • Spaces and environments (e.g., learning, social or digital environments) • Gender dimensions • Vulnerability and disadvantage 	

Young people were invited to think critically about social and political responses to the pandemic, impacts on themselves as a generational group, and what they think needs to happen to ensure that young people's rights are safeguarded during and after the pandemic (Figure 2).

Figure 2. Key themes (2): Young people's social commentary and recommendations

- 1) Young people's perspectives of emergency measures taken** – perceived sufficiency of the speed and type of actions by government and other public authorities: school closures, social distancing, restrictions placed on mobility and privacy (e.g., contact tracing, monitoring of citizens' movements, forfeiting of rights and freedoms).
- 2) Views on impacts for young people as a group within society** – perceived social justice and fairness (e.g., trade-offs between young people's education and public health); intended or unintended consequences for young people of emergency legislation; concerns about groups who are vulnerable within society or overlooked.
- 3) Commentary on societal values, attitudes and behaviors** – perceptions of media coverage of the pandemic and how young people are portrayed; reliability of information; unexpected positive consequences of the crisis (e.g., reduced travel and carbon emissions, community support, collective responsibility and acts of kindness).
- 4) Future proofing** – learning from the COVID-19 crisis for safeguarding child rights in future emergency situations: actions needed at municipal, national or global scales; views on spending priorities for recovery after the crisis—economic, public health, welfare and social justice; and mechanisms to ensure that young people have a voice.

In keeping with the philosophy and ethos of PAR, the specific focus of young people's own research was left for them to decide according to their own situations, interests and realities. Hence, some chose to focus on their own or their family's experiences, while others, for example, used video diaries to provide ongoing commentaries on political decisions being made at a national level. Young people also chose different methods: some conducted interviews and surveys with friends and families, and others focused on documenting their experiences using diaries (written and video) or other creative forms of expression such as art and creating artefacts, both as a medium for inquiry and a mode for findings. Most supplemented their research with their own investigative online searches and interviews to find out more about the pandemic and decisions made. Some young people also engaged in social action such as community support, writing letters to politicians or organizing meetings with local leaders such as the town mayor as part of the project; while constituting actions in their own right, these activities also provided opportunities for further learning.

Panels met approximately every two weeks to share, reflect on and discuss their research findings, using a closed online platform (Yammer) that enabled young people to post and respond to thoughts, findings and questions. In addition, panels were brought together periodically in cross-panel sessions across countries to widen

the scope of dialogue and inquiry across groups and countries. Young people largely worked autonomously within a robust ethical and safeguarding framework in partnership with the adult researcher overseeing their panel. Ethical clearance was provided by the lead organization as well as reviewed on an ongoing basis as the project emerged, for example, for the purposes of involving young people in external webinars and in co-writing publications and reports. The study began in May 2020 and finished in October 2021³.

Young people shared the learning and outputs from their research on the Yammer platform with their peers, which in turn provided a focus for discussion. Some young people also posted their research outputs on the project website. Adult research panel leads supported young people in discussing and making sense of their research findings in relation to different areas of their lives; these discussions were recorded and captured on the Yammer platform as a learning history as well as stimulating further discussion. In addition, the adult researchers interviewed the young people at the end of the first phase of research to enable those who were less forthcoming in groups to have an opportunity to articulate their perspectives on issues arising in the research. All research "data" was uploaded to NVIVO to enable cross-project analysis and sense-making according to the different thematic areas of the study.

Impacts and Changes in Young People's Lives as a Result of the Pandemic

This paper uses the idea of socio-ecological contexts flexibly, to understand how the global pandemic was experienced by different young people in this study depending on changing personal, familial, social, and political influences. We argue that the impact of COVID-19 was mediated by the dynamic relationships between these different socio-ecological contexts. At the same time, COVID-19 initiated changes in the way young people as social actors can affect these wider social domains through the realization of their own agency and development of their sense of citizenship.

Personal Impacts and Responses

The significant impacts of the pandemic on young people's education, health and wellbeing, sense of identity and future plans have been well documented (Bourne et al., 2021; Thorisdottir et al., 2021). Our focus here is to discuss some of the more nuanced psychosocial impacts on young people in terms of their changing sense of self, coping strategies and personal development.

When the pandemic first hit, and as a response to COVID-19 restrictions forcing them to stay at home, young people often made a conscious choice to use the time that otherwise would be filled with schooling as productively as possible. Keeping busy with tasks and a structured routine for many helped prevent boredom and frustration and provided them with some sense of control over their lives (as also found by Mariani et al. 2020). While some pursued new leisure activities, others

³ For further detail about the methodological approach see Monchuk et al. (2020) and www.guc19.com

reconnected with existing commitments such as civic responsibilities, for example by "kicking my student voice work back into gear again." Others found fulfilment in community volunteering, as in Singapore where they supported local migrant workers who were disproportionately affected by the pandemic.

While some young people looked outwards, others turned their focus inwards to creative expression such as visual arts, music, or writing, as art allowed them "to escape the grim reality COVID dumped on their shoulders." Art provided important means for processing their thoughts and feelings about the crisis—like discomfort with empty public spaces and a sense of helplessness after a year of restrictions, as represented in the artwork below (Figure 1)—and reassure themselves about their ability to cope. Some young people used art or poetry to communicate with friends they could not see.

I started writing more poems during this period. I think that was one way that I managed to cope with my down-ness, I guess, because I feel that writing poetry, it allows me to express myself. It tells a story that I would not be able to tell anybody face-to-face. (M17, Singapore)

Figure 1. One young person's artistic depiction of experiences during lockdown



I drew this during a time I felt really powerless against our whole situation. My frustration wasn't directed at the restrictions themselves—we had to lock down [as] our cases were surging—but... a year on it felt like nothing had changed and this virus still wasn't going away. (F18 UK)

Faith was a central part of how some young people coped during this phase, with some rediscovering their lost faith, which provided comfort and reassurance:

For me as a Muslim, I sort of focused more on the prayer aspect of things... If I do have another life, this is going to be something quite small... I kept telling myself that, and that helped me cope through it and realize that it's not that much of a bigger deal. (F17, England)

I've always been a spiritual person. I've always had a connection with the higher power, but I never felt close.... It's when COVID, when there was a lockdown... I felt like I should start getting close to my spiritual beliefs. (F18, England)

As a result of lockdown, young people recognized how they had neglected their wellbeing due to academic responsibilities, social life, and extra-curricular activities. As a result, and with encouragement from parents and carers, young people spoke of feeling that they had become better at caring for themselves, adopting beneficial routines, thought patterns and behaviors that could be applied long-term, beyond coping with the pandemic.

I think if there is one good thing to come out of COVID-19, it's more of how not to distract myself, but how to self-care... even before the pandemic, it's something that a lot of my peers and I struggled with... I just honestly decided to pay more attention to the smaller things... I stopped feeling so hopeless. (F15, Singapore)

For others, lockdown brought a more critical appraisal of life goals. A common theme was to reassess the importance of academic achievement relative to other aspects of their lives, such as family, leisure interests and personal development. Young people spoke about the need for respite from grade competition with peers and from the anxiety induced by exams and results; others spent time on the development of their own sense of self. A central theme was that young people often felt they were no longer the same person as before the COVID-19 crisis.

I've changed as a person... before I was much shyer, I would get involved with things but not to my full abilities... looking back, I don't think I had anywhere near as much confidence as I do now. (F15, UK)

2020 in general was a challenge for me and I learned a lot of things. I thought 2020 would be the year I get everything I want. Now I know 2020 is the year I appreciate everything I have... I learned when you change your priorities you change your life. (F17, Lebanon)

These are quite fundamental shifts in young people's personal development that occurred as a result of changes to the context of their everyday lives. Young people spoke of becoming more mature and self-aware. They regretted losing the opportunity to experience key milestone events such as in-person post-exam celebrations, graduation ceremonies and school trips. However, they simultaneously recognized the value of learning to cope with a crisis of this magnitude, the psychological strength they gained from it, and a sense of perspective about what they felt was important. Above all, young people rejected the narrative that they

were victims of the pandemic, with many proving able to pragmatically adapt to changing circumstances.

I've changed a lot, both for the best and the worst on different aspects. I have become more mature, I have changed my opinion on many things, because I had more time to reflect about them and discuss with others. This pandemic has changed my identity and beliefs very much. (M14, Italy)

Changing Family Roles

For some participating young people, COVID-19 prompted changes in relation to the family and their role within it. School closures and working from home meant that many of the young people spent much longer periods of time with family members within the home, which resulted in changes in relationships for better and for worse. Some felt that the experience of lockdown had resulted in a greater level of emotional closeness, as well as appreciating the value of time spent with family members. Concerns about the health of parents who were frontline workers or about financial hardships posed a strain on young people and their family members' mental wellbeing. In some cases, young people reacted by taking on new roles and responsibilities within the family, by helping with house chores and siblings' home schooling.

With my immediate family, my brother, my mum and my dad, it's just been us four, and normally, we don't really spend this much time together.... It's really helped us to strengthen our bonds... I think we've grown a lot closer to each other than... before. (F16, England)

Lockdown also exposed similarities and differences in values and beliefs within the family. For some, this involved getting to know a side of family members or siblings that they may not have had an opportunity to observe before. Young people sometimes found that they appreciated parents or siblings to a greater extent following lockdown, because they had the chance to learn more about their views and interests as well as how much their parents did on a daily basis to take care of the family. Many young people gained a newfound respect towards their family members as a result of that:

My mum helped me a lot. She's always optimistic... I think over those three months, she started to grow on me... her way of thinking. (F16, England)

This echoes findings elsewhere (Liu & Doan, 2020; Prime et al., 2020) that positive experiences of family life during the pandemic were contingent upon a degree of compatibility of values between family members, and related to greater emotional closeness to family members (Moore et al., 2020), a slower pace of life (Hawke et al., 2020), and realizing new abilities (Chawla et al., 2020).

Elsewhere, clashes and conflicts provided opportunities for young people to develop their own values and identities in relation to family members. Indeed, young people noted that the added time spent with family because of the pandemic made them

more comfortable and willing to engage adult family members in discussion when these views came into conflict.

I spent some time with my dad, he has a lot of very far-right beliefs, and I do not share any of those, so I think I've become more opinionated and vocal...and standing up to him. (F17, Scotland)

I got to know my dad better, especially in terms of his political views, which turned out to be different than what I thought. I heard him comment on the news sometimes, and I would stare at him thinking, 'What are you saying?' (F17, Italy)

These experiences highlight that while COVID-19 will leave lasting effects (OECD, 2020), the young people in this study have demonstrated creativity and resilience in managing to grow through adversity.

Changing Patterns of Social Activities

Contrary to the popular view that young people choose to spend time predominantly on social media (Common Sense & Hopelab, 2021), our research revealed young people missed face to face "genuine" human interaction with friends during the pandemic, as also reported elsewhere (Butler & Bannock, 2021). However, the pandemic also highlighted how young people developed new possibilities for socializing with each other, including exercising remotely together, playing online games or starting a blog to share experiences with close friends.

Recently, there was this very popular game 'Among Us' that many of us played. After a tiring day of studying, my class would Skype each other and play this game together, allowing us to have fun and interact with one another despite the physical distance. (F17, Singapore)

In many cases, the lockdown led young people to realign their friendships, developing stronger bonds with close friends while putting distance between themselves and others they had not felt supported or understood by. Others developed new friendships as a result of new interests and activities online and mutual support groups. For example, in Italy the strengthening of class groups providing solidarity and mutual support partially compensated for lack of real-time interaction:

You have no idea how much it helped me, making me feel so relieved because we would take study breaks and have some fun. (M15, Italy)

We as a class have bonded, out of solidarity, we have all felt the lack of school in the true sense of the word. (F18, Italy)

However, despite these self-help initiatives, young people also became aware of the extent to which many of their friends were struggling to cope, especially those disadvantaged by digital exclusion, highlighting how the context for experience is structurally variable.

Schools and Learning

Repeated school closures, the move to online learning, and changes to assessment procedures all had significant impacts on young people's lives. Home-based learning was experienced both positively and negatively. On the positive side, home-schooling meant less time spent travelling to and from school and more time for rest, doing other things and interacting with family, as well as learning how to study and manage one's own time independently. Some felt that chat functions enabled them to interact with teachers more easily than through face-to-face teaching.

Contrary to narratives that this was a "lost year," young people argued that, despite difficulties of online learning, there were opportunities and benefits in terms of modernizing teaching, making classes more engaging through PowerPoint presentations, students becoming autonomous learners, and students and teachers learning digital skills that are important for future careers.

At school we had never been taught how to use these resources. At school we were always with pen and paper, writing. Now it's different, now if they asked us to do any autonomous work, we would be able to do that. (F17, Italy)

On the negative side, home-based learning brought about problems related to too much time spent in front of a screen, limited opportunities to engage in informal chats with classmates and teachers, limited wider social interactions, technical difficulties with learning online, (especially when teachers were not properly trained), and disrupted learning due to having to care for younger siblings.

Across countries, the experience of home-schooling during the pandemic made some young people realize the social significance of school but also how little they were involved in school decision-making processes, how their needs were often just assumed, rather than discussed and understood by school staff and decision-makers. When some young people had tried to voice their experiences with remote learning, they did not feel their concerns were taken seriously.

Our teachers did this... mass survey to... 'tell us how it felt and rank us on a scale of 1 to 10.' But then they were like 'oh most of the people enjoyed online learning.' I was like, that is a lie... So I think the schools were overplaying too much how well online learning went and how much young people were actually engaging with it... all of us are like 'we hated it.' (M17, England)

The Political Domain

Many young people reported that their needs were not sufficiently accounted for during the pandemic, with decisions seemingly based on what was best for the country and economy as a whole, often at the expense of young people. For example, in Italy young people appreciated the strict measures adopted during the first wave of the pandemic, but grew disappointed with the government's

management during the second wave, as they realized how little their concerns and priorities were reflected in post-pandemic recovery plans.

The superficiality with which the school is treated is the revelation of the lockdown, and its most catastrophic part. (M14, Italy)

These feelings of being marginalized in the political process echoed across other countries. In Lebanon, young people's experiences of the pandemic were exacerbated by wider issues such as the collapsing economy, sectarianism, structural inequalities (refugees, urban/rural divide), a general lack of government accountability, and poor investment in infrastructure, including schools, broadband, and public services—for example, having electricity for only three hours a day. These triggered a strong feeling of frustration among young people, as well as calls for politicization and youth social action mirroring trends in Egypt where youth disenfranchisement has fueled the creation of youth-led civic action (Abdou & Skalli, 2017).

Even in Singapore, where young people had a more positive view of political leaders, uncovering of poor conditions affecting migrant workers gave rise to young people having concerns about such inequalities existing in their country.

The coronavirus exposed a lot more about our society that we were perhaps not ready or open or even willing to know existed in our communities. Some of the truths really shocked me to my core because I didn't believe that, as progress[ive] as Singapore was, that we could... make these mistakes. (F16, Singapore)

Young people were in turn similarly spurred to engage in community outreach activities to support marginalized groups in need within their local community.

Digital Civic Engagement

Cutting across personal, social, and political dimensions is the affordance of the digital environment and young people's use of digital media to make their voices heard and spur collective action to respond to issues highlighted by the COVID-19 pandemic. Our research echoed evidence (Cho et al., 2020; Pelter, 2020; Wike & Castillo, 2018) concerning the potential role of social media and digital platforms as alternative spheres for young people's political engagement to "develop their civic identities and express political stances in creative ways, claiming agency that may not be afforded to them in traditional civic spaces" (p. 3), and facilitate participation in individual or collective actions to improve the well-being of their communities or societies (Pelter, 2020). Young people readily discussed the value of digital tools and platforms such as online surveys, Instagram, and Twitter as effective, accessible ways to share information. The changing relationship between young people and the broader civic sphere is reflected in a growing proportion of young people looking for news online and discussing political problems online. For example, young people in Lebanon utilized social media to organize and mobilize for their campaigns and protests, and in Singapore for volunteering.

To some extent, young people's use of social media was encouraged through the PAR approach in this project, which was conducted entirely online, including young people communicating findings with practitioners and decision-makers via online workshops, presentations, webinars, and video commentaries. Regular discussions with young people about the pandemic led to wider reflections about social issues, political decisions, and opportunities for civic action. This aligns with research (Cho et al., 2020; Kahne et al., 2013; Ito et al., 2019) that found that a vibrant digital exchange between peers around seemingly non-political issues can be conducive to higher political engagement, online and off, and higher participation in civic life more generally. This is illustrated, for example, with Singaporean young people's concern over data privacy implications and surveillance resulting from contact tracing:

There are real threats that this information and technology may one day be repurposed for surveillance purposes and may in turn result in the people's privacy and security being heavily compromised. (M18, Singapore)

Lessons for Providing Nurturing Environments for Young People to Live, Learn and Grow

i) On Becoming a Person

For most young people in advanced economic societies, their lives are programmed around education and assumptions that growing up involves doing well in school and acquiring qualifications. Yet, the findings from this article underscore the importance of a more holistic perspective on young people's development including having time to play, socialize, gain new experiences, establish their own identity, and develop their capacity as citizens (Kroger, 1996; Lister, 2008; Wulff, 1995). In this paper we have highlighted the way in which personal development and change happens, albeit sometimes out of adversity, when young people have free, unprogrammed space and time for new ways of being, learning, reflecting, and acting (OECD, 2020). It is in this respect that young people bemoan the narrow focus of governments solely on education to the detriment of wider determinants and factors affecting young people's development. To that extent, we argue that in the context of young people's rights and inclusion as citizens, having the opportunity to advance their own sense of self, develop resilience and evolve their capabilities as autonomous social actors is fundamental to being able to take control of their lives and adapt to change. This more holistic and nuanced perspective on youth-focused policy should therefore be central to post-pandemic planning.

ii) Life Learning "Beyond the Classroom"

Young people realized the significance and availability of learning opportunities beyond the narrow confines of subject-based curricula and formulaic learning cultures of the classroom. Many participants saw the pandemic as an opportunity for developing a more holistic education for life and active citizenship (Bentley, 1998), by gaining a greater awareness of social issues such as racism (e.g., Black Lives Matter), inequalities (Bambra et al., 2021), vulnerability of particular groups

(e.g., migrant workers in Singapore), and climate change, as well as reflecting on social values in society at large.

Many young people realized a sense of their own agency and identity, dedicating more time to self-reflection and reassessing their relationships and priorities. Young people talked about the value of having the opportunity to discuss with others about their individual experiences and what was happening around them, for example through the meetings organized as part of our projects, as they believed school did not provide them with space for reflective dialogue. Indeed, many complained about the missed opportunity of using school to discuss the pandemic, as this would have increased young people's understanding of what was happening around them and their ability to cope with that, offering further opportunities for self-growth and helping to contrast some of the mental health issues that young people experienced.

This year, COVID was a taboo. We heard how it affected the school, but no teacher asked us: 'How are you? How are you experiencing it?' The mood of the young would have been better, if these questions had been asked. You couldn't talk about COVID with your family, at school you couldn't talk about it... Once again, it was like school was that thing out of this world that doesn't help you in life. (M15, Italy)

iii) Political Accountability, Rights, and Participation as Active Citizens

As a result of young people becoming more aware of social issues around them and, in turn, the way in which professionals and decision-makers responded to those issues, there has been a significant development in young people's political agency. This mirrors rising trends in social movements and new forms of social action, in part a product of the affordances that social media provides. This activation or politicization of young people is characterized by Freire's (1970) idea of conscientization, in which young people develop a heightened sense of their own political agency through critical reflection on their social environment. In this project this resulted in young people seeking opportunities to speak out and communicate their experiences with political decision-makers, for example through writing letters to elected officials or through engagement in dialogue at events with political leaders. Despite the popular press and politicians scorning young people's involvement in these types of activities, they are nonetheless key to young people realizing their rights to participation as active citizens. In some cases, as a result of perceived limitations in opportunities for democratic engagement, some young people developed their own forms of self-initiated social action, through for example social media, community volunteering and support groups for peers.

Conclusion

This study has highlighted how young people are not solely passive victims of the COVID-19 pandemic. Rather, COVID initiated a more complex set of responses from young people at personal, familial, social and political levels. On a personal level, young people were able to respond to the pandemic through critical self-reflection, art, and faith, investing in their own wellbeing or channeling their energies into civic action. While prosocial behaviors and family support contributed

to mediating some of the pandemic's negative effects and opened new possibilities for young people, many reported a feeling of stagnation and disappointment with the personal and social experiences they were missing out on, and disillusionment with government responses and prevailing social attitudes. Young people in our study underwent long spells of emotional and psychological instability, which tested even the most motivated ones. This demonstrates the non-linear growth path they experienced during the pandemic, which they believed generated long-lasting learning in terms of their approach to life, priorities, and life goals.

Unpacking young people's engagement, growth and change through the pandemic, our findings have highlighted that there is no fixed "normal." Rather, life is constantly unfolding and changing, with young people's wellbeing dependent on their ability to engage with, negotiate and reflexively deal with changes and ups and downs. Our findings have also revealed the importance for young people's wellbeing, of being afforded a space to discuss and debate these changes with their peers and adults. On the one hand, this could have at least partially compensated for the lack of mental health support with which many young people struggled during the pandemic. On the other, this stresses the importance of formal civic education in schools as "an important step in creating awareness of children's rights as citizens and of the possibilities for action in the civic space" (Cho et al., 2020, p. 15). Strengthening the teaching of civic education in schools would turn these spaces into sources of young people's increased awareness of their rights as citizens, and of the possibilities for action in the civic space. This might go some way in redressing the inequalities and disadvantage that many young people experience. Taken together, evidence concerning how the young people in this study responded to the unintended opportunities afforded by the pandemic has provided a renewed perspective on what young people need in terms of nurturing environments in which to grow up.

Barry Percy-Smith is Professor of Childhood, Youth and Participatory Practice at University of Huddersfield, UK. He has extensive experience as a participatory action researcher and an international reputation for his work in child and youth participation. His main interests are in children and youth as active agents of change, participatory social learning and action inquiry approaches to learning and change in organizations and communities. He has published widely on these issues including *A Handbook of Children and Young People's Participation: Perspectives from Theory and Practice* (co-edited with Nigel Thomas and currently being revised for the second edition).

Sara Rizzo is a Senior Research Manager at Ecorys. She has a Master's in Urbanisation and Development from the London School of Economics and Political Science. She is an experienced qualitative researcher, specializing in participatory action research, youth policy and participation, and socio-economic inclusion. She was Project Manager of the Nuffield-funded Growing up Under Covid-19 project and co-led the Italian panel of youth researchers. Before joining Ecorys, Sara spent three years working as a Monitoring and Evaluation officer for a non-formal

education program that promotes social entrepreneurship among at-risk youth in Rio de Janeiro.

Chermaine Tay is a Research Manager at Ecorys. She holds a dual Master's in International Affairs from the London School of Economics and Sciences Po Paris. Chermaine is a mixed-methods researcher, with practical experience of remote data collection through participatory methods. She co-led the Singapore panel of youth researchers as part of the Growing up Under Covid-19 project. Chermaine's work on youth-related issues includes research on youth, violent extremism and online hate speech with a UK-based think-tank; an exploration of youth and conflict drivers with the United Nations in Lebanon; and an adolescent health survey in British Columbia, Canada.

Enrica Lorusso is a Research Manager with Ecorys. She has a Master's in Development Studies from the Graduate Institute, Geneva, and experience working in multilateral processes across different sectors, including at the UN Human Rights Council with the EU delegation to the UN and with the advocacy team of Human Rights Watch. She specializes in qualitative approaches and participatory methodologies, including with young people; she has co-led the Italian and Singaporean panels of young researchers for the Growing up under COVID-19 project, coordinating bi-weekly meetings, supporting panel members in their individual researches, and collecting and analyzing data.

Laurie Day is a Director at social policy consultancy Ecorys, with lead responsibility for child, youth and family research. His main interests and expertise lie in the areas of youth participation, child rights, educational inclusion, multi-professionalism and place-based initiatives. He has over 20 years' experience overseeing scoping studies, policy analysis, thematic reviews and policy and program evaluations, including for public authorities and NGOs, and he is currently Principal Investigator for the Nuffield Foundation transnational participatory action research (PAR) project, Growing-Up under Covid-19. Laurie is also a Visiting Research Fellow at the School of Human & Health Sciences, University of Huddersfield (2020-25).

Dr. Leanne Monchuk is a Senior Lecturer and qualitative researcher in the School of Human and Health Sciences, University of Huddersfield. Leanne is interested in the co-design and co-production of research tools and outputs and how research can engage different types of publics. Leanne leads one of the UK panels in the Growing Up Under Covid-19 research project.

References

- Abdou, E. D. & Skalli, L. H. (2017). Egyptian youth-led civil society organizations: Alternative spaces for civic engagement? *What Politics?* 75–94.
[doi:10.1163/9789004356368_006](https://doi.org/10.1163/9789004356368_006)

- Bailenson, J. (2021). Nonverbal overload: A theoretical argument for the causes of zoom fatigue. *Technology, Mind and Behaviour*, 2(1).
[doi:10.1037/tmb0000030](https://doi.org/10.1037/tmb0000030)
- Bambra, C., Lynch, J., & Smith, K. E. (2021). *The unequal pandemic: COVID-19 and health inequalities*. Policy Press.
- Bambra, C., Riordan, R., Ford, J., & Matthews, F. (2020). The COVID-19 pandemic and health inequalities. *Journal of Epidemiology and Community Health*, 74, 964-968.
- Bentley, T. (1998). *Learning beyond the classroom: Education for a changing world*. Routledge.
- Berridge, B. (2017). The education of children in care: Agency and resilience. *Children and Youth Services Review*, 77, 86-93.
- Biroli, P., Bosworth, S., Della Giusta, M., Di Girolamo, A., Jaworska, S. & Vollen, J. (2020). Family life in lockdown. *IZA Discussion Paper*, 13398
- Blaskó Z., & Schnepf, S. (2021) *Educational inequalities in Europe and physical school closures during COVID-19*. Joint Research Centre of the European Commission.
- Bourne, T., Kumar, S., & Coutu, F. H. (2021). COVID-19 effects on education and mental health within adolescents. *Pediatrics*, 147(3).
[doi:10.1542/peds.147.3_meetingabstract.213](https://doi.org/10.1542/peds.147.3_meetingabstract.213)
- Branquinho, C., Kelly, C., Arevalo, L. C., Santos, A., & Gaspar de Matos, M. (2020). "Hey, we also have something to say": A qualitative study of Portuguese adolescents' and young people's experiences under COVID-19. *Journal of Community Psychology*, 4(8), 2740-2752.
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard University Press.
- Butler, K., & Bannock, C. (2021, June). "A sacrificed generation": Psychological scars of Covid on young may have lasting impact. *The Guardian*.
<https://www.theguardian.com/world/2021/jun/02/a-sacrificed-generation-psychological-scars-of-covid-on-young-may-have-lasting-impact>
- Carr, W. and Kemmis, S. (1986) *Becoming critical: Education, knowledge and action research*. Routledge Falmer
- Carroll, N., Sadowski, A., Laila, A., Hruska, V., Nixon, M., Ma, D. W. L., & Haines, J. (2020). The impact of COVID-19 on health behavior, stress, financial and food security among middle to high income Canadian families with young children. *Nutrients*, 12(8).

- Chawla, K., Ahmed, F., Wakabayashi, A., Bhimani, M., & Grushka, D. (2020). Effect of the COVID-19 pandemic on residents' training experiences. *Canadian Family Physician*, 66(11).
- Cho, A., Byrne, J., & Pelter, Z. (2020). *Digital civic engagement by young people*. UNICEF.
- Cluver, L., Lachman, J. M., Sherr, L., Wessels, I., Krug, E., Rakotomalala, S., Blight, S., Hills, S., Bachman, G., Green, O., Butchart, A., Tomlinson, M., Ward, C. L., Doubt, J., & McDonald, K. (2020). Parenting in a time of COVID-19. *The Lancet*, 395(10231).
- Common Sense & Hopelab (2021). Coping with Covid-19: How young people use digital media to manage their mental health.
<https://www.chcf.org/publication/coping-covid-19-young-people-digital-media-manage-mental-health/>
- Crawley, E., Loades, M., Feder, G., Logan, S., Redwood, S., & Macleod, J. (2020). Wider collateral damage to children in the UK because of the social distancing measures designed to reduce the impact of COVID-19 in adults. *BMJ Paediatrics Open*. <http://dx.doi.org/10.1136/bmjpo-2020-000701>
- Cuevas-Parra, P., & Stephano, M. (2020) *Children's voices in the time of COVID-19: Continued child activism in the face of personal challenges*. World Vision International.
- Di Pietro, G., Biagi, F., Dinis Mota Da Costa, P., Karpinski, Z. & Mazza, J. (2020). *The likely impact of COVID-19 on education: Reflections based on the existing literature and recent international datasets*. Publications Office of the European Union.
- Duan, L., Shao, X., Wang, Y., Huang, Y., Miao, J., Yang, X., & Zhu, G. (2020). An investigation of mental health status of children and adolescents in China during the outbreak of COVID-19. *Journal of Affective Disorders*, 275, 112–118.
- Engzell, P., Frey, A., & Verhagen, M. D. (2021). Learning loss due to school closures during the COVID-19 pandemic. *PNAS*, 118(17). doi:[10.1073/pnas.2022376118](https://doi.org/10.1073/pnas.2022376118)
- Ford, T., John, A., & Gunnell, D. (2021). Mental health of children and young people during pandemic. *BMJ*, 372, 614. doi:[10.1136/bmj.n614](https://doi.org/10.1136/bmj.n614)
- Freire, P. (1970) *Pedagogy of the oppressed*. Penguin.
- Gadernann, A. C., Thomson, K. C., Richardson, C. G., Gagne, M., McAuliffe, C., Hirani, S., & Jenkins, E. (2021). Examining the impacts of the COVID-19

- pandemic on family mental health in Canada: Findings from a national cross-sectional study. *BMJ Open*, 11(1).
- Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P., & Trow, M. (1994). *The new production of knowledge: The dynamics of science and research in contemporary societies*. Sage.
- Gibson, J. J. (1979). *The ecological approach to visual perception*. Houghton-Mifflin.
- Gupta, S., & Jawanda, M. K. (2020). The impacts of COVID-19 on children. *Acta paediatrica*, 109(11), 2181–2183.
- Hawke, L. D., Hayes, E., Darnay, K., & Henderson, J. (2021). Mental health among transgender and gender diverse youth: An exploration of effects during the COVID-19 pandemic. *Psychology of Sexual Orientation and Gender Diversity*, 8(2), 180–187.
- Imran, N., Zeshan, M., & Pervaiz, Z. (2020). Mental health considerations for children & adolescents in COVID-19 Pandemic. *Pakistan Journal of Medical Sciences*, 36(COVID19-S4), S67–S72.
<https://doi.org/10.12669%2Fpjms.36.COVID19-S4.2759>
- Itō, M., Martin, C., Pfister, R. C., Rafalow, M. H., Tekinbaş, K. S. & Wortman, A. (2019). *Affinity online: How connection and shared interest fuel learning*. University Press.
- James, A. & Prout, A. (Eds.). (1997). *Constructing and reconstructing childhood*. Routledge Falmer
- Kahne, J., Lee, N.-J. & Feezell, J. T. (2013). The civic and political significance of online participatory cultures among youth transitioning to adulthood. *Journal of Information Technology & Politics*, 10(1), 1–20.
[doi:10.1080/19331681.2012.701109](https://doi.org/10.1080/19331681.2012.701109)
- Kroger, J. (1996). *Identity in adolescence: The balance between self and others*. Routledge.
- Lebow, J. L. (2020). Family in the age of COVID-19. *Family Process*, 59(2), 309–312.
- Lister, R. (2008). Unpacking children's citizenship. In A. Invernizzi & J. Williams (Eds.), *Children and citizenship*, pp. 9–19. Sage.
- Loades, M. E., Chatburn, E., Higson-Sweeney, N., Reynolds, S., Shafran, R., Brigden, A., Linney, C., McManus, M. N., Borwick, C., & Crawley, E. (2020). Rapid systematic review: The impact of social isolation and loneliness on the mental health of children and adolescents in the context of COVID-19.

- Journal of the American Academy of Child and Adolescent Psychiatry*, 59(11), 1218–1239.
- Liu, C. H., & Doan, S. N. (2020). Psychosocial stress contagion in children and families during the COVID-19 pandemic. *Clinical Pediatrics*, 59(9-10), 853-855. doi:10.1177/0009922820927044
- Lundy, L., Byrne, B., Lloyd, K., Templeton, M., Brando, N., Corr, M. L., Heard, E., Holland, L., MacDonald, M., Marshall, G., McAlister, S., McNamee, C., Orr, K., Schubotz, D., Symington, E., Walsh, C., Hope, K., Singh, P., Neill, G., & Wright, L. H. V. (2021). Life under coronavirus: Children's views on their experiences of their human rights. *International Journal of Children's Rights*, 29(2), 261-285.
- Mariani, R., Renzi, A., Di Trani, M., Trabucchi, G., Danskin, K., & Tambelli, R. (2020). The impact of coping strategies and perceived family support on depressive and anxious symptomatology during the coronavirus pandemic (Covid-19) lockdown. *Frontiers of Psychiatry*, 11, 587-724. doi:10.3389/fpsy.2020.587724
- Monchuk, L., Day, L., Rizzo, S., & Percy-Smith, B. (2020). Exploring young people's experiences of growing up under COVID-19. In H. Kara & S. Koo (Eds.), *Researching in the age of COVID-19: Volume 2—Care and resilience*, pp. 58-67. Bristol University Press.
- Moore, S.A., Faulkner, G., Rhodes, R.E. et al. (2020). Impact of the COVID-19 virus outbreak on movement and play behaviours of Canadian children and youth: a national survey. *International Journal of Behavioral Nutrition and Physical Activity*, 17(85). DOI:10.1186/s12966-020-00987-8
- OECD (2020). *Youth and covid-19: Response, recovery and resilience*. <https://www.oecd.org/coronavirus/policy-responses/youth-and-covid-19-response-recovery-and-resilience-c40e61c6/>
- OECD (2021). *Supporting young people's mental health through the COVID-19 crisis*. OECD Policy Responses to Coronavirus (COVID-19).
- Paceley, M. S., Okrey-Anderson, S., Fish, J. N., McInroy, L., & Lin, M. (2021). Beyond a shared experience: Queer and trans youth navigating COVID-19. *Qualitative Social Work*, 20(1-2), 97-104.
- Pelter, Z. (2020). Pandemic participation: Youth activism online in the COVID-19 crisis. UNICEF. <https://www.unicef.org/globalinsight/stories/pandemic-participation-youth-activism-online-covid-19-crisis>
- Prime, H., Wade, M., & Browne, D. T. (2020). Risk and resilience in family well-being during the Covid-19 pandemic. *American Psychologist*, 75(5), 631-643. doi:10.1037/amp0000660.

- Ray, P. (2010) The participation of children living in the poorest and most difficult situations. In Percy-Smith, B. and Thomas N., Eds. *A handbook of children and young people's participation: Perspectives from theory and practice*. Routledge.
- Reason, P. (1988) *Human inquiry in action: Developments in new paradigm research*. Sage.
- Rosenthal, D. M., Ucci, M., Heys, M., Hayward, A., & Lakhanpaul, M. (2020). Impacts of COVID-19 on vulnerable children in temporary accommodation in the UK. *Lancet Public Health*, 5(5), e241-e242.
- Rotas, E. E. & Cahapay, M. B. (2020). Difficulties in remote learning: Voices of Philippine university students in the wake of COVID-19 crisis. *Asian Journal of Distance Education*, 15(2), 147-158.
- Thorisdottir, I. E., Asgeirsdottir, B. B., Kristjansson, A. L., Valdimarsdottir, H. B., Jonsdottir Tolgyes, E. M., Sigfusson, J., Allegrante, J. P., Inga Dora Sigfusdottir, I. D., Halldorsdottir, T. (2021). Depressive symptoms, mental wellbeing, and substance use among adolescents before and during the COVID-19 pandemic in Iceland: A longitudinal, population-based study. *Lancet Psychiatry*, 8(8), 663-672. doi:10.1016/S2215-0366(21)00156-5.
- Uprichard, E. (2008). Children as "being and becomings": Children, childhood and temporality. *Children & Society*, 22(4), 303-313.
- Van Lancker, W., & Parolin, Z. (2020). COVID-19, school closures, and child poverty: A social crisis in the making. *Lancet Public Health*, 5(5), e243-e244.
- Vuorikari, R., Velicu, A., Chaudron, S., Cachia, R. & Di Gioia, R. (2020) *How families handled emergency remote schooling during the COVID-19 lockdown in spring 2020*. EUR 30425 EN, Publications Office of the European Union, Luxembourg. doi:10.2760/31977.
- Wike, R. & Castillo, A. (2018). Many around the world are disengaged from politics. Pew Research Center's Global Attitudes Project. <https://www.pewresearch.org/global/2018/10/17/international-political-engagement/>
- Wulff, H. (1995). Introducing youth culture in its own right: The state of the art and new possibilities. In Amit-Talai, V. & Wulff, H. (Eds.), *Youth cultures: A cross cultural perspective*. Routledge.
- Young Minds (2021). *Coronavirus: Impact on young people with mental health needs*. <https://youngminds.org.uk/media/4350/coronavirus-report-winter.pdf>

Parent-Perceived Changes in Active Transportation and Independent Mobility among Canadian Children in Relation to the COVID-19 Pandemic: Results from Two National Surveys

Richard Larouche

Faculty of Health Sciences, University of Lethbridge

Sarah A. Moore

School of Health and Human Performance, Dalhousie University

Mathieu Bélanger

Faculté de médecine et des sciences de la santé, Université de Sherbrooke

Mariana Brussoni

Department of Pediatrics, and School of Population and Public Health, University of British Columbia

Guy Faulkner

School of Kinesiology, University of British Columbia

Katie Gunnell

Department of Psychology, Carleton University

Mark S. Tremblay

Healthy Active Living and Obesity Research Group, CHEO Research Institute and Department of Pediatrics, University of Ottawa

Citation: Larouche, R., Moore, S. A., Bélanger, M., Brussoni, M., Faulkner, G., Gunnell, K., & Tremblay, M. S. (2022). Parent-perceived changes in active transportation and independent mobility among Canadian children in relation to the COVID-19 pandemic: Results from two national surveys. *Children, Youth and Environments*, 32(3), 25-52.
<http://www.jstor.org/action/showPublication?journalCode=chilyoutenvi>

Abstract

Children's active transportation (AT) and independent mobility (IM) can provide benefits for health and social development. Using data from two national surveys, we assessed parent-perceived changes in AT and IM among 5- to 17-year-olds in Canada since the outbreak of COVID-19. About half of parents reported no changes, but two to three times more parents reported declines compared to

increases in AT and IM. We explored many potential correlates of changes in AT and IM. Changes in IM were the strongest correlate of changes in AT. Strategies to minimize unintended negative impacts on children's physical activity from policies to prevent infectious disease transmission should be developed.

Keywords: active travel, independent mobility, physical activity, coronavirus, Canada

Physical activity (PA) is associated with multiple benefits among children and youth such as higher cardiovascular fitness, lower cardiovascular disease risk factors, reduced risk of obesity, better cognitive functioning, and enhanced mental health (Dale et al., 2019; Donnelly et al., 2016; Poitras et al., 2016). Despite the known benefits, the majority of children and youth are not meeting the World Health Organization's PA guideline (Bull et al., 2020) of accumulating 60 minutes of daily moderate- to vigorous-intensity PA (Aubert et al., 2018; Hallal et al., 2012). In fact, only 23.1% of Canadian youth ages 12-17 met this guideline in 2014-2017 based on accelerometry data (Colley et al., 2019). This may have worsened as many studies observed declines in PA and increases in sedentary behavior since the onset of the COVID-19 pandemic (Moore et al., 2020, Moore et al., 2021; Paterson et al., 2021; Xiang et al., 2020). In Canada, survey-based data suggest that only 4.8% of children and 0.6% of youth were meeting movement behavior guidelines during the first wave of COVID-19 (Moore et al., 2020).

Pandemic-related restrictions have drastically reduced opportunities to engage in several types of PA, including organized sports, recreation, and fitness (Moore et al., 2020, Moore et al., 2021, Riazi et al., 2021). However, unstructured PA performed outdoors can typically be done in compliance with physical distancing orders. Among the various forms of outdoor PA, active transportation (AT) may represent an important form of PA to promote in the context of COVID-19. Evidence consistently shows that children and youth who engage in AT to/from school are more physically active than those who use motorized modes (Larouche et al., 2014; Larouche, 2018) and AT has consistently been shown to be associated with improvements of health markers (Mueller et al., 2015). Replacing motorized travel by AT would also have the added benefit of reducing greenhouse gas emissions that fuel climate change and particulate matter emissions that contribute to cardiovascular and respiratory diseases (Brand et al., 2021; Patz et al., 2014).

Despite its benefits, the prevalence of AT has decreased over the last few decades, in parallel with children's independent mobility (IM) (Fyhri et al., 2011; Larouche, 2018; Shaw et al., 2013). Although AT and IM can be interrelated, they represent distinct constructs: AT represents the use of human-powered modes, such as walking and cycling, to travel places (Sallis et al., 2004) and IM represents children's freedom to explore their neighborhood without adult supervision (Shaw et al., 2013). IM also contributes to children's social, cognitive, and motor development (Marzi & Reimers, 2018; Riazi & Faulkner, 2018). Researchers have shown that children who are granted more IM are more likely to engage in AT (Larouche et al., 2020; Page et al., 2010) and are more physically active (Larouche et al., 2020; Schoeppe et al., 2013).

During the COVID-19 pandemic, many cities invested in walking and cycling infrastructure and/or temporarily closed streets to car travel (Fischer & Winters, 2021). In a period characterized by a large decline in public transit use associated with concerns about propagation of the virus (Savage & Turcotte, 2020; Zhang et al., 2021), this might have created favorable conditions for the promotion of AT and IM. However, it is unclear how children's AT and IM changed since the pandemic was also associated with a reduction in access to outdoor PA infrastructure (de

Lannoy et al., 2020). In a qualitative study from two large Canadian urban centers (Toronto, Ontario and Vancouver, British Columbia), parents attributed a reduction in children's IM to closures of parks, playgrounds, and other outdoor facilities (Riazi et al., 2021). Simply, if there is nowhere to go to play, and no one with whom to play once there, then a child's interest in going places independently is likely weakened. Yet, another qualitative study with families in Prince George, a small community in Northern British Columbia, suggested that the pandemic led to a shift from organized activities towards unstructured outdoor activities, including cycling (Pelletier et al., 2021). To our knowledge, no previous quantitative studies have examined changes in AT and IM associated with the COVID-19 pandemic in national samples of Canadian children and youth.

Therefore, our primary objective was to examine changes in AT and IM among children and youth since COVID-19 was declared a pandemic (i.e., March 2020). To this end, we combined data from two national surveys of parents across Canada conducted by different market survey firms in October and December 2020. We also explored the correlates of changes in AT and IM since COVID-19 and how they vary by gender. Potential correlates explored in this study included many variables identified as correlates of AT or IM in pre-pandemic studies, including household income (D'Agostino et al., 2021), employment (D'Agostino et al., 2021), dog ownership (Christian et al., 2014), type of home (Johansson et al., 2012), age (D'Agostino et al., 2021; Pabayo et al., 2011), number of children in the household (Pabayo et al., 2011), vehicle ownership (McDonald et al., 2008), immigration status (Te Velde et al., 2017), and health/disability status (Wheeler et al., 2009). Region of residence was also considered given variation in pandemic-related restrictions across provincial and territorial jurisdictions in Canada. The analyses were stratified by gender because of known differences between boys and girls' level of AT and IM and their determinants (Egli et al., 2018).

Methods

Participants and Setting

The study targeted 5- to 17-year-olds since Canadian movement guidelines for children and youth are specifically designed for this age group. Survey 1 consisted of baseline data from a national longitudinal study conducted by Léger (leger360.com). Léger maintains an online panel that includes over 450,000 Canadians who volunteer to participate in online studies. Baseline data were collected in December 2020 from 2,291 parents of 7- to 12-year-old children. Only parents able to complete the online survey in English or French were included. Parents provided consent electronically after reviewing an information letter. The survey was self-administered online, using a computer-aided web interviewing method. Prior to beginning the survey, parents had to answer yes to the following screening questions: 1) Do you have a child aged 7 to 12 years?; and 2) Do you agree to be invited again to participate in this study in 6, 12, and 18 months? Parents are provided with \$3 compensation for each completed survey, which corresponds to Léger's usual practice. Survey 1 was approved by the University of Lethbridge's Human Participant Research Committee (#2020-097).

Survey 2 was a cross-sectional study conducted by ParticipACTION (a Canadian non-profit organization promoting physical activity), and data were collected by Maru/Matchbox (www.marugroup.net), a third-party market research company with an online consumer database of >120,000 Canadian panelists, in October 2020. The sample included 1,622 parents of 5- to 17-year-olds. Third-party market research companies (like Léger and Maru/Matchbox) are commonly hired by researchers and organizations conducting national studies given their ability to recruit large, representative panels and their robust quality control procedures (e.g., Dubé et al., 2021). Such panels are designed to be demographically representative of the target populations (Göritz, 2007). Parents completed the survey in English or French, and households under COVID-19 isolation at the time of the survey or who had a COVID-19 case in the last month were excluded. Similar consent methods were used as in Survey 1, and modest compensation (\$0.50–\$3.00 CDN) was provided to respondents. Secondary use of the survey 2 data was approved by Dalhousie University's Research Ethics Board (2020-5351).

During data collection, most schools in Canada were open with altered environments to reduce student movement (e.g., dedicated class bubbles, staggered breaks) with some schools offering virtual learning (Breton et al., 2022). School policies were relatively consistent across Canada at that time.

Measures

Changes in AT and IM

In Survey 1, perceived change in children's AT since the pandemic began was assessed with the question "Compared to before the COVID-19 outbreak and related restrictions, my child walks, bikes or uses other active means of transportation (e.g., scooter, skateboard or rollerblades) to go from place to place" using a 5-point scale ranging from 1 (*a lot less*) to 5 (*a lot more*). Similarly, perceived change in children's IM since the pandemic began was measured with the question, "Compared to before the COVID-19 outbreak and related restrictions, my child's independent mobility (e.g., their amount of freedom to move around in our neighborhood without adult supervision) is" with the same 5-point scale. In November 2020, we conducted a separate one-week test-retest reliability assessment with a separate bilingual sample of 53 parents. Kappa coefficients for items on perceived changes in AT and IM were 0.53 and 0.23 respectively, suggesting fair to moderate agreement (Landis & Koch, 1977). At this time, provinces and territories were adopting new restrictions to mitigate the second wave of COVID-19, so reliability statistics may reflect both measurement error and genuine behavior change. Survey 2 included an item on perceived changes in AT to school with the same response options: "Compared to before the COVID-19 outbreak and related restrictions, my child actively transports (i.e., walks, bikes, scoots, etc.) to school." Previous analysis showed the survey had good test-retest reliability (Moore et al., 2020).

COVID-19-Related Questions

Our surveys were designed to assess movement behaviors in the week prior to the survey. In Survey 1, we viewed COVID-19 as a potential confounder; thus, we

asked parents if any household members had been diagnosed with COVID-19 in the previous two weeks and if their household was under isolation/quarantine in the previous week. In Survey 2, parents were screened out if any household members had been diagnosed with COVID-19 in the previous month or if they were currently under isolation/quarantine. In both surveys, we asked parents to report how their child attended school in the last week (*in person, online, blended, and N/A*). The latter category would include homeschooled children and those who did not attend school in the week prior to the survey. In Survey 1, we included additional questions about parental concerns with COVID-19 (*not concerned, somewhat concerned, very concerned*), and whether school buses were running in the previous week (*yes, no, N/A*). We included the N/A option because in some cities, there is no school bus service, regardless of pandemic restrictions.

Potential Correlates of Perceived Changes in AT and IM

In both surveys, we collected data on household income and parental employment status using standard questions from the survey vendors. There were six income categories in Survey 1 and ten in Survey 2. Both surveys employed the same items on province/territory of residence, dog ownership, type of home, child and parent age, the number of children and adults in the household, and whether the child had a disability. Survey 1 also collected data on vehicle ownership, time since the child lived in Canada (*2 years or less, 3-5 years, 6 years or more, born in Canada*), and whether the child suffered from any acute health condition in the previous week (e.g., flu, asthma).

Data Treatment

Because of minimal sample size requirements to carry analyses and in line with previous research on changes in PA associated with COVID-19, we restricted our sample to parents aged 20-65 years and children who identified as either boy or girl (Mitra et al., 2020; Moore et al., 2020). These restrictions led to the removal of 29 parents from Survey 1 and 54 from Survey 2. We recoded response options for items on perceived changes in AT and IM into three categories: *decreased, maintained, and increased*. Household income was recategorized into three categories in Survey 1 (*CAD\$39,999 or less; \$40,000-99,999; \$100,000 or more*) and Survey 2 (*CAD\$34,999 or less; \$35,000-99,999; \$100,000 or more*) to minimize small cell sizes. Using these cut points minimized differences in income categories between the two surveys. Similarly, we recoded response options for parent occupation as *working full-time, homemaker, and other* for both surveys. We recategorized the participants' type of home as *detached/semi-detached vs. others*. Similar to methods used in other publications (e.g., de Lannoy et al., 2020), we also recategorized the participants' province/territory of residence into five geographic regions, namely Pacific (British Columbia and Yukon), Prairies (Alberta, Saskatchewan, Manitoba, and Northwest Territories), Ontario, Quebec, and Atlantic (Newfoundland and Labrador, New Brunswick, Prince Edward Island, and Nova Scotia). For time in Canada, we collapsed the categories *2 years or less* and *3-5 years* because there were few recent immigrants.

Statistical Analyses

We first computed descriptive statistics, including means and standard deviations for continuous variables and frequencies and percentages for categorical variables. We examined differences between boys and girls in perceived changes in AT and IM with chi-squared tests. Because our outcomes were three-level ordered categorical variables, we considered employing ordered logistic regression; however, the assumption of proportional odds was violated for all models at $p \leq 0.001$.

Therefore, we examined the correlates of perceived decreases or increases in AT and IM with gender-stratified multinomial logistic regression models. In all models, the group reporting no changes in AT and IM was set as the reference because we were interested in the correlates of perceived changes. For each binary independent variable, multinomial logistic regression models produce two odds ratios: one for decreases in the outcome variable (vs. no changes) and one for increases (vs. no changes); thus, the same exposure can be associated with decreases and increases in AT or IM.

First, we ran bivariate multinomial logistic regression models and retained variables associated with the outcome at $p < 0.20$ as potential candidates for inclusion in multivariable models. Second, we used a backward selection process to obtain a more parsimonious multivariable model by removing non-significant variables ($p > 0.05$). We considered child age as a mandatory variable because it is a consistent correlate of AT and IM (Larouche, 2018; Marzi & Reimers, 2018) and kept it in all models regardless of statistical significance. We conducted all analyses with IBM SPSS version 26 and excluded missing data listwise. We assessed model fit with the deviance statistic ($-2 \log$ likelihood) and estimated the proportion of variance explained by the models with Nagelkerke's pseudo- R^2 . We found no evidence of multicollinearity in any multivariable model as the highest variance inflation factor value was 1.203.

Results

Descriptive characteristics of Survey 1 and 2 participants are presented in Tables 1 and 2 respectively. In Survey 1, 37.5% of parents reported a decline in their child's AT since COVID-19 was declared a pandemic, 48.5% reported no change, and 14.0% reported an increase. 32.8% of parents reported that their child's IM had decreased, 56.6% reported no changes, and 10.6% reported an increase. Perceived changes in AT and IM were moderately correlated (Spearman's $\rho = 0.544$; $p < 0.001$). Parents of boys were more likely to report an increase in IM (11.9% vs. 9.1%; $\chi^2_{[2 \text{ df}]} = 8.74$; $p = 0.013$). In Survey 2, 33.5% of parents reported a decline in AT to school, 49.7% reported no changes, and 16.8% reported an increase. In both surveys, changes in AT did not differ by gender (all $p > 0.40$; data not shown).

Table 1. Descriptive characteristics of Survey 1 participants stratified by gender

Variable	Girls (n=1095)		Boys (n=1167)	
	Frequency (%)	Mean (SD)	Frequency (%)	Mean (SD)
Changes in AT				
Decreased	394 (36.0)		451 (38.6)	
No change	546 (49.9)		555 (47.6)	
Increased	155 (14.2)		161 (13.8)	
Changes in IM				
Decreased	341 (31.1)		397 (34.0)	
No change	654 (59.7)		631 (54.1)	
Increased	100 (9.1)		139 (11.9)	
Household income				
\$39,999 or less	124 (12.4)		133 (12.6)	
\$40,000 to \$99,999	487 (48.8)		532 (50.2)	
\$100,000 or more	387 (38.8)		394 (37.2)	
Region				
Pacific	123 (11.2)		138 (11.8)	
Prairies	220 (20.1)		217 (18.6)	
Ontario	433 (39.5)		446 (38.2)	
Quebec	249 (22.7)		265 (22.7)	
Atlantic	70 (6.4)		101 (8.7)	
School delivery				
In person	775 (70.8)		855 (73.3)	
Blended	58 (5.3)		62 (5.3)	
Online	198 (18.1)		182 (15.6)	
N/A (e.g., home-schooled)	64 (5.8)		68 (5.8)	
Disability				
No	1000 (91.3)		1012 (86.7)	
Yes	95 (8.7)		155 (13.3)	
Type of home				
Other	271 (24.7)		328 (28.1)	
Detached or semi-detached	824 (75.3)		839 (71.9)	
Dog ownership				
Yes	418 (38.2)		451 (38.6)	
No	677 (61.8)		716 (61.4)	
Employment				
Work full-time	690 (63.4)		741 (63.8)	
Homemaker	128 (11.8)		116 (10.0)	
Other	270 (24.8)		304 (26.2)	
School buses running last week				

Yes	613 (56.0)		695 (59.6)	
No	101 (9.2)		104 (8.9)	
N/A	381 (34.8)		368 (31.5)	
Conditions in the last week				
Yes	113 (10.3)		127 (10.9)	
No	982 (89.7)		1040 (89.1)	
Concerns about COVID-19				
Not concerned	156 (14.2)		156 (13.4)	
Somewhat concerned	594 (54.2)		633 (54.2)	
Very concerned	345 (31.5)		378 (34.2)	
Time since child lived in Canada				
5 years or less	54 (4.9)		53 (4.5)	
6 years or more	145 (13.2)		152 (13.0)	
Born in Canada	896 (81.8)		962 (83.4)	
Vehicle ownership				
No	56 (5.1)		82 (7.0)	
One	408 (37.3)		502 (43.0)	
Two or more	631 (57.6)		583 (50.0)	
Child age		9.9 (1.7)		9.9 (1.7)
Parent age		41.2 (7.3)		41.0 (7.4)
Number of adults in household		2.0 (0.7)		2.0 (0.6)
Number of children in household		2.0 (1.0)		2.0 (1.9)

Table 2. Descriptive characteristics of Survey 2 participants stratified by gender

Variable	Girls (n=767)		Boys (n=801)	
	Frequency (%)	Mean (SD)	Frequency (%)	Mean (SD)
Changes in AT				
Decreased	266 (34.7)		259 (32.3)	
No change	373 (48.6)		407 (50.8)	
Increased	128 (16.7)		135 (16.9)	
Household income				
<\$35,000	70 (9.8)		87 (11.6)	
\$35,000 to \$99,999	364 (50.8)		350 (46.7)	
\$100,000 or more	282 (39.4)		312 (41.7)	
Region				
Pacific	81 (10.6)		91 (11.4)	
Prairies	159 (20.7)		142 (17.7)	
Ontario	288 (37.5)		331 (41.3)	
Quebec	136 (17.7)		119 (14.9)	

Atlantic	103 (13.4)		118 (14.7)	
School delivery				
In person	498 (64.9)		522 (65.2)	
Blended	113 (14.7)		132 (16.5)	
Online	137 (17.9)		123 (15.4)	
N/A	19 (2.5)		24 (3.0)	
Disability				
No	695 (90.6)		728 (90.9)	
Yes	72 (9.4)		73 (9.1)	
Type of home				
Other	204 (26.6)		199 (24.8)	
Detached or semi-detached	563 (73.4)		602 (75.2)	
Dog ownership				
Yes	313 (40.8)		319 (39.8)	
No	454 (59.2)		482 (60.2)	
Employment				
Work full-time	513 (66.9)		558 (69.7)	
Homemaker	80 (10.4)		72 (9.0)	
Other	174 (22.7)		171 (21.3)	
Child age		11.6 (3.8)		11.7 (3.7)
Parent age		42.9 (8.5)		42.8 (8.3)
Number of adults in household		2.1 (0.7)		2.1 (0.6)
Number of children in household		1.7 (0.8)		1.7 (0.8)

Correlates of Changes in Active Transportation (Survey 1)

Table 3 provides the results of multivariable models of the correlates of perceived changes in AT reported in Survey 1. In these models, odds ratios (OR) represent the likelihood that parents reported either a decrease or an increase in AT compared to no changes. For example, decreases in AT were much more likely in boys and girls who also presented a decrease in IM (OR and 95% confidence interval = 13.64, 9.72-19.14 and 11.10, 7.76-15.86, respectively). Always in comparison with children presenting no change in AT, we found that an increase in IM was associated with a decline in AT in girls, but not in boys. Attending school online vs. in person was associated with higher odds of a decrease in AT whereas lower parental concerns with COVID-19 were associated with lower odds of a decrease in children's AT. Boys from families who had a COVID-19 diagnosis in the two weeks before the survey, who owned fewer vehicles or lived in areas where school buses are not usually provided had higher odds of a decrease in AT. Girls living in Canada for five years or less were more likely to report a decrease in AT than Canadian-born girls. Conversely, boys and girls who experienced an increase in IM, and girls who had a decrease in IM, were more likely to present an increase in AT. Older children were less likely to present an increase in AT. Girls from families earning between \$40,000 and \$99,999 (vs. ≥\$100,000) or living in areas

where school buses are not usually provided were less likely to report an increase in AT. Boys whose parent respondent was a homemaker (vs. full-time worker) and those living in Quebec (vs. the Atlantic provinces) were more likely to present an increase in AT. Children whose parents were not concerned with COVID-19 were about two times less likely to present an increase in AT, although statistical significance was not met for girls ($p=0.050$). Gender-stratified multivariable models explained 42.1-48.1% of the variance in changes in AT.

Table 3. Correlates of changes in active transportation in Survey 1 stratified by gender

Variable	Girls (n = 1095)				Boys (n = 1167)			
	Decrease in AT		Increase in AT		Decrease in AT		Increase in AT	
	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
Annual household income (ref = \$100,000 or more)								
\$39,999 or less	0.90 (0.53-1.56)	0.716	1.00 (0.52-1.91)	0.990				
\$40,000 to \$99,999	1.05 (0.74-1.49)	0.793	0.62 (0.39-0.98)	0.041				
Child's age (each additional year)								
	1.02 (0.93-1.13)	0.656	0.77 (0.68-0.88)	<0.001	0.93 (0.84-1.02)	0.101	0.87 (0.77-0.99)	0.037
School delivery (ref = in person)								
N/A	1.70 (0.80-3.61)	0.165	1.71 (0.60-4.87)	0.312	1.47 (0.71-3.04)	0.3	0.36 (0.11-1.17)	0.089
Online	2.06 (1.33-3.20)	0.001	1.78 (0.99-3.20)	0.053	1.64 (1.03-2.61)	0.037	1.75 (0.93-3.26)	0.081
Blended	1.84 (0.83-4.06)	0.132	2.13 (0.81-5.62)	0.126	0.76 (0.35-1.63)	0.475	1.39 (0.60-3.22)	0.449
Changes in independent mobility (ref = no change)								
Decreased	11.10 (7.76-15.86)	<0.001	2.09 (1.19-3.67)	0.011	13.64 (9.72-19.14)	<0.001	1.22 (0.64-2.31)	0.545
Increased	2.31 (1.14-4.69)	0.020	17.84 (9.83-32.37)	<0.001	1.68 (0.91-3.09)	0.099	17.11 (10.26-28.52)	<0.001
Region (ref = Atlantic)								
Pacific					0.87 (0.42-1.78)	0.700	1.20 (0.42-3.48)	0.733
Prairies					0.98 (0.52-1.87)	0.959	1.06 (0.39-2.90)	0.910
Ontario					1.27 (0.70-2.33)	0.436	2.15 (0.86-5.36)	0.100
Quebec					1.79 (0.96-3.36)	0.067	2.98 (1.16-7.64)	0.023
School buses running last week (ref = yes)								
No	0.88 (0.46-1.68)	0.691	1.34 (0.61-2.93)	0.472	1.26 (0.68-2.34)	0.458	1.28 (0.53-3.09)	0.581
N/A	0.85 (0.59-1.21)	0.359	0.51 (0.31-0.83)	0.006	1.46 (1.02-2.09)	0.037	1.07 (0.67-1.72)	0.784

Concern about COVID-19 (ref = very concerned)								
Not concerned	0.53 (0.31-0.89)	0.016	0.49 (0.24-1.00)	0.050	0.43 (0.26-0.71)	0.001	0.46 (0.22-1.00)	0.049
Somewhat concerned	0.65 (0.45-0.94)	0.022	0.77 (0.48-1.25)	0.295	0.52 (0.37-0.73)	<0.001	0.94 (0.58-1.51)	0.793
Time since child lived in Canada (ref = born in Canada)								
5 years or less	2.27 (1.01-5.11)	0.048	1.36 (0.46-4.04)	0.579				
6 years or more	1.14 (0.72-1.82)	0.580	1.03 (0.55-1.91)	0.934				
Dog ownership (ref = no)								
	0.92 (0.66-1.29)	0.641	0.64 (0.41-1.00)	0.050				
Occupation (ref = work full-time)								
Homemaker					1.00 (0.58-1.73)	0.995	2.00 (1.04-3.83)	0.037
Other					0.74 (0.52-1.07)	0.107	1.01 (0.61-1.67)	0.965
Vehicle ownership (ref = 2 or more)								
No					2.24 (1.20-4.16)	0.011	0.79 (0.33-1.88)	0.597
One					1.46 (1.05-2.04)	0.023	0.99 (0.63-1.54)	0.949

Note. Model fit information for girls: deviance (empty model) = 1,715.094; deviance (final model) = 1,2644.966; Nagelkerke pseudo R^2 = 0.421. Model fit information for boys: deviance (intercept only model) = 2,146.078; deviance (final model) = 1,523.753; Nagelkerke pseudo R^2 = 0.481.

Correlates of Changes in Active Transportation to School (Survey 2)

Table 4 presents multivariable models of the factors associated with changes specifically in AT to school in Survey 2, which did not include a measure of IM. Consistent with Survey 1, we observed that attending school online vs. in person was associated with greater odds of a decline in AT to school for both genders. Attending school in a blended format was also associated with a decline in AT. Interestingly, online school was also associated with higher odds of an increase in AT for girls. It is worth noting that the question about school attendance was specific to the previous week, whereas the question about perceived changes in AT was “compared to before the COVID-19 outbreak.” Children from Ontario and boys from Quebec had higher odds of a decline in AT to school than their counterparts from the Atlantic provinces. Children who had more siblings and boys from dog-owning families were less likely to report a decline in AT to school. Girls living in condos, apartments or townhouses (vs. detached/semi-detached houses) were more likely to report a decline in AT. If the respondent’s occupation was classified as “other” vs. full-time worker, boys were more likely to experience a decline in AT. Boys from lower-income households were less likely to report an increase in AT, whereas boys living in the Prairies or Quebec (vs. the Atlantic provinces) were more likely to report an increase. Gender-stratified multivariable models explained 13.5-13.7% of the variance in changes in AT to school.

Table 4. Correlates of changes in active transportation in Survey 2 stratified by gender

Variable	Girls (n = 767)				Boys (n = 801)			
	Decrease in AT		Increase in AT		Decrease in AT		Increase in AT	
	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
Annual household income (ref = \$100,000 or more)								
<\$35,000					1.22 (0.68-2.19)	0.497	0.17 (0.05-0.51)	0.002
\$35,000 - \$99,999					0.75 (0.51-1.10)	0.138	0.63 (0.41-0.99)	0.043
Child's age (each additional year)								
	1.01 (0.96-1.06)	0.642	0.95 (0.90-1.01)	0.097	0.99 (0.94-1.04)	0.649	0.99 (0.93-1.05)	0.711
School delivery (ref = in person)								
N/A	1.79 (0.64-5.04)	0.267	1.06 (0.22-5.22)	0.944	1.85 (0.69-4.97)	0.224	2.85 (0.95-8.52)	0.061
Online	2.93 (1.84-4.68)	<0.001	2.33 (1.32-4.13)	0.004	2.78 (1.70-4.52)	<0.001	1.65 (0.87-3.12)	0.124
Blended	2.11 (1.28-3.47)	0.003	1.68 (0.88-3.21)	0.115	2.12 (1.31-3.45)	0.002	1.41 (0.76-2.59)	0.275
Region (ref = Atlantic)								
Pacific	1.56 (0.85-2.84)	0.152	0.71 (0.33-1.49)	0.360	1.49 (0.79-2.79)	0.211	1.45 (0.62-3.37)	0.388
Prairies	0.99 (0.48-2.03)	0.970	0.66 (0.27-1.58)	0.345	1.84 (0.90-3.76)	0.092	3.32 (1.42-7.76)	0.006
Ontario	2.00 (1.14-3.53)	0.016	1.59 (0.83-3.02)	0.160	1.87 (1.08-3.24)	0.024	2.07 (0.99-4.23)	0.052
Quebec	1.23 (0.65-2.31)	0.525	1.19 (0.58-2.44)	0.637	2.72 (1.43-5.18)	0.002	3.80 (1.69-8.57)	0.001
Disability/chronic condition (ref=no)								
Type of home: apartment, condo, townhouse, other (ref = detached or semi-detached)								
	2.04 (1.41-2.97)	<0.001	0.83 (0.49-1.39)	0.477				
Dog ownership (ref = no)								
					0.69 (0.48-0.98)	0.039	0.72 (0.47-1.11)	0.135
Occupation (ref = work full-time)								
Homemaker					1.20 (0.62-2.31)	0.590	1.60 (0.73-3.52)	0.245
Other					1.85 (1.17-2.92)	0.009	1.71 (0.97-3.01)	0.066
Number of adults in household (each additional adult)								
Number of children in household (each additional child)								
	0.77 (0.62-0.96)	0.018	0.84 (0.65-1.09)	0.198	0.74 (0.58-0.93)	0.011	1.01 (0.77-1.33)	0.932

Note. Model fit information for girls: deviance (empty model) = 1,173.596; deviance (final model) = 1,077,475; Nagelkerke pseudo R^2 = 0.137. Model fit information for boys: deviance (intercept only model) = 1,393,691; deviance (final model) = 1,301.098; Nagelkerke pseudo R^2 = 0.135.

Correlates of Changes in Independent Mobility

Table 5 presents the correlates of changes in IM in Survey 1. Children living in households who received a COVID-19 diagnosis in the two weeks prior to the survey had higher odds of reporting a decline in IM. Yet, boys living in such households also had higher odds of reporting an increase in IM. Lower parental concerns with COVID-19 were associated with lower odds of a decrease in IM whereas living in apartments, condos or townhouses (vs. detached/semi-detached houses) was associated with higher odds. Girls living in Canada for five years or less (vs. Canadian-born girls) and those living in areas where school buses were not running in the week before the survey were more likely to report a decrease in IM. Boys attending school online vs. in person were more likely to experience a decline in IM whereas boys living in areas where school buses are not usually provided were less likely to report a decline. Girls with older parents or living in lower-income households were less likely to report an increase in IM, while girls attending school in a blended format vs. in person were more likely to report an increase. Boys who did not attend school in the week prior to the survey (or were homeschooled) and those living in the Pacific region were more likely to report an increase in IM. Conversely, boys living in areas where school buses were not running in the week prior to the survey or with parents who were not concerned about COVID-19 were less likely to experience an increase in IM. Gender-stratified multivariable models explained 10.9-13.9% of the variance in changes in IM. Table 6 provides a summary of the statistically significant correlates of changes in AT and IM in the surveys.

Table 5. Correlates of changes in independent mobility in Survey 1 stratified by gender

Variable	Girls (n = 1095)				Boys (n = 1167)			
	Decrease in IM		Increase in IM		Decrease in IM		Increase in IM	
	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
Annual household income (ref = \$100,000 or more)								
\$39,999 or less	0.94 (0.57-1.53)	0.788	0.41 (0.18-0.94)	0.035				
\$40,000 to \$99,999	0.94 (0.68-1.30)	0.721	0.52 (0.32-0.85)	0.009				
Child's age (each additional year)								
	1.06 (0.97-1.16)	0.231	1.00 (0.87-1.15)	0.961	1.08 (1.00-1.17)	0.061	1.12 (1.00-1.26)	0.053
Parent's age (each additional year)								
	1.00 (0.98-1.02)	0.782	0.95 (0.92-0.99)	0.005				
School delivery (ref = in person)								
N/A	1.40 (0.73-2.67)	0.308	0.62 (0.16-2.34)	0.477	1.24 (0.64-2.39)	0.521	2.88 (1.23-6.75)	0.015
Online	1.38 (0.95-2.02)	0.095	0.88 (0.44-1.74)	0.712	2.05 (1.41-2.97)	<0.001	1.25 (0.70-2.24)	0.450
Blended	2.01 (0.99-4.08)	0.055	5.68 (2.55-12.63)	<0.001	1.06 (0.58-1.93)	0.853	1.33 (0.61-2.91)	0.469

Region (ref = Atlantic)								
Pacific					1.01 (0.55-1.88)	0.967	3.25 (1.24-8.49)	0.016
Prairies					1.31 (0.77-2.24)	0.315	1.37 (0.53-3.52)	0.516
Ontario					0.96 (0.58-1.58)	0.861	1.99 (0.84-4.71)	0.116
Quebec					0.91 (0.54-1.53)	0.719	1.53 (0.62-3.75)	0.353
School buses running last week (ref = yes)								
No	1.83 (1.06-3.16)	0.030	1.23 (0.52-2.94)	0.635	0.66 (0.39-1.12)	0.119	0.38 (0.17-0.89)	0.025
N/A	0.94 (0.68-1.30)	0.720	0.68 (0.40-1.15)	0.148	0.65 (0.48-0.89)	0.007	0.74 (0.47-1.15)	0.175
Concern about COVID-19 (ref = very concerned)								
Not concerned	0.39 (0.24-0.64)	<0.001	0.60 (0.29-1.23)	0.164	0.47 (0.30-0.73)	0.001	0.49 (0.25-0.98)	0.042
Somewhat concerned	0.48 (0.35-0.66)	<0.001	0.68 (0.41-1.15)	0.150	0.65 (0.49-0.87)	0.004	0.86 (0.57-1.32)	0.497
Time since child lived in Canada (ref = born in Canada)								
5 years or less	2.19 (1.12-4.30)	0.023	1.56 (0.52-4.72)	0.428				
6 years or more	1.37 (0.90-2.06)	0.135	0.90 (0.43-1.85)	0.765				
Type of home (ref = detached or semi-detached)								
Other	1.51 (1.08-2.12)	0.016	1.20 (0.69-2.06)	0.515	1.71 (1.27-2.31)	<0.001	1.01 (0.65-1.58)	0.968

Note. Model fit information for girls: deviance (empty model) = 1,718,797; deviance (final model) = 1,595,683; Nagelkerke pseudo R^2 = 0.139. Model fit information for boys: deviance (intercept only model) = 1,480.633; deviance (final model) = 1,366.758; Nagelkerke pseudo R^2 = 0.109.

Table 6. Summary of the correlates of changes in active transportation and independent mobility in the two surveys

Survey	Indicator	Gender	Direction of change	Variables
1	AT	Girls	Decrease	Attending school online in the previous week, increases or decreases in IM, and living in Canada since ≤5 years associated with higher odds; parent not/ somewhat concerned with COVID-19 associated with lower odds
1	AT	Boys	Decrease	Attending school online in the previous week, decreases in IM, household COVID-19 diagnosis in previous 2 weeks, living in a household owning <2 vehicles, living in an area where school buses not normally provided associated with higher odds; parent not/ somewhat concerned with COVID-19 associated with lower odds
1	AT	Girls	Increase	Increases or decreases in IM associated with lower odds; household income between \$40,000-99,999 (vs. \$100,000+, higher child age, and living in an area where school buses are not normally provided associated with lower odds
1	AT	Boys	Increase	Increases in IM, living in Quebec (vs. Atlantic provinces), and homemaker parent (vs. full-time worker) associated with higher odds; higher child age and parent not concerned about COVID-19 associated with lower odds
1	IM	Girls	Decrease	COVID-19 diagnosis in previous two weeks, living in an area where school buses were cancelled in the previous week, living in Canada since ≤5 years, and living in an apartment, condo, or townhouse (vs. detached/semi-detached house) associated with higher odds; parent not/ somewhat concerned with COVID-19 associated with lower odds
1	IM	Boys	Decrease	Attending school online in the previous week, COVID-19 diagnosis in previous two weeks, living in an apartment, condo, or townhouse (vs. detached/semi-detached house) associated with higher odds; living in an area where school buses are not normally provided, and parent not/ somewhat concerned with COVID-19 associated with lower odds
1	IM	Girls	Increase	Attending school in a blended format in the previous week associated with higher odds; lower household income and higher parent age associated with lower odds
1	IM	Boys	Increase	Not attending school in the previous week, COVID-19 diagnosis in previous two weeks, and living in the Pacific (vs. Atlantic region) associated with higher odds; living in an area where school buses were cancelled in the previous week, and parent not concerned with COVID-19 associated with lower odds
2	AT to school	Girls	Decrease	Attending school in an online or blended format in the previous week, living in Ontario (vs. Atlantic provinces), and living in an apartment, condo, or townhouse (vs. detached/semi-detached house) associated with higher odds; living in a household with more children associated with lower odds
2	AT to school	Boys	Decrease	Attending school in an online or blended format in the previous week, living in Ontario or Quebec (vs. Atlantic provinces), and having a parent who does not work full-time associated with higher odds; dog ownership and living in a household with more children associated with lower odds
2	AT to school	Girls	Increase	Attending school online associated with higher odds
2	AT to school	Boys	Increase	Living in the Prairies or Quebec (vs. Atlantic provinces) associated with higher odds; lower household income associated with lower odds

Note. Only statistically significant ($p < 0.05$) correlates of changes in active transportation and independent mobility are included in this summary table. Effect sizes (odds ratios) for all variables included in this table are provided in Tables 3 to 5. AT: active transportation; IM: independent mobility

Discussion

Using data from two comparable national surveys, we aimed to describe parent-reported changes in children's AT and IM from the beginning of the COVID-19 pandemic in Canada and explore correlates of behavior change. Even though the cross-sectional surveys were conducted by separate firms and at different times (October and December 2020), perceived changes in AT were remarkably similar with two to three times more children experiencing a decrease than an increase in AT, although about half of parents reported no changes in AT and IM as a result of COVID-19. In Survey 1, declines in AT and IM were moderately correlated and changes in IM were the strongest correlate of changes in boys' and girls' AT. Collectively, our findings suggest that COVID-19 was associated with a perceived decline in children's mobility (in the broader sense that also includes travel behaviors) and is likely one important reason for reported declines in PA (Paterson et al., 2021).

We explored associations between COVID-19 infections, parental concerns about the disease, and changes in AT and IM in Survey 1. Our multivariable models showed that boys from households who had a COVID-19 diagnosis in the two weeks prior to the study were more likely to present declines in AT and IM compared to boys from households who did not experience such diagnoses. We observed similar results for girls' IM. Unexpectedly, boys from families with recent infections were also more likely to present increases in IM than those from families without infections. It is worth noting that there was a time mismatch between the questions on COVID-19 diagnoses (in the last two weeks) and those on changes in AT and IM (since the beginning of the pandemic), so these findings should be interpreted cautiously. Children whose parents were not concerned or somewhat concerned with COVID-19 (vs. very concerned) were less likely to present changes in AT and IM, although results were not statistically significant for increases in AT and IM among girls. Based on the health belief model (Rosenstock et al., 1988), individuals who are less concerned with the severity of a disease or their susceptibility to it are less likely to respond by changing their behavior. Conversely, parents who were more concerned with COVID-19 may have responded to physical distancing orders by restricting their child's AT and IM (as well as school bus use). From a public health perspective, this suggests that presentation of measures to minimize risk of infections should be accompanied by messaging on strategies to safely maintain or increase AT and PA levels. As public health measures are reduced, former school bus/transit users may still hesitate to return to their previous commuting methods, and AT could alleviate concerns associated with a lack of physical distance.

As part of measures to prevent COVID-19, many provinces required that students attend school in online or blended formats. Online school attendance was consistently associated with greater odds of declines in AT and IM. The blended format was also associated with greater odds of declines in AT to school in Survey 2. Unexpectedly, the blended format was associated with higher odds of increases in girls' IM (Survey 1) and online attendance was associated with higher odds of AT to school in Survey 2. This finding must be interpreted with caution given that questions about schooling asked parents to consider the past week while questions about mobility were "compared to before the COVID-19 outbreak." Therefore, it is

possible that some children experienced an increase in AT or IM before schools shifted from in person to blended or online delivery due to public health restrictions. Alternatively, we cannot exclude the possibility that this finding is a type I error.

The pandemic may also have limited travel mode choice due to the suspension of school buses in some regions for those that were attending school in person or in blended learning situations. To this end, we asked Survey 1 participants if school buses were running in the week prior to the survey. If buses were not running, girls were significantly more likely to report a decrease in IM and boys were less likely to report an increase in IM. Although using school buses is not considered as a form of IM (e.g., see Hillman et al., 1990), it does provide less parental supervision than car travel. In areas where school buses were not normally provided, which would primarily correspond to larger cities, girls had lower odds of an increase in AT and boys had higher odds of a decrease in AT and IM. Further, boys from families owning fewer vehicles were more likely to present a decrease in AT in Survey 1. These findings could be attributable to a ceiling effect where people with initially higher AT levels naturally had greater odds of reducing AT. Previous studies documented that children living in larger cities and in households with fewer cars have higher odds of engaging in AT (Gray et al., 2014; Grize et al., 2010; Larouche, 2018; Rothman et al., 2021). Future infection control interventions should be accompanied by messages that promote other types of PA that can comply with physical distancing guidelines.

We found some evidence that changes in AT and IM differed by regions and immigration status. We treated the Atlantic provinces as the reference group given that they had the lowest rates of COVID-19 infections (Statistics Canada, 2022). The surveys were completed by parents in October or December 2020, and they were asked to compare AT/IM at that time to pre-pandemic. School policies were relatively consistent across Canada at that time (Breton et al., 2022), suggesting that other unmeasured factors may have contributed to regional differences. In Survey 1, boys from Quebec were more likely to present an increase in AT and boys from the Pacific region were more likely to present an increase in IM. In Survey 2, boys and girls from Ontario and boys from Quebec were more likely to report a decline in AT to school whereas boys from Quebec and the Prairies were more likely to report an increase. Disparities between provinces were expected given that policies related to outdoor play (inclusive of activities such as walking and cycling) and school closures during COVID-19 differed substantially between provinces (de Lannoy et al., 2020). In addition, we found that girls living in Canada for five years or less were more likely to report decreases in AT and IM. Previous studies have reported that immigrant children were less likely to engage in AT (Pabayo & Gauvin, 2008) and that children speaking a minority language at home had less IM (Riazi et al., 2019), underscoring a need for future research with minority groups.

We also observed disparities in changes in AT and IM by household income. In Survey 1, girls from low- and middle-income households had lower odds of increases in IM and girls from middle-income households had lower odds of increases in AT. In Survey 2, boys from low-income families were about six times less likely to present an increase in AT to school. Previous North American studies

have found higher rates of AT to school among children from low-income households (Chaufan et al., 2015; Gray et al., 2014; Pabayo et al., 2011), suggesting that they had a higher “baseline” (or pre-pandemic) AT level. Low-income populations have faced a higher incidence of COVID-19 (Whittle & Diaz-Artiles, 2020) and lower household income may be associated with living in apartment buildings. We found that living in apartments, condos or townhouses (vs. detached/semi-detached houses) was associated with greater odds of declines in IM (Survey 1) and AT (Survey 2 for girls). We also noted a positive correlation between income and living in detached/semi-detached houses ($r=0.310$; $p<0.001$). These observations suggest that, collectively, public health measures implemented to prevent COVID-19 transmission may have made it harder for children from low- and middle-income households to reap the benefits of AT and IM.

Other household characteristics facilitated or deterred AT and IM in the COVID-19 context. In Survey 2, boys and girls who had more siblings and boys from dog-owning households had reduced odds of a decline in AT. Both of these variables could facilitate AT by increasing parents’ confidence in their child’s safety. In contrast, older parents were less likely to report that their daughters had an increase in IM, suggesting that they may have been more protective since the beginning of the pandemic. Older children were also less likely to experience an increase in AT in Survey 1. In a post-hoc analysis, we found that the proportion of children who attended school in person at the time of the survey was lower for older children ($\chi^2_{[5df]}=31.73$; $p<0.001$), suggesting that they had less opportunities to engage in AT.

Notwithstanding the above correlates, we observed that changes in IM were by far the strongest predictor of changes in AT. For instance, children whose IM increased were over 10 times more likely to present an increase in AT and vice-versa. These effect sizes were not attenuated when controlling for other variables. In girls only, increases in IM were also associated with decreases in AT and decreases in IM were associated with increases in AT, but effect sizes were much weaker. The latter findings suggest that some children may have engaged in more AT, but with their parents rather than in the absence of adult supervision. The majority of previous studies found that children who are granted more IM are more likely to engage in AT to/from school, but the use of cross-sectional designs precluded investigation of relationships between changes in IM and AT (Marzi & Reimers, 2018). Given our retrospective design, we cannot confirm that changes in IM caused changes in AT, emphasizing a need for prospective longitudinal studies. Nevertheless, our results are in agreement with a qualitative study with parents in Toronto and Vancouver suggesting that, with the closures of parks, playgrounds, and other outdoor facilities, children had access to fewer destinations (Riazi et al., 2021).

Another qualitative study with families in Prince George, BC suggested that the pandemic was associated with a shift from organized activities to unstructured outdoor activities, including cycling (Pelletier et al., 2021). Yet, as the authors pointed out, their findings may not represent the experience of Canadian families in general. The decrease in IM that we observed concurs more with the stories told by parents in Toronto and Vancouver (Riazi et al., 2021), and may primarily reflect the

experience of children living in larger cities and areas with more severe COVID-19 restrictions. de Lannoy et al. (2020) also reported substantial regional disparities in access to outdoor play opportunities during the pandemic. Furthermore, Mitra et al. (2021) found that children who had greater access to places for play and exercise during the pandemic were less likely to have low subjective wellbeing. Collectively, this body of evidence suggests that, in preparation for future pandemics, efforts to preserve access to outdoor activities and minimize socio-economic disparities are warranted to support children's AT, IM, and PA. Such efforts can help children cope with stress (Kemple et al., 2016; Mitra et al., 2021), and are crucial to respect children's rights to play and to grow up in a safe and healthy environment, which are recognized in the Convention on the Rights of the Child (United Nations, 1989).

Limitations and Strengths

The main limitation of our study is the reliance on retrospective parental reports of changes in AT and IM, which are vulnerable to recall and social desirability biases. In Survey 1, the test-retest reliability of our questions was modest, though these estimates should be interpreted with caution given that the test-retest assessment was conducted during the second wave of COVID-19. Thus, differences in parents' responses in the test-retest reliability study may reflect both measurement error and true behavior change. The fact that Survey 2 only inquired about changes in AT to school may have yielded discrepancies between surveys in the correlates of changes in AT. In Survey 1, there was a mismatch between the time period addressed by the questions on changes in AT and IM and the question about COVID-19 diagnoses and school attendance, so associations between these variables should be interpreted with caution. Our measures of environmental variables were crude, and our survey did not include questions about community size and distance between home and school, which can influence the likelihood of engaging in AT. Further, as the analysis of correlates of changes in AT and IM was exploratory and many potential correlates were tested, there is a considerable risk of type I errors, so future studies would be needed to confirm our findings. However, the use of two relatively large national surveys upholds the external validity of our findings (within the Canadian context). The fact that surveys conducted by separate firms provided similar results regarding changes in AT is remarkable and reassuring. Finally, it is a strength that we investigated multiple potential correlates based on factors previously identified as potential determinants of AT and IM in the literature.

Conclusion

Using data from two national surveys, we found that about half of Canadian parents reported no changes in their child's AT and IM since the beginning of the COVID-19 pandemic. However, two to three times more parents reported decreases vs. increases in AT and IM. Changes in IM were the strongest predictor of changes in AT. Furthermore, our results suggest that there is a complex web of factors at the individual, household, built environment (e.g., type of home), and policy levels (e.g., pandemic restrictions and changes in school delivery mode) that are related to changes in AT and IM during the pandemic. Our findings extend previous research showing that COVID-19 has been associated with significant decreases in children's PA (Paterson et al., 2021). These observations underscore a need for

developing public health strategies designed to minimize the unintended negative impacts of policies adopted to prevent the spread of infectious diseases. This is particularly important given the potential of global trends such as deforestation, climate change, and globalization to increase the frequency of pandemic outbreaks (Myers & Frumkin, 2020; Patz et al., 2014).

Acknowledgments

We acknowledge the contribution of Ms. Victoria Hecker in reviewing the questionnaire for Survey 1 and Ms. Madeline Kleinfeld for assisting with manuscript formatting and identifying previous studies on the effects of the COVID-19 pandemic. Richard Larouche holds a Board of Governors Research Chair from the University of Lethbridge and receives book royalties from Elsevier. Mariana Brussoni is supported by a salary award from the British Columbia Children's Hospital Research Institute. The other authors have no conflicts of interest to declare. Survey 1 was sponsored by a grant-in-aid from the Heart & Stroke Foundation of Canada. Survey 2 was partly funded by Dalhousie University, the Province of Nova Scotia's Department of Communities, Culture and Heritage, and ParticipACTION.

Richard Larouche is an Associate Professor of Public Health and Board of Governors Research Chair in Children's Physical Activity at the University of Lethbridge. He is the founder and director of the Physical Activity, Transport & Health (PATH) research group (<https://pathresearch.wordpress.com/>). His research interests include active transportation, physical activity, outdoor play, independent mobility, and sustainability. Richard is the editor of the book *Children's Active Transportation* published by Elsevier. In 2019, he cycled across Canada to raise funds for research on Alzheimer's disease.

Sarah A. Moore is an Assistant Professor in the School of Health and Human Performance, Faculty of Health, and a Healthy Populations Institute Scholar at Dalhousie University. Her research expertise is in childhood growth and development, movement and play behaviors, and adapted physical activity for children and youth with disabilities. Dr. Moore is interested in assessing the benefits of and barriers to play and physical activity and their potential to improve health and quality of life. She has a particular interest in tracking healthy behaviors from childhood through adulthood and believes that several adult conditions have pediatric antecedents.

Mathieu Bélanger is a Full Professor in the Department of Family Medicine at the Université de Sherbrooke, Director of Research at the Centre de formation médicale du Nouveau-Brunswick, and Epidemiologist for the Vitalité Health Network. He leads longitudinal studies on the epidemiology of health-related behaviors. His research team adopted a mission to uncover the power of lifestyle behaviors to reduce the burden of chronic diseases. Specifically, they study the development of physical activity and other behaviors throughout the life course and identify determinants and outcomes of these behaviors.

Mariana Brussoni is an Associate Professor in the Department of Pediatrics and the School of Population and Public Health at the University of British Columbia. She

is an investigator with the BC Children's Hospital Research Institute and Academic Scientist with the BC Injury Research and Prevention Unit. Mariana investigates child injury prevention, perceptions of risk and safety and developmental importance of children's risky play.

Guy Faulkner *is a Professor and Chair in Applied Public Health in the School of Kinesiology at the University of British Columbia. Broadly, his research has focused on two inter-related themes: the development and evaluation of physical activity interventions, and physical activity and mental health.*

Katie Gunnell *is an Associate Professor in Psychology at Carleton University and an Affiliate Investigator with the Healthy Active Living and Obesity Research (HALO) Research Group at the Children's Hospital of Eastern Ontario Research Institute. Her research examines the psychological antecedents of behaviors and psychological health in various populations including children and youth, adults, and people diagnosed with osteoporosis. To better understand how to enhance psychological health and physical activity and decrease screen time, she is particularly interested in psychological needs (e.g., competence, autonomy, and relatedness) and motivation as mechanisms for change.*

Professor **Mark Tremblay** *is a senior scientist with the Healthy Active Living and Obesity Research (HALO) Research Group at the Children's Hospital of Eastern Ontario Research Institute and Professor of Pediatrics in the Faculty of Medicine, University of Ottawa. He is a Fellow of the Canadian Society for Exercise Physiology, Fellow of the American College of Sports Medicine, Fellow of the Canadian Academy of Health Sciences, President of the Active Healthy Kids Global Alliance, Founder of the Sedentary Behaviour Research Network, Chair of Outdoor Play Canada, and Adjunct/Visiting Professor at five other universities on four continents.*

References

- Aubert, S., Barnes, J. D., Abdeta, C., Abi Nader, P., Adeniyi, A. F., Aguilar-Farias, N., Andrade Tenesaca, D. S., Bhawra, J., Brazo-Sayavera, J., Cardon, G., Chang, C.-K., Delisle Nyström, C., Demetriou, Y., Draper, C. E., Edwards, L., Emeljanovacs, A., Gaba, A., Galaviz, K., I., Gonzalez, S. A., ... Tremblay, M. S. (2018). Global matrix 3.0 physical activity report card grades for children and youth: Results and analysis from 49 countries. *Journal of Physical Activity and Health*, 15(Suppl. 2), S251–S273.
<https://doi.org/10.1123/jpah.2018-0472>
- Brand, C., Götschi, T., Dons, E., Gerike, R., Anaya-Boig, E., Avila-Palencia, I., de Nazelle, A., Gascon, M., Gaupp-Berghausen, M., Iacorossi, F., Kahlmeier, S., Panis, L. I., Racioppi, F., Rojas-Rueda, D., Standaert, A., Stigell, E., Sulikova, S., Wegener, S., & Nieuwenhuijsen, M. J. (2021). The climate change mitigation impacts of active travel: Evidence from a longitudinal panel study

- in seven European cities. *Global Environmental Change*, 67, 102224. <https://doi.org/10.1016/j.gloenvcha.2021.102224>
- Breton, C., Han, J. Y., Mohy-Dean, T., & Sim, P. (2022, May 26). *COVID-19 Canadian Provinces Measures Dataset*. Center of Excellence on the Canadian Federation. <https://centre.irpp.org/data/covid-19-provincial-policies/>
- Bull, F. C., Al-Ansari, S. S., Biddle, S., Borodulin, K., Buman, M. P., Cardon, G., Carty, C., Chaput, J.-P., Chastin, S., Chou, R., Dempsey, P. C., DiPietro, L., Ekelund, U., Firth, J., Friedenreich, C. M., Garcia, L., Gichu, M., Jago, R., Katzmarzyk, P. T., ... Willumsen, J. F. (2020). World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *British Journal of Sports Medicine*, 54(24), 1451–1462. <https://doi.org/10.1136/bjsports-2020-102955>
- Chaufan, C., Yeh, J., Ross, L., & Fox, P. (2015). You can't walk or bike yourself out of the health effects of poverty: Active school transport, child obesity, and blind spots in the public health literature. *Critical Public Health*, 25(1), 32–47. <https://doi.org/10.1080/09581596.2014.920078>
- Christian, H., Trapp, G., Villanueva, K., Zubrick, S. R., Koekemoer, R., & Giles-Corti, B. (2014). Dog walking is associated with more outdoor play and independent mobility for children. *Preventive Medicine*, 67, 259–263. <https://doi.org/10.1016/j.ypmed.2014.08.002>
- Colley, R. C., Butler, G., Garriguet, D., Prince, S. A., & Roberts, K. C. (2019). Comparison of self-reported and accelerometer-measured physical activity among Canadian youth. *Health Reports*, 30(7), 3–12. <https://doi.org/10.25318/82-003-x201900700001-eng>
- D'Agostino, E. M., Armstrong, S. C., Alexander, E. P., Østbye, T., Neshteruk, C. D., & Skinner, A. C. (2021). Predictors and patterns of physical activity from transportation among United States youth, 2007–2016. *Journal of Adolescent Health*, 69(2), 263–271. <https://doi.org/10.1016/j.jadohealth.2021.03.028>
- Dale, L. P., Vanderloo, L., Moore, S., & Faulkner, G. (2019). Physical activity and depression, anxiety, and self-esteem in children and youth: An umbrella systematic review. *Mental Health and Physical Activity*, 16, 66–79. <https://doi.org/10.1016/j.mhpa.2018.12.001>
- de Lannoy, L., Rhodes, R. E., Moore, S. A., Faulkner, G., & Tremblay, M. S. (2020). Regional differences in access to the outdoors and outdoor play of Canadian children and youth during the COVID-19 outbreak. *Canadian Journal of Public Health*, 111(6), 988–994. <https://doi.org/10.17269/s41997-020-00412-4>
- Donnelly, J. E., Hillman, C. H., Castelli, D., Etnier, J. L., Lee, S., Tomporowski, P., Lambourne, K., & Szabo-Reed, A. N. (2016). Physical activity, fitness, cognitive function, and academic achievement in children: A systematic

- review. *Medicine and Science in Sports and Exercise*, 48(6), 1197–1222. <https://doi.org/10.1249/MSS.0000000000000901>
- Dubé, È., Dionne, M., Pelletier, C., Hamel, D., & Gadio, S. (2021). COVID-19 vaccination attitudes and intention among Quebecers during the first and second waves of the pandemic: Findings from repeated cross-sectional surveys. *Human Vaccines & Immunotherapeutics*, 17(11), 3922–3932.
- Egli, V., Ikeda, E., Stewart, T., & Smith, M. (2018). Interpersonal correlates of active transportation. In R. Larouche (Ed.), *Children's active transportation* (pp. 115–125). Elsevier. <https://doi.org/10.1016/B978-0-12-811931-0.00008-9>
- Fischer, J., & Winters, M. (2021). COVID-19 street reallocation in mid-sized Canadian cities: Socio-spatial equity patterns. *Canadian Journal of Public Health*, 112, 376–390. <https://doi.org/10.17269/s41997-020-00467-3>
- Fyhri, A., Hjorthol, R., Mackett, R. L., Fotel, T. N., & Kyttä, M. (2011). Children's active travel and independent mobility in four countries: Development, social contributing trends and measures. *Transport Policy*, 18, 703–710. <https://doi.org/10.1016/j.tranpol.2011.01.005>
- Görizt, A. S. (2007). Using online panels in psychological research. In A. Joinson, K. McKenna, T. Postmes, & U. Reips (Eds.), *The Oxford handbook of internet psychology* (pp. 473–485). Oxford University Press.
- Gray, C. E., Larouche, R., Barnes, J. D., Colley, R. C., Bonne, J. C., Arthur, M., Cameron, C., Chaput, J.-P., Faulkner, G., Janssen, I., Kolen, A. M., Manske, S. R., Salmon, A., Spence, J. C., Timmons, B. W., & Tremblay, M. S. (2014). Are we driving our kids to unhealthy habits? Results of the Active Healthy Kids Canada 2013 report card on physical activity for children and youth. *International Journal of Environmental Research and Public Health*, 11(6), 6009–6020. <https://doi.org/10.3390/ijerph110606009>
- Grize, L., Bringolf-Isler, B., Martin, E., & Braun-Farhländer, C. (2010). Trend in active transportation to school among Swiss school children and its associated factors: Three cross-sectional surveys 1994, 2000 and 2005. *International Journal of Behavioral Nutrition and Physical Activity*, 7, 28. <https://doi.org/10.1186/1479-5868-7-28>
- Hallal, P. C., Andersen, L. B., Bull, F. C., Guthold, R., Haskell, W., Ekelund, U., & Lancet Physical Activity Series Working Group (2012). Global physical activity levels: Surveillance progress, pitfalls, and prospects. *The Lancet*, 380(9838), 247–257. [https://doi.org/10.1016/S0140-6736\(12\)60646-1](https://doi.org/10.1016/S0140-6736(12)60646-1)
- Hillman, M., Adams, J., & Whitelegg, J. (1990). *One false move: A study of children's independent mobility*. Policy Studies Institute.

- Johansson, K., Laflamme, L., & Hasselberg, M. (2012). Active commuting to and from school among Swedish children—A national and regional study. *The European Journal of Public Health*, 22(2), 209–214. <https://doi.org/10.1093/eurpub/ckr042>
- Kemple, K. M., Oh, J., Kenney, E., & Smith-Bonahue, T. (2016). The power of outdoor play and play in natural environments. *Childhood Education*, 92(6), 446–454. <https://doi.org/10.1080/00094056.2016.1251793>
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33(1), 159–174. <https://doi.org/10.2307/2529310>
- Larouche, R. (2018). *Children's active transportation*. Elsevier. <https://doi.org/10.1016/C2016-0-01988-5>
- Larouche, R., Barnes, J. D., Blanchette, S., Faulkner, G., Riazi, N. A., Trudeau, F., & Tremblay, M. S. (2020). Relationships among children's independent mobility, active transportation, and physical activity: A multisite cross-sectional study. *Pediatric Exercise Science*, 32(4), 189–196. <https://doi.org/10.1123/pes.2019-0238>
- Larouche, R., Saunders, T. J., Faulkner, G. E. J., Colley, R., & Tremblay, M. (2014). Associations between active school transport and physical activity, body composition, and cardiovascular fitness: A systematic review of 68 studies. *Journal of Physical Activity and Health*, 11(1), 206–227. <https://doi.org/10.1123/jpah.2011-0345>
- Marzi, I., & Reimers, A. K. (2018). Children's independent mobility: Current knowledge, future directions, and public health implications. *International Journal of Environmental Research and Public Health*, 15(11), 2441. <https://doi.org/10.3390/ijerph15112441>
- McDonald, N. C. (2008). Critical factors for active transportation to school among low-income and minority students: Evidence from the 2001 National Household Travel Survey. *American Journal of Preventive Medicine*, 34(4), 341–344. <https://doi.org/10.1016/j.amepre.2008.01.004>
- Mitra, R., Moore, S. A., Gillespie, M., Faulkner, G., Vanderloo, L. M., Chulak-Bozzer, T., Rhodes, R. E., Brussoni, M., & Tremblay, M. S. (2020). Healthy movement behaviours in children and youth during the COVID-19 pandemic: Exploring the role of the neighbourhood environment. *Health & Place*, 65, 102418. <https://doi.org/10.1016/j.healthplace.2020.102418>
- Mitra, R., Waygood, E. O. D., & Fullan, J. (2021). Subjective well-being of Canadian children and youth during the COVID-19 pandemic: The role of the social and physical environment and healthy movement behaviours. *Preventive Medicine Reports*, 101404. <https://doi.org/10.1016/j.pmedr.2021.101404>

- Moore, S. A., Faulkner, G., Rhodes, R. E., Brussoni, M., Chulak-Bozzer, T., Ferguson, L. J., Mitra, R., O'Reilly, N., Spence, J. C., Vanderloo, L. M., & Tremblay, M. S. (2020). Impact of the COVID-19 virus outbreak on movement and play behaviours of Canadian children and youth: A national survey. *International Journal of Behavioral Nutrition and Physical Activity*, 17, 85. <https://doi.org/10.1186/s12966-020-00987-8>
- Moore, S. A., Faulkner, G., Rhodes, R. E., Vanderloo, L. M., Ferguson, L. J., Guerrero, M. D., Brussoni, M., Mitra, R., O'Reilly, N., Spence, J. C., Chulak-Bozzer, T., & Tremblay, M. S. (2021). Few Canadian children and youth were meeting the 24-hour movement behaviour guidelines 6 months into the COVID-19 pandemic: Follow-up from a national study. *Applied Physiology, Nutrition, and Metabolism*, 46(10), 1225–1240. <http://doi:10.1139/apnm-2021-0354>
- Mueller, N., Rojas-Rueda, D., Cole-Hunter, T., De Nazelle, A., Dons, E., Gerike, R., Götschi, T., Int Panis, L., Kahlmeier, S., & Nieuwenhuijsen, M. (2015). Health impact assessment of active transportation: A systematic review. *Preventive Medicine*, 76, 103–114. <https://doi.org/10.1016/j.ypmed.2015.04.010>
- Myers, S., & Frumkin, H. (2020). *Planetary health: Protecting nature to protect ourselves*. Island Press.
- Pabayo, R., & Gauvin, L. (2008). Proportions of students who use various modes of transportation to and from school in a representative population-based sample of children and adolescents, 1999. *Preventive Medicine*, 46(1), 63–66. <https://doi.org/10.1016/j.ypmed.2007.07.032>
- Pabayo, R., Gauvin, L., & Barnett, T. A. (2011). Longitudinal changes in active transportation to school in Canadian youth aged 6 through 16 years. *Pediatrics*, 128(2), e404–e413. <https://doi.org/10.1542/peds.2010-1612>
- Page, A. S., Cooper, A. R., Griew, P., & Jago, R. (2010). Independent mobility, perceptions of the built environment and children's participation in play, active travel and structured exercise and sport: the PEACH Project. *International Journal of Behavioral Nutrition and Physical Activity*, 7, 17. <https://doi.org/10.1186/1479-5868-7-17>
- Paterson, D., Ramage, K., Riazi, N., Moore, S. A., Tremblay, M. S., & Faulkner, G. (2021). Exploring impact of COVID-19 on the movement behaviors of children and youth: A scoping review of evidence after the first year. *Journal of Sport and Health Science*, 10(6), 674–689. <https://doi.org/10.1016/j.jshs.2021.07.001>
- Patz, J. A., Frumkin, H., Holloway, T., Vimont, D. J., & Haines, A. (2014). Climate change: Challenges and opportunities for global health. *JAMA*, 312(15), 1565–1580. <https://doi:10.1001/jama.2014.13186>

- Pelletier, C. A., Cornish, K., & Sanders, C. (2021). Children's independent mobility and physical activity during the COVID-19 pandemic: A qualitative study with families. *International Journal of Environmental Research and Public Health*, 18(9), 4481. <https://doi.org/10.3390/ijerph18094481>
- Poitras, V. J., Gray, C. E., Borghese, M. M., Carson, V., Chaput, J. P., Janssen, I., Katzmarzyk, P. T., Pate, R. R., Connor Gorber, S., Kho, M. E., Sampson, M., & Tremblay, M. S. (2016). Systematic review of the relationships between objectively measured physical activity and health indicators in school-aged children and youth. *Applied Physiology, Nutrition, and Metabolism*, 41(6), S197–S239. <https://doi.org/10.1139/apnm-2015-0663>
- Riazi, N. A., Blanchette, S., Trudeau, F., Larouche, R., Tremblay, M. S., & Faulkner, G. (2019). Correlates of children's independent mobility in Canada: A multi-site study. *International Journal of Environmental Research and Public Health*, 16(16), 2862. <https://doi.org/10.3390/ijerph16162862>
- Riazi, N. A., & Faulkner, G. (2018). Children's independent mobility. In R. Larouche (Ed.), *Children's active transportation* (pp. 77–91). Elsevier. <https://doi.org/10.1016/B978-0-12-811931-0.00005-3>
- Riazi, N. A., Wunderlich, K., Gierc, M., Brussoni, M., Moore, S. A., Tremblay, M. S., & Faulkner, G. (2021). "You can't go to the park, you can't go here, you can't go there": Exploring parental experiences of COVID-19 and its impact on their children's movement behaviours. *Children*, 8(3), 219. <https://doi.org/10.3390/children8030219>
- Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the health belief model. *Health Education Quarterly*, 15(2), 175–183. <https://doi.org/10.1177/109019818801500203>
- Rothman, L., Hagel, B., Howard, A., Cloutier, M. S., Macpherson, A., Aguirre, A. N., McCormack, G. R., Fuselli, P., Buliung, R., HubkaRao, T., Ling, R., Zanutto, M., Rancourt, M., & Winters, M. (2021). Active school transportation and the built environment across Canadian cities: Findings from the child active transportation safety and the environment (CHASE) study. *Preventive Medicine*, 146, 106470. <https://doi.org/10.1016/j.ypmed.2021.106470>
- Sallis, J. F., Frank, L. D., Saelens, B. E., & Kraft, M. K. (2004). Active transportation and physical activity: opportunities for collaboration on transportation and public health research. *Transportation Research Part A: Policy and Practice*, 38(4), 249–268. <https://doi.org/10.1016/j.tra.2003.11.003>
- Savage, K., & Turcotte, M. (2020, August 10). *Commuting to work during COVID-19*. Statistics Canada. http://publications.gc.ca/collections/collection_2020/statcan/45-28/CS45-28-1-2020-62-eng.pdf

- Schoeppe, S., Duncan, M. J., Badland, H., Oliver, M., & Curtis, C. (2013). Associations of children's independent mobility and active travel with physical activity, sedentary behaviour and weight status: A systematic review. *Journal of Science and Medicine in Sport*, 16, 312–319. <https://doi.org/10.1016/j.jsams.2012.11.001>
- Shaw, B., Watson, B., Frauendienst, B., Redecker, A., Jones, T., & Hillman, M. (2013). *Children's independent mobility: A comparative study in England and Germany (1971–2010)*. Policy Studies Institute.
- Statistics Canada. (2022, May 31). *COVID-19 daily epidemiology update*. Statistics Canada. <https://health-infobase.canada.ca/covid-19/epidemiological-summary-covid-19-cases.html>
- Te Velde, S. J., Haraldsen, E., Vik, F. N., De Bourdeaudhuij, I., Jan, N., Kovacs, E., Moreno, L. A., Dössel, L. A., Manios, Y., Brug, J., & Bere, E. (2017). Associations of commuting to school and work with demographic variables and with weight status in eight European countries: The ENERGY-cross sectional study. *Preventive Medicine*, 99, 305–312. <https://doi.org/10.1016/j.ypmed.2017.03.005>
- United Nations (1989). Convention on the Rights of the Child. *Treaty Series*, 1577, 3. <https://www.refworld.org/docid/3ae6b38f0.html>
- Wheeler, K., Yang, Y., & Xiang, H. (2009). Transportation use patterns of US children and teenagers with disabilities. *Disability and Health Journal*, 2(3), 158–164. <https://doi.org/10.1016/j.dhjo.2009.03.003>
- Whittle, R. S., & Diaz-Artiles, A. (2020). An ecological study of socioeconomic predictors in detection of COVID-19 cases across neighborhoods in New York City. *BMC Medicine*, 18(1), 271. <https://doi.org/10.1186/s12916-020-01731-6>
- Xiang, M., Zhang, Z., & Kuwahara, K. (2020). Impact of COVID-19 pandemic on children and adolescents' lifestyle behavior larger than expected. *Progress in Cardiovascular Diseases*, 63(4), 531–532. <https://doi.org/10.1016/j.pcad.2020.04.013>
- Zhang, J., Hayashi, Y., & Frank, L. D. (2021). COVID-19 and transport: Findings from a world-wide expert survey. *Transport Policy*, 103, 68–85. <https://doi.org/10.1016/j.tranpol.2021.01.011>

Pivoting an In-Person Multiplatform Science Program to a Virtual Program during a Pandemic: Lessons Learned

Linlin Li
Gary Weiser
Kim Luttgen
Megan Schneider
Chun-Wei (Kevin) Huang
WestEd

Momo Hayakawa
Joan Freese
Beth Daniels
Mai Chue Lor
Emily Jensen
Twin Cities PBS

Citation: Li, L., Hayakawa, M., Freese, J., Daniels, B., Weiser, G., Luttgen, K., Lor, M. C., Schneider, M., Huang, C.-W., & Jensen, E. (2022). Pivoting an in-person transmedia science program to a virtual program during a pandemic: Lessons learned. *Children, Youth and Environments*, 32(3), 53-81.
<http://www.jstor.org/action/showPublication?journalCode=chilyoutenvi>

Abstract

School closures because of natural phenomena, such as COVID-19, underscore long-standing gaps in access to science education in the United States of America, particularly for young students. When educators have to pivot to deliver virtual instruction, it is important to identify feasible remote learning strategies for science content across formal and informal learning environments. This article discusses two evaluation studies of a multiplatform science learning program was originally developed for an in-person, formal learning environment that was modified based on infrastructure, preparations, and resource availability to meet the needs of distance learning in formal and informal learning environments due to COVID-19.

Keywords: multiplatform science learning, distance learning, Next Generation Science Standards

School closures in response to the COVID-19 pandemic underscored long-standing gaps in access to science education in the United States, particularly for young students. For decades, U.S. schools serving students from disadvantaged communities have struggled with limited budgets to find resources and teachers for their science classrooms. On the National Assessment of Educational Progress in 2015, only 22% of U.S. fourth-grade students from low-income communities scored at or above proficient in science achievement (U.S. Department of Education, 2015). As schools across the country transitioned to virtual learning in response to the COVID-19 pandemic, addressing issues of access and equity in science, technology, engineering, and mathematics (STEM) education became more urgent than ever. It became important to identify feasible remote learning strategies for science content across formal and informal learning environments.

Hero Elementary, funded by the U.S. Department of Education Ready to Learn (RTL) grant, provides opportunities for early science engagement and learning across diverse student populations through multiplatform media collections. The overarching goal of Hero Elementary is “to build the science and literacy skills of diverse students ages five to eight and promote equity for historically underrepresented children in science (race-ethnic minorities, children in low-income households, children with disabilities, English learners)” (Ellington et al., 2021). It embeds Next Generation Science Standards (NGSS) learning opportunities for students in kindergarten through second grade across an animated show, digital games, non-fiction e-articles, hands-on activities, and a digital science notebook. In response to the need for distance learning during both the formal school day and informal learning time (such as after school and during the summer), the Hero Elementary developer further collaborated with researchers and educators to modify its content and delivery strategies. Specifically, Hero Elementary staff developed hands-on activity videos and activity plans for instruction with (1) whole-class, synchronous modes; (2) interactive learning for individual, asynchronous modes; and (3) hybrid modes. This paper presents two evaluation studies of Hero Elementary that analyze the wide variation in implementation of the multiplatform program across formal (Study 1) and informal (Study 2) learning environments that had pivoted to virtual instruction.

Theoretical Framework

There is a concerted effort to identify effective strategies to promote equity and access in STEM learning, including studying how the design of learning resources and pedagogical approaches can support historically underrepresented groups of students and encourage them to participate in STEM learning (Heaster-Ekholm, 2020; Lee et al., 2015; Ryoo & Calabrese Barton, 2018; Vossoughi et al., 2016). At the same time, technology resources have become more accessible, particularly among minority and low-income families (McClure et al., 2017; Rideout & Katz, 2016). Levinson and Barrod (2018) found that while hurdles still exist for low-income families (e.g., opacity of app stores, cost, technology infrastructure), these families utilize innovative approaches to integrate technology into their lives to enrich their children’s experiences. Further, Lee and Barron (2015) reported that while Latinx families had the least access to technology, they still consumed educational media—via television and DVDs—and

participated in higher rates of joint media engagement than families who only spoke English.

While significant discrepancies in technology ownership exist between Latinx families and non-Hispanic families, over 60% of Latinx families have a television, computer, high-speed internet, video game player, and/or smartphone at home. Correspondingly, a growing body of literature has championed the design and use of digital resources to promote inclusion and accessibility for educational purposes (Caria et al., 2018; Cheng & Lai, 2020; Knight et al., 2013).

In the U.S., students typically participate in formal learning environments, which typically include traditional education in a classroom-based setting designed specifically to educate students. Many students also experience informal learning environments outside of formal school programming, such as before-school programs, after-school programs, clubs offered by community-based organizations, science centers at museum, and summer camps. Informal learning environments can be defined as “an array of safe, structured programs that provide children and youth ages kindergarten through high school with a range of supervised activities intentionally designed to encourage learning and development outside of the typical school day” (Little et al., 2008, p. 2).

Both formal and informal learning environments can benefit from including multiplatform educational resources. In contrast to a single medium, such as a television series or a digital game, multiplatform learning environments combine the use of multiple, related media platforms (e.g., a television series, a digital game, and hands-on materials) to address the same learning concepts, using the same characters and setting (Fisch, 2016). Well-designed multiplatform learning environments provide opportunities for students to extend their learning time and space across formal and informal learning environments while experiencing the affordances of game-like, narrative-based curricular materials, which may enhance students’ motivation and engagement in the learning process (Lacasa, 2010). Research on multiplatform educational programs has found positive impacts in school and at home, including actively involving students in the narrative, creating a unified learning experience, improving the learning process by integrating students’ knowledge and skills, developing 21st century skills (e.g., collaboration and critical thinking), and improving student achievement (Andreu et al., 2012; Cohen et al., 2012; McCarthy et al., 2015; Miller, 2012; Rosenfeld et al., 2019; Thai et al., 2019; Verbruggen et al., 2020).

The Impact of COVID-19 on Learning Environments

Beginning in March 2020, and continuing through the summer of 2020, the COVID-19 pandemic forced schools and informal learning environments to close their buildings and required “social distancing,” or maintaining a distance of 6 feet or more from other people.

While the duration of these closures varied by U.S. geographical regions (e.g., 3 weeks to 1 year), the educational system abruptly pivoted to virtual learning out of necessity. Primary schools varied in the infrastructure that was available to

support teaching in this new environment. Science was often excluded from curricula because educators lacked the tools and capacity to teach science virtually as well as the time to synchronously teach their students. Moreover, because educators often could not provide one-on-one support to students in this virtual learning environment, adult caregivers were called upon to assist their children through school activities. However, many caregivers faced personal, technical, logistical, and financial barriers, which limited their ability to assist their students with virtual learning during the pandemic (Abuhammad, 2020). Feasible options in this emergency context where schools had to quickly implement a virtual learning experience were largely limited to pre-packaged curricula, such as video lessons and resources accessible to students asynchronously (i.e., resources that could be accessed any time; Daniel, 2020).

The Program

Multiplatform-based programs provide the opportunity to deliver early science content at a lower cost and on a flexible schedule, increasing opportunities for students to be exposed to science learning and maximizing the number of students who can benefit (Clark & Dede, 2009). Virtual environments for delivering programs also provide opportunities for personalization or flexible implementation suited to classroom needs (Kucirkova et al., 2021). Although literature has shown that multiplatform resources often produce greater learning than a single learning media, the benefits of multiplatform learning occur when related media and quality educational content are connected in meaningful and relevant ways for students (Fisch et al., 2016; Fisch et al., 2014; Piotrowski et al., 2012).

Hero Elementary is a multiplatform, equity-focused educational initiative that provides science and literacy instruction to learners in kindergarten through second grade from underserved communities. More specifically, Hero Elementary includes science content designed to meet the vision of the NGSS while supporting communication skills aligned with the Common Core standards for English Language Arts. It uses the *Transformative Transmedia Framework for Early STEM Learners* (Ellington et al., 2021) as a guide to support equity and access in science education. In addition, the design of Hero Elementary was informed by research on literacy for English learners, students with disabilities, Latinx learners, and students from low socioeconomic communities (National Academies of Sciences, Engineering, and Medicine, 2017), as well as Universal Design for Learning and computer-assisted instruction frameworks (CAST, 2011; Weng et al., 2014). Many best practices articulated in Universal Design for Learning emphasize flexible learning environments and multiple modes for learning to maximize accessibility and ensure that individual learning differences are accommodated during instruction.

Media collections referred to as “playlists” are central to the Hero Elementary design. Each playlist focuses on a given science concept and contains an animated television story in which the characters learn about the science concept; a live action, song-based video featuring the Superpowers of Science (science practices); a digital or analog game; two hands-on activities; a digital

journal for reflection and communication; and a non-fiction e-book. A noted feature of the Hero Elementary design is its openness to flexible implementation approaches. Educators are encouraged to customize Hero Elementary to suit their learning community by selecting high-interest playlists that align with their community's goals, rather than presenting the materials in a specific, predetermined sequence. Hero Elementary also provides professional development for educators to learn about the media resources, program design, and equity strategies that effectively engage young students in science learning. Table 1 summarizes the content types within Hero Elementary and their typical implementation in an in-person setting.

Table 1. Types of program content in Hero Elementary

Type of Content	Description	In-Person Implementation	In-Person Resources
Animated video	An 11-minute animated video, depicting a story in which a team of students explore core science concepts as they investigate a phenomenon using Science and Engineering Practices.	Students watch the video individually or as a whole group. This is followed with group discussion.	<ul style="list-style-type: none"> • 11-minute video • Co-viewing Guide to support student discourse • Content management system
Live-action music video	A 90-second live-action video based on a song that addresses one Science and Engineering Practice. The lyrics describe the practice, and the live action video shows students using the practice in an everyday scenario.	Students watch the music video individually or as a whole group.	<ul style="list-style-type: none"> • 90-second video • Content management system
Hands-on activity	A science investigation, facilitated by an educator. Includes scientific discourse.	Students may work as individuals, in pairs or small groups, or as a whole group. Activities include exploration and age-appropriate scientific discourse.	<ul style="list-style-type: none"> • Detailed activity plan • List of materials needed • (optional) "How-to" video
Digital game	A suite of digital games tied to science topics for grades kindergarten through second grade. Games are based on constructivist principles and feature core science concepts and Science and Engineering Practices.	Students play the game individually or they may share a device and play with a partner.	<ul style="list-style-type: none"> • Digital game • "How to play" video • Content management system
Analog game	A game that focuses on core science content, played in-	Students play the game with others.	<ul style="list-style-type: none"> • Detailed activity plan

	person by a group of students and facilitated by an educator.		<ul style="list-style-type: none"> • Game materials
Science Power Notebook	A digital science notebook tool in which students record their observations and work out their understanding about the science they are learning. Notebook pages are related to specific animated videos or hands-on activities. Directions for the Science Power Notebook pages are embedded within the hands-on activity plans or video co-viewing guides.	Students first discuss the page with a partner or in small groups. Then, they create their pages individually on a device. Finally, they share their pages with other students.	<ul style="list-style-type: none"> • Interactive digital notebook page • Directions for educators • Content management system
Non-fiction eBook	Informative articles in digital format, with available voiceover, that provide children with additional information about the science topic.	Students access the eBooks online and read or listen to the content.	<ul style="list-style-type: none"> • Digital eBook Content management system

Material Modifications Made to Hero Elementary Due to the Pandemic

Because of the COVID-19 pandemic and the shelter-in-place order, student learning transitioned from in-school instruction to distance learning. To determine the viability of implementing Hero Elementary in distance learning environments, the educational outreach team and the research team at Hero Elementary quickly reached out to educators via emails, phone calls, and online video meetings to learn how to best modify Hero Elementary to suit educators' changing teaching strategies. Educators reported that they used both synchronous and asynchronous instructional strategies during distance learning to address the varying needs of family schedules and technology accessibility. They also reported using a variety of platforms to communicate with students during closures, such as Class Dojo, Google Classroom, Google Calendar, Flipgrid, and Seesaw. Educators also created paper packets for students to pick up and provided instructional support via online platforms.

While the educational outreach team and research team gathered information directly from educators, the Hero Elementary content development team analyzed the affordances and challenges that arose when adapting content for distance-learning environments (Table 1). They drew on existing information to develop a plan for modifying content so that Hero Elementary could be flexible and support multiple distance implementation options. To provide a support system for students and their families, the modified Hero Elementary content encouraged educators to connect with individual students, either by phone or online. In addition to staying in touch with students and families, Hero Elementary encouraged educators to send home materials for hands-on activities and analog games, enabling students to have opportunities to do these activities in a similar

way as they would have in a classroom or an out-of-school program. Table 2 shows supports and modifications for implementing Hero Elementary in distance-learning environments. Resources and trainings related to Hero Elementary implementation in distance learning were made available to educators.

Table 2. Supports and modifications for distance implementation

Type of Content	Considerations for Distance Implementation	Modifications for Distance Implementation
Animated video	<p>Students watching as a group online could discuss the content with an educator as usual.</p> <p>Students watching individually at home needed additional support for discussion:</p> <ul style="list-style-type: none"> • Individual conversation with their educator online; • Have a whole-class discussion via Zoom; or • Support for a conversation with someone at home. 	<ul style="list-style-type: none"> • Train educators to hold discussions with individual students who access the video asynchronously. • Home Co-viewing Guide document to support families in having conversations at home.
Live-action music video	Students could watch these short music videos individually or as a group online.	No need for additional support.
Hands-on activity (synchronous)	Students meeting as a group online could engage in a live, interactive demo and discussion with their educator, or they could watch a video demonstration of the activity as a group and discuss with their educator while online.	<ul style="list-style-type: none"> • Distance Implementation overview document helped educators select their approach. • Live Demo document supports educators to offer an interactive “live demonstration” of the activity in which students drive the investigation and engage in meaningful scientific discourse. Students decide how to investigate and direct the educator’s action. They observe and analyze the results, and the educator facilitates discussion. If students have materials available at home, they may investigate along with the rest of the group. • Each hands-on activity was re-created in an engaging video. The video invites viewers to observe, ask questions, analyze data, and explain phenomena during

		the investigation. Educators can show the videos to students in online meetings instead of doing a live demo. They may then engage students in discussion following the video or pause the video and discuss as appropriate throughout the investigation.
Hands-on activity (asynchronous)	<p>Students who do hands-on activities individually from home needed support for doing the activity.</p> <p>Educators had two options for creating opportunities for discussion among students who worked individually and asynchronously:</p> <ul style="list-style-type: none"> • Educators could contact students and have one-on-one discussions. • Educators could schedule a synchronous, online discussion for their whole group. 	<ul style="list-style-type: none"> • Distance Implementation overview document helped educators select their approach. • The home version of each activity was a modified version of the in-person, educator-facilitated activity plans, providing support for students to do the activities at home with adult oversight. These plans were written so that non-educators could follow the steps and engage in a fun family activity, incorporating meaningful science learning. Activities were written to be child-directed as much as possible. • The videos of hands-on activities were made available for students to watch at home if they were not able to do the activity themselves. • A Discussion Guide was developed for each activity to support educators in facilitating scientific discourse
Digital game	Digital games were originally designed to be played by individual students on their own devices	No modifications were developed for digital games.
Analog game	<p>Modalities for analog games mirrored those for hands-on activities:</p> <ul style="list-style-type: none"> • Students meeting as a group online could engage in a live, interactive analog game and discussion with their educator, or they could watch a video demonstration of the game as a group and discuss with their educator while online. • Students working 	<ul style="list-style-type: none"> • Distance Implementation overview document helped educators select their approach. • Live Demo document supports educators to offer an interactive version of the game in which students drive game play and engage in meaningful scientific discourse. Students decide what to do on their turn and

	<p>asynchronously from home needed support for playing analog games and educators needed to create opportunities for these students to discuss the analog games.</p>	<p>direct the educator's actions.</p> <ul style="list-style-type: none"> • Each analog game was re-created in an engaging video. The video invites viewers to play along. Educators can show the videos to students in online meetings instead of doing a live demo. They may then engage students in discussion following the video or pause the video and discuss as appropriate during game play. • The home version of each analog game was a modified version of the in-person, educator-facilitated game, providing support for students to play the game at home with other family members. These plans were written so that non-educators could follow the steps and engage in a fun family game that includes science learning. Games were written to be child-directed as much as possible. • The videos of analog games were made available for students to watch at home if they were not able to play the games themselves.
Science Power Notebook	<p>It was not feasible for students to engage in pair or small-group discussion as they would have done in person. Most students had only one digital device to use at home, and this was often a tablet or phone. Thus, engaging in a video chat while simultaneously opening their digital notebooks was not possible.</p>	<ul style="list-style-type: none"> • The videos of analog games were made available to support use of the Science Power Notebook in the context of watching a video or engaging in a hands-on activity, the distance documents for hands-on activities and videos end by telling students to open their notebooks. In addition, the content management system lists the Science Power Notebook following the appropriate activities.
Non-fiction eBook	<p>eBooks are available digitally via students' digital devices.</p>	<p>No modifications were developed for non-fiction eBooks.</p>

Research Questions

The present paper includes two studies that sought to understand the virtual implementation of Hero Elementary across formal school and informal learning environments. Study 1, implemented in the spring of 2020, focused on the program's impact and implementation in a formal virtual classroom environment. Study 2, implemented in the summer of 2020, examined the program's implementation in an informal virtual environment.

Both studies addressed the following implementation research questions:

1. What were the variations in implementing the virtual Hero Elementary?
2. Which components of the virtual Hero Elementary were the most successful and/or challenging?

In addition to these questions, Study 1 examined the impact of the virtual program on students' science knowledge and engagement.

Study 1: Implementation of Modified Hero Elementary Resources in a Formal Virtual Learning Environment**Study Design and Sample**

Study 1 used a multi-site cluster, randomized, experimental design that randomly assigned 34 second-grade classrooms ($n = 810$ students) from 20 schools in California that served economically disadvantaged students to either a treatment or control group. The treatment classrooms implemented the Hero Elementary intervention, while control classrooms implemented their business-as-usual science activities. The original study sample consisted of 810 students in 34 classrooms (17 treatment and 17 control classrooms). Although the sudden transition from in-school instruction to distance learning instruction due to COVID-19 created challenges for implementing Hero Elementary, 12 out of 17 treatment classrooms were able to continue Hero Elementary in distance learning environments. Similarly, 12 out of 17 control classrooms were able to remain in the study and provide valuable data on their remote instruction experiences and practices. To understand teachers' use of Hero Elementary and their science instruction, as well as the successes and challenges teachers faced during distance learning, we collected teacher survey and interview data.

In addition, 318 students (160 treatment students and 158 control students) completed a researcher-developed, NGSS-aligned online assessment. This assessment included 18 items that assessed second-grade students' knowledge of matter and its interactions. The reliability of the assessment is 0.70. Students completed the pre-assessment in school before school closures and completed the post-assessment at home during school closures. To ensure the integrity of the assessment scores, teachers communicated with parents about the importance of students completing the assessment independently and highlighted the expectation that parents would support students only with technical challenges. Given the circumstances of unexpectedly and rapidly transitioning to remote learning,

however, it is not surprising that students' completion of the post-assessment was low.

Analysis of the student demographic data indicated that more than three-fourths of the final analytic sample qualified for a free or reduced-price lunch program (indicating low socioeconomical status) and about 65% were Latinx. There were no statistical differences between the treatment and control groups on students' ethnicity, free or reduced-price lunch status, English learner status, or gender. Table 3 provides the demographic information for the impact sample.

Table 3. Demographic information for Study 1 sample, by condition

	Percentage of Treatment Students	Percentage of Control Students	Percentage of Total Students
Ethnicity			
Asian	14.65	19.87	17.25
Black/African American	5.10	7.69	6.39
Hispanic	68.79	60.90	64.86
White/Caucasian	8.92	5.77	4.15
Other	2.55	5.77	7.35
significance test ^a	$p = .211$		
Free / Reduced-Price Lunch			
No	19.44	23.58	21.50
Yes	80.56	76.42	78.50
significance test ^a	$p = .413$		
English learner			
No	55.06	62.66	58.86
Yes	44.94	37.34	41.14
significance test ^a	$p = .173$		
Gender			
Female	56.60	55.70	56.15
Male	43.40	44.30	43.85
significance test ^a	$p = .910$		

^aFisher's exact test (n = 160 for treatment group, n = 158 for control group, total n = 318)

Most teachers who participated in the study were regular classroom teachers with more than five years of teaching experiences and were responsible for providing instruction in all content areas. Two teachers were science specialists who provided only science instruction for several different classes. All teachers reported that they had no specialized science training outside of the general education classes that were required for their credentials.

Results

To study the impacts of Hero Elementary, the research team used a two-level hierarchical linear model to analyze student science content outcomes (i.e., scores on the post-assessment). This model considered the clustering nature of the data, as students were nested within teachers. The results indicated that treatment students performed better than control students on the post-assessment (the adjusted mean for the treatment group is 13.27 versus 12.76 for the control group; effect size is 0.15), although the difference was not statistically significant (Table 4).

Table 4. The effect of Hero Elementary on student science achievement

Adjusted means

Outcome measure	Treatment (standard deviation)	Control (standard deviation)	Difference (standard error)	p-value	Effect size	Unweighted student sample size
Post-assessment	13.27 (3.11)	12.76 (3.55)	0.51 (0.38)	.176	0.15	318

Note. Standard errors were estimated using the Huber-White procedure (Greene, 2003). Effect sizes were calculated by dividing impact estimates by the pooled standard deviation of the outcome variable.

The analysis of the treatment and control teacher interviews and surveys indicated wide variations in the virtual implementation of activities. Teachers reported that they used both synchronous and asynchronous instructional strategies during distance learning. They generally used Zoom or Google Meet to emulate in-school instruction and discussion. Most of the participating teachers scheduled one or two whole-class meetings per week. About a quarter of the teachers met with the whole class several times a day or met with small groups for discussions throughout the week. To address the varying needs of family schedules, teachers provided students with access to assignments asynchronously.

Science instruction during distance learning varied widely from none at all to daily. One teacher in the control group shared, "I can tell you now, that was non-existent, aside from the videos, because we were told we had to focus on math and language arts." Although science was de-emphasized in favor of English Language Arts and math at most sites, some control teachers tried to implement some form of science instruction at least once a week. The most common activities in control classrooms were watching a video from Mystery Science, BrainPOP, or other online sources and responding to questions during a class discussion or in writing. A few teachers

provided instructions for activities that could be done safely at home.

As all participating teachers adjusted their core course instructions to distance learning environments, treatment group teachers also modified their implementation of the Hero Elementary program to fit the distance learning environment. The treatment teachers continued to use videos and digital games throughout the implementation of the program, chose alternatives for hands-on activities, and implemented notebook and eBook activities when possible.

Video Activities

Among the playlist activities, teachers consistently found that the videos were the easiest activity to implement during distance learning, because, as one teacher explained, “all you have to do is put the YouTube video directly into the Google slide... when they put it in present mode, it just automatically plays.”

Teachers reported that the videos were fun and engaging for students. One teacher pointed out, “The videos, I think, were really simple to put in because they were a highly preferred activity for the kids. They loved watching them, they enjoyed the songs, the interstitials... so that was really simple.” Teachers also saw students connecting with the characters in the videos and believed this was a key factor in their students’ high engagement levels. One teacher shared:

They, across the board, were connecting with the characters, which was really great to see... everyone was able to connect, and that's what I appreciated, that was across the board. I saw students from different genders, different ethnicities, all connecting to one character or another, or more than one character.

Teachers also found that the videos engaged all students in a shared learning experience.

One teacher explained that the easy-to-understand storylines provided students with Individualized Education Programs and English learners “an entry point where they could actively participate in discussion about topics that they maybe didn’t fully understand, but that they could connect to through the video and through the characters in the cartoon.” Another teacher agreed, characterizing the episodes as “a great equalizer” that “created the most equal platform for special education, English learners, and other abilities to all come together.” For these reasons, teachers found the episodes to be “one of the strongest components of the program.”

Teachers appreciated that the videos established compelling, real-world contexts for the playlists’ key science concepts. They found that students were able to understand the key idea in each video. Teachers also found that the videos supported students’ learning by highlighting the Superpowers of Science (i.e., the scientific practices). The videos provided clear definitions and examples of the “superpowers.” This was especially useful during distance learning because class discussions were challenging, and having a short, easy to understand video was an

effective way to introduce a scientific practice. One teacher explained:

in the distance learning I was using the videos, the little, short videos on what the superpowers were more than I was [using them] in the classroom. Just because in the classroom, I felt like I could just skip that and just go and talk to them about why this was important. Whereas, through distance learning, I was using those little videos because I didn't have the ability to explicitly state it.

Digital Games

All treatment teachers implemented the digital games as individual activities during distance learning. Some teachers had students play the game during group meeting times to monitor them; others implemented the activities asynchronously. While some teachers reported that the games took a long time to load, most agreed that they were easy to implement. Students understood the game mechanics and could play independently, making the games well-suited to the distance learning environment.

According to teachers, students continued to find the games to be interesting, engaging, and easy to use during distance learning—just as they had while in the classroom. Students regularly chose to play the games when they had the freedom to choose an activity. Students enjoyed talking to each other about the games and would often comment on the games when they were together as a class. One teacher shared:

I had a lot of comments about the game. They really like it... students would say, 'You guys, it's so funny, you get to do X, Y, and Z. Got to try it out. This was my high score, what was your high score?' Different things like that.

Hands-On Activities

Teachers identified students' lack of access to the physical hands-on activity materials as a prominent barrier to implementation during distance learning. However, many teachers found that the video of the hands-on activity was an effective alternative to the physical activity. Most teachers assigned videos of the hands-on activities for students to watch on their own; some teachers had students watch the video as a class on Zoom. They found that the explanations in the videos of the hands-on activities were thorough and easy to follow. One teacher shared:

I actually really thought she did a way better job than I could have done because she was really prepared and there's a script on how to tie in the concept and you know, how they talk about it. I think that was really helpful even in the future... Not that a teacher would use the video [in person], but they could watch it to see how to introduce it or what kinds of things you can say as you're talking about, talking through the experiment.

Teachers also appreciated that the videos of the hands-on activities highlighted the Superpowers of Science. One teacher said:

With the distance learning, when I would send them the hands-on activity video, I love that... she always said, "We're going to use our Superpowers of Science," because I think my students, when we were implementing it in the class, I think that was when the dots were starting to connect, with each activity we do building on the next. I think that was definitely educational, those Superpowers of Science.

When possible, some teachers demonstrated the activity live on Zoom. Some teachers sent instructions to students so that they could try the activities on their own at home if they had the materials. One enterprising teacher sent the materials to a subset of students and had them conduct the experiment live on Zoom for the rest of the class as the "professors of the classroom." Regardless of their approach to implementation, most teachers reported discussing the experiment during the whole-class Zoom meetings. Some teachers also posted questions for students to respond to asynchronously.

Overall, teachers noticed that student engagement during the distance learning setting was not as good as it had been during in-school implementation. Teachers attributed the lack of engagement to the fact that students were no longer directly interacting with materials, classmates, and their teacher:

I definitely think it would be more [engaging] if we were in the classroom and they were doing these experiments themselves as opposed to just watching and talking about it... I would say it was probably more [engaging] when we were in the class.

I think when the kids see a stranger on their computer, it's less engaging than if you're like, "Oh, this is my teacher, and she's talking to me, and I haven't seen her."

However, teachers reported high levels of engagement from several students who managed to conduct the hands-on activities at home, either individually or with parental support: "For students that got to try it on their own, it was amazing." One teacher described their students' enthusiasm:

I would ask, 'Oh, did anybody try out the experiments?' And we would have a little discussion, and it was so fun because they would bring in what they made or what they used, like the melting of the ice cubes and the heating and cooling. They showed a lot of cool melted things.

Notebooks

Teachers attempted to implement the notebooks synchronously and asynchronously but encountered problems with both models. When implementing the notebooks synchronously, teachers observed that students needed significant support to navigate the platform. They noted that students had trouble fitting their work onto the digital notepad and accessing the camera and audio recording features. Students had similar issues when teachers assigned the notebook as individual, asynchronous work, and students often did not complete the activity. Teachers also

struggled to provide support for using the notebook remotely; students lost interest in the activity when they could not easily get answers to their questions.

Teachers reported that while students enjoyed using the notebooks when they were in the classroom before COVID-19, engagement dropped significantly in the distance learning environment. A key factor that contributed to lack of engagement was that many students switched from using the notebook on tablets in the classroom to using laptops at home. "The students lost their interest because it's not the same as on the tablet," explained one teacher. Another teacher added, "They can't take pictures. It was just like typing and dragging pictures."

eBooks

The majority of teachers assigned the eBooks to students as an individual activity. The rest of the teachers experimented with reading the eBooks as a class on Zoom. Some teachers read aloud, and others asked students to read aloud. Some teachers also supplemented the eBooks with their own materials. For example, one teacher asked students to record vocabulary words in science journals. Another teacher had students read independently and then created comprehension and "cite the evidence" questions for students to answer during discussion. A third teacher supplemented the text by asking students to answer questions about the eBooks' content, report something they had learned, and annotate the text.

Teachers reported that students' engagement in eBooks diminished after transitioning to distance learning. It was logistically challenging to access and navigate the eBook platform, which contributed to the low engagement levels. However, several teachers noted that the read-aloud feature of the eBooks was critical for engaging students who struggled to read, including English learners and students with Individualized Education Programs. "They were easy books for the struggling readers," one teacher explained and added, "The read-aloud feature made it accessible for English learners and struggling students." Another noted that this was especially important because, "A lot of my students struggle with reading still." Yet another teacher elaborated:

What I appreciated most... was that it read to them because I do have some students who would not have been able to access the text otherwise. And then I did have a few students who played with the Spanish version and were listening to that just because they wanted to. I do have some Spanish speakers, but they don't read in Spanish, not much, but it was a new feature for them. But definitely helped that it had the option [of it being] read to them.

The distance learning context changed how teachers interacted with students to keep them engaged and motivated in science learning. Reflections from teachers indicated that they used a variety of strategies to adapt the activities to fit the sudden need for distance learning. Teachers adjusted how activities were implemented, as well as the format (synchronous versus asynchronous), attempting different methods to keep the students engaged in science learning as in-person, hands-on learning experiences were no longer an option.

Study 2: Implementation of Modified Hero Elementary Resources in an Informal Virtual Learning Environment

Study Design

This study examined how Hero Elementary was used in informal learning environments by studying six summer programs. The developers of Hero Elementary recruited organizations that implemented educational activities in informal learning environments. They also used a "train-the-trainer" model to teach the organizations to use the modified resources when implementing Hero Elementary virtually. All informal educators had access to the same training, educator resources, and technology. To help the developers improve the feasibility of implementing Hero Elementary in summer programs, the informal educators reported the successes and barriers of Hero Elementary implementation through interviews. Telemetry, or educator dashboard data, provided quantitative data on activities completed by students for each classroom.

Study Sample

The program was implemented by educators in informal environments serving English learners, students from low-income households, and Latinx populations. Two hundred and five students in 14 classrooms at six summer or after-school programs across six states participated in distance learning during the summer of 2020 (Table 5).

The informal educators ranged in their teaching experiences because in many informal learning environments, educators are not required to have a teaching license or a bachelor's degree. While some educators who taught in the summer school programs did have a teaching license and were formal educators during the school year, they co-taught with part-time staff members who were working towards college degrees. Moreover, as physical learning spaces (e.g., school buildings) were closing and shifting to virtual learning environments, many informal learning spaces were unable to retain staff, and thus the staffing was unpredictable from month to month, and the staff turn-over was high.

Table 5. Study 2 participation by program and location

Program Type	Location	Number of students	Number of playlists
Summer program	Central Minnesota	32	6
After-school	East Texas	27	12
After-school	East Texas	6	4
After-school	East Texas	20	14
After-school	South Dakota	16	6
After-school	South Dakota	7	2
After-school	South Dakota	7	3
Summer program	Northeast Ohio	9	4
Summer program	Northeast Ohio	7	2
Summer program	Northeast Ohio	7	3
After-school	Central Maryland	12	5
After-school	Central Maryland	29	2
Summer Program	Eastern Nebraska	6	9
Summer program	Eastern Nebraska	20	10

Results

Across 14 classrooms, educators implemented the program to best fit their schedules, resources, and communities. Some organizations implemented all the activities synchronously. For example, the educators played the digital games in real time as their students watched, and students participated by voicing their ideas for the next step that the teacher should take in the game. Some organizations also provided hardcopy resources (by driving and dropping off the materials at each student's residence) in response to students' lack of access to technology such as wi-fi and devices. These activity packets were supplementary resources to the program. Some organizations also allowed older students and older siblings to participate. The educators created roles for the older students so that they could support the younger students. Older siblings also provided technical support, such as logging into the program and providing digital game support.

Virtual Implementation Successes

The virtual "train-the-trainer" model of professional development highlighted flexibility and adaptation. The modified resources that were developed since the pandemic began were presented to educators as learning materials that could be modified to accommodate a broad range of students. Regarding the program

materials, an educator noted, "A lot of the materials given to us early on helped us get started... We also would look at some of the playlists and try to see how we can make it... fit our kids."

During the programs with students, educators would log onto a video conferencing platform such as Zoom at scheduled times of the week to synchronously implement the program. During this time, educators would often share their screen and focus on a particular activity (typically the hands-on activity or animated video episode). Other activities were usually reserved for asynchronous implementation, with debriefs and check-ins during the synchronous session. One educator reflected on the virtual implementation and said:

We show it [the episode] as a whole group over Zoom. We all watch it together. And then we have a group discussion afterwards with all the science questions, like whether it's investigating or comparing. We have those discussions afterwards. We use the guide that gives the questions.

While on Zoom, some educators encouraged students to use the chat feature during the hands-on activity to express ideas, predictions, and encouragement. One educator explained, "We get the kids to use their chat. Kindergarten to second grade, they know how. They use the chat not so much with the cartoon [episode] part of it, but when we do the actual experiment."

Moreover, the range of different activities (videos, digital games, hands-on activities, eBooks, and a digital notebook) and multiple representations of key NGSS-aligned science concepts woven throughout each of the activities engaged students with different learning preferences and abilities. One teacher noted:

It was particularly great for them to have five different types of activities, each that appeared to be helpful for different students, like those who are English learners, have Individualized Education Programs, or are visual learners and kinesthetic learners, the ones that really like the hands-on activities. They can see the content in different ways, in different modalities.

Some educators took advantage of the fact that students accessed the virtual program materials from home. Educators would ask students to collect materials from their homes during the synchronous session so students could complete part of the hands-on activity. Educators would use the "advance" and "pause" features of the recorded video to discuss and reflect on the activity with the students and have students try aspects of the activity with the materials they had at home. Students then had an opportunity to share their experience to the group: "We have to do scavenger hunts or different things to make it hands-on with the different materials. We don't know what they have at home, but we encourage them to find things that they have at home."

Another unique feature of implementing the program that was only possible in this virtual learning environment was the participation of siblings. Older siblings could

support their younger siblings in using Hero Elementary virtually, especially if their parents were not available or were unfamiliar with technology. Older siblings and friends who participated in the synchronous sessions frequently praised and encouraged younger students as they made predictions and discussed possible outcomes and results.

Educators noticed that students continued to log on and remained engaged with the virtual program. Educators reported that students were eager to engage in the activities, which allowed for successful lessons. One educator explained:

What's so encouraging is that these kids continue to come on Hero Elementary virtual learning to participate after being in [virtual] school continuously. They're enjoying it and they love it. That means whatever we put into them [the lessons] is productive. If not, then they wouldn't continue to return.

Educator comments and telemetry showed that educators attempted different strategies to implement the activities (e.g., conducting a live demonstration versus sharing a video demonstration, or implementing one playlist per week versus one playlist biweekly) based on students' capacities and abilities. This meant that while students were assigned the same playlist, they worked on different playlist activities. These findings about the successes of implementing Hero Elementary in a virtual environment suggest that educators' adaptations of the resources, including accommodations and modifications, provided students with greater access to the virtual learning content.

Virtual Implementation Barriers

Many students experienced barriers to participating in the virtual learning program. Technology was the first and most significant barrier to program access, including lack of reliable internet connectivity and lack of an available device, which prevented some students from logging onto their Hero Elementary accounts. Some of the activities in the playlist, such as the digital game, require a strong internet connection, so children with weak connections could not complete these activities. Additionally, during synchronous sessions using Zoom, many students could not access Hero Elementary at the same time because their devices did not allow two browser windows to operate simultaneously. Lack of access to technology was particularly challenging in rural communities. Some caregivers lacked the necessary devices and wi-fi access, and others had the devices but had to learn how to use them. Limited experience with technology was a barrier for caregivers supporting their child's participation in the virtual learning program (e.g., caregivers had difficulties logging children into the web platform).

Additionally, there was inconsistent participation for students who lived and traveled between two households, which led to inconsistent access to internet connectivity and caregiver support. Some households also lacked parental supervision during the school hours due to work schedules. In many of these cases, older siblings would keep the younger sibling safe but would forget to log into the virtual learning platform at the designated synchronous time. Hence, given the

numerous barriers that impacted families as schools and programs suddenly switched to virtual learning, there was inconsistent attendance and completion of activities across playlists.

Furthermore, because educators were not physically present with students and the additional support at home from caregivers or siblings may have been inconsistent, it was difficult to observe or provide individual support for students in this learning environment. One educator explained:

You can't really know exactly what a child is thinking per se over the internet. And they're not going to ask [as many] questions. Their questions are different than say if they were there physically [together] looking at a hands-on to this activity, rather than doing it over the Zoom.

Discussion

Study 1 and Study 2 shed light on successes, challenges, adaptations, and modifications that educators experienced as they pivoted to a virtual learning environment from an in-person environment. Findings from both studies—across both formal and informal virtual learning environments—stress the importance of using learning platforms that are flexible. Across both studies, each implementation of Hero Elementary was unique. Though all sites struggled with technology issues, whether students faced unreliable internet connectivity or lack of technology support, it was clear that both formal and informal educators were able to adapt the program to fit the needs of their students and this new learning environment. The modified documents and options provided by the developers offered an opportunity for formal and informal educators to try new methods of delivery and assess how to best meet the needs of their students. These choices ultimately allowed sites to successfully implement the virtual Hero Elementary across a full semester.

The present studies highlight the implementation of a science program in a virtual learning environment in two different learning settings, formal and informal. Students participating in Hero Elementary through their formal classrooms were led through the program by trained second-grade teachers, while students participating in informal, summer Hero Elementary programs were led by informal educators who varied in their teaching experience and use of tools and techniques. Formal teachers had support from their school administration because the entire school was switching to a virtual learning environment; this may have led to a smoother transition and more consistent implementation of the program as compared to the informal learning environment. In contrast, the informal environment may have lacked the infrastructure to pivot to distance learning, which may have caused delays and inconsistent implementation of the program. Nonetheless, informal programs were also able to implement a modified version of the distance Hero Elementary program among students who had access to technology, thus highlighting the feasibility of program implementation across both formal and informal contexts.

Conclusion

The COVID-19 school closures underlined the importance of effective distance learning strategies. Since the spring of 2020, temporary school closures in over 180 countries have kept 1.6 billion students out of school (Azevedo, 2020; World Bank, 2020). The stressors associated with the pandemic and lack of access to schools (e.g., loss of routines, social isolation, lack of technology) have challenged teachers to provide developmentally appropriate educational experiences to all students.

Practical Contributions

The present evaluation studies documented the rich, complex, lived educational experiences of children and educators who abruptly transitioned from their typical learning environments to a novel virtual learning environment. Once distance learning became a reality in the spring of 2020, schools were forced to make decisions about how much time students would spend learning online. This resulted in science and other subjects being considered as optional for distance learners at some schools. Schools with adequate resources may not have had to sacrifice certain subjects in the transition to distance learning. However, students attending schools that were not requiring all subjects to be taught during distance learning did not have the benefit of accessing a well-rounded education, which may result in educational discrepancies and delays in the future. The disruptions to student learning due to COVID-19 may have longer-term impacts on student learning, depending on the resources they had to decrease the opportunity gaps that were heightened during the pandemic.

The teacher interviews underlined the inequities that students and their families face on a regular basis. Distance learning provided a glimpse into the homes of families that did not have access to the technology necessary for their students to function as online learners. Many families lacked devices like computers, laptops, and tablets, as well as access to high-speed internet. The cost of technology was a major barrier to access for some families; families may have used older computers or students may have had to share devices with their siblings.

Teachers mentioned additional inequities in the form of insufficient adult support and guidance for young students and those with Individualized Education Programs. Many parents and guardians did not have the time to help their students or the computer literacy to navigate online activities. Some caregivers also faced language barriers when attempting to communicate with their child's teacher. Parents and guardians of students with Individualized Education Programs also may not have had the requisite pedagogical skills to assist their child when schools were not providing the appropriate support. One teacher summarized:

Yeah, so that is another equity issue where students with Individualized Education Programs and students from lower socio-economic backgrounds had a lot less support in general during distance learning because they didn't have their parents, they didn't have any of the pullout services, they didn't have anyone providing guidance, and so that was one of the hardest affected groups in my classroom and unfortunately probably one of the groups that had the least engagement with Hero Elementary.

Our findings provide strong practical support for (1) equitable access to technology, such as wi-fi connection and tablets, (2) access to a flexible virtual learning program, and (3) foundational technological knowledge—for both educators and families—to provide robust educational opportunities and support for students across formal and informal learning environments.

Scientific Contributions

To provide effective virtual learning and draw upon best practices to ensure students are engaged in science and are accessing quality education, teachers, school principals, and district leadership need to acquire new technologies and instructional approaches, as well as develop creative and effective ways to connect with students (Kaden, 2020). It is imperative that Hero Elementary and programs like it can be implemented flexibly in different environments to ensure that students have continued learning opportunities despite interruptions to the typical learning environment. Hero Elementary's multiplatform design, which presented the same learning concepts in multiple related media formats, allowed students to flexibly engage in learning through whatever types of media suited their needs best. Indeed, the results from Study 1 indicated that Hero Elementary was positively associated with gains in students' science knowledge (specifically, matter and its interactions; effect size = 0.15), although differences from the control group were not statistically significant. In addition, treatment teachers reported that students were using more scientific vocabulary and making connections between the activities in Hero Elementary and their own lives. While multiplatform programs like Hero Elementary have shown initial evidence of promoting science learning in virtual learning environments, future research can continue to explore (1) the strengths in and affordance of each medium for enhancing science learning, (2) the potential impact of multiplatform programs on in-person formal and informal learning environments, and (3) the expected implementation fidelity and impact on learning in environments where all students have access to sufficient technology.

The findings of these evaluation studies contribute to research by documenting the efforts of teachers, researchers, and program developers working together to address students' needs based on schools' infrastructure, preparations, and resource availability. There are a large number of socioeconomically disadvantaged students in today's public school classrooms. Approximately 24% of schools in the U.S. are considered high-poverty—that is, having more than 75% of students eligible for free or reduced-price lunch (U.S. Department of Education, 2009-2015). To reach diverse populations of student learners, researchers have emphasized the importance of identifying and implementing best strategies when designing learning resources (Smith & Abrams, 2019; Davey & Marx, 2020; Dyjur et al., 2021). Hero Elementary provides an example of using effective design strategies and pedagogical practices to create accessible science learning experiences. The implementation of Hero Elementary in formal and informal learning environments contributes to a growing effort to support historically underrepresented groups of students to participate in science learning through multiplatform products. This research shines new light on the field's understanding of which of the available remote learning strategies are most effective—with or without the internet, web-enabled devices, and comprehensive educational support. Multiplatform learning

environments such as Hero Elementary demonstrate the potential to address student needs in distance learning.

Researchers and developers of multiplatform programs can continue to leverage play and television narratives in their designs to develop interactive experiences that are engaging and meaningful for students. Such designs should include socio-technical structures that engage users, allow for individuals' continual growth within the communities and cultures in which they are nested, and encourage active learner, child-centered, inquiry-based learning (Barab et al., 2005, Clarke & Dede, 2009).

Dr. Linlin Li is a Senior Research Associate at WestEd and directs cross-site, multi-year, federally funded projects. She earned her Ph.D. in Human Development and Family Studies from the University of North Carolina at Greensboro. Her research interests are on the areas of developmental psychology, early math and science intervention, inclusion of children with disabilities in the regular education classroom, and family engagement. Her recent work involves using interactive games to design and evaluate interventions for students living in poverty and at risk for academic difficulties.

Dr. Momo Hayakawa is the Managing Director of Child Development and Research and oversees the formative and evaluation research conducted on Hero Elementary. She earned her Ph.D. in Child Development from the Institute of Child Development at the University of Minnesota and holds a master's degree in Social Sciences from University of California, Irvine. Her research interests lie in the intersection of early childhood education and innovative prevention and intervention programs, and her work has been published in peer-reviewed journals, book chapters, and presented at international conferences.

Joan Freese is Senior Managing Director of Educational and Digital Media at Twin Cities PBS. Her work utilizes educational technology and media to provide equitable learning experiences for all learners. Joan is Executive Producer of Hero Elementary, a broad and engaging educational media initiative focused on science and literacy learning for K-2 children. She is also PI for the NSF funded SciGirlsCode, which supports middle school girls and educators with computational thinking and coding skills. Under Joan's leadership, the SciGirls website earned an Emmy Award for New Approaches in children's programming and a Parents' Choice Gold Award.

Beth Daniels manages the content and education for Hero Elementary. She guides content and pedagogy across media platforms to engage and empower young children in underserved communities, their families, and educators. Beth received her MEd in curriculum and instruction: youth development from the University of Minnesota and a BA in psychology, computer science, and education (Macalester College). She designs/develops award-winning digital educational content, including Oregon Trail II, Big Science Ideas: Systems, and Reading Explorations. She has taught grades K-8 and coached community-based afterschool programs. Her presentations address youth program quality, experiential learning, accessibility, science- literacy integration, and racial justice in education.

Dr. Gary Weiser is a Research Associate at WestEd. He earned his PhD in Science Education at Teachers College, Columbia University. Gary brings an evidence-centered approach to design, research, and program evaluation, which fuses quasi-experimental and experimental designs, mixed methods, and qualitative research. His research work focuses on the Next Generation Science Standards, supporting English language arts and the development of rich, standards-aligned assessments. Gary continues to promote science in interdisciplinary learning with a focus on using STEM and the Arts to help children learn about the environment and sustainability issues.

Kim Luttgen is a Research Associate II with the Learning and Technology content area at WestEd. She earned her BS in Software Engineering from California State University, Sacramento and a single subject math, science, and technology California Professional Clear teaching credential with Cross-cultural, Language & Academic Development emphasis from National University. Kim brings her experience as a software developer, teacher, and teacher trainer to bear on research projects evaluating the effects of technology-based curricula and assessment on learning and attitudes of students and teachers.

Mai Chue Lor received a BS degree in Early Childhood Foundations from the University of Minnesota – Twin Cities in 2016. She currently serves as the Outreach Specialist at Twin Cities PBS on the Ready to Learn grant Hero Elementary.

Megan Schneider is a Program Associate and Operations Coordinator with the Learning and Technology content area at WestEd. She brings experience in teaching, coaching, and project management as well as an interest in educational equity, pedagogy, teacher preparation, and STEM education. Megan supports project management, timeline and task organization, and team and client coordination. Prior to working at WestEd, she taught middle school mathematics and science and served as a grade-level coach for first-year teachers. Megan earned her MS in Educational Studies from Johns Hopkins University and her BA in Cognitive Science from University of California, Berkeley.

Dr. Chun-Wei (Kevin) Huang is a Senior Research Associate with the Learning and Technology content area at WestEd. He is a co-principal investigator and lead methodologist for several federally funded projects. He earned his Ph.D. in applied statistics and measurement from the University of Maryland at College Park. His research interests include using modern statistical and psychometric methods to study learning, behavioral, and attitudinal changes among children and teachers. His recent work involves developing a screener to identify Pre-K-1st graders who are at risk in early math learning and designing online assessment tools to track student learning over time.

Emily Jensen is the community engagement manager for Hero Elementary and Mashopolis at TPT, PBS. Prior to TPT, Emily worked with governments in Mexico, United Arab Emirates and Colombia, creating teacher professional development and education programs for children ages 5-11. Her master's is in international educational development from Teachers College, Columbia University. Emily is a

Fulbright Scholar whose research focused on access to education for minority children in post-Soviet nations and has worked for over 12 years in community engagement, leading initiatives at the Minnesota State Senate and the Minnesota House of Representatives.

References

- Abuhammad, S. (2020). Barriers to distance learning during the COVID-19 outbreak: A qualitative review from parents' perspective. *Heliyon*, e05482. <https://doi.org/10.1016/j.heliyon.2020.e05482>
- Andreu, L., Marti, J., & Aldas, J. (2012). *The use of digital transmedia storytelling for case studies in marketing education*. INTED2012 Proceedings, 1406-1414.
- Azevedo, J. P. (2020). *Learning poverty in the time of COVID-19: A crisis within a crisis*. World Bank Group. <http://hdl.handle.net/10986/34850>
- Barab, S., Thomas, M., Dodge, T., Carteaux, R., & Tuzun, H. (2005). Making learning fun: Quest Atlantis, a game without guns. *Educational Technology Research and Development*, 53(1), 86-107. <https://doi.org/10.1007/BF02504859>
- Caria, S., Paterno, F., Santoro, C., & Semucci, V. (2018). The design of web games for helping young high-functioning autistics in learning how to manage money. *Mobile Networks and Applications*, 23(6), 1735-1748. <https://doi.org/10.1007/s11036-018-1069-0>
- Center for Applied Special Technology (CAST) (2011). Universal Design for Learning Guidelines version 2.0, Wakefield, MA. <http://www.udlcenter.org/aboutudl/udlguidelines/downloads>
- Cheng, S. C., & Lai, C. L. (2020). Facilitating learning for students with special needs: A review of technology-supported special education studies. *Journal of Computers in Education*, 7(2), 131-153. <https://doi.org/10.1007/s40692-019-00150-8>
- Clarke, J., & Dede, C. (2009). Design for scalability: A case study of the river city curriculum. *Journal of Science Education and Technology*, 18(4), 353-365. <https://doi.org/10.1007/s10956-009-9156-4>
- Cohen, J., Ducamp, G., Kjellstrom, W., & Tillman, D. (2012, March, 5). What happens when children encounter the T-book?: The potential for transmedia books in teacher education. Society for Information Technology & Teacher Education International Conference, Waynesville, NC. <https://www.learntechlib.org/p/39712/>

- Daniel, S. J. (2020). Education and the COVID-19 pandemic. *Prospects*, 49, 91–96.
<https://doi.org/10.1007/s11125-020-09464-3>
- Davey, A., & Marx, S. (2020). *EAP 4.0: Transforming the English for Academic Purposes Toolkit to meet the evolving needs and expectations of digital students*. In K. Borthwick & A. Plutino (Eds.), *Education 4.0 revolution: Transformative approaches to language teaching and learning, assessment and campus design* (pp. 53-59). Research-publishing.net.
<https://doi.org/10.14705/rpnet.2020.42.1087>
- Dyjur, P., Ferreira, C., & Clancy, T. (2021). Increasing accessibility and diversity by using a UDL framework in an infographics assignment. *Currents in Teaching & Learning*, 12(2), 71–83.
<http://search.ebscohost.com/login.aspx?direct=true&db=eue&AN=148965073&site=ehost-live>
- Ellington, R., Daniels, B., Orozco, F., Santiago, A., & Arnold, A. L. (2021). Transformative transmedia framework for early STEM learners: Harnessing the power of science, literacy, and media. *Journal of Educational Multimedia and Hypermedia*, 30(1), 5–34.
<https://www.learntechlib.org/primary/p/217700/>
- Fisch, S. M. (2016). Introduction to the special section: Transmedia in the service of education. *Journal of Children and Media*, 10(2), 225–228.
<https://doi.org/10.1080/17482798.2016.1140482>
- Fisch, S. M., Damashek, S. & Aladé, F. (2016) Designing media for cross-platform learning: Developing models for production and instructional design. *Journal of Children and Media*, 10(2), 238–247.
<https://doi.org/10.1080/17482798.2016.1140485>
- Fisch, S. M., Lesh, R., Motoki, E., Crespo, S., & Melfi, V. (2014). Cross-platform learning: How do children learn from multiple media? In F. C. Blumberg (Ed.), *Learning by playing: Video gaming in education* (pp. 207–219). Oxford University Press.
- Greene, W. H. (2003) *Econometric analysis*. Macmillan Publishing Company.
- Heaster-Ekholm, K. L. (2020). Popular instructional design models: Their theoretical roots and cultural considerations. *International Journal of Education and Development using Information and Communication Technology*, 16(3), 50–65.
- Kaden, U. (2020). COVID-19 school closure-related changes to the professional life of a K–12 teacher. *Education Sciences*, 10(6), 165.
<https://doi.org/10.3390/educsci10060165>
- Knight, V., McKissick, B. R., & Saunders, A. (2013). A review of technology-based

- interventions to teach academic skills to students with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 43(11), 2628-2648. <https://doi.org/10.1007/s10803-013-1814-y>
- Kucirkova, N., Gerard, L., & Linn, M. C. (2021). Designing personalized instruction: A research and design framework. *British Journal of Educational Technology* (April), 1–23. <https://doi.org/10.1111/bjet.13119>
- Lacasa, P. (2010). Children transmedia and virtual experiences inside and outside the classrooms. In S. L. Wong, et al. (Eds.), *Proceedings of the 18th International Conference on Computers in Education: Enhancing and sustaining new knowledge through the use of digital technology in education* (pp. 663-667). Putrajaya, Malaysia: Asia-Pacific Society for Computers in Education.
- Lee, J., & Barron, B. (2015). Aprendiendo en Casa: Media as a resource for learning among Hispanic-Latino families. A Report of the Families and Media Project. Joan Ganz Cooney Center at Sesame Workshop.
- Lee, O., Miller, E., & Januszyk, R. (2015). *NGSS for all students*. NSTA Press.
- Levinson, A., & Barrod, B. (2018). Latino immigrant families learning with digital media across settings and generations. *Digital Education Review*, 33, 150-169. <https://doi.org/10.1344/der.2018.33.150-169>
- Little, P. M. D., Wimer, C., & Weiss, H. B. (2008). After-school programs in the 21st century: Their potential and what it takes to achieve it. *Issues and Opportunities in Out-of-School Time Evaluation*, No. 10. Harvard Family Research Project.
- McCarthy, B., Li, L., Atienza, S., & Tiu, M. (2015, June). *Engaging families in early mathematics learning: A study of a preschool family engagement model*. Paper presented at the Jean Piaget Society Conference, Toronto, Ontario.
- McClure, E., Vaala, S., & Spiewak Toub, T. (2017). *QuickReport: Discovering kids' apps: Do family strategies vary by income?* The Joan Ganz Cooney Center at Sesame Workshop. https://joanganzcooneycenter.org/wp-content/uploads/2017/06/jgcc_discoveringkidsapps.pdf
- Miller, A. (2012). Game-based learning to teach and assess 21st century skills. *Edutopia*. <http://www.edutopia.org/blog/game-learning-21st-century-skills-andrewmiller>
- National Academies of Sciences, Engineering, and Medicine (2017). *Promoting the educational success of children and youth learning English: Promising futures*. The National Academies Press. <https://doi.org/10.17226/24677>
- Piotrowski, J. T., Jennings, N. A., & Linebarger, D. L. (2012). Extending the lessons

- of educational television with young children. *Journal of Children and Media*, 7, 216–234. <https://doi.org/10.1080/17482798.2012.693053>
- Rideout, V., & Katz, V. S. (2016). *Opportunity for all? Technology and learning in lower- income families*. The Joan Ganz Cooney Center at Sesame Workshop.
- Rosenfeld, D., Dominguez, X., Llorente, C., Pasnik, S., Moorthy, S., Hupert, N., Gerard, S. & Vidiksis, R. (2019). A curriculum supplement that integrates transmedia to promote early math learning: A randomized controlled trial of a PBS KIDS intervention. *Early Childhood Research Quarterly*, 49, 241-253. <https://doi.org/10.1016/j.ecresq.2019.07.003>
- Ryoo, J. J., & Calabrese Barton, A. (2018). Equity in STEM-rich making: Pedagogies and designs. *Equity & Excellence in Education*, 51(1), 3–6. <http://dx.doi.org/10.1080/10665684.2018.1436996>
- Smith, K., & Abrams, S. S. (2019). Gamification and accessibility. *International Journal of Information & Learning Technology*, 36(2), 104–123. <https://doi.org/10.1108/IJILT-06- 2018-0061>
- Thai, K., Li, L., & Schachner, A. (2019). *Accelerating early math learning with a digital math resource: A cluster randomized controlled trial*. Paper presented at the American Educational Research Association Annual Meeting, Toronto, Canada.
- U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 and 2015 Science Assessments.
- Verbruggen, S., Depaepe, F., & Torbeyns, J. (2020). Effectiveness of educational technology in early mathematics education: A systematic literature review. *International Journal of Child-Computer Interaction*, 100220. <https://doi.org/10.1016/j.ijcci.2020.100220>
- Vossoughi, S., Hooper, P. K., & Escudé, M. (2016). Making through the lens of culture and power: Toward transformative visions for educational equity. *Harvard Educational Review*, 86(2), 206–232. <https://doi.org/10.17763/0017-8055.86.2.206>
- Weng, P. L., Maeda, Y., & Bouck, E. C. (2014). Effectiveness of cognitive skills-based computer-assisted instruction for students with disabilities: A synthesis. *Remedial and Special Education*, 35(3), 167-180. <https://doi.org/10.1177/0741932513514858>
- World Bank (2020). *The COVID-19 pandemic: Shocks to education and policy responses*. World Bank. <https://openknowledge.worldbank.org/handle/10986/33696>

Changes in Outdoor Recreation among Rural and Urban Children during the COVID-19 Pandemic: Fathers' Perspectives

Dina Izenstark

San José State University

Iryna Sharaievska

Clemson University

Citation: Izenstark, D. & Sharaievska, I. (2022). Changes in outdoor recreation among rural and urban children during the COVID-19 pandemic: Fathers' perspectives. *Children, Youth and Environments*, 32(3), 82-99.
<http://www.jstor.org/action/showPublication?journalCode=chilyoutenvi>

Abstract

Using the Family-Based Nature Activities Framework, we examined fathers' perceptions of how their children's outdoor recreation changed during COVID-19, and differences between rural and urban participants' outdoor experiences. Fathers of children ages 5-12 (n = 26) participated in semi-structured interviews. Results showed that due to sweeping lifestyle changes, fathers reported increased time spent outdoors and the development of new outdoor family routines as a way to promote children's health, fulfill caretaking responsibilities, and promote family relationships. Urban fathers reported more outdoor restrictions due to local policies whereas rural fathers reported engaging in a larger variety of nearby outdoor activities.

Keywords: outdoor recreation, COVID-19 pandemic, rural, urban, children 5-12

The coronavirus pandemic (COVID-19) negatively disrupted the experiences and everyday routines of most families with children (Gassman-Pines et al., 2020; Patrick et al., 2020). Parents reported increased financial and employment concerns (Recto & Lesser, 2020), exacerbated feelings of stress due to the merging of personal and professional spaces and overlapping responsibilities of employment and caretaking (Burk et al., 2020), and more negative mental health outcomes than nonparents (Elder & Greene, 2021). Scholars found that parents' and children's psychological health was negatively impacted due to fear related to COVID-19 and the indirect effects of the pandemic impacted daily routines (e.g., quarantine, school closures) (Chawla et al., 2021; Cusinato, 2020). Furthermore, Gassman-Pines et al. (2020) discovered that parents' psychological health was strongly associated with the number of crisis-related hardships, including job loss, caregiving burdens, and illness. Parents who reported a decline in psychological health were also more likely to experience a decline in their children's behavioral health, loss of childcare, and increased food insecurity (Patrick et al., 2020).

Children's psychological health was also negatively affected during the COVID-19 pandemic (Gassman-Pines et al., 2020; Patrick et al., 2020). Children experienced increased anxiety associated with changes to their everyday routines (e.g., reduced physical activity, increased technology usage) (Chawla et al., 2021). Children also felt disconnected from peers and social support systems outside of the family (Singh et al., 2020). Moreover, families who struggled to address their children's most basic needs (e.g., food, healthcare, safety) were particularly vulnerable to increased psychological strain due to sudden disconnect from services ensuring children's everyday care and well-being (Patrick et al., 2020; Phelps & Sperry, 2020; Wong et al., 2020).

Scholars recommend engagement in regular health-promoting activities to reduce the negative impact of the COVID-19 pandemic on psychological health (Chawla et al., 2021; Wong et al., 2020). Getting adequate physical activity and sleep as well as reducing internet use were among some recommendations to improve psychological health (Chawla et al., 2021). One effective, pandemic-friendly yet often overlooked way to promote health and family interactions is engagement in family-based nature activities (Izenstark & Ebata, 2017; 2019). Family-based nature activities include participating in outdoor recreation (e.g., hiking, biking), using outdoor spaces (e.g., parks), and/or taking family trips to natural areas (Izenstark & Ebata, 2016). Research highlights how engagement in outdoor recreation can provide opportunities to promote physical and psychological health (Chawla, 2015; Ewert et al., 2014), foster social cohesion (Hartig et al., 2014) and positively influence family relationships (Izenstark & Ebata, 2016; 2017). During the pandemic, researchers found that children's participation in outdoor recreation was associated with bolstered resilience to stressors (Jackson et al., 2021), self-efficacy, positive youth development (Reed et al., 2022), and increased participation in physical activity (Rossi et al., 2021). Given the benefits of participation in family-based nature activities, we wanted to better understand fathers' outdoor experiences with their children and how they changed during the COVID-19 pandemic.

We specifically interviewed fathers for several reasons. Fathers enact a vital role in their children's leisure experiences (Bauer & Giles, 2018; Creighton et al., 2015; Fletcher, 2020; Jenkins, 2009). These experiences not only provide a means for building relationships, life skills, and shared time together, but may influence men's understanding of their own identity as a father (Creighton et al., 2015). While societal expectations towards fathers have changed in the last several decades (Taylor et al., 2013), many fathers engage less with their children than mothers, and often view themselves as less competent caretakers than mothers (Doucet, 2018). However, when it comes to participation in leisure and recreation, fathers often feel empowered to bond, communicate and build meaningful relationships with their children (Fletcher, 2020; Jenkins, 2009; Sharaievska & Hodge, 2018).

Moreover, past research shows that fathers' active involvement plays a vital role in their children's lives (Buswell et al., 2012; Doucet, 2018). Knoester and Randolph (2019) found that fathers of nine-year-old children who reported participating in outdoor activities or sports with their child at least once per week experienced improved father-child closeness and self-reported health. Despite existing research on the importance of fathers' engagement in children's lives, the literature on how nature affects children and their caregivers together is rather limited (Chawla, 2015). For example, Hodge et al. (2015) conducted an integrative review of the family leisure literature published between 1990 and 2012 and found that mothers/caregivers/decision-makers were the focus of more than three times the number of articles than fathers.

Past research provides important insights on the role of fathers' involvement with their children in outdoor adventure programs (Overholt, 2022), outdoor risky play behavior (Bauer & Giles, 2019), sports (Fletcher, 2020) and active play (Creighton et al., 2015). However, one context that is missing from the literature is how fathers and children engage in outdoor activities together close to home—an environment in which children spent increased time during COVID-19 restrictions (Nathan et al., 2021). Simultaneously, many communities temporarily closed schools, playgrounds, recreational facilities and other outdoor environments, and thus neighborhood outdoor spaces became increasingly important places for children's leisure and physical activity (Mitra et al., 2020).

Due to stay-at-home restrictions and closures of leisure locations throughout the pandemic, families were encouraged to recreate outdoors and close to home (Perry et al., 2021). However, families' outdoor recreation opportunities differed based on neighborhood environment and local policy responses to the COVID-19 pandemic (de Lannoy et al., 2020; Mitra et al., 2020). For example, de Lannoy et al. (2020) discussed differences in COVID-19-related restrictions implemented in outdoor spaces in Canadian provinces and found a correlation between severity of restrictions and decreased children's outdoor experiences. Similarly, Mitra et al. (2020) found that living in a house (versus apartment), a low dwelling density neighborhood, and access to parks was correlated with increased outdoor activities among children. Research on participation in family-based nature activities among rural versus urban participants is needed (Izenstark et al., 2016), especially during the pandemic, to better understand how local policy restrictions and access to

outdoor spaces influenced children's outdoor experiences in both types of locations.

Theoretical Framework

We utilize the Family-Based Nature Activities (FBNA) framework to provide insights into how participation in outdoor family leisure may uniquely benefit children and families (Izenstark & Ebata, 2016). Within this larger term, family leisure in nature is characterized as an outdoor setting with high levels of greenness (e.g., trees) and low levels of builtness (e.g., buildings, concrete). The FBNA framework integrates Attention Restoration Theory (ART) and Routines and Rituals Theory to highlight why the context of nature and continued participation in outdoor family leisure can enhance family functioning (Izenstark & Ebata, 2016). For example, ART highlights why natural environments are unique settings for fostering improved attention (Kaplan, 1995), given that these spaces provide four unique qualities: being away, fascination, extent, and compatibility (Kaplan & Kaplan, 1989). When individuals' attention is restored, they are less irritable, can pick up on social cues more easily, and have more self-control (Kaplan, 1995), all characteristics that Izenstark and Ebata (2016) posited would contribute to getting along better with other family members.

Simultaneously, the Routines and Rituals Theory highlights how continued and repeated engagement in outdoor family rituals can contribute to improved family outcomes. Examples of family rituals include daily patterned interactions (i.e., leisure activities, bedtimes), traditions (i.e., family gatherings), or celebrations (i.e., holidays) and can arise in any area of family life (Bossard & Boll, 1950). It is difficult to provide a specific operational definition of a family ritual because they are unique to each family (Fiese, 2006; Fiese et al., 2002). However, family rituals are often characterized by three dimensions: communication (e.g., reflecting a meaningful and symbolic message), commitment (e.g., participation in the activity over time), and continuity (e.g., a desire to pass on the ritual) (Fiese, 2006). Several research studies have utilized the FBNA framework to study the benefits of outdoor family leisure, highlighting numerous individual and family benefits including improved attention and greater dyadic cohesion (Izenstark & Ebata, 2017), less negativity during and after an outdoor walk (Izenstark et al., 2021), and improved family communication (Izenstark & Ebata, 2022). Given the important role fathers play in children's leisure experiences (Bauer & Giles, 2018; Creighton et al., 2015; Fletcher, 2020), and due to a greater change in child-rearing responsibilities among fathers during the pandemic (Craig & Churchill, 2020), we wanted to better understand the role fathers play in their children's outdoor family rituals and how families adapted their daily routines. Taken together, the FBNA framework will provide a lens to interpret the data and better understand specific phenomena related to family leisure in the outdoors.

Current Study

The purpose of this study was to explore how children's outdoor experiences changed in both rural and urban environments during the COVID-19 pandemic. Specifically, the objectives were to explore: 1) general changes in shared outdoor experiences among fathers and children during daily life; and 2) the differences in rural compared to urban children's outdoor experiences.

Method

Recruitment and Participants

Fathers living in the United States who had at least one child between the ages of 5-12 years old were recruited to participate in the study. Participants were recruited through electronic flyers shared through parenting list-serves, social media sites (e.g., Facebook neighborhood groups, parks and recreation sites), and word-of-mouth. All participants in the study met the following eligibility criteria: 1) was the child's biological or adopted father; 2) had at least one child between the ages of 5-12; 3) lived in the same household with the child the majority of the time; 4) participated in outdoor recreation with their child at least once per month; and 5) could complete the interview in English. We specifically selected fathers of school-aged children because the amount of time these children spend outside is strongly influenced by the amount of time their parents spend outdoors (Larson et al., 2011). School-aged children also experienced many changes in their everyday routines during the pandemic (i.e., quarantine and the transition to online learning) (Phelps & Sperry, 2020). For the purposes of this study, "daily activities" refers to the activities and experiences that make-up their everyday, normal life.

Twenty-six fathers from both urban ($n=13$) and rural areas ($n=13$) participated in the study. All of the urban fathers lived on the west coast of the U.S., whereas the rural fathers lived in the southeast region of the country. We utilized the United States Department of Agriculture's (USDA) Urban Influence Codes (UIC) to classify rural and urban counties based on population size and adjacency to a metropolitan area (Economic Research Service, 2013). All of the urban residents in our study lived within a county defined by having a UIC of 1 or higher (e.g., at least 1 million residents or more). All of the rural residents lived within a county with a UIC of 2. While the USDA defines a UIC of 2 as fewer than 1 million residents, it is important to note that population size ranged from 2,557 to 15,500 in the towns in which the rural participants resided.

Overall, the two groups were similar in age (urban $M=43.6$; 37-50; rural $M=40.6$; 35-46), primarily identified as middle class (urban $n=10$; rural $n=13$), and were married (24 out of 26). Participants' education levels included "some college" (urban $n=3$; rural $n=1$), earning a "bachelor's degree" (urban $n=4$), or earning a "master's degree or higher" (urban $n=6$; rural $n=12$). While both the urban and rural fathers primarily identified as Caucasian (92% rural; 84% urban), more urban fathers reported that their child was multiracial (46% urban; 0% rural). On average rural fathers reported more total children (range of 2-6; $M=3$) than urban fathers (range of 1-3; $M=2$).

Data Collection

The Institutional Review Boards of the authors' respective institutions approved this study. Data for this study was collected from in-depth, semi-structured interviews that took place over the phone or Zoom between May and August of 2020 at a convenient time for the participants. Trained interviewers with extensive experience collecting qualitative data conducted the interviews, which lasted 45-65 minutes. Following the attainment of informed verbal consent, the interviewers began the

formal interview process. Fathers received a \$25 gift card after completing the interview.

Analytic Strategy

Thematic analysis (Braun & Clarke, 2006) in combination with grounded theory techniques (Glaser & Strauss, 1967; Strauss & Corbin, 1990) were used to identify themes and patterns in the data. We practiced reflexivity throughout the study through writing memos and peer discussions on our own positions (e.g., geographical location, professional work, gender, and parenting status) and how these may influence the research process. For example, we reflected and challenged assumptions based on where we currently live and how the outdoor opportunities available in our geographic area during the pandemic might influence the conclusions drawn (Braun & Clarke, 2013). Prior to data analysis, all of the interviews were audio recorded, transcribed verbatim, and checked for accuracy. Participants' names were replaced with pseudonyms and all transcripts were de-identified to maintain anonymity.

We followed Braun and Clarke's (2006) six steps to conducting thematic analysis, which began with familiarizing ourselves with the data (e.g., reading transcripts, listening to interviews, and memoing coding ideas and observations). We then started the process of generating initial open codes by sorting the data by research question and coding segments of the larger interview transcript in which the participant mentioned the COVID-19 pandemic. During this process, we worked with a research assistant, who had no competing interest in the project, to help generate initial codes.

In the third phase of data analysis, we began to search for themes and moved from open coding to focused coding by analyzing the patterns and trends of the most significant and frequent codes evident. As we began to generate more themes and subthemes, we utilized Strauss and Corbin's (1990) axial coding paradigm to put the data back together in new ways to better understand the relationships between codes. The axial coding process helped us relate our categories to subcategories by identifying our main phenomenon (e.g., changes to outdoor recreation), and how it was impacted by causal conditions (e.g., switching to remote living), action/interaction strategies (e.g., spending more time outside), and intervening conditions (e.g., living in rural vs. urban areas). In this phase, we also utilized Glaser and Strauss's (1967) constant comparative methods to analyze similarities and differences across the urban and rural participants' interviews. From here we developed new focused codes to help us move toward developing major themes and subthemes. Code and meaning saturation was reached with the 26 fathers interviewed during this phase as no new concrete or conceptual codes were evident (Hennink et al., 2017).

This iterative process helped us move into phase four of reviewing and refining the themes. Throughout phase four and the entire analysis process, we maintained trustworthiness by checking the findings of the study against the coded extracts and full data set to ensure quality and accuracy (Braun & Clarke, 2006) while maintaining a detailed audit trail (see Guba & Lincoln, 1985). The authors and

research assistant met regularly to conceptualize the data, debrief, check interpretations, discuss agreements, and negotiate disagreements.

Finally, we moved into phases five and six and continued to further refine the themes in writing up the results section. It is important to note that we do not report the percentage of participants who reported each theme. Braun and Clarke (2013) argue that frequency of responses in qualitative research should be interpreted with caution given that they do not determine value and the absence of a response does not mean the participant did not experience a specific theme, only that the theme was not mentioned on its own.

Results

Our analysis showed that the COVID-19 pandemic forced sweeping lifestyle modifications (e.g., remote learning and work, stay-at-home orders, reduced contact with friends/family), cancellation of children's leisure programs (e.g., sports, extracurricular activities, summer camps), and local policy changes to parks/recreation activities. This in turn created changes in our participants' outdoor recreation participation patterns. We also identified differences in how local policies impacted rural versus urban children's outdoor recreation.

Changes in Outdoor Recreation During the COVID-19 Pandemic

We identified two main themes that captured how both urban and rural participants' outdoor recreation behaviors changed.

Spending More Time Outdoors

Almost every participant in the study reported that they spent more time outdoors with their children indicating that during the pandemic they made "a more concerted effort to get outside together," "we get outside as a family more than we did before" and that outdoor activities together "have gone up substantially." On average, rural and urban fathers reported spending six days per week outdoors with their children during the pandemic—multiple times per day in some cases. Fathers reported having more time to spend with their children due to pandemic induced stay-at-home orders, which necessitated many changes to family schedules with online school, remote work, and cancellation of extracurricular activities. Rural Father (RF) 6 shared how his family had more availability to spend time outside (three or four times as much) since "I don't have to be at the office eight or nine hours a day." Similarly, several other fathers shared that finding time was the greatest barrier to outdoor family recreation prior to COVID-19, but during the pandemic, they had more flexibility to create their own schedules/ timelines.

For example, Urban Father (UF) 12 provided a description of his family's schedule before and during the pandemic:

It [opportunity to participate in outdoor activities] maybe has increased actually... we have more free time. We would always go outside on the weekends pre-COVID, but it's more during the week now. It's just become like an extended weekend to us in essence. We get out there more often in the middle of the day.

Developing New Outdoor Family Routines

Many fathers shared how they not only spent more time outdoors but also intentionally integrated new outdoor family routines into their daily schedules. The most commonly reported outdoor routine was regular and predictable family walks among both rural and urban participants. As one father shared, “we try to do about a walk every day in some way, shape, or form” (UF 5). Within this larger theme, we identified three subthemes regarding why fathers felt it was important to get their children outside every day to: 1) promote health and well-being, 2) fulfill increased caretaking responsibilities, and 3) encourage positive family relationships.

First, children’s health and well-being was promoted through time spent outside as it allowed them to “keep their energy and fitness levels up,” “get out of the house,” and be “away from technology.” Fathers described how getting their children outdoors was “essential to their well-being,” helped them feel a sense of normalcy, and be “healthy in their development as a whole person [physically, cognitively, emotionally].” UF 12 summarized why he made it a priority to take his children outside:

I love the outdoors. I think it's really important for kids to be outdoors, getting exercise, fresh air, understanding nature and how important it is to us. And, I just think it's overall good for your health. So I want to influence that on them and have them be outside as much as possible.

Fathers also recognized that their children were more dependent on technology as it became the primary way they participated in distance learning and connected with friends and extended family. It also served as a form of family leisure (e.g., watching movies, playing video games) and a babysitter (when parents needed to complete their own job responsibilities). RF 5 discussed how his family started taking more neighborhood walks to get away from technology:

Rather than sitting in front of electronics or the TV, we would go out for a lunch walk or an evening walk or both sometimes. So, it's definitely improved [minimized the amount of technology time]... and promotes just being outside and being kids and enjoying everything outdoors has to offer.

Second, fathers developed new outdoor family routines because they felt a greater caretaking responsibility to ensure their children got outside every day. Fathers reported the need to intentionally organize outdoor opportunities for their children to make up for the absence of outdoor time at school, in extracurricular activities and playing with friends. For example, UF 8 shared:

During the school time, I rely more on the school. Like they have their outside time at school, they have recess and I know that they're outside and they're running around, so I don't worry about it. But [now] I stress about it... like I grew up outdoors. And so I really think that's important... but now during the lockdown, I have to make sure it happens.

UF 13 described how one of the first things he did when the stay-at-home orders

began was go to a local store and “stocked up on all the backyard summer games” for his children. Similarly, RF 10 described how he put together new backyard equipment (e.g., monkey bars, trampolines, a garden, and games) so that they would have everything they needed in their own backyard. Other fathers shared how they felt a change in their role from father to playmate with the COVID-19 restrictions since their children were discouraged from interacting with peers. RF 4 explained:

...their interaction with their friends has dropped down to nearly zero. Before COVID, most days... it would have been out with friends. So my involvement has actually increased in the sense that when we're out, I'm their only playmate most of the time... I don't get to just sit by the nice creek.

Finally, fathers developed new outdoor family routines with their children as a way to encourage positive family relationships and spend more meaningful time together. This extra time allowed families to slow down and focus on one another. Previously families were “rushing from task to task” and everything had “a feeling of urgency,” but now having “the time and availability to do things has improved everything.” UF 13 explained how his view of family time changed:

COVID time actually has been kind of strange because it has been kind of nice to just be a family unit and not have the go-go-go of everyday life, which was what we considered as normal. But when you look at what normal was, normal was never being home because we were always out being involved. Whereas this has now turned it around and made us kind of like just slow things down and turn us into a family.

Several fathers shared how they would like to continue spending quality time with their family in these new outdoor family routines, even after COVID-19 restrictions are lifted.

Comparisons of Outdoor Recreation in Urban and Rural Areas

Changes in Local Policies

While both rural and urban fathers reported general outdoor recreation changes, these significantly varied based on local policies in their community. Fathers of school-aged children living in urban areas reported significantly more challenges, restrictions, and lack of access to outdoor spaces than rural fathers. Urban fathers described drastic changes to the outdoor recreation opportunities available to their children due to the closure of public recreation facilities and spaces including swimming pools, parking lots to beaches, bathroom facilities at parks, and “no tennis courts, no basketball courts, no baseball fields, no playgrounds.” They shared how it has been “enormously challenging” and “a huge, huge barrier” as the pandemic “completely upended” their typical outdoor recreation behaviors. These restrictions caused many participants to adapt by participating in activities closer to home (e.g., in the backyard or local neighborhood). Fathers shared how both the types of activities and places one could go outdoors changed due to local policies. Participation in an outdoor activity away from one’s home was challenging due to

crowded spaces, physical distancing concerns, county travel limitations, stay-at-home orders, and mask mandates. UF 3 explained “you have to find other types of activities to do at the park or outdoors when those other places are closed.” In his family, they have been bike riding instead of playing team sports. UF 5 similarly shared how the biggest change was “where we could go.” Although some county and state parks remained opened, they became increasingly crowded. UF 1 described a cascade effect of more people using fewer outdoor spaces:

You start closing one trail, everybody starts going to another trail, close that trail, and eventually it means that things get so packed that they close down. So it's been really interesting, like trying to keep up with what is actually open and where we can go and then not going if there are too many people.

In comparison, rural participants also experienced local policy changes but reported fewer restrictions. For example, rural fathers commonly shared how they had to be more creative in finding places that were open and less crowded. RF 10 explained:

So I think what changed mostly was finding the places we were allowed to go. So when the state parks opened we definitely went to the state parks. And then when they weren't, that's more when our outdoor activities were either going to the lake where my parents live or getting in the four-wheeler and going and finding some place off in the woods that there wasn't anybody.

Similarly, others described how they adapted their outdoor recreation when places further from home were closed (e.g., campgrounds, county/state parks) by finding new outdoor spaces close to home and in their community. RF 13 explained how school and store policies negatively affected them more than changes in local outdoor policies because they had access to many different neighborhood outdoor spaces, and could easily adapt if needed. For example, he described how they had access to a local park, creek, and trail system within their neighborhood, which was enough to keep their school-aged child engaged. Conversely, RF 11 shared how their outdoor recreation was impacted by self-imposed restrictions more so than local policies.

We didn't really even look into hiking [at the beginning of the outbreak]. I wasn't even really sure what the status of the forest and the parks were. I know at some point they were closed, but I didn't follow it closely because I kind of just assumed they were all pretty much shut down.... I think they were reopened for a while before we started going again, and it kind of occurred to me for the first time, like, okay, I guess you can pretty well socially distance out in the woods... So for a while, whether it was real policy or just my perceptions of what I thought policies were, we were not using those spaces and just confining to home, and later on we started to do it again.

Adaptations to Outdoor Recreation

Both rural and urban fathers described needing to make adaptations to their child's

outdoor recreation, which often resulted in participating in outdoor activities closer to home. Urban children participated primarily in walking and bike riding, whereas rural children engaged in a larger variety of outdoor activities close to home, including gardening, fishing, camping, swimming, and playing in larger yards. Additionally, rural fathers discussed the closures of forests and lakes more, whereas urban fathers discussed the closure of beaches, parks, and specific theme/amusement parks.

Fathers from both areas reported challenges associated with the cancellation of team sports. Many described how “the things that changed drastically obviously were no more team sports” and “none of the teams can meet and practice and play because of regulations.” For example, RF 2 shared how his daughter was, “full swing into two softball teams when COVID hit, and that's when everything shut down. So all of a sudden, you know, two or three days a week at the softball field turn into zero days a week.” Several fathers from both rural and urban areas expressed concern about the negative impact the abrupt cancellation of sports during spring 2020 would have on their children.

Appreciation for Outdoor Spaces

Finally, urban and rural fathers also expressed an appreciation for when trails and parks began to re-open, sharing comments such as, “Yeah, I think they actually made me appreciate those spaces a little bit more” (RF 9). Others expressed how once outdoor recreational spaces re-opened, it “caused us to be even more happy” (UF 7). RF 10 shared,

I think I just had to be more patient and understand that those local outdoor spaces are a privilege and not a right because when they're just open all of the time they start to feel like a right.... It did shift the perspective in my mind from a right to a privilege.

Discussion

Overall, the findings from this study complement and extend existing research by highlighting the importance of outdoor environments in reinforcing children's health and family relationships, especially during the COVID-19 pandemic when opportunities for organized recreation and social interaction were limited. Our results showed that the COVID-19 pandemic caused sweeping lifestyle modifications and changes in outdoor recreation as well as where children learn, play, and socialize. As a result of the pandemic, participants spent more time outdoors, adapted the types of activities in which they engaged, and developed new outdoor family routines. Similar to Jackson et al. (2021), we found outdoor recreation served as an important opportunity for promoting health and well-being. The results reconfirm the health and familial benefits of outdoor recreation participation.

During a time when parents and children experienced increased stress and anxiety (Gassman-Pines et al., 2020; Patrick et al., 2020), our findings showed that participants were able to utilize outdoor environments to exercise, get away from technology, relieve stress, and maintain some sense of normalcy. For many

families, outdoor spaces served as a refuge because they were one of the only leisure spaces available to them outside the home. Additionally, the findings highlight the versatility of outdoor recreation, as participants were able to successfully adapt their outdoor activities and still derive numerous health benefits from participation.

The findings suggest that increased father-child time together outdoors was an unanticipated benefit of the pandemic. Prior to the pandemic, “time” was one of the greatest barriers to outdoor family recreation (Reis et al., 2012). Pre-pandemic research showed that fathers participated in outdoor activities with their child at least once per week (Knoester & Randolph, 2019), whereas our participants reported spending an average of six days per week outside with their child. Fathers shared how this additional time together shifted the responsibility for getting their kids outside from other institutions to fathers themselves.

Fathers had to find a way to balance multiple roles during the pandemic as they took on greater caretaking roles, as well as the role of a friend. Past research has shown that the amount and way fathers spend time with their children influences fathers’ identity (Creighton et al., 2015; Marsiglio et al., 2005). For example, Creighton et al., (2015) explained how fathering is a socially constructed and consistently changing concept influenced by social, cultural, and institutional norms (Butler, 1990; West & Zimmerman, 1987). The findings in our study suggest that fathers’ identities were reshaped by their increased caretaking responsibilities. During the pandemic, fathers spent more time with their children outdoors, developed new outdoor family routines, sought out new outdoor spaces, and several even created new backyard opportunities to promote their child’s health and family relationships. The changes in everyday life brought on by the pandemic gave fathers flexibility, space, and time to reflect on their familial values and the opportunity to create, implement, and engage in valued outdoor activities with their children. Our findings corroborate existing research that shows fathers bond with and build meaningful relationships with their children through participation in leisure and recreation (Fletcher, 2020; Jenkins, 2009; Sharaievska & Hodge, 2018).

These findings can also be interpreted through the FBNA Framework (Izenstark & Ebata, 2016). While it is unknown whether families’ new outdoor routines have continued since COVID-19 restrictions have been lifted, we hypothesize that many fathers will continue to promote them because they exemplified the three characteristics of a long-term ritual (communication, commitment, and continuity; Fiese, 2006). For example, in the language used to describe why they developed new outdoor family routines fathers described how it was part of their identity (i.e., “I love the outdoors” or “I grew up outdoors”), which reflected symbolic communication. They also indicated that they spent time outdoors “regularly,” “with intention,” and that it was an important part of their daily schedule. Along with these examples, fathers also reported reflecting on their lives (e.g., slowing down, focusing more on the family unit), and the desire to continue spending more quality family time in the future. Furthermore, several fathers shared how they hoped the natural environment would be important to their children in the same way it was to them as a child—reflecting continuity across generations through the desire to pass

on this value. This application of the FBNA framework complements past research on how childhood time spent in nature is associated with future participation in adulthood (Asah et al., 2012; Ward Thompson et al., 2008).

Finally, the findings emphasize the importance of access to nature. While de Lannoy et al.'s (2020) commentary discussed how neighborhood type and local policy responses to COVID-19 influenced outdoor recreation opportunities available to children in Canada, our findings complement this research by providing in-depth examples of these differences for families living in rural compared to urban areas in the U.S. For example, while public health officials were encouraging parents and children to go outside during the pandemic to promote mental and physical health, urban families experienced more restrictions and lack of access to outdoor public spaces than rural fathers. While fathers in this study only experienced temporary restrictions, it complements existing research that highlights how the neighborhood where a child lives may influence their outdoor experiences (Mitra et al., 2020).

Limitations and Future Research

There were several limitations to this study. First, data was collected between May and August 2020 at the peak of the COVID-19 pandemic. Restrictions in the U.S. were constantly changing throughout that time and thus fathers may have been impacted differently based on the time of data collection (May vs. August). To address this limitation, we asked fathers in later stages of data collection to reflect on the times when restrictions were most severe. Although COVID-19 restrictions have changed since the start of the study, the effects of the pandemic are ongoing and future studies should capture how families' outdoor recreation patterns continue to change over time. Additionally, collection of retrospective interview data assumes reliance on fathers' recollection of past events and only provides a glimpse into a family's experiences. Observational research and interviews from the child's perspective are also needed to provide a fuller picture of how families integrate outdoor routines into their daily lives.

Second, while a major strength of our study was capturing fathers' perspectives, we acknowledge that experiences of fathers across the U.S. varied significantly during the pandemic. Every father in our study worked from home during the pandemic and reported a medium to high socioeconomic status. The experiences of fathers who continued to work outside the home, became unemployed, or who did not live with their children during the pandemic may have been different, and thus should be studied. Furthermore, the majority of fathers in this study were married in a heterosexual relationship. Since past research shows that socioeconomic status, gender, and family structure discrepancies can affect fathers' ability to engage in activities with their child (Knoester & Randolph, 2019; Sharaievska & Hodge, 2018), there is a strong need to better understand the experiences of fathers of diverse backgrounds, and single, stay-at-home, and gay fathers (Bauer & Giles, 2019; Fletcher, 2020).

Conclusion

In conclusion, this project demonstrated the important role outdoor spaces play in the lives of children and the entire family, especially in times of major disruptions in

everyday routines. This study contributes to existing research by providing additional information on how time spent outdoors may serve to promote child health and family relationships. These findings have policy implications and highlight the importance of communities' funding and investing in free outdoor public recreation opportunities for families, especially in urban areas as these spaces played a critical role in helping families maintain their health and well-being.

Dina Izenstark is an Assistant Professor in the Child and Adolescent Development Department at San José State University. She earned her Ph.D. in Human Development and Family Studies from the University of Illinois Urbana-Champaign. She conducts applied, interdisciplinary research exploring the impact of time spent in nature on children and families, and how participation in family-based nature activities can promote strong family relationships. Dina's full list of publications can be found at <https://www.sjsu.edu/people/dina.izenstark/publications/>

Iryna Sharaievska, Ph.D. is an Assistant Professor in the Department of Parks, Recreation and Tourism Management at Clemson University. Her research areas include technology-based leisure in contemporary families, with specific focus on families of diverse backgrounds, use of new technologies in recreation and tourism management (e.g., the new media/social network sites, gaming, cell phones, navigational devices), as well as fathers and their leisure and recreation time with their children. Iryna's full list of publications can be found at <https://scholar.google.com/citations?hl=en&user=M2fZ3JwAAAAJ>

References

- Asah, S. T., Bengston, D. N., & Westphal, L. M. (2012). The influence of childhood: Operational pathways to adulthood participation in nature-based activities. *Environment and Behavior*, 44(4), 545-569.
- Bauer, M. E., & Giles, A. R. (2018). Single, stay-at-home, and gay fathers' perspectives on their 4-12-year-old children's outdoor risky play behaviour and 'good' fathering. *Qualitative Research in Sport, Exercise and Health*, 11(5), 704-719.
- Bossard, J. H., & Boll, E. S. (1950). *Ritual in family living*. University of Pennsylvania Press.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.
- Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners*. Sage.

- Burk, B. N., Pechenik Mausolf, A., & Oakleaf, L. (2020). Pandemic motherhood and the academy: A critical examination of the leisure-work dichotomy. *Leisure Sciences*, 43(1-2), 225-231.
- Buswell, L., Zabriskie, R. B., Lundberg, N., & Hawkins, A. J. (2012). The relationship between father involvement in family leisure and family functioning: The importance of daily family leisure. *Leisure Sciences*, 34(2), 172-190.
- Butler, J. (1990). *Gender trouble and the subversion of identity*. Routledge.
- Chawla, L. (2015). Benefits of nature contact for children. *Journal of Planning Literature*, 30(4), 433-452.
- Chawla, N., Tom, A., Sen, M. S., & Sagar, R. (2021). Psychological impact of COVID-19 on children and adolescents: A systematic review. *Indian Journal of Psychological Medicine*, 43(4), 294-299.
- Craig, L., & Churchill, B. (2021). Dual-earner parent couples' work and care during COVID-19. *Gender, Work & Organization*, 28, 66-79.
- Creighton, G., Brussoni, M., Oliffe, J., & Olsen, L. (2015). Fathers on child's play: Urban and rural Canadian perspectives. *Men and Masculinities*, 18(5), 559-580.
- Cusinato, M., Iannattone, S., Spoto, A., Poli, M., Moretti, C., Gatta, M., & Miscioscia, M. (2020). Stress, resilience, and well-being in Italian children and their parents during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 17(22), 8297.
- de Lannoy, L., Rhodes, R. E., Moore, S. A., Faulkner, G., & Tremblay, M. S. (2020). Regional differences in access to the outdoors and outdoor play of Canadian children and youth during the COVID-19 outbreak. *Canadian Journal of Public Health*, 111(6), 988-994.
- Doucet, A. (2018). *Do men mother?* University of Toronto Press.
- Economic Research Service (2013). *Urban Influences Codes*. Retrieved from <https://www.ers.usda.gov/data-products/urban-influence-codes/documentation/>
- Elder, L., & Greene, S. (2021). A recipe for madness: Parenthood in the era of Covid-19. *Social Science Quarterly*, 102(5), 2296-2311.
- Ewert, A. W., Mitten, D. S., & Overholt, J. R. (2014). *Natural environments and human health*. CABI.
- Fiese, B. H. (2006). *Family routines and rituals*. Yale University Press.

- Fiese, B. H., Tomcho, T. J., Douglas, M., Josephs, K., Poltrock, S., & Baker, T. (2002). A review of 50 years of research on naturally occurring family routines and rituals: Cause for celebration? *Journal of Family Psychology*, 16(4), 381.
- Fletcher, T. (2020). *Negotiating fatherhood: Sport and family practices*. Palgrave Macmillan.
- Gassman-Pines, A., Ananat, E. O., & Fitz-Henley, J. (2020). COVID-19 and parent-child psychological well-being. *Pediatrics*, 146(4), e2020007294.
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Aldine de Gruyter.
- Guba, E. & Lincoln, Y. (1985). Establishing trustworthiness. In E. Guba & Y. Lincoln (Eds.), *Naturalistic inquiry* (pp. 289-311). Sage.
- Hartig, T., Mitchell, R., De Vries, S., & Frumkin, H. (2014). Nature and health. *Annual review of Public Health*, 35, 207-228.
- Hennink, M. M., Kaiser, B. N., & Marconi, V. C. (2017). Code saturation versus meaning saturation: How many interviews are enough? *Qualitative Health Research*, 27(4), 591-608.
- Hodge, C., Bocarro, J. N., Henderson, K. A., Zabriskie, R., Parcel, T. L., & Kanter, M. A. (2015). Family leisure: An integrative review of research from select journals. *Journal of Leisure Research*, 47(5), 577-600.
- Izenstark, D., & Ebata, A. T. (2016). Theorizing family-based nature activities and family functioning: The integration of attention restoration theory with a family routines and rituals perspective. *Journal of Family Theory & Review*, 8(2), 137-153.
- Izenstark, D., & Ebata, A. T. (2017). The effects of the natural environment on attention and family cohesion: An experimental study. *Children, Youth and Environments*, 27(2), 93-109.
<https://doi.org/10.7721/chilyoutenvi.27.2.0093>
- Izenstark, D., & Ebata, A. T. (2022). Why families go outside: An exploration of mothers' and daughters' family-based nature activities. *Leisure Sciences*, 44(5), 559-577.
- Izenstark, D., Oswald, R. F., Holman, E. G., Mendez, S. N., & Greder, K. A. (2016). Rural, low-income mothers' use of family-based nature activities to promote family health. *Journal of Leisure Research*, 48(2), 134-155.

- Jackson, S. B., Stevenson, K. T., Larson, L. R., Peterson, M. N., & Seekamp, E. (2021). Outdoor activity participation improves adolescents' mental health and well-being during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 18(5), 2506.
- Jenkins, J. M. (2009). Nonresident fathers' leisure with their children. *Leisure Sciences*, 31(3), 255-271.
- Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology*, 15(3), 169-182.
- Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. Cambridge university press.
- Knoester, C., & Randolph, T. (2019). Father-child sports participation and outdoor activities: Patterns and implications for health and father-child relationships. *Sociology of Sport Journal*, 36(4), 322-329.
- Larson, L. R., Green, G. T., & Cordell, H. K. (2011). Children's time outdoors: Results and implications of the National Kids Survey. *Journal of Park and Recreation Administration*, 29(2), 1-20.
- Marsiglio, W., Roy, K. & Fox, G. L. (Eds.) (2005). *Situated fathering: A focus on physical and social spaces*. Rowman & Littlefield.
- Mitra, R., Moore, S. A., Gillespie, M., Faulkner, G., Vanderloo, L. M., Chulak-Bozzer, T., Rhodes, R. E., Brussoni, M., & Tremblay, M. S. (2020). Healthy movement behaviours in children and youth during the COVID-19 pandemic: Exploring the role of the neighbourhood environment. *Health & Place*, 65, 102418.
- Nathan, A., George, P., Ng, M., Wenden, E., Bai, P., Phiri, Z., & Christian, H. (2021). Impact of covid-19 restrictions on western Australian children's physical activity and screen time. *International Journal of Environmental Research and Public Health*, 18(5), 2583.
- Overholt, J. R. (2022). Role shifts and equalizing experiences through father-child outdoor adventure programs. *Leisure Sciences*, 44(5), 614-633.
- Patrick, S. W., Henkhaus, L. E., Zickafoose, J. S., Lovell, K., Halvorson, A., Loch, S., Letterie, M. & Davis, M. M. (2020). Well-being of parents and children during the COVID-19 pandemic: A national survey. *Pediatrics*, 146(4).
- Perry, E. E., Coleman, K. J., Iretskaia, T. A., Baer, J. M., Magnus, L. F., & Pettengill, P. R. (2021). COVID-19 messaging in U.S. state parks: Extensions of the outdoor recreation strategies and practices framework unmasked by the pandemic. *Journal of Outdoor Recreation and Tourism*, 36, 100449.

- Phelps, C., & Sperry, L. L. (2020). Children and the COVID-19 pandemic. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(S1), S73–S75.
- Recto, P., & Lesser, J. (2020). Young Hispanic fathers during COVID-19: Balancing parenthood, finding strength, and maintaining hope. *Public Health Nursing*, 28(3), 267-373.
- Reed, K. B., Hanna, S., Bai, S., & Agans, J. P. (2022). Outdoor recreation as an asset for youth development in the context of the COVID-19 pandemic. *Journal of Outdoor Recreation, Education, and Leadership*, 14(1).
- Reis, A. C., Thompson-Carr, A., & Lovelock, B. (2012). Parks and families: Addressing management facilitators and constraints to outdoor recreation participation. *Annals of Leisure Research*, 15(4), 315-334.
- Rossi, L., Behme, N., & Breuer, C. (2021). Physical activity of children and adolescents during the COVID-19 pandemic: A scoping review. *International Journal of Environmental Research and Public Health*, 18(21), 11440. <https://doi.org/10.3390/ijerph182111440>
- Sharaievskia, I., & Hodge, C. J. (2018). "Hey Dad, I just wanna say hello": Digital leisure among nonresident fathers. *International Journal of the Sociology of Leisure*, 1(3), 241-260.
- Singh, S., Roy, D., Sinha, K., Parveen, S., Sharma, G., & Joshi, G. (2020). Impact of COVID-19 and lockdown on mental health of children and adolescents: A narrative review with recommendations. *Psychiatry Research*, 293, 113429.
- Strauss, A., & Corbin, J. (1990). *Basics of qualitative research*. Sage Publications.
- Taylor, P., Parker, K., Morin, R., Cohn, D., & Wang, W. (2013). *The new American father*. Washington, D.C.: Pew Research Center. <http://www.pewsocialtrends.org/2013/06/14/the-new-american-father/>
- Ward Thompson, C. W., Aspinall, P., & Montarzino, A. (2008). The childhood factor: Adult visits to green places and the significance of childhood experience. *Environment and Behavior*, 40(1), 111-143.
- West, C., & Zimmerman, D. H. (1987). Doing gender. *Gender & Society*, 1(2), 125-151.
- Wong, C. A., Ming, D., Maslow, G., & Gifford, E. J. (2020). Mitigating the impacts of the COVID-19 pandemic response on at-risk children. *Pediatrics*, 146(1), e20200973. <https://doi.org/10.1542/peds.2020-0973>

Differential Impacts of COVID-19 on Summer Activities and Environments for Children from High- and Low-Income Families

**Dan Richmond
Rachel McGovern
Taylor Wycoff
Michael Froehly
Meagan Ricks
Jim Sibthorp**

*Department of Parks, Recreation, and Tourism
University of Utah*

Citation: Richmond, D., McGovern, R., Wycoff, T., Froehly, M., Ricks, M., & Sibthorp, J. (2022). Differential impacts of COVID-19 on summer activities and environments for children from high- and low-income families. *Children, Youth and Environments*, 32(3), 100-123.
<http://www.jstor.org/action/showPublication?journalCode=chilyoutenvi>

Abstract

This study examined how the COVID-19 affected the summer activities and environments of children from high- and low-income households. Results show that children from high-income households had access to more enriching activities both before and during the pandemic, even though COVID-19 restricted access to programming for all children. While all families struggled in many ways to make the most of the pandemic summer of 2020, there were silver linings that included more family time and less hectic schedules. The paper also identifies how work-from-home arrangements and virtual programming that arose during the pandemic could help bridge the opportunity gap moving forward.

Keywords: opportunity gap, summertime, children, COVID-19, recreation

The spring 2020 arrival of COVID-19 to the United States brought uncertainty and eventual change to the summers of children across the country. The COVID-19 pandemic forced school closures and canceled activities and modified programming through the summer and beyond (Van Lancker & Parolin, 2020). In the United States, there remains a considerable “opportunity gap” where kids from high-income households are twice as likely to participate in out-of-school-time activities than kids from low-income households (Outley & Floyd, 2002; Snellman et al., 2015). Experts anticipated the COVID-19 pandemic to widen social inequality, as low-income households have fewer resources to compensate for a loss of available programming for their children than high-income families (Van Lancker & Parolin, 2020).

Summertime has extraordinary potential to support positive youth development (Sepúlveda & Hutton, 2019). While school and school-related extracurricular activities dominate the rest of the year, summer provides freedom for children to explore new opportunities and interests through both structured and less-structured activities. Activities like summer camps, sports, arts and music, and family vacations can help children develop self-confidence, independence, and essential relationship skills necessary for success in school and life (Vandell et al., 2015). The pandemic affected kids from all income levels, but families with lower incomes were hit especially hard due to the cancelation of many free and low-cost summer programs (Ettekal & Agans, 2020). This study sought to investigate how the COVID-19 pandemic affected the summer activities and environments of children and families from across the United States and identify ways the pandemic differentially impacted families based on household income.

The Opportunity Gap, Summertime Experiences, and the COVID-19 Pandemic

Over the last two decades, scholars have identified a significant difference in access to and participation in out-of-school-time activities between young people from high- and low-income households (Putnam et al., 2012; Snellman et al., 2015). Young people from low-income households are much less likely to participate in extracurricular activities, from sports and arts to clubs and academic enrichment, than those from high-income households, with high-income children and youth sometimes participating at twice the rate (Snellman et al., 2015). The differences in access to high-quality out-of-school-time activities between kids from high- and low-income households extend into the summer months. As Sepúlveda & Hutton (2019, p. 3) observe,

when schools close for the summer, children, youth, and families may lose a number of vital supports, such as access to healthy meals, access to medical care, daily supervision, and structured enrichment opportunities. These losses make summer a time of increased vulnerability for many children and youth—especially those from communities and families with fewer resources. While children from higher- and middle-income families may not be affected by these losses, many families with fewer resources cannot fill this gap.

The COVID-19 pandemic had a compounding effect on access to developmental summer experiences, disproportionately impacting low-income families (Dunton et al., 2020; Ettekal & Agans, 2020).

Impacts of the Opportunity Gap

The term “opportunity gap” refers to how differential circumstances—such as race, ethnicity, socioeconomic status, English language proficiency, ZIP code, community wealth, and familial situations—affect, and often limit, one’s opportunities in life. A similar term, the achievement gap, focuses on outputs like differences in average test scores. Conversely, the opportunity gap is an inputs-focused framework that calls attention to the “deficiencies in the foundational components of societies, schools, and communities that produce significant differences in educational—and ultimately socioeconomic—outcomes” (Carter & Welner, 2013). Young people from low-income households have less access to developmentally enriching experiences because many out-of-school-time activities bear additional costs to families (Nagaoka et al., 2015). As higher-income families have more discretionary income for these experiences, the difference in spending between families of differing socioeconomic status contributes to the opportunity gap.

Research has further demonstrated that the opportunity gap persists during the summer months when more affluent children and youth engage in enrichment activities at higher rates than their lower-income peers (McCombs et al., 2017). A report from the National Academies of Sciences, Engineering and Medicine (Sepúlveda & Hutton, 2019) affirms that access to developmentally enriching summer experiences is often dependent on parents’ financial standing. The opportunity gap also highlights environmental stressors and systemic inequities that contribute to constrained access to other developmentally enriching activities like family vacations¹ away from home.

Importance of Summertime in Youth Development

Out-of-school-time activities taking place during the summer serve multiple purposes for young people, families, and communities (Cooper et al., 2000). These activities provide a rich context for development, affecting academic, health, social and emotional, and safety outcomes for children and youth (Sepúlveda & Hutton, 2019). Attention has recently shifted to the needs of children and youth outside of school and the traditional academic calendar and the importance of summer activities and environments² that may affect their health, well-being, educational attainment, and future college and career readiness (Alexander et al., 2016; Sepúlveda & Hutton, 2019).

¹ In this paper, *family vacation* refers to family time involving travel away from home.

² In this paper we use the terms “activities and environments” to encompass what children do during the summer and where these activities may occur. For example, summer camp is an environment with many activities and soccer is an activity that may take place in different environments or contexts.

Research has found that participation in structured out-of-school-time activities like day and overnight camps, sports, arts, and music activities contribute to positive youth development. Scholars have found connections between participation and improved social skills, independence, self-confidence, and self-efficacy, among others (e.g., Durlak et al., 2010; Henderson et al., 2007; Vandell et al., 2015). Another typical summer activity, family vacation, though less structured than organized out-of-school-time programming, is also linked to positive developmental outcomes. Family vacations away from home contribute to family bonding and communication (Jepson et al., 2019; Lehto et al., 2009). Pomfret and Varley (2019) reported positive health and personal development outcomes stemming from shared family vacation time. Summertime affords access to activities and environments that are both distinct and different from the school year for most young people, opportunities for experiential learning, and freedom of choice for both parents and children (Sepúlveda & Hutton, 2019). For children with access to quality summer activities and environments, summertime can provide opportunities for growth that can complement school-based learning.

The Impact of COVID-19 on Summertime Activities

Unfortunately, the COVID-19 pandemic reduced or eliminated access to many positive developmental summertime opportunities for children and youth during the summer of 2020, regardless of family income. Summer camps were closed, sports canceled or postponed, and leaders shut down neighborhood recreation opportunities to slow the spread of COVID-19 (Dunton et al., 2020; Ettekal & Agans, 2020). However, research highlights how the pandemic had compounding effects on families with lower incomes due to increased financial hardship and unemployment (Sharma et al., 2020), including further limiting access to community programs and other resources (Fortuna et al., 2020). Likely, the pre-pandemic pattern of high-income families having more resources than low-income families to fund more developmental opportunities for their children continued during the pandemic. However, there is only limited research on the impact of the COVID-19 pandemic on child activities, as much of the research has focused on physical activities (e.g., Dunton et al., 2020) and health outcomes of the pandemic (Millett et al., 2020; Sharma et al., 2020).

The Present Study

This study team aimed to identify the differential impacts of the COVID-19 pandemic on the summer activities and environments of children and families from different socioeconomic backgrounds in the U.S., specifically high- and low-income households. We sought to a) examine how the COVID-19 pandemic affected participation in summer activities like summer camp, sports, arts and music, and family vacation during the summer of 2020 by comparing time use to the summer of 2019 and b) identify participation differences between families with higher and lower incomes. In addition, we examined how the pandemic affected typical child and family activities that can occur in or near the home during the summer, from socializing with friends and playing outside to family time and screen time. We collected rich qualitative data to help explain the quantitative findings.

Methods

We employed an explanatory sequential design to address the study aims. An explanatory sequential design has two distinct phases that interact. The first phase collects quantitative data, which serves as the primary source of information to answer the main research questions. The second phase collects qualitative data to help explain findings from the quantitative data (Creswell & Plano Clark, 2011). For this study, an early analysis of quantitative data identified patterns of time use within and between families. Researchers then developed questions for the subsequent interviews to gather qualitative data. The analysis of the qualitative data was used to provide context and explain the quantitative results.

Participant Recruitment

This study collected survey data from 325 families across the U.S. who had sent their children to camp in the summer of 2018. This sample was originally recruited for a longitudinal study on the impacts of summer camps and other summer activities on child development, but as that study was profoundly impacted by COVID-19, it became appropriate for the present study. Parents were recruited and enrolled through camps accredited by the American Camp Association (ACA) during the spring of 2018. The purposive stratified sample aimed to represent a range of camp types, geographic diversity, racial and ethnic diversity, and a mix of income levels. Demographic information was provided by the ACA. At the start of the study in 2018, children were between the ages of 9 and 11 years. Children were associated with 48 different day and residential camps from all regions of the U.S. and included for-profit and non-profit camps, agency-affiliated (e.g., YMCA, Girl Scouts), religiously affiliated, single-gender, and co-ed camps.

Survey

Drawing from the population of parents who had sent their child to camp in the summer of 2018, the present study asked parents in the fall of 2019 and the fall of 2020 to complete retrospective weekly environment and activity reports (WEARs) to document their child's time use in the summers of 2019 and 2020. Researchers compared the children's 2020 WEAR with their 2019 WEAR to assess the impact of the COVID-19 pandemic on time spent in particular activities and environments. WEARs gathered information about how many weeks children spent most of their daytime hours in the following activities or environments: home, family vacation, day camp, overnight camp, sports, arts or music, and "other." The survey then asked parents to provide additional information about the child's activities when the child was at home. Questions asked parents if their child spent more or less time in various activities (e.g., spending time outside, playing sports, hanging out with family, watching TV, playing video games). Follow-up questions asked parents to evaluate whether spending more or less time in a given activity was positive or negative for their child.

Family Interviews

Following WEAR data collection periods, the research team conducted semi-structured interviews with parents and children who agreed to participate in this phase of the study. We conducted 16 interviews with members of low-income households and 34 interviews with members of high-income households. The

purpose of the interviews was to learn more about summer activities and family decision-making regarding summer choices, and to identify highlights and any salient challenges from the summer. Parent interview questions included, "how did you go about selecting activities for your child for this past summer?" and, for 2020, "how did COVID-19 affect your summer plans?" Child interview questions included, "what were some highlights from your summer?" and "how did COVID-19 affect your summer as compared to previous summers?"

Data Analysis

The authors analyzed quantitative data using descriptive statistics and a mixed 3x2 MANOVA where we examined differences between the three income groups across the summers of 2019 and 2020. To categorize families into high-, medium-, and low-income groups, we used a tool by the Pew Research Center that takes into account income, family size, and ZIP code (Bennett et al., 2018). For the qualitative data, the authors chose to focus on comparisons between high- and low-income households as differences between these two groups were more notable in the quantitative data. Also, much of the existing research on the opportunity gap has focused on the differences between high- and low-income households (e.g., McCombs et al., 2017; Snellman et al., 2015).

The researchers coded and analyzed the interviews using a systematic multi-step process that identified significant themes within the responses (Miles et al., 2014). First, four members of the research team open-coded the transcripts using In Vivo and descriptive codes. Next, the research team used more focused coding with constant comparison aided by research notes and memos. Focused coding allowed the team to collapse codes and identify themes across coders. We then worked to identify key themes, responses, and quotes that could help explain and contextualize the quantitative data within the explanatory sequential design. Finally, we identified representative interview responses and quotes to help explain the quantitative findings in the results section (Creswell & Plano Clark, 2011; Saldana, 2013). These analyses included all interviews with low- and high-income households from families that opted into the interview process after completing their surveys during the study period.

Results

Three hundred twenty-five parents completed two retrospective WEAR time diaries, one completed in fall 2019 and the second in fall 2020. Based on household income, family size, and ZIP code, 50 households were categorized as low income, 141 were middle income, and 134 were high income. Median annual income was \$40,000-\$49,999 for low-income households, \$100,00-\$149,999 for middle-income households, and over \$250,000 for high-income households. Among participating parents, 80.9% identified as White, 6.8% as Black or African-American, 4.3% as multi-racial, 4% as Latinx, 2.5% as Asian, 0.3% as Native Hawaiian or Pacific Islander, and 0.3% as other. However, the low-income group was 58% White and 28% Black or African-American compared to 90.3% and 0.7%, respectively, for the high-income group. Parents in the low-income group were less likely to have a four-year degree or higher (36%) than middle- (82%) and high-income parents (97%) and more likely to be single parents (60%) as compared to middle- and high-

income parents (15.6%, 3%). Additionally, parents in low-income households were more likely to be laid-off or furloughed during the pandemic (20%) than parents of middle (12.1%) and high-income households (4.5%). Households with low income were also less likely to have at least one parent able to work from home during the pandemic (28%) as compared to households in the middle-income (59.9%) and high-income groups (60.1%).

Time Use Data: Weekly Environments and Activities Reports

Data from the weekly environments and activities reports (WEARs) for the summer of 2019 (pre-pandemic) reveals significant differences in time use across income groups. Our initial 3x2 MANOVA indicated a significant interaction effect (*Pillai's Trace* = .144, $F_{(16,632)} = 3.1$, $p < .001$, *partial* $\eta^2 = .07$) as well as significant main effects for income level (*Pillai's Trace* = .141, $F_{(16,632)} = 3.0$, $p < .001$, *partial* $\eta^2 = .07$) and time (*Pillai's Trace* = .557, $F_{(8,315)} = 49.4$, $p < .001$, *partial* $\eta^2 = .56$). We followed up these significant effects using Bonferroni corrected 2x3 ANOVAs and post hoc tests.

While the time effect indicated the largest effect size, we first examined the interaction effects to see how income level moderated the effects of time during the study period, which includes non-COVID (2019) and COVID (2020) summers. Using Bonferroni corrections for multiple comparisons, only the ANOVA's examining weeks spent at overnight camp ($F_{(2,322)} = 8.4$, $p < .001$, *partial* $\eta^2 = .05$) and home ($F_{(2,322)} = 9.7$, $p < .001$, *partial* $\eta^2 = .06$) were significant. Post hoc comparisons indicated that high-income families used overnight camp for more weeks than low- or middle-income families in 2019, but these differences in overnight camp attendance did not differ significantly by income group in 2020.

As expected, due to the COVID-19 pandemic, regardless of income, children were home for more weeks in 2020 than in 2019. ANOVAs examining time effects, showed that declines in day camp attendance ($F_{(1,322)} = 91.2$, $p < .001$, *partial* $\eta^2 = .22$) and family vacation ($F_{(1,322)} = 11.2$, $p < .001$, *partial* $\eta^2 = .03$) regardless of family income. Weeks spent at overnight camp ($F_{(1,322)} = 137$, $p < .001$, *partial* $\eta^2 = .30$) significantly decreased between 2019 and 2020 and weeks spend at home ($F_{(1,322)} = 166$, $p < .001$, *partial* $\eta^2 = .34$) significantly increased; however income somewhat moderated these effects, as indicated by the significant interaction terms.

Testing the main effect of income group alone, only weeks of family vacation varied significantly by income group ($F_{(2,322)} = 5.6$, $p = .004$, *partial* $\eta^2 = .03$), with higher-income families reporting more weeks of family vacation across both times compared to middle- and low-income families. While weeks spent at overnight camp and home also varied as main effects of income group, given the significant interaction terms (time and income) and modest, small effect sizes of income group alone (*partial* $\eta^2 < .04$), these effects are best interpreted as interactions rather than main effects. See Table 1 for a comparison of means by activity/setting.

Table 1. Average weeks in activity/setting for summer 2019 and summer 2020 by income group

<i>Activity</i>	Summer 2019			Summer 2020		
	Low-Income (n=50)	Middle-Income (n=141)	High-Income (n=134)	Low-Income (n=50)	Middle-Income (n=141)	High-Income (n=134)
School	1.13	1.16	1.43	1.38	0.61	0.77
Family Vacation ²	1.19	1.54	1.97 ³	0.87	1.17	1.36 ³
Day Camp ²	1.94	2.56	2.67	0.60	0.53	0.31
Overnight Camp ²	1.29	1.58	2.44 ¹	0.41	0.23	0.37
Sports	0.21	0.80	0.91	0.44	1.18	1.07
Arts or Music	0.28	0.16	0.21	0.22	0.44	0.27
Home ²	6.20	4.73	2.97 ¹	8.34	8.57	8.43
Childcare	0.12	0.24	0.14	0.72	0.24	0.21
Other	0.64	0.23	0.25	0.02	0.04	0.22
<i>Total Weeks</i>	<i>13.00</i>	<i>13.00</i>	<i>13.00</i>	<i>13.00</i>	<i>13.00</i>	<i>13.00</i>
<i>Weeks at Camp, Family Vacation, Sports, Arts, Music</i>	<i>4.91</i>	<i>6.64</i>	<i>8.20</i>	<i>2.54</i>	<i>3.54</i>	<i>3.37</i>

Notes: 1) High-income families report that their child spent more weeks at overnight camp and less time at home in 2019 than middle- and low-income families. These differences diminished in 2020. 2) Between the 2019 and 2020 summers, all families reported fewer weeks of family vacation, day camp, and overnight camp, and more weeks at home. 3) High-income families reported more weeks of summer vacation than low-income families during both summers. Summer weeks were reported based on a 13-week summer between June 1 and August 31.

Insights from Family Interviews on Summer Activities and Environments

We followed up with families using semi-structured interviews to better understand our quantitative findings. One parent from the low-income group aptly summarized the unprecedented situation brought on by the pandemic, explaining that “it was a summer full of planning and rearranging finances and figuring out what was going to happen and... what was open and what wasn’t open and how to pull things off when the world was shutting down.”

Replacing Summer Activities Lost during the Summer of 2020

Parents across income groups discussed their disappointment at the loss of so many summer opportunities for their child and the need to replace many activities from 2019. For some, this meant taking day trips to local sites or visiting family. One parent from the low-income group in upstate New York explained, “my parents live about two miles down the road, so we did get to spend a lot of time on the lake [where they live].” Similarly, a low-income parent from Philadelphia talked about replacing trips to the park and the beach with cook-outs with nearby extended family. In some cases, visiting family and taking trips looked much different when comparing income groups. Several high-income families talked about taking extended road trips across the country to visit family or experience novelty. One high-income family from Chicago spent several weeks in a Colorado ski town where they enjoyed outdoor family recreation while the parents were able to work remotely.

High-income parents were also more likely to have their children participate in traveling club sports—teams that come with considerable participation fees. Several families from the Chicago metro area described how their child's club soccer, baseball, or softball could practice locally and then compete in Indiana, where there were fewer COVID-19 restrictions for youth sports. Conversely, many low-cost youth leagues run by city parks and recreation departments shut down, leaving many families with limited resources without options for their kids.

Other high-income families reported participation in soccer and baseball camps, horse riding lessons, and socially distanced dance classes. One parent expressed gratitude for other parents in the community who decided to run informal tennis or golf camps to "provide some type of physical and social activities for the kids, which really helped out a lot." However, these stories of in-person opportunities were rare in interviews with families in both high- and low-income groups.

Some children could still attend in-person summer camps, though this was rare among all income groups. Even if summer camps were open, however, some parents made the difficult decision to not send their child. One high-income father living in Texas explained that he had the option to send his 12-year-old daughter to her regular overnight camp, but chose not to send her. He felt that camp was not worth the additional expense because the children would not fully enjoy their time at camp due to onerous COVID-19 restrictions that required masks and limited social interaction.

Adapting to Virtual Activities

It was more common for children to participate in virtual activities during the summer of 2020 if they participated in any activities at all. Sports teams offered virtual practices focusing on skills and conditioning using Zoom meetings. A girl from a high-income household in Illinois who played soccer talked about doing drills in her backyard alone but accompanied by her coaches and teammates by video on her phone. Another young woman from a high-income household in San Francisco talked about attending rehearsals for a play using Zoom before coming together at the end of the summer for an outside performance. She also spoke of taking several improvisation workshops online that she might not have been able to do in person due to the travel time to and from the activity. Football players from both high- and low-income households talked about how they had virtual training during the summer before convening in the fall for in-person practices in states and municipalities that allowed it.

Several families talked about finding virtual summer camps for their children to replace canceled summer camps. For example, a high-income parent explained how she enrolled her daughter in five different virtual camps as she "tried to fill in some time so [her daughter] wouldn't get bored." Yet, virtual programming fell flat for some parents and their kids. A low-income parent lamented that the virtual classes available for her child still cost as much as in-person programming, which was not worth it to her. A high-income parent explained how she decided her daughter's

virtual guitar lessons were not of the same quality as an in-person lesson and decided to cancel them.

Parental Work Arrangements

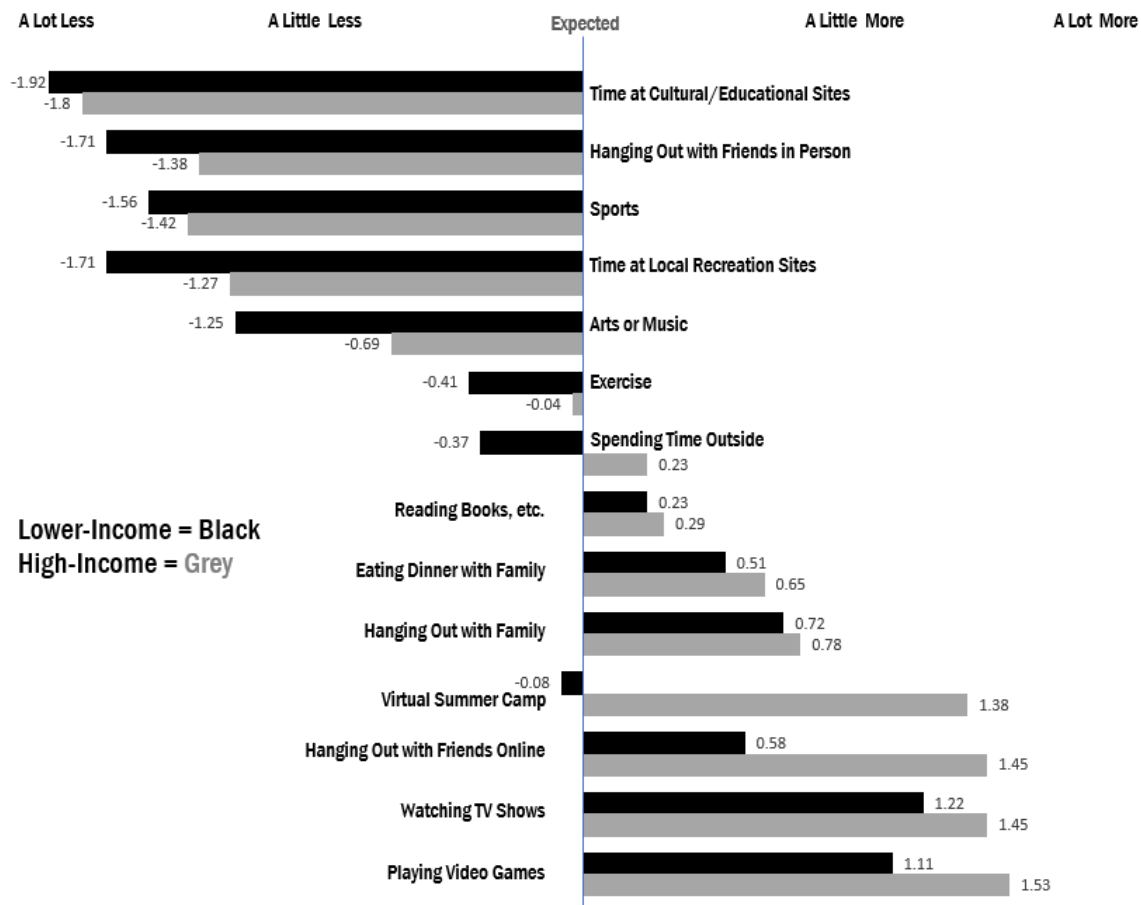
While financial resources contributed to differences in where children spent their time during the summer of 2020, so did parents' work situations. High-income parents were more likely to hold jobs that allowed them to work remotely. In contrast, parents from low-income households were much more likely to be "essential workers," working in health care professions or in service-industry jobs that would not allow for remote work. Differences between parents who worked at home and those that could not helped determine if families were financially stressed and if kids from these families could participate in activities like family vacation and sports. For example, one high-income parent explained that "a work schedule where I could work from anywhere just really made it a lot easier to spend time with my family [in another state], which was great." Few parents from low-income households reported opportunities to work remotely, which afforded fewer travel opportunities.

Changes to Normal Summer Activities at Home

Parents also reported how activities that generally occur at or near home changed during the summer of 2020 due to the cancellation of organized activities outside the home. Parents from all income groups said their child spent less time in normal activities like visiting cultural and educational sites, hanging out with friends in person, playing sports, spending time at local recreation facilities, and participating in arts and music activities.

Rather, parents reported that their children spent more time playing video games, watching shows on TV or online, and hanging out with friends online. Most families also spent more time hanging out with family and eating dinner with family. There were a few differences between high- and low-income groups, with high-income families reporting that their child spent a little more time in virtual summer camp and spent more time outside. In comparison, low-income families spent less time than families expected in these activities. Figure 1 presents the actual time versus anticipated time for each activity by family income group, emphasizing differences between high- and low-income households.

Figure 1. Actual time in activities vs. families' expected time in activities during the summer of 2020 by income group



Note: -2 = a lot less time than expected, -1 = a little less time than expected, 0 = about the amount of time expected, 1 = a little more time than expected, and 2 = a lot more time than expected.

Considerable Unstructured Time for Children

Interviews gave us additional insight into how children spent their time during the summer of 2020. A mom from the high-income group reported that she could not schedule any out-of-home activities for her children's days because she and her husband were so busy working from home. This mom explained she "left it up to [the kids] to decide what they wanted to do, whether it was video games, sleeping in, or time with the dog." The child, when asked to describe his summer, replied,

My summer was twelve hours of the day on the iPad and 3 hours on Xbox. Ninety-five percent of my iPad battery was spent on YouTube and Disney plus. I pretty much watched YouTube and streamed stuff and only played FIFA on my Xbox. Normally, I would spend much less time on video games, more time in the park, and a month at sleep-away camp.

Considerable downtime at home was typical for families from both high- and low-income groups. The father from the high-income household in Texas quoted above

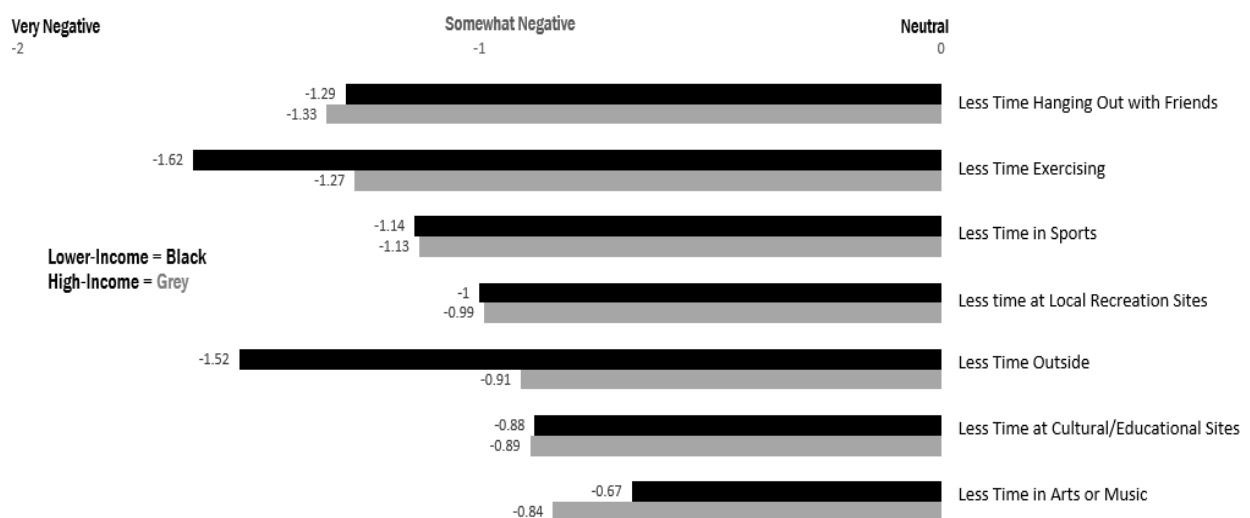
talked about how his kids did “absolutely nothing” during the summer of 2020, explaining that the family was extra-cautious during the pandemic. Parents in low-income households reported that having to work in person limited what their kids could do, particularly with local COVID-19-related restrictions and no organized programming in the neighborhood.

Several high-income families living in suburban areas described their strategies for letting their children continue to play with friends. Sometimes, families would create a “pod” with another family that had kids the same age. In most cases, children were limited to play with one or two other children in the neighborhood. These children often spent time playing outside, riding bikes, hiking on nearby trails, and hanging out in the backyard. Another parent explained, “We wanted the kids to be outside and active. A lot of walking and bike riding, no buses. Hike to [the] reservoir and play. We had a pretty good summer.” The child of this parent, describing his summer experience, explained, “I played outside with my brother. We came up with new games. We played card games.” There were fewer stories about low-income families creating contained social groups with other families and kids, with many low-income households limiting contact to just family members. However, children from across income groups reported working on projects at home, getting a first pet, or spending time training and playing with an existing pet to fill the unstructured time.

Parent Perceptions of Child Time Use during Summer 2020

Parents reported that spending less time in normal activities was generally negative for their child. Having their child spend less time with friends in person and less exercising were reported as having the greatest negative impact. Figure 2 presents how having their child spend less time in normal activities was viewed by parents.

Figure 2. Parent perceptions of their child spending less time in everyday activities during the summer of 2020



"How Do We Keep the Kids Happy?"

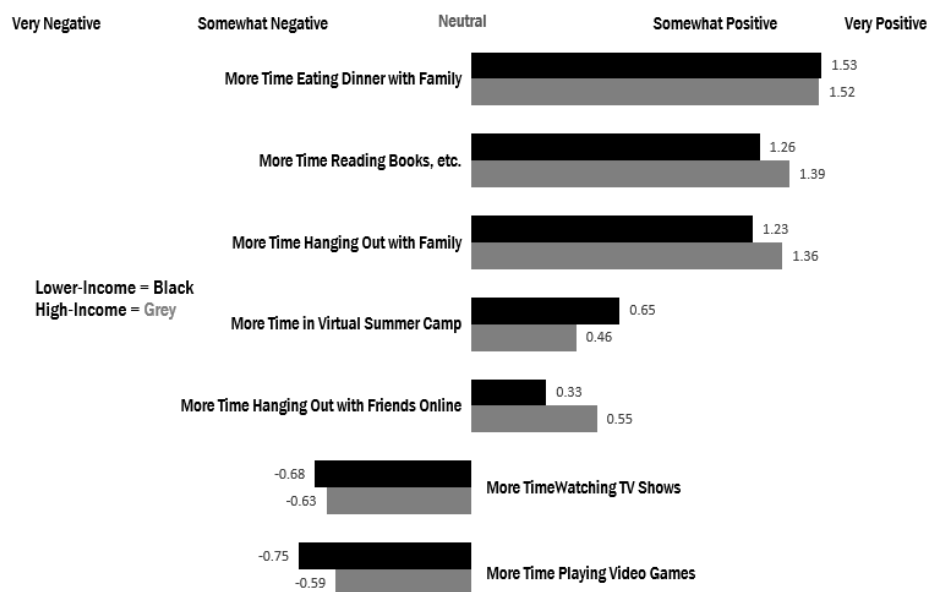
Parents and children who participated in the interviews tended to express disappointment at being restricted from spending time with friends and participating in everyday activities. One parent from a high-income household explained, "I think the biggest challenge for us was how do we keep the kids happy this summer and occupied when the two of us still have to work?" Another parent from a high-income household lamented, "there was no joy at all and if there's no joy, and there's nothing on the horizon and nothing to look forward to, it's just a real grind." One low-income parent described how depressed her daughter became over the summer from being kept away from friends and social activities. This sense of isolation was common among many children in the study across all income groups. As one high-income parent explained,

there's just such a lack of novelty in our lives these days because you can't really go out and do things that you would normally have done, and [our daughter] can't really be independent the way I would expect a 7th grader to be, you know? I think those are things that lead to growth, and so that's too bad.

Looking for Silver Linings during the Pandemic

When reflecting on activities in which their child spent more time than expected during the summer of 2020, parents reported that more time eating dinner with family, hanging out with family, reading, participating in virtual summer camp, and hanging out with friends online were generally positive. Conversely, parents rated more time watching TV shows and playing video games as somewhat negative. Figure 3 compares parental evaluations of their children spending more time in particular activities during the summer of 2020.

Figure 3. Parent perceptions of their child spending more time in everyday activities during the summer of 2020



Across income groups, parents we interviewed expressed joy at spending more time with family. For example, a parent from the high-income group shared the following sentiment:

[We spent] lots of home time together with the four of us, which ended up being really nice. Like no plans on that Friday, Saturday, and Sunday. It really just forced us to spend time together, which is probably better for me and my husband than it was for the kids. I really enjoyed it. Lots of time in the backyard. Like that's the most time we've ever spent in the backyard and the pool and the couch outside. We got a ping pong table which my husband and [my son] really love playing together. The best part of the summer was dinners together every night.

Similarly, another high-income parent explained, "This was the first summer where I actually got to spend time with the boys. This was the first summer that my boys actually got to do what they wanted to do. It was just lovely." That parent's child shared that "it was really nice just to be at home." Several children we spoke with talked about how nice it was to hang out at home and not have their days filled with activities. Some even expressed they were happy that their summer camps were canceled.

While most parents expressed disappointment at the amount of time their children spent watching television and playing video games, some acknowledged screen time was a necessary distraction for their children. And in some cases, time playing video and computer games turned out to be very positive. For example, one child met a new friend during a virtual camp and spent the rest of summer playing computer games long-distance with the friend until they could finally meet in person at the end of summer. Children from both high- and low-income households said that online video chats, social media, and playing multi-player video games online helped them stay connected with their friends. One child from a low-income household explained how having an iPad allowed her to pursue her newfound passion for digital art. Other parents and children across income groups mentioned how they looked forward to weekly movie nights as a way to combat the monotony of quarantine. Unsurprisingly, several children were pleased with the opportunity to spend more time with their video games and other technologies.

Identifying "silver linings" resulting from the pandemic was an important approach for parents from both high- and low-income groups trying to make the best of the time available during the summer of 2020. For example, one low-income parent explained, "we tried to make the best of anything we did—going for walks, playing games—any little thing we did we just tried to enjoy it." And a high-income parent expressed, "a lot of time together was really fun for us... We were really lucky. God was good to us during the pandemic." Similarly, another high-income parent explained, "the year has shown us how privileged we are," even though this family missed seeing family and had to cancel a trip to Europe.

Several parents expressed how nice it was to simplify their lives and not have to worry about scheduling and shuttling their kids to and from multiple activities,

lessons, and friends' homes. Reduced travel to and from activities opened up time for both children and parents.

Seeking Normalcy during the Pandemic

In addition to looking for "silver linings" during the pandemic, a few parents across income groups made efforts to create as much normalcy as possible for their families. As one low-income parent described,

It was really important for me to maintain some of the normal childhood [things] during this experience. I didn't want this to be a time that they looked back on and remembered being sad or depressed or stuck in the house. So I was seeking out any type of... normal activities that we could.

Some households were better situated to provide typical summer experiences for their families. For example, one high-income parent explained that even though her child's activities were canceled, she found ways to fill their summer with alternatives. These alternatives included soccer camps, a personal trainer, and art classes, even though they had to leave the city to find some of these opportunities. Another high-income parent described the process of figuring out which activities were safe enough for her child and ended up signing him up for horse riding lessons. A parent from a different high-income family talked about her desire to keep putting activities on the calendar "so [her children] would have something to look forward to." Many families in the study could still plan short vacations and take day trips or visit extended family—outings that made summer seem a bit more normal. A mom from a low-income household arranged a short trip with two other families, staying at a rental house in another state. She explained that she was "really seeking out any type of normal activities we could do."

When Normalcy Was Hard to Find, Endure

Unfortunately, some parents felt getting through the summer was a matter of enduring. For example, when asked what they did to create a high-quality summer for their child, one parent from the high-income group expressed a sense of defeat. "I would say survival is the better word than trying to imagine that we could have created a very high-quality summer," she lamented. A low-income parent explained it was more important for her family to stay healthy than to try to plan a summer, so they quarantined through the summer. She explained, "there's been kind of a like a PTSD sort of thing that's happened. So we are more comfortable being homebound right now." A different high-income parent, although positive, described her strategy to make do and get through the summer: "We all knew this was the best we could do... When you work from home, video games it is. We're doing the best we can. And this summer, it was like, 'well, this is it.'"

Discussion

The purpose of this study was to identify the differential impacts of the COVID-19 pandemic on the summer activities and environments of children from high- and low-income households. We were particularly interested in learning how the cancellation of summer programs and the need for COVID-19 precautions changed how children spent their time during the summer of 2020 compared to the pre-

pandemic summer of 2019. Data from 2019 revealed a clear opportunity gap between children from high- and low-income households, with high-income children spending over three weeks more than their lower-income peers in developmental activities and environments like summer camp, family vacation, sports, arts, and music. The COVID-19 pandemic limited options for all children in 2020, with children from high- and low-income groups spending more than eight weeks at home during a 13-week summer; yet, children from high-income households were still able to spend significantly more time on family vacations and playing sports. However, what may be most interesting was how families from both high- and low-income groups navigated the challenges posed by the pandemic and what this may mean for families and summer youth programs when summer activities return to normal. In particular, the pandemic revealed the importance of access to resources beyond financial resources, including job flexibility for parents, access to technology for young people, access to family and social networks, and access to neighborhood and community resources.

The Importance of Resources to Child Participation in Summer Activities

A straightforward interpretation of the findings reveals that families with more financial resources could have their children involved in more developmentally enriching activities during the summer than families with lower incomes, both before the pandemic and during the pandemic when summertime options were more limited. This opportunity gap among families in this study may not be surprising due to the considerable amount of literature that links household income to child and youth participation in out-of-school-time activities (e.g., McCombs et al., 2017; Nagaoka et al., 2015; Outley & Floyd, 2002; Putnam et al., 2012; Snellman et al., 2015). While money matters to child participation in activities, access to other resources matters as well.

Job Flexibility for Parents

Interviews with families in this study showed that how and where parents worked during the pandemic influenced children's summers. Parents with jobs that allowed them to work from home often had more flexibility with their work schedules allowing for more family time and opportunities to work while also taking children on a family vacation. Parents from high-income households were more likely to be able to work from home. These income-differentiated patterns of adults working from home parallel other national findings on work during the pandemic (Parker et al., 2020). Yet, it is important to note that parents from low-income households able to work from home saw some of the same benefits as their high-income peers, like spending more time with their children and making time for activities outside the home.

In the post-pandemic United States, workers will increasingly have the option to work from home, at least for some of the workweek (Lund et al., 2021). Scholars have noted that for some industries, having employees work from home did not affect productivity negatively and that there are many benefits to having a remote workforce (Gaskell, 2020). These benefits included reduced commute times and lower overhead costs related to maintaining a shared workspace. This study revealed that there are clear advantages to working from home for families and

children. The main benefit is time—time to be with family, time to take children to out-of-school-time activities, and time flexible enough to mix work with vacation. Unfortunately, many parents from low-income households work in industries like manufacturing, retail, construction, hospitality, and health care where working from home is not an option (Lund et al., 2021). This fact underscores the many challenges that face families with low incomes, even in non-pandemic times. Not only do these families make less money, but they also have less job flexibility resulting in less time for their children, particularly during the summer when school is out of session. Without the “luxury” of time, many parents from low-income households are unable to have their kids involved in certain activities, especially those like highly competitive sports that require shuttling kids to and from multiple practices and games, and vacations that require taking time off work.

Indeed, many parents who worked from home during the pandemic struggled to provide a summer filled with developmental opportunities for their children. The demands of work paired with the cancelation of most organized out-of-school-time programs limited options for all families. However, as the pandemic recedes, it will be crucial to follow how work-from-home opportunities may disproportionately benefit families with high incomes, potentially widening the already substantial opportunity gap.

Access to Technology for Children

Children from all household income groups spent more time with technology during the pandemic. While parents noted that more screen time watching shows or playing video games was mostly negative, there were some positive outcomes related to having access to technology. Social media, video calls, texting, and socializing while playing video games provided opportunities for young people to connect with friends. Some out-of-school-time activities, from summer camps and sports to theater and other arts and science opportunities, moved online, taking advantage of interactive video technology. Time in these virtual environments cannot capture all the advantages of hosting activities in person, but some benefits may carry over into a post-pandemic world.

For example, in this study, many parents and children mentioned that less travel time to and from activities was a silver lining of the pandemic. Parents talked about the stress of transporting their children to and from activities during a regular year. Virtual activities eliminated the need for travel while also giving children the chance to interact with their peers and stay engaged in activities that they found meaningful. For example, kids involved in theater groups could rehearse using video calls, and those in sports could work on physical conditioning and skills remotely. When it was safe to convene in person, programs could build on what occurred in the virtual environment. Out-of-school-time programs may want to consider continuing or creating hybrid models that could reduce barriers to child participation. Travel to and from activities is a significant constraint for parents, especially in households with lower incomes (Lee et al., 2001; Stodolska et al., 2011). As a result, parents often choose to keep their children out of certain activities requiring extensive transportation. However, if some activities move online, transportation to fewer in-person meetings might be more manageable. For

example, a theater group could hold some auditions and rehearsals remotely and then meet every other week in person. Such an arrangement could mean the difference between participation and non-participation for children with parents unable to arrange transportation to and from activities multiple times per week. Of course, this can only help address the opportunity gap if all children have access to the technology needed to participate in virtual activities.

Family and Social Connections

Families and social connections were also critical resources to parents and children who navigated a summer during the pandemic. There is extensive research on the importance of these connections for adults' quality of life and children's positive development (Levula, 2016; Smith et al., 2016). Extended family members provided vital support for many families during the pandemic, affording needed social interactions when connecting with non-family members was not possible. Social connections played a similar role for some families as parents and kids could create a "pod" with a limited group of others. Such arrangements provided much-needed social interaction while also limiting exposure risk to COVID-19. Our interview data showed a range of interactions between families in the study and their extended families and non-family social networks. Family and social connections afford opportunities for socialization, recreation, and play in normal times (Graber et al., 2020), and the pandemic only underscored the value of these networks.

It is unclear how the use of family and social networks during the pandemic will influence access to summertime opportunities for young people in the future. However, it might be possible for practitioners of youth programming to help parents be more creative in providing positive experiences for kids when they are not in formal programming during the summer. For example, summer camps and local youth organizations could share resources and activities with families so that a collective of parents could facilitate fun and developmentally appropriate activities for kids in the neighborhood. These neighborhood activities could help build a sense of community that may have emerged in "pods" of kids and families during the pandemic. Such collaboration between youth organizations and communities, neighborhoods, and families is often noted as essential for supporting lasting developmental outcomes for children and youth (e.g., Eccles & Gootman, 2002).

The Impact of Where Families Live on Summertime Opportunities

Finally, the pandemic brought attention to the impact of where families live on available summertime opportunities. In the summer of 2020, access to camps, sports, arts, and music near home often depended on where families lived. Some states and municipalities were more restrictive on youth activities than others. In this study, there was also a clear difference in access to outdoor recreation opportunities between families living in urban areas and those living in suburban and more rural areas, favoring families in wealthier, non-urban communities in this study. In youth development literature, access to community resources like parks, playgrounds, pools, and recreation centers plays an essential role in supporting healthy child socialization and overall development (Crozier Kegler et al., 2005; Smith et al., 2016). The pandemic once again brought attention to disparities

between neighborhoods, with high-income communities having considerably more resources, natural or otherwise, than low-income areas. Moving forward, policy-makers and city planners will need to continue to push for more equitable access to recreational and community resources for communities where families have limited incomes.

Addressing the Opportunity Gap: Future Research and Study Limitations

Thus far, the discussion has sought to paint a nuanced picture of how access to resources affects access to summertime developmental opportunities for children. Job flexibility for parents, access to technology, family and social connections, and community resources all contribute to whether or not young people can participate in particular activities. Ideally, access to these resources would be available for all families, regardless of income. Unfortunately, higher-income families often have more and better access to these resources. While we have tried to offer some insights for researchers and practitioners of summertime youth programming, bridging the opportunity gap between young people from high- and low-income households will remain a challenge.

Future research should examine the lasting impact of the COVID-19 pandemic on access to opportunities for children from different income groups. It is not yet clear whether high- and low-income households will rebound from the pandemic at a similar rate. It may take longer for children from low-income households to have access to opportunities that were available before COVID-19 spread worldwide. Additional research can also help provide a fuller picture of the impact of access to resources on the opportunity gap than could be provided in this research.

This study had several limitations. First, this study used a purposive stratified sample of parents that had previously sent their kids to summer camp, which required parents to opt into the study. This sample is likely not representative of all families in the United States. Second, the study gathered WEARs time-use data at the end of the summers of 2019 and 2020. This process was necessary to minimize the burden on family responses. However, the survey did not collect detailed information about how children spent their days, and such retrospective designs can be susceptible to non-response and recall bias. Future studies may want to collect data daily or weekly instead of at the end of the summer to gather more timely data about child activities. Third, although efforts were made to ensure the integrity and trustworthiness of qualitative data analysis, interpretations of interview data from parents and children were subject to the research team's perspectives and biases.

Conclusion

The summer of 2020 will remain indelibly etched into the minds of parents and children across the United States. The COVID-19 pandemic changed everyday life. Some families saw the worst of the pandemic through illness or the loss of family and friends from the virus. Other families saw parents lose employment or income. However, for many children, the impacts of the pandemic were less direct, as governments, communities, and their families eliminated traditional summertime opportunities. These children played more video games, consumed increased

amounts of digital media, and were less able to participate in activities outside their home environments. They also spent more time with their families and turned to technology for socializing with their friends and peers.

As parents struggled to navigate this pandemic summer, many came to realize the limits of their resources. Income and financial resources helped families adjust, especially for high-income households, but so did access to extended family, proximity to outdoor environments, access to technology, and the ability to work from home. While in some ways COVID-19 expanded the opportunity gap between young people from high- and low-income households, in other ways it brought attention to these other resources that contribute to whether a child has access to developmental activities during the summer. It is impossible to predict where the United States will head as the pandemic recedes. It is very likely that children from high-income households will once again have access to more out-of-school-time activities than their low-income peers. However, there remains an opportunity to bridge the opportunity gap through innovative thinking as leaders and policy makers consider how to leverage lessons from the pandemic and ameliorate disparities among children and families.

Dan Richmond is a post-doctoral research associate in the Department of Parks, Recreation, and Tourism at the University of Utah. His research interests include youth development, out-of-school-time, opportunity gaps, outdoor recreation, and college pathway programs.

Rachel McGovern is a Ph.D. student in the Department of Parks, Recreation, and Tourism at the University of Utah. Her research interests include families and leisure, youth development, and qualitative research.

Taylor Wycoff completed her master's degree in Parks, Recreation, and Tourism at the University of Utah. Her research interests include youth development, leisure constraints, out-of-school time, and social justice.

Michael Froehly is a Ph.D. student in the Department of Parks, Recreation, and Tourism at the University of Utah. His research interests include youth development, staff development, out-of-school-time, and social justice.

Meagan Ricks is a Ph.D. student in the Department of Parks, Recreation, and Tourism at the University of Utah. Her research interests include LGBTQ youth, youth development, qualitative research, out-of-school-time, and social justice.

Jim Sibthorp is a professor in the Department of Parks, Recreation, and Tourism at the University of Utah. His research interests include youth development, summer camps, and outdoor adventure education.

References

- Alexander, K., Pitcock, S., & Boulay, M. C. (2016). *The summer slide: What we know and can do about summer learning loss*. Teachers College Press.
- Bennett, J., Fry, R., & Kochhar, R. (2018). Are you in the American middle class? Pew Research Center. <https://www.pewresearch.org/fact-tank/2018/09/06/are-you-in-the-american-middle-class/>
- Carter, P. L., & Welner, K. G. (2013). *Closing the opportunity gap: What America must do to give every child an even chance*. Oxford University Press.
- Cooper, H., Charlton, K., Valentine, J. C., Muhlenbruck, L., & Borman, G. D. (2000). Making the most of summer school: A meta-analytic and narrative review. *Monographs of the Society for Research in Child Development*, 65(1), 1–127.
- Creswell, J. W., & Plano Clark, V. L. (2011). Choosing a mixed methods design. In C. J. W. & V. L. Plano-Clark (Eds.), *Designing and conducting mixed methods research* (2nd ed., pp. 53–106). Sage Publications.
- Crozier Kegler, M., Oman, R. F., Vesely, S. K., Mcleroy, K. R., Aspy, C. B., Rodine, S., & Marshall, L. (2005). Relationships among youth assets and neighborhood and community resources. *Health Education & Behavior*, 32(3), 380–397. <https://doi.org/10.1177/1090198104272334>
- Dunton, G. F., Do, B., & Wang, S. D. (2020). Early effects of the COVID-19 pandemic on physical activity and sedentary behavior in children living in the U.S. *BMC Public Health* 20(1), 1–13. doi: 10.1186/s12889-020-09429-3.
- Durlak, J. A., Weissberg, R. P., & Pachan, M. (2010). A meta-analysis of after-school programs that seek to promote personal and social skills in children and adolescents. *American Journal of Community Psychology*, 45, 294–309. <https://doi.org/10.1007/s10464-010-9300-6>
- Eccles, J., & Gootman, J. A. (Eds.) (2002). *Community programs to promote youth development*. <https://doi.org/10.17226/10022>
- Ettekal, A. V., & Agans, J. P. (2020). Positive youth development through leisure: Confronting the COVID-19 pandemic. *Journal of Youth Development*, 15(2), 1–20. <https://doi.org/10.5195/jyd.2020.962>
- Fortuna, L. R., Tolou-Shams, M., Robles-Ramamurthy, B., & Porche, M. V. (2020). Inequity and the disproportionate impact of COVID-19 on communities of color in the United States: The need for a trauma-informed social justice response. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(5), 443–445.
- Gaskell, A. (2020, December). Productivity in the times of Covid. *Forbes*. <https://www.forbes.com/sites/adigaskell/2020/12/08/productivity-in-times-of->

[covid/?sh=42e452551fa1](#)

- Graber, K. M., Byrne, E. M., Goodacre, E. J., Kirby, N., Kulkarni, K., O'Farrelly, C., & Ramchandani, P. G. (2020). A rapid review of the impact of quarantine and restricted environments on children's play and the role of play in children's health. *Child: Care, Health and Development*, 47, 143–153.
- Henderson, K. A., Whitaker, L. S., Scanlin, M. M., & Thurber, C. (2007). Summer camp experiences: Parental perceptions of youth development outcomes. *Journal of Family Issues*, 28(8), 987–1007.
<https://doi.org/10.1177/0192513X07301428>
- Jepson, A., Stadler, R., & Spencer, N. (2019). Making positive family memories together and improving quality-of-life through thick sociality and bonding at local community festivals and events. *Tourism Management*, 75(May), 34–50.
<https://doi.org/10.1016/j.tourman.2019.05.001>
- Lee, J., Scott, D., & Floyd, M. F. (2001). Structural inequalities in outdoor recreation participation: A multiple hierarchy stratification perspective. *Journal of Leisure Research*, 33(4), 427–449.
<https://doi.org/10.1080/00222216.2001.11949953>
- Lehto, X. Y., Choi, S., Lin, Y.-C., & Macdermid, S. M. (2009). Vacation and family functioning. *Annals of Tourism Research*, 36(3), 459–479.
<https://doi.org/10.1016/j.annals.2009.04.003>
- Levula, A. (2016). The association between social network factors and mental health at different life stages. *Quality of Life Research*, 25, 1725–1733.
<https://doi.org/10.1007/s11136-015-1200-7>
- Lund, S., Madgavkar, A., Manyika, J., Smit, S., Ellingrud, K., Meany, M., & Robinson, O. (2021). *The future of work after COVID-19*.
<https://www.mckinsey.com/featured-insights/future-of-work/the-future-of-work-after-covid-19>
- Mccombs, J. S., Whitaker, A. A., & Yoo, P. Y. (2017). *The value of out-of-school-time programs*. <https://www.rand.org/pubs/perspectives/PE267.html>
- Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). Sage Publications.
- Millett, G. A., Jones, A. T., Benkeser, D., Baral, S., Mercer, L., Beyrer, C., Honermann, B., Lankiewicz, E., Mena, L., Crowley, J. S., Sherwood, J., & Sullivan, P. S. (2020). Assessing differential impacts of COVID-19 on black communities. *Annals of Epidemiology*, 47, 37–44.
<https://doi.org/10.1016/j.annepidem.2020.05.003>

- Nagaoka, J., Farrington, C. A., Ehrlich, S. B., & Heath, R. D. (2015). *Foundations for young adult success: A development framework*. <https://consortium.uchicago.edu/sites/default/files/publications/WallaceReport.pdf>
- Outley, C. W., & Floyd, M. F. (2002). The home they live in: Inner city children's views on the influence of parenting strategies on their leisure behavior. *Leisure Sciences*, 24(2), 161–179. <https://doi.org/10.1080/01490400252900130>
- Parker, K., Menasce Horowitz, J., & Minkin, R. (2020). *How the coronavirus outbreak has—and hasn't—changed the way Americans work*. <https://www.pewresearch.org/social-trends/2020/12/09/how-the-coronavirus-outbreak-has-and-hasnt-changed-the-way-americans-work/>
- Pomfret, G., & Varley, P. (2019). Families at leisure outdoors: Well-being through adventure. *Leisure Studies*, 38(4), 494–508. <https://doi.org/10.1080/02614367.2019.1600574>
- Putnam, R. D., Frederick, C. B., & Snellman, K. (2012). *Growing class gaps in social connectedness among American youth, 1975-2009*. Harvard Kennedy School of Government—The Saguaro Seminar: Civic Engagement in America.
- Saldana, J. (2013). *The coding manual for qualitative researchers* (2nd ed.). Sage Publications.
- Sepúlveda, M.-J., & Hutton, R. (Eds.). (2019). *Shaping summertime experiences: Opportunities to promote healthy development and well-being for children and youth*. <https://doi.org/10.17226/25546>
- Sharma, S. V., Chuang, R., Rushing, M., Naylor, B., Ranjit, N., Pomeroy, M., & Markham, C. (2020). Social determinants of health-related needs during COVID-19 among low-income households with children. *Preventing Chronic Disease: Public Health Research, Practice, and Policy*, 17(119), 1–16.
- Smith, E. P., Faulk, M., & Sizer, M. A. (2016). Exploring the meso-system: The roles of community, family, and peers in adolescent delinquency and positive youth development. *Youth and Society*, 48(3), 318–343. <https://doi.org/10.1177/0044118X13491581>
- Snellman, K., Silva, J. M., Frederick, C. B., & Putnam, R. D. (2015). The engagement gap: Social mobility and extracurricular participation among American youth. *Annals of the American Academy of Political and Social Science*, 657(1), 194–207. <https://doi.org/10.1177/0002716214548398>
- Stodolska, M., Shinew, K. J., Acevedo, J. C., & Izenstark, D. (2011). Perceptions of urban parks as havens and contested terrains by Mexican-Americans in Chicago neighborhoods. *Leisure Sciences*, 33(2), 103–126. <https://doi.org/10.1080/01490400.2011.550220>

- Van Lancker, W., & Parolin, Z. (2020). COVID-19, school closures, and child poverty: A social crisis in the making. *The Lancet: Public Health*, 5(5), e243–e244. [https://doi.org/10.1016/S2468-2667\(20\)30084-0](https://doi.org/10.1016/S2468-2667(20)30084-0)
- Vandell, D. L., Larson, R. W., Mahoney, J. L., & Watts, T. W. (2015). Children's organized activities. In R. Lerner, M. Bornstein, & T. Leventhal (Eds.), *Handbook of child psychology and developmental science* (vol. 4, 7th ed.). <https://doi.org/10.1002/9781118963418.childpsy408>

Exploring Camp Community in Online Summer Camp Programs during COVID-19

Megan H. Owens

*Department of Recreation, Park and Tourism Administration
Western Illinois University*

K. Dale Adkins

*College of Education and Human Services
Western Illinois University*

Citation: Owens, M. H., & Adkins, K. D. (2022). Exploring camp community in online summer camp programs during COVID-19. *Children, Youth and Environments*, 32(3), 124-142.
<http://www.jstor.org/action/showPublication?journalCode=chilyoutenvi>

Abstract

During summer 2020, many organizations shifted traditional, in-person camp programs online due to concerns from the COVID-19 pandemic. This study explores the intentional design and building process of a camp community in an online program when that format was not the organizations' original delivery mode. The study involved six online camp programs that historically operated in person. Researchers gathered data through interviews with camp directors across three time points during their online programs. The findings revealed distinct components that comprise a camp-specific community with pertinent considerations for youth development organizations seeking to create a feeling of community in their online programs.

Keywords: camp community, communitas, youth online community, summer camp

Introduction

Until summer 2020, providing in-person summer camp experiences was rarely questioned. The COVID-19 pandemic changed that for millions of campers worldwide. In the United States, many organizations halted in-person operations and ventured into the uncharted territory of online camp programs. Many camp professionals were skeptical and apprehensive initially (Summer Camp Professionals, 2020a). Some camp directors could not imagine converting traditions, rituals, and socialization practices to an online format. Yet, the camp industry moved in this direction, which some camp professionals called designing “the longest rainy-day program... ever planned” in an effort to connect the camp community (Shendelman, 2020).

Many environments where youth lived, learned, worked, and/or played during the COVID-19 pandemic changed drastically. While the online camp movement grew and directors contemplated the pandemic’s lasting impact, organizations connected with campers and alumni in novel ways online. Initially, the engagement focused on group support and connection during the difficult period. For example, some organizations used Facebook Live or Zoom® to host sing-a-longs (Summer Camp Professionals, 2020b). As summer camp organizations overhauled their program design, we wondered, could the qualities of an in-person camp community be experienced through new, temporary online programs? This study explored the process of transitioning community-building practices and experiences of youth summer camp during the COVID-19 global event. The following research questions guided the study:

1. What comprises a camp community?
2. In what ways did camp directors attempt to create a camp community through these new, temporary online camp programs?

Literature Review

Since the 1860s, summer camp programs have existed to connect campers to nature (Paris, 2008) and develop life skills (e.g. Garst et al., 2011; Sibthorp et al., 2013; 2020). Historically, summer camps have provided experiences unavailable at home such as expeditions or sports (Paris, 2008). These experiences are typically delivered in person (American Camp Association, Inc., 2021), but online camp programs have existed prior to the COVID-19 pandemic. Summer camp programs provide distinct socialization and community-like experiences. These specific experiences have not been explored through the lens of online summer camps, particularly during a global crisis such as a pandemic.

Online communities for youth and adults have emerged through social networking sites (Reich, 2010) and virtual reality experiences (Kovatcheva & Kommers, 2004). Early on, individuals believed that “any erosion in the traditional face-to-face socialability and personal communication or *Gemeinschaft* (i.e., community connection) in modern societies represented a threat to the quality of civic life, collaborative social exchanges, and the community spirit” (Norris, 2002, p. 11). This perspective insinuated that in-person experiences supported the intact design of community unlike the dispersed nature of individuals online. Youth, alongside

most individuals, have moved their primary interactions online, with some researchers arguing that online spaces are just as natural to youth as a physical space (Szekely & Nagy, 2011).

While an in-person summer camp community is initiated by the program staff, online community formation and continuance appears driven by the youth involved in the experience. For example, popular online communities focused on fandom, interactive media design (e.g., Scratch), social justice, support, or general social networking sites involve a high level of individual initiative (Reich, 2010). These online communities may provide an “escapism” from negative offline experiences for some youth while providing a space to gather with other like-minded individuals (McInroy, 2020, p. 1886).

Summer camp programs are interactive, social environments (Garst et al., 2011). Individuals attending summer camp programs have reported a “second-home feeling” (Dahl et al., 2013, p. 101) or feeling safe being themselves (Darlington et al., 2010). These feelings often derive from forming lasting relationships (Catalano et al., 2004) and being in a welcoming community-like environment (Roth & Brooks-Gunn, 2003). The process of building a camp community is strongly influenced by intentional planning (Garst et al., 2011). A component of intentional planning revolves around the shared experience that campers have during the program. This shared experience relates to an equalized environment or reduction of personal status symbols, as all campers are in a shared space and participating in similar activities (Baker, 2018; Garst et al., 2011). Baker (2018) connected camps’ property design (i.e., closed gates, spaces surrounded by trees) to the ability for campers and staff to feel separated from the outside world and immersed in activities. Rituals, lore, and traditions support the immersive experience leading to “you had to be there to understand” types of stories (Baker, 2018; Paris, 2008).

Online communities form outside the physical boundaries that are paramount to the traditional in-person summer camp experience, and research suggests that youth may be able to form communities online, as well as in person. For example, research on “bedroom culture” highlights the shift of youth activity from the outdoors to inside one’s bedroom due to increased usage of personal devices (Livingstone, 2009) and internet-based experiences (Wong, 2020). Some youth considered “hidden” are resistant to in-person interactions but are actually highly engaged with others online (Wong, 2020, p. 1227). While the frequency of online interactions and program-specific experiences (e.g., MIT Junior Summit, 1998) suggest that youth may indeed be able to form online communities, in-person experiences have been foundational to establishing summer camp communities.

The theoretical framework of *communitas* (Turner, 1982) grounded this study’s exploration of camp community in online programs. *Communitas* are metaphorical communities established when individuals step outside societal structures and into a “world of ambiguity and possibility” (Sharpe, 2005, p. 256). Baker’s (2018) detailed description of the “camp bubble” suggests that a camp community differs from the sense of community experienced in other settings (p. 26), as when camp staff distinguish between their camp life versus “the real world” (Baker, 2018, p.

31) and when campers bond through an intense wilderness experience (Sharpe, 2005). Olaveson (2001) distinguished *communitas* as temporary in nature, spontaneous, and immediate (p. 107). Equality among members, lack of status or structure, and having an immersive, shared, and bonding experience are necessary to *communitas* formation (Olaveson, 2001; Turner, 1982).

Several aspects of *communitas* may be found among summer camp programs. For example, rituals and rites of passage are experiences fostering community membership that outsiders may not understand (Turner, 1969). Summer camps incorporate traditions such as chants/songs or age-specific trips, and rituals such as ceremonies or events (e.g., Baker, 2018; Paris, 2008). These temporary shared experiences and spaces are distinct to *communitas* (Olaveson, 2001). Individuals engage with summer camp programs in the same space for a few days up to several weeks. This temporary period spent away from home encourages relationship building within that space due to inter-personal proximity and similar interests (Baker, 2018; Olaveson, 2001).

This study sought to uncover the potential experience of community when the camp setting was transferred from its traditionally in-person setting to online. The occurrence was unique to the global effects of the COVID-19 pandemic. Thus, this study intended to capture this moment in time when one sector of the youth development field attempted to provide a connective experience for their population.

Methodology

Study Scope and Design

The purpose of this study was to explore the presence of community within newly created online camp programs during summer 2020. Approval for this study was obtained from the university Institutional Review Board. The study was open to all U.S.-based camps without prior experience providing online camp programs. The study engaged directors from organizations providing summer camp programs to various populations with different program designs, and across geographical regions (see Table 1). The researchers gathered data through in-depth participant interviews and employed phenomenology to explore this distinct community experience (Creswell, 2014).

Various disciplines have used phenomenology to guide naturalistic and qualitative inquiries of a particular phenomenon that is experienced by an individual or group of people (Gallagher, 2012). For example, researchers utilized phenomenology to examine the meaning behind unique situations such as the experience of being a caregiver (Sabat, 2009) or experiencing homesickness during camp (Thurber, 1999). Similar to COVID-19 pandemic situations, these phenomena are unlike everyday lived experiences and may benefit from a distinctive approach to explore their contextual meaning. Phenomenology guided all aspects of the study design, particularly identifying the target population, data collection methods, and analysis due to the unique factors: a global pandemic, required social and physical distancing measures, and non-traditional camp program design.

The population engaged for this study was the camp directors that designed and led their online camp programs. Directors have a multifaceted role that involves oversight, design, implementation, and evaluation. The rapid shift from a traditional on-site, in-person experience to the creation of online camp experiences resulted in a more limited workforce. Thus, directors were directly involved with planning and delivering the camper experience that summer. We employed both convenience and snowball sampling for director recruitment. Convenience sampling occurred through two private groups on Facebook (Summer Camp Professionals and Virtual Camp Ideas) and a camp administrator email list managed by the American Camp Association, Illinois Section (ACA-Illinois). We then used snowball sampling of study participants to obtain additional contacts of directors who were leading new online camp programs. The managing administrators of the private Facebook groups granted the researchers permission to post recruitment information, and we submitted the information to the ACA-Illinois Executive Director to distribute via their listserv. Recruitment occurred in May and June 2020. Eligibility requirements were that the director needed to hold a camp administrative role and work at their current camp for at least two years. Initially, 18 directors expressed interest in the study. Seven directors began the study with six directors completing the full study. (One director dropped out for an unknown reason.) Table 1 presents the camp and director information (pseudonyms used for all participants).

Table 1. Camp and corresponding director information

Camp	Director Name	Years' Experience	Camp Information	Online Camp Components
A	Mae	7+	<ul style="list-style-type: none"> • Location: Mid-Atlantic Region • Camp Type: Governmental, non-profit • Camp Design: Overnight & day camps • Camp Activities: Varies by program theme, generally outdoor-focused • Timeframe: Weekly sessions • Population: Co-ed, all income levels 	<ul style="list-style-type: none"> • One 2-week session • Activity box: optional, fee • Provided free boxes to area homeless and transition shelters • Three engagement options: <ul style="list-style-type: none"> ◦ Recorded videos on YouTube© channel ◦ Complete activities on own from box ◦ Livestreamed activities via Zoom©
B	Felicity	3	<ul style="list-style-type: none"> • Location: Midwest Region • Camp Type: Independent, non-profit • Camp Design: Overnight camp • Camp Activities: Outdoor skills, creative/performing arts, educational skills • Timeframe: Two 4-week sessions • Population: Co-ed; youth from low-resource households 	<ul style="list-style-type: none"> • Two 4-week sessions • Activity box: free for all • Flexibility for engagement was important • Recorded videos on YouTube© channel • Complete activities on own from box • Livestreamed activities via Zoom©

C	Kari	4+	<ul style="list-style-type: none"> • Location: Midwest Region • Camp Type: Organizational, non-profit • Camp Design: Overnight & day camps • Camp Activities: Varies by program theme (e.g., career exploration, outdoor skills) • Timeframe: Weekly sessions • Population: Female only, all income levels 	<ul style="list-style-type: none"> • Eight 1-week themed sessions • Activity box: included • Flexibility for engagement • Recorded videos • Complete activities on own from box • Livestreamed activities via Zoom© & Facebook© Live • Virtual fieldtrips
D	Jason	17+	<ul style="list-style-type: none"> • Location: Mid-Atlantic Region • Camp Type: Independent, non-profit • Camp Design: Overnight camp • Camp Activities: Nature-based programming • Timeframe: Four 2-week sessions • Population: Co-ed, middle- to upper-income levels 	<ul style="list-style-type: none"> • One 6-week session • Class/subject focused • Recorded lessons • Livestreamed classes via Zoom©
E	Brooke	2	<ul style="list-style-type: none"> • Location: Northeast Region • Camp Type: Independent, non-profit • Camp Design: Overnight camp • Camp Activities: Traditional activities (e.g. arts/crafts, games, outdoor skills) • Timeframe: Four 2-week sessions • Population: Co-ed, all income levels 	<ul style="list-style-type: none"> • Ten 1-week sessions • Livestreamed activities via Zoom©
F	Polly	31	<ul style="list-style-type: none"> • Location: Southeast Region • Camp Type: Independent, non-profit • Camp Design: Overnight camp • Camp Activities: Traditional activities (e.g. arts/crafts, games, outdoor skills) • Timeframe: Four 1-week sessions • Population: Co-ed, medical diagnosis specific, all income levels 	<ul style="list-style-type: none"> • Five 1-week sessions • Activity box: free for all • Live engagement through video game platform (Discord) • Livestreamed some events

Data Collection and Analysis

The directors participated in semi-structured interviews at three time points during the summer: pre-camp, mid-camp, and post-camp. While we scheduled these interviews as close to these time points as possible, two camps (Camp E and F)

began their online camp prior to the pre-camp interview. The interviews occurred via the video conference platform Zoom© and were recorded with participant permission. Each interview lasted between 30-60 minutes. The interview questions focused on elements of *communitas* and the ways community might emerge in camp programs. Specifically, the pre-camp interview focused on learning how the participants believed the feeling of community developed among campers during an in-person camp. Additionally, the researchers obtained the 2020 online program plans. The mid-camp interview served as a check-in of the online program implementation and discussion of campers' behaviors or actions related to community building. The post-camp interview allowed directors to reflect on the online program, contemplate the presence of community and connection among participants, and discuss techniques for building community online moving forward. To identify core elements comprising a camp community, directors answered the same question at the beginning of each interview: What does the phrase "camp community" mean to you?

Each interview was immediately transcribed verbatim, then the researchers reviewed the interview recording to add behavioral markers to the transcript (Weiss, 1995). Upon completing all interviews, the researchers followed the multi-step process for phenomenological analysis: (1) organized the data into meaning units (e.g., interview foci: camp community definition or online camp community), (2) clustered items within the meaning units, (3) conceptualized the central theme of clusters within meaning units, and (4) compared central themes across the data (Giorgi, 1997; Hycner, 1985). This multi-step process occurred at each interview time period (i.e., pre-, mid-, and post-camp interviews), then we compared themes across each director's data as well as across all interviews according to time period (Churchill & Wertz, 2014).

The researchers employed multiple methods to ensure trustworthiness of this study. Researchers that follow a phenomenological approach engage in bracketing, which is the process of separating a researcher's personal beliefs, feelings, and influencing knowledge from the perspective shared by study participants (Giorgi, 1997; Moustakas, 1994). Memo writing and regular meetings allowed the researchers to identify and separate any personal or professional bias, and identify unique factors in the data (Glaser & Strauss, 1967). The researchers collaboratively coded one director's full interview data to ensure proper application of the *communitas* theoretical framework to the data (Olaveson, 2001; Turner, 1982), then compared codes and discussed their meanings. Once both researchers confirmed their theoretical understanding and application, each researcher analyzed the remaining camps' interview data. Finally, the primary researcher shared the findings of the study (in the form of an accepted conference abstract) with the directors; three directors affirmed the findings and three directors did not provide a response.

Findings

This study explored the formation and experience of community in new online camp programs. The findings suggest that while the directors attempted to provide a

community-building experience there were significant challenges to the full realization of community.

Defining Camp Community

Identifying the presence of a camp community rests on one's ability to understand the community-building process and behaviors exhibited by members. By asking directors to describe what the phrase "camp community" meant to them during each interview, the researchers sought to identify perspective shifts while narrowing the factors contributing to a camp community. Examples of the directors' varied individual perspectives are noted in Table 2.

Table 2. Individual Directors' Perspectives of Community Factors

Community Factor	Example
A feeling	<ul style="list-style-type: none"> • "a feeling that our campers and our staff have when they're in our camp [that] camp is more than just a camp" – Felicity, Camp B
A place	<ul style="list-style-type: none"> • "a kind of a specific place" – Kari, Camp C • "I think from a virtual perspective our community shifted a little. I think they've built a community within their homes" – Mae, Camp A
Personal similarities	<ul style="list-style-type: none"> • "we want our kids and our people to be in a place with people like them, that's the purest definition of community" – Polly, Camp F
Combination of factors	<ul style="list-style-type: none"> • "a camp group is sort of tossed together, it's not necessarily the people you would choose to associate with but to me it's those two concepts that are the most important concepts: membership and acceptance" – Jason, Camp D • "having a sense of mastery. Camp communities allow kids to develop new skills" – Brooke, Camp E

While the directors expressed nuanced aspects, two primary factors emerged as necessary components to form a camp community: (1) personal belonging and acceptance (e.g., "you really do get to find a home for the parts of yourself that maybe don't feel like they have a home during the rest of the year"; Felicity, Camp B) and (2) people who are supportive and encouraging (e.g., "a group of people who encourage you to do bigger and better things, who support you, and who are willing to try new things with each other"; Kari, Camp C).

These two primary factors are reminiscent of Turner's conceptualization of *communitas*. Turner (1982) believed *communitas* maintained an "essential and generic human bond" that is free of judgment and egalitarian (Olaveson, 2001, p. 104). *Communitas* are recognized as having little to no formal structure or power roles. Summer camps do incorporate structure, which varies according to organization purpose and mission. Yet, the opportunity to feel equally valued and build multiple high-quality relationships, regardless of status, suggests camp community is possible when these primary factors are present (Baker, 2018; Garst et al., 2011; Sibthorp et al., 2020).

Initially, the directors' conceptualization shifted from "a place where" these factors occur to considering how "a group of people" are influential to the process.

Directors began shifting their verbiage at the mid-camp interviews, and people-first perspectives were fully exhibited during post-camp interviews. Garst et al. (2011) suggested that “camp is more than a location or a program; it encompasses the affective, cognitive, behavioral, physical, social, and spiritual benefits that youth receive during and after the camping experience” (pp. 73-74). The individuals involved in the program may have some influence over a campers’ feeling of belonging and support (Darlington et al., 2010), which affects community (Olaveson, 2001; Sibthorp et al., 2007).

An important caveat to the definition of camp community is the intentional effort of staff (Sharpe, 2005). For Mae (Camp A), building trust with campers was pivotal to fostering community, as for “some kids, this may be the first stable environment that they’ve had where they get three meals a day and have a place to sleep. For other kids, this is their ‘what is happening?’ or ‘where is my tv?’ [situation].” Felicity’s organization believed camp community extended across all associated individuals: campers, staff, volunteers, and board members. This foundation of belonging, acceptance, and a supportive group of people have been the foci of in-person camps (e.g., Dahl et al., 2013; Darlington et al., 2010; Garst et al., 2011; Sibthorp et al., 2007; 2020), which proved difficult, but not impossible, to foster during these online programs.

Directors’ Intentional Attempts at Building Community

When planning the online programs, the directors wrestled with design, content, and methods to engage campers. “I want to start off with... What are our values as a camp? How can we maintain those values this summer when we are distant from one another? What do we really want the camp experience to be like for campers?” (Jason, Camp D). Each camp attempted to incorporate their values with interesting and interactive experiences for campers.

We really had to get to a place where I was saying out loud repeatedly ‘we are not taking traditional summer camp and making it happen on a computer, because they’re not the same thing...’ We really had to refocus on what is [sic] best parts of our program and how do we give kids those parts virtually... How do we create ways for them to connect with other people (Mae, Camp A).

The directors described intentionally designing their online camp to foster connection and community (Sharpe, 2005). Some activities worked better than others.

Some weeks were much better for experiencing community than others. If they experienced it, it started with a common love of something. A big, big example of that is our Harry Potter week. Our older girls for Harry Potter week were so excited. They were talking to each other. They were bouncing off [each other], they were very excited (Kari, Camp C).

Regardless of theme, directors indicated the activities that incorporated staff-to-camper or peer-to-peer questions increased camper engagement. For example,

“the activities that there’s a lot of sharing, collaboration, opportunity to say ‘what decisions did you make when you were baking your cookies or can you show us physically your craft,’ I think those have remained our most popular” (Brooke, Camp E).

Intentional program design included experimenting with small groups. Initially, cabin/bunk groups were created for socialization purposes. Only two programs maintained their small groups for the duration of online camp. Camp F’s cabin groups interacted spontaneously throughout the session when a camper initiated an online chat then the group members joined the conversation. Camp D led weekly bunk group sessions starting week two. Camp D matched all campers’ and staff’s schedules to arrange bunk groups, which may have increased engagement compared to programs with pre-set meeting times.

We just gave campers a chance to sign up for this if they were interested and tell us what days of the week they were able to meet, whether they had a preference for morning and afternoon... [We] took the staff availability... we came up with nine different time combinations. We also gave campers the chance to let us know if they wanted a same-gender group or a mixed-gender group (Jason, Camp D).

The other directors encountered issues maintaining the small groups due to inconsistent attendance. Most online programs stopped their cabin groups after the first session, but some directors continued providing all-camp social sessions and campers were randomly divided into smaller groups when attendance was high enough. For example, Camp B “eliminated cabin time. We had cabins and we were getting really inconsistent attendance” (Felicity). Instead, the campers requested an evening all-camp “community time” session for the campers unable to attend the morning session.

Sibthorp et al. (2007) suggested connectedness “begins with one-on-one relationships” but program structure is also important to consider (p. 3). For example, Camp E intentionally used restorative justice circles to help campers resolve conflict during their online program. This process required additional coordination, but the director felt that extra effort was worthwhile for supporting campers’ relationships. These attempts to create community through program structure (e.g., online bunk groups (Camp D), community time (Camp B), and restorative justice circles (Camp E)) may have provided some resemblance of the shared space common to in-person programs (Baker, 2018; Garst et al., 2011) that have been seen as pivotal to community formation (Olaveson, 2001; Sharpe, 2005).

Situations That Supported Community-Building

In addition to intentionally structured opportunities for community connection, participants suggested that inside jokes, modified rituals and traditions, and family-centered experiences had the potential to nurture community-building in online camp programs. Inside jokes suggested that campers connected with others and attempted to continue that connection beyond the moment:

There were jokes that came out of it... one of our staff members got accused of being a mafia [detective-type circle game popular among U.S. summer camp programs] and he never defended it. His camera was off and he never said anything. Eventually he came back and he was like 'I was in the bathroom, what happened?' Everyone had voted that he was the mafia and he was sent to jail. This joke [stuck] throughout the rest of July, 'Aaron got thrown in jail while he was sitting on the toilet!' The kids loved it! (Felicity, Camp B)

Rituals and traditions can be potent experiences for community-building (Baker, 2018; Olaveson, 2001; Turner, 1982). Traditions (e.g., closing ceremony) are omnipresent across camp programs (Baker, 2018; Garst et al., 2011; Paris, 2008).

We have a tradition at in-person camp: When we are playing a night game for the villain to be thrown into the lake, it tends to be one of the founders of the camp. All the kids chant 'Gabe in the lake.' After every night game he tends to be the villain. We hear it from so many parents, they think it's the best part of the program. They're constantly talking about it... We do run night games on Zoom© and we were running one where a staff member, not Gabe, [was leading it] when the kids kind of unexpectedly started saying, 'Sarah in the lake.' She walked her computer to her bathroom, put her head under her shower and the kids went wild! It was such a cool moment. We can still have these magical moments... on Zoom© (Brooke, Camp E).

Another example suggested a shift of community connection from campers to family members within the home. During the online program, many families shared photos of their child dressed in silly costumes, independently completing their activity, or engaged with the livestreamed session. This reverse photo-sharing allowed directors to create and livestream the traditional closing slideshow for the campers and families. Similar to the in-person experience, campers responded enthusiastically when seeing their photos.

We had parents and families send pictures of their children doing things. I was like, 'oh, we're just going to put it out there. We'll get like a picture or two.' No! We got a lot of pictures. We've been able to do a lot of slideshows. It's really fun watching their faces as we do that... It's been really cool to scroll through and hear them say, 'oh, that's me,' just like they would have at camp. That builds community (Kari, Camp C).

Some camps saw community form within the home when older siblings helped younger siblings complete projects or when cousins and neighbors participated together during the Zoom© sessions. Camp F added a new parent program focused on supporting and learning from each other. Camp A created family-centric evening programs (e.g., family paint night).

You could see a camera at the end of the table and then mom and dad and all the sisters and brothers with easels up and paint out. It was the coolest

thing... We have pictures of dads painting with their daughters and younger siblings painting and just the whole family was engaged. [It] was very, very cool (Mae, Camp A).

Forming bonds with others is foundational to community-building (Baker, 2018; Olaveson, 2001; Sharpe, 2005). The bonds formed between family members and neighbors may have been more accessible to campers, as peers and staff had limited engagement outside the program time. Additionally, these momentary situations occurred during sporadic sessions unlike the “camp bubble” (Baker, 2018, p. 26), or they extended the opportunities for socializing and bonding common to in-person camp programs (Sharpe, 2005).

Challenges to Community Formation

Each camp faced significant challenges when attempting to foster community within their online program. Some campers participated sporadically or felt there were limited opportunities for peer-to-peer engagement.

We do tell them, we honestly think that they're going to get more out of the calls with their video [on] since everything is highly interactive. We think that seeing each other's faces is going to build that sense of community faster and more genuinely. We've made a decision that currently to be the most equitable, most accessible to folks, [we] make the exception 'that if you don't want to turn your video on that's okay' (Brooke, Camp E).

While equity was one consideration, some directors suggested that certain campers only wanted to be present but not interact with others. “There’s an element of being around other people that don’t live in their house. There’s a value to that for everybody. We all need human interaction, beyond who lives in our building. I get that listening to conversations is enough” (Felicity, Camp B). Similarly, Jason (Camp D) reassured his staff when they struggled with engagement, “if all the camper wants to do is show up to your weekly Zoom® meeting and talk about insects or birds and they don’t want to do anything between class that’s okay... it’s not your fault. You’re not a failure.”

The decision to *not* turn one’s video on might represent their ability to make choices. Many in-person camps allow campers to make decisions, such as which activities they will participate in or where they sit at mealtime. During online camp, campers chose when, where, and how to engage with the activities, their peers and staff. All the programs provided multiple delivery methods for the online program such as activity boxes, recorded videos, or livestreamed sessions to address issues of equity. For example, “we have families who are low income and we know that... buying a bunch of materials... this summer would be a major barrier. We put all that together for them” and ensured “they could access it in a couple of different platforms” (Felicity, Camp B). Nonetheless, campers’ ability to choose their engagement level may have affected their community experience.

Online is a different level of choice. I think you get to choose how you engage in your community in a different way than being in person. 'So, I can

turn off my screen and you as a presenter or as another member can just think that I don't like to be on camera, and I'm still totally engaged,' whereas in-person, if [they] zone out, it's much easier to see that and to be aware of that and to feel the ramifications of that as a person (Mae, Camp A).

Not every camper participated each time despite the variety of activities offered. Also, the time between activities ranged from one day to one week, which affected camper attendance.

Now the campers had multiple options, multiple different things that [they] could participate in, in a given week. Each one of the things like a particular class or a particular bunk group, each of those only met once a week. This is the short discrete chunks of time that campers were spending interacting with one another. Then they'd have to go for another week without interacting with a thing again. In an on-site session those times together can often last much longer and you don't have to go for an entire week without seeing the same people again (Jason, Camp D).

The opportunity to build community may not occur during formal activities (Sibthorp et al., 2020). "I think a lot of community forms in downtime. Just chillin' in our cabin [or] we're waiting to go to meals" (Kari, Camp C). As the summer progressed, the directors' acknowledged the most significant challenge to fostering community was the inability to provide the unstructured time imbedded in every in-person camp for example during rest hours, transition times, or meals.

We're missing, and there's really no way to get it, it's the unstructured time... Every interaction we have has to be structured—that's just how we're set up. We're missing that. That's where a lot of the fun memories come from. Kids love doing activities, they love sitting around the campfire and singing songs and all of that. But the stories they tell are about when they were just sitting in their cabin during rest hour and someone did something silly or while doing an activity in the art center, they were having a conversation that they remembered. We don't get to do those things (Felicity, Camp B).

A hallmark of in-person camp is the opportunity to have semi-private conversations with friends and/or staff (Baker, 2018; Dahl et al., 2013; Sibthorp et al., 2007). These conversations may be the foundation of camp community. Sitting next to a friend while building a craft, riding the field trip bus, or late night chats supports deeper connections (Yuen, 2005).

One of our staff member's son, age 13, he was like 'this is fine, but I like when the lights are out and we're supposed to be quiet and the counselors are sitting on the porch and we're whispering to each other.' I can't replicate that in any way (Felicity, Camp B).

The online programs did not allow private online chatting between campers, due to the staff's inability to monitor conversations, concerns with potential bullying or

inappropriate behaviors. The directors collectively agreed that removing private chats hampered community-building despite the need for internet security.

It's so hard, because we don't let them private chat for security reasons, so there's no way for me to really know. And that's the hard thing too, because normally you'd see two or three girls going over here and they're learning [together]. We wouldn't be able to tell that if we let them do that in the chat... So it's hard. We've kind of effectively locked down any way for them to develop that community because online safety is such a thing (Kari, Camp C).

Unstructured time during in-person camp programs has been identified as a potential space for building relationships and overall connection with others (Sibthorp et al., 2020). Yuen (2005) suggested that campers need both public and private spaces during the program to build relationships. Relationship-building is initiated in public spaces while private spaces support campers' desire to converse with peers without staff facilitation, but within a reasonable distance should they need support (Hough & Browne, 2009; Owens & Browne, 2021; Sibthorp et al., 2020). Directors indicated the need to create an online space that mimics the unstructured time during camp. Navigating online spaces is commonplace for youth (Way & Malvini Redden, 2017), as many youth utilize creative methods to address online safety and privacy (Youn, 2005).

Although producing an online camp community was challenging, the directors' efforts were met with some appreciation from campers.

The other night I think they almost to a person spoke to just appreciating the chance to have some connection to an interaction with one another this summer... I really think it was the chance, just to be, to have some sort of a tangible or more tangible connection to the camp community this summer that they would not have if they hadn't participated at all (Jason, Camp D).

Throughout the study, the directors narrowed their perspective of a camp community to the individuals within that program and attempted a variety of experiences to foster a sense of interpersonal connection. After taking time for reflection, the directors intended to use successes and challenges encountered during the summer of 2020 to inform the development and implementation of future virtual programming, as many organizations were in the midst of continued restrictions for in-person activities.

Limitations

This study represents a snapshot during a global pandemic. The small sample of camps and directors does not allow for generalizability, but the perspectives shared illuminate the community-building process undertaken every summer at camp programs. Further study of camp community among pre-existing online programs would extend our understanding of this process.

We attempted to engage campers aged 10-13 years old in this study, however the very low response rate resulted in dropping that data from the analysis. The low response rate suggested that our recruitment and communication method was not effective during that time period. Future studies should include campers' perspectives and the researchers recommend that data be collected at the time of program delivery versus depending on campers' parents or guardians to pass along survey links or requests. Camper data would enrich the broader understanding of camp community in traditional and non-traditional settings.

Future Research

Some organizations are continuing their online programs after learning effective approaches to engaging participants and alumni beyond the camping season. Studying the process of building a camp community may expand our understanding and ability to design connective experiences both in person and online. The additional findings may further enhance our understanding of the lasting learning experiences that have already been found through camp programs (Sibthorp et al., 2020). The composition of community members is another area of study when considering online youth programs. Household cohorts or program hubs (i.e., small group meeting locations) might be a program option when large in-person gatherings are unavailable. Lastly, more research exploring the incorporation of unstructured time for peer engagement is pivotal to online youth communities. Youth need both public and semi-private spaces to build connections with others during programs (Sibthorp et al., 2007; 2020; Yuen, 2005).

Conclusion

During summer 2020, numerous summer camp programs shifted from in-person to online camp experiences. This drastic programmatic shift provided a distinct opportunity to explore community-building experiences among summer camp programs. Through director interviews, this study identified and explored mechanisms for fostering camp community. The directors' conceptualization of camp community shifted from a place-bound feeling to an interpersonal experience that became prioritized when the camp space changed. The online camp programs used interactive experiences to encourage campers to directly communicate with their peers and staff members, as the directors believed those experiences fostered community building. The modified rituals and traditions that were both planned and spontaneous led to campers continuing conversations, discussions, or phrases across the online camp sessions. The directors believed those shared experiences allowed campers to connect to the organization's camp community.

Despite momentary glimpses of camp community, the directors collectively agreed the absence of unstructured time and unencumbered conversations between campers limited the scope of community formation. While camp still occurred and provided an outlet for campers and their families during a time of uncertainty, the realization of the camp community may have been secondary to the novelty of an online summer camp experience. The degree to which lasting connections and/or camp communities formed is debatable. Still, the desire for interpersonal connection became the essence of camp community that these directors attempted to foster through their online summer camp programs. Understanding the

components of a camp community and the situations that support community-building experiences remain important, as professionals utilize online spaces for programmatic engagement with youth.

Dr. Megan Owens is an Assistant Professor in the Department of Recreation, Park and Tourism Administration at Western Illinois University. She received her doctoral degree from the University of Illinois, Urbana-Champaign specializing in youth development practices in the Department of Recreation, Sport and Tourism. Her research explores youth and adolescent social-emotional learning through recreation. Dr. Owens led research and evaluation for the University of Maryland 4-H Extension and held supervisory roles leading youth and family programs for both park and recreation agencies in Illinois and Indiana.

Dr. K. Dale Adkins is Associate Dean Emeritus for the College of Education and Human Services at Western Illinois University. He received his Doctorate of Recreation from Indiana University-Bloomington. Dr. Adkins has been actively involved as a volunteer, accreditation visitor, and board member across the camping industry for the duration of his career while teaching youth development courses through the Department of Recreation, Park and Tourism at WIU. He continues to serve in volunteer capacities with American Camp Association sections.

References

- American Camp Association, Inc. (2021, June 29). *Find a camp*.
<http://find.acacamps.org/search.php>
- Baker, M. (2018). Welcome to the bubble: Experiences of liminality and communitas among summer camp counsellors. *Journal of Youth Development*, 13(1–2), 24–43. <https://doi.org/10.5195/jyd.2018.565>
- Catalano, R. F., Haggerty, K. P., Oesterle, S., Fleming, C. B., & Hawkins, J. D. (2004). The importance of bonding to school for healthy development: Findings from the Social Development Research group. *Journal of School Health*, 74(7), 252–262.
<https://link.gale.com/apps/doc/A122921721/HRCA?u=anon~5de27b2a&sid=googleScholar&xid=3a4f7654>
- Churchill, S. D., & Wertz, F. J. (2014). An introduction to phenomenological research in psychology: Historical, conceptual, and methodological foundations. In K. J. Schneider & J. F. Pierson (Eds.), *The handbook of humanistic psychology* (2nd ed., pp. 275–296). Sage Publications, Inc.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th Ed.). Sage Publications, Inc.
- Dahl, T. I., Sethre-Hofstad, L., & Salomon, G. (2013). Intentionally designed

- thinking and experience spaces: What we learned at summer camp. *Learning Environments Research*, 16, 91–112. <https://doi.org/10.1007/s10984-012-9124-4>
- Darlington, E., McWhirter, B., & Eldridge, J. (2010). Summer camp: An exploration of camper reports of connectedness. *American Camping Association Camp Research Symposium*.
- Gallagher, S. (2012). What is phenomenology? In *Phenomenology*. Palgrave Philosophy Today. Palgrave Macmillan. https://doi.org/10.1057/9781137283801_2
- Garst, B. A., Browne, L. P., & Bialeschki, M. D. (2011). Youth development and the camp experience. *New Directions for Youth Development*, 130, 73–87. <https://doi.org/10.1002/yd.398>
- Giorgi, A. (1997). The theory, practice, and evaluation of the phenomenological method as a qualitative research procedure. *Journal of Phenomenological Psychology*, 28(2), 235–260. <https://doi.org/10.1163/156916297X00103>
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Aldine De Gruyter.
- Hough, M., & Browne, L. P. (2009). Connecting camp mechanisms to camper outcomes: A case for program theory. *American Camping Association Camp Research Symposium*.
- Hycner, R. H. (1985). Some guidelines for the phenomenological analysis of interview data. *Human Studies*, 8, 279–303.
- Kovatcheva, E., & Kommers, P. (2004). Web-based youth communities in the light of cyberspace psychology. *International Journal of Web Based Communities*, 1(1), 46–57. <https://doi.org/10.1504/IJWBC.2004.004798>
- Livingstone, S. (2009). *Children and the internet: Great expectations challenging realities*. Polity Press.
- McInroy, L. B. (2020). Building connections and slaying basilisks: Fostering support, resilience, and positive adjustment for sexual and gender minority youth in online fandom communities. *Information, Communication & Society*, 23(12), 1874–1891. <https://doi.org/10.1080/1369118X.2019.1623902>
- Moustakas, C. (1994). *Phenomenological research methods*. Sage Publications, Inc. <https://doi.org/10.1007/978-1-4615-6989-3>
- Norris, P. (2002). The bridging and bonding role of online communities. *The International Journal of Press/Politics*, 7(3), 3–13. <https://doi.org/10.1177/1081180X0200700301>

- Olaveson, T. (2001). Collective effervescence and communitas: Processural models of ritual and society in Emile Durkheim and Victor Turner. *Dialectical Anthropology*, 26, 89–124.
- Owens, M. H., & Browne, L. P. (2021). Camp counselor as a role model for social-emotional learning skills in camp. *Journal of Outdoor Recreation, Education, and Leadership*, 13(1), 8–22. <https://doi.org/10.18666/jorel-2021-v13-i1-10543>
- Paris, L. (2008). *Children's nature: The rise of the American summer camp*. New York University Press.
- Reich, S. M. (2010). Adolescents' sense of community on MySpace and Facebook: A mixed-methods approach. *Journal of Community Psychology*, 38(6), 688–705. <https://doi.org/10.1002/jcop.20389>
- Roth, J. L., & Brooks-Gunn, J. (2003). Youth development programs: Risk, prevention and policy. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, 32(3), 170–182. <http://www.ncbi.nlm.nih.gov/pubmed/12606110>
- Sabat, S. R. (2009). Existential phenomenology and the quality of life of carers and care recipients: A case study. *Dementia*, 8(2), 163–166. <https://doi.org/10.1177/1471301209103247>
- Sharpe, E. K. (2005). Delivering communitas: Wilderness adventure and the making of community. *Journal of Leisure Research*, 37(3), 255–280.
- Shendelman, E. (2020, March 23). Camp and covid: Summer 2020 update. Camp is on no matter what. Tell everyone today!!! To all camp owners, directors, programmers and administrators. [post] Facebook. <https://www.facebook.com/groups/175579742455688/search/?q=rainy%20day>
- Sibthorp, J., Bialeschki, M. D., Morgan, C., & Browne, L. P. (2013). Validating, norming, and utility of a youth outcomes battery for recreation programs and camps. *Journal of Leisure Research*, 45(4), 514–536. <https://doi.org/https://dx.doi.org/10.18666/jlr-2013-v45-i4-3897>
- Sibthorp, J., Browne, L. P., & Bialeschki, M. D. (2007). Measuring positive youth development at summer camp: Problem solving and camp connectedness. *Outdoor Education*, 1–13.
- Sibthorp, J., Wilson, C., Povilaitis, V., & Browne, L. P. (2020). Active ingredients of learning at summer camp. *Journal of Outdoor and Environmental Education*, 23(1), 21–37. <https://doi.org/10.1007/s42322-019-00050-6>

- Summer Camp Professionals (2020a). *Home [Summer Camp Professionals]*. Facebook. Retrieved April 14, 2020 from <https://www.facebook.com/groups/camppros/posts/3328733060473658>
- Summer Camp Professionals (2020b). *Home [Summer Camp Professionals]*. Facebook. Retrieved March 20, 2020 from <https://www.facebook.com/groups/camppros/posts/3320651911281773>
- Szekely, L., & Nagy, A. (2011). Online youth work and eYouth: A guide to the world of the digital natives. *Children and Youth Services Review*, 33, 2186–2197. <https://doi.org/10.1016/j.childyouth.2011.07.002>
- Thurber, C. A. (1999). The phenomenology of homesickness in boys. *Journal of Abnormal Child Psychology*, 27(2), 125–139. <https://doi.org/10.1023/A:1021911514768>
- Turner, V. (1969). *The ritual process: Structure and anti-structure*. Chicago Aldine Publishing.
- Turner, V. (1982). *From ritual to theatre: The human seriousness of play*. Performing Arts Journal Publications.
- Way, A. K., & Malvini Redden, S. (2017). The study of youth online: A critical review and agenda. *Review of Communication*, 17(2), 119–136. <https://doi.org/10.1080/15358593.2017.1293838>
- Weiss, R. (1995). *Learning from strangers: The art and method of qualitative interview studies*. Free Press.
- Wong, M. (2020). Hidden youth? A new perspective on the sociality of young people “withdrawn” in the bedroom in a digital age. *New Media & Society*, 22(7), 1227–1244. <https://doi.org/10.1177/1461444820912530>
- Youn, S. (2005). Teenagers’ perceptions of online privacy and coping behaviors: A risk-benefit appraisal approach. *Journal of Broadcasting & Electronic Media*, 49(1), 86–110. https://doi.org/10.1207/s15506878jobem4901_6
- Yuen, F. C. (2005). Building community and social capital through children’s leisure in the context of an international camp. In T. Delamere, C. Randall, & D. Robinson (Eds.), *Eleventh Canadian Congress on Leisure Research* (pp. 1–5). <http://lin.ca/Uploads/cclr11/CCLR11-167.pdf>

Physically Distanced but Socially Connected: Interactive Playgroup Sessions Delivered Remotely during the COVID-19 Lockdown

Brittany Huber
Joanne Tarasuik
Nancylee Merzel
Deborah Njegac
Playgroup Victoria
Melbourne, Australia

Citation: Huber, B., Tarasuik, J., Merzel, N., Njegac, D. (2022). Physically distanced but socially connected: Interactive playgroup sessions delivered remotely during the COVID-19 lockdown. *Children, Youth and Environments*, 32(3): 143-154.

<http://www.jstor.org/action/showPublication?journalCode=chilyoutenvi>

Abstract

In 2020, Melbournians were subjected to one of the world's longest and strictest pandemic-necessitated lockdowns. Prior to lockdown, many Australian families received social support from their local playgroup, a group of children (birth-5 years) and their parents who meet regularly to play and socialize. Playgroup at Home LIVE (PAHL), the online adaptation, was developed to address a recognized need. Survey responses from 338 (out of 2,046) PAHL participants suggested that families experienced similar benefits between PAHL and in-person sessions; these included social connections, routine, and play, which may have mitigated the negative impacts of COVID-19 restrictions on children and their parents.

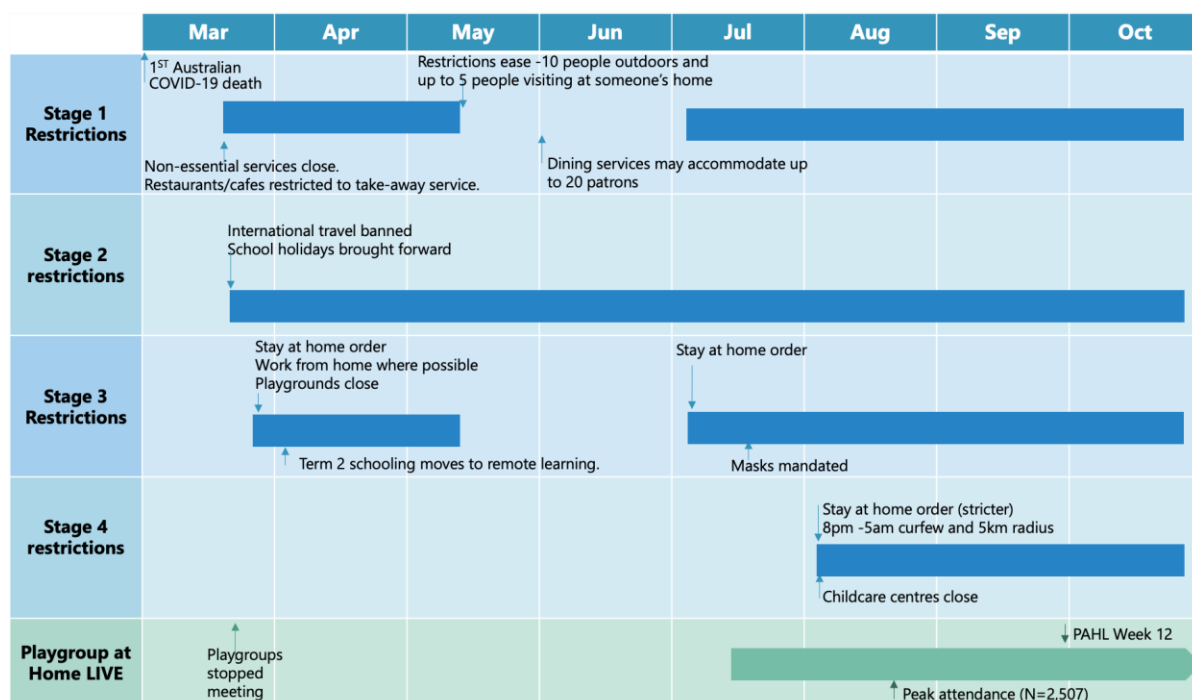
Keywords: playgroup, parent-child engagement, COVID-19, remote interaction, social connection

Background

The impacts of COVID-19 have been felt the world over; in addition to the obvious health toll, the pandemic has caused pervasive economic and social consequences (O'Sullivan et al., 2020). Social distancing measures, stay-at-home orders, cities in lockdown, closure of public spaces, and the like have caused social isolation so severe that many individuals experienced degradations to their mental health or an exacerbation of pre-existing symptoms (Sher, 2020). Children and families have been especially impacted by these conditions, including the prolonged exposure to stress and uncertainty (Morelli et al., 2020; Saladino et al., 2020; Stark et al., 2020).

Residents of Melbourne, in the state of Victoria, Australia's second-most populous city (4.9 million), experienced one of the world's longest and strictest pandemic-necessitated lockdowns of 2020 (Gross et al., 2020). Beginning in March 2020, social distancing measures (termed Stage One restrictions) were implemented Australia-wide to slow the spread of COVID-19. Figure 1 illustrates the timeline of restrictions in Victoria between March and October 2020. As the number of cases grew, so too did the limitations on social mobility. The world was watching as case numbers in Italy grew exponentially and infection rates in the U.S. surpassed China's. Just weeks after the Stage One restrictions were implemented nationally, Melbournians entered Stage Three restrictions, including a stay-at-home order permitting people to leave their homes only for four reasons: food and supplies, medical care, exercise, and work/education (Storen & Corrigan, 2020).

Figure 1. Key COVID-19 dates between March and October 2020, including restrictions affecting residents of metropolitan Melbourne



The most severe measures (Stage Four restrictions) implemented a curfew, 5km travel radius limit, and the closure of many businesses and public spaces including childcare centers and playgrounds. Victorians were already suffering from job loss and other economic stressors from the initial fallout of the pandemic, but this announcement caused a new wave of consequences. The crisis mental health hotline, *Lifeline*, received 30% more calls from Victorians when the Stage 4 restrictions were announced (Kinsella, 2020). Additionally, parents working from home were tasked with full-time childcare responsibilities in the advent of childcare closures (Australian Institute of Family Studies, 2020). Parental stress, social isolation and confinement, and loss of routine were all consequences of Australian life in lockdown uncertainty (de Young et al., 2021). These factors can negatively impact child development, depending on the severity and duration (de Araújo et al., 2020). Social support, such as visits with family and friends, can mitigate the impacts of stress in the context of disasters and pandemics (Earls et al., 2008; Pfefferbaum et al., 2015), but had been inaccessible for months due to limits on social mobility.

Rationale for Playgroup at Home LIVE

Prior to lockdown, many Australian families received social support from their local playgroup: a group of children (birth-5 years) and their parents who meet regularly to play and socialize. A typical playgroup session includes story time, songs, and an activity such as a craft. Playgroups provide opportunities for parent-child engagement, a space for discussions about parenting, and the formation of social networks by parents and children alike. The benefits of playgroup can be observed for both children and their parents, and include improved school-readiness and transition to school, social supports, and parenting confidence and knowledge (Commerford & Hunter, 2017; Gregory et al., 2017).

Playgroup Victoria, the state's peak body for playgroups, recognized that families needed the benefits of playgroup arguably more than ever in lockdown. Research has demonstrated that children are reassured by the virtual presence of their parent after separation, thus video communication may be a useful tool to maintain relationships when physical presence is not possible (Tarasuik et al., 2011). With this in mind, Playgroup Victoria developed Playgroup at Home LIVE (PAHL)—remotely delivered, interactive playgroup sessions that families could participate in from their homes. PAHL provided families the opportunity to continue to “go to playgroup” by offering a consistent weekly schedule of programs. The engaging and social sessions were intentionally planned to help families overcome feelings of isolation and loneliness. Strengthening community wellbeing and connectedness are key aspects of playgroup and were thus a focus of PAHL.

Playgroup at Home LIVE Development and Implementation

When social restrictions were first implemented, two music-based primary prevention programs were adapted for remote delivery. Facilitators applied their understanding from this new and unforeseen format to develop the PAHL sessions which followed a traditional playgroup structure including story time, songs, and a group activity. Consistent with the goals of physical playgroups, PAHL development focused on cultivating positive experiences by providing opportunities for

socialization, promoting play, enhancing children's learning and development, encouraging parent-child engagement, and improving the wellbeing of both children and their parents.

In addition to an all-ages playgroup (birth to 5 years), sessions were designed for specific audiences: baby playgroup for new parents, children with Autism Spectrum Disorder (or similar characteristics), and parents of children with a disability. Sessions were run by experienced playgroup facilitators who were also trained in peepLTP (Evangelou & Sylva, 2007), an evidence-based curriculum that teaches parents about how children learn—and how to implement things at home that make a difference to children's outcomes.

The initial 12-week schedule was communicated to families via Playgroup Victoria's Facebook page, website and member email, plus informal promotion from maternal child health nurses and local community organizations. Additional program components included the development of protocols concerning eSafety, booking processes, and technical assistance.

Program Evaluation

After the first 12 weeks of PAHL, families who had registered to participate (n=2,046) were invited via email to provide their feedback in an evaluation survey. Participation was voluntary and anonymous, and participants could elect to enter a prize draw after survey completion. The 15-question survey asked parents about their PAHL experience and was a mix of multiple choice, ratings, and open-ended questions. Fourteen percent of participating families (n=338) completed the survey via the online survey tool, Typeform. Data was collected and treated with adherence to ethics principles, however the project protocol was not subject to an institutional ethics committee. Researchers analyzed the data using MS Excel (quantitative) and NVivo 12 (qualitative) software.

Quantitative Responses

From the quantitative multiple choice and ratings data, we particularly highlight attendance and impacts on participants.

Attendance

PAHL was the first experience of playgroup for nearly half of the families who responded to the survey (47%). During the 12 weeks, there were between 2 and 7 weekly PAHL sessions. Table 1 shows the number of sessions families attended during the first three months of PAHL and how many children participated within each family. Infants less than one year old were the most represented age group in attendance (27%) followed by children aged 2 years (21%), 1 year (13%), 3 years (16%), and 4 years (15%), and the remaining children were school-aged (5 years or older).

Table 1. Frequency of sessions attended during the first 12 weeks and number of children per household

Sessions Attended	
# of sessions	% of families
1	20
2	13
3	12
4	10
5	12
6-10	22
>10	11

Children per Household	
# of children	% of families
1	64
2	27
≥3	9

Impacts of Participation

Participants were asked to rate whether seeing other families participate had impacted themselves or their children. More than half of families (53%) indicated their child(ren) enjoyed seeing other children participating. One-third of families (34%) thought it helped their child(ren) feel like they were part of a group (34%), and seeing other children take part encouraged children to participate (31%). Parents also reported that they benefitted from the socialization of playgroup; one-third (33%) of parents felt like they were part of a group, 38% of families said that observing other families normalized the challenges of parenting and 19% enjoyed seeing other adults (amid social restrictions). Eighteen families (5%) provided additional comments such as that they mostly paid attention to the presenters rather than the other families. One of the most powerful findings, and one that supported the goals of PAHL, was that nearly all families felt that attending the sessions made them feel less socially isolated during lockdown by either a little (65%) or a lot (26%).

Many playgroups, including PAHL, provide examples of accessible activities that can be replicated at home to strengthen the parent-child relationship and build the home learning environment. Most families (96%) reported learning new activities to do with their child: 63% got a few ideas, 33% got many ideas, and less than 4% of families reported that they did not get any ideas from the sessions.

Program satisfaction was reflected by participants' willingness to recommend the program to others and re-enroll (McCurdy & Daro, 2001). Almost all families (95%) said they would participate in PAHL again. Nearly three-quarters of families (73%) had recommended PAHL to other families, 25% said they intended to do so, but 2% indicated they probably would not.

Qualitative Responses

To further understand families' experiences of PAHL, the survey included open-ended questions about what families enjoyed most about PAHL and suggestions for improvement.

participants. One parent said, “The community feel, activity ideas and it’s fun!” Another parent responded they enjoyed the “dancing and socializing. Seeing the children smiling and socializing during a difficult time.” One participant remarked, “The interaction and ideas for entertaining the kids we get from Playgroup sessions make lockdown a little bit easier and gives us a chance to socialize from home.” Given that physical playgroup has been shown to impact families’ feelings of community and sense of social support, including feeling less isolated (Hancock et al., 2015; Strange et al., 2014), it was encouraging to have social benefits reported from the online engagement.

Thirteen families praised the presenters for their enthusiasm and engaging the children, e.g., one parent enjoyed “The presenters—they’re so engaging. They personalize it too by calling out the kids names and my little one LOVES it when he hears his name being called.” Twelve families mentioned they enjoyed the structure or routine it brought, e.g., “Having a regular time to attend an activity feels normal”; “We LOVED having something structured to do at a certain time each week.”

Suggestions for Improvement

When asked whether they had any suggestions to improve the PAHL program, almost half (46%) either had nothing to add or reiterated positive perceptions of the program:

I think given it’s very tricky to engage a large group of children in an online platform, the playgroup sessions are fantastic! My children love hearing their names called out too! I’m sure this type of learning is new for most of us, but the program is high quality and makes my boys feel better about life in lockdown. Thank you to all involved.

Love it as is.

I think they’ve been really well put together and engaging for the children.

The suggestions for improvement were less consistent than what families enjoyed most about the program, but included changes to content, more opportunities for social interaction, and the schedule (e.g., more sessions). While not a large representation, three families mentioned it would be great for more men to participate in the sessions as facilitators or caregivers, e.g., “It is a great session. I think it is really good for dads too. My husband has gained a lot from it. I was also thinking that virtual playgroups could be a great way to get dads involved post-COVID. Congratulations!”

Consistent with what families reported enjoying most about PAHL, many requested more time be dedicated to singing and storytelling. There were some suggestions for PAHL to be offered in various languages, and/or to utilize the sessions as an opportunity for cultural awareness/ education:

Since there are many different cultures participating in the playgroup community, maybe consider an international component? Sing an indigenous song, tell a cultural story, learn how to count in a different language? It would be great to teach our children about different cultures from an early age.

A few families suggested more age-appropriate activities for specific ages, specifically young infants and younger toddlers who were considered outside the developmental stages that the Baby or All-Ages PAHL sessions targeted. There were also comments related to the materials needed for the activities. Although activities generally utilized materials often found in the home, some families noted that it was difficult to source what was not in their home during lockdown. A few parents mentioned that PAHL could include some outdoor activities during the warmer weather.

Given that social interaction was reported to be a favorite aspect of PAHL, it was unsurprising that more opportunities to interact with others was suggested. Parents also remarked how much their child enjoyed hearing their name called and wanted there to be more of this. To improve the social component of PAHL, families suggested breakout rooms or limiting attendance to smaller numbers. While breakout rooms are not within the capacity of the program nor the current PAHL design, parents who have participated in various sized sessions have commented on the enhanced interactivity in the smaller sessions. A potential solution to this would be to cap session enrollment, but we acknowledge the challenge this presents and depends on having more facilitators to maintain inclusive participation.

Reflecting on session enjoyment, nine families requested longer sessions. Consistent with parents' recommendation for more age-appropriate activities, some families suggested introducing more age-specific sessions. There were requests for more sessions per day to accommodate for different schedules, particularly pertinent for children who nap at inconsistent times.

There were some requests (n=16) for sessions to be recorded and available to watch later, which could not be fulfilled for privacy reasons. Although watching a recording might offer the benefits of activity ideas for families to try at home, there were already sufficient non-interactive idea offerings available for families. Additionally, the theoretical basis for PAHL is grounded in research that suggests video chat can help maintain social connections in the absence of face-to-face interactions (McClure & Barr, 2016; Tarasuik et al., 2011). It is less likely that watching a recording, void of the social interaction afforded by video chat, would yield similar results of social connection.

Conclusion and Recommendations

Playgroup at Home LIVE appeared to help maintain a routine for many families throughout lockdown and provided activities, ideas, and socialization for children and adults alike. The survey responses indicated that the online delivery of playgroup provided some of the benefits known to occur at in-person sessions,

most notably, social support. Nearly all families reported the sessions made them feel less socially isolated during lockdown, and that they appreciated the ideas for activities to do with their child. By providing a semblance of routine and social connection to families, as well as activities and play opportunities, PAHL may have buffered some of the COVID-19 distress for many families.

The survey findings of PAHL demonstrate that we can remove the physical barrier of playgroup attendance while maintaining program satisfaction and similar benefits. Just as telehealth has removed barriers and improved access to healthcare, PAHL can do the same with playgroups. All children have the right to participate, and personal mobility, immunity, time and financial challenges associated with physically attending should not prevent them from being part of the playgroup community. PAHL has great potential beyond the COVID-19 pandemic, and future efforts should focus on reaching families facing a variety of barriers.

Acknowledgements

The authors wish to recognize the efforts of the entire Playgroup at Home LIVE team, and the families who participated in the evaluation.

Brittany Huber (PhD) has focused her research on the impacts of screen media content and interaction on young children's learning. She is currently a Senior Fellow at the Center for Scholars and Storytellers consulting on children's media creation and writing content for their blog, with a focus on early childhood and evidence-based practices. Brittany also consults with Playgroup Victoria's Practice and Research department, contributing the team's knowledge translation and dissemination efforts.

Joanne Tarasuik (PhD, BSc) is the Research Manager at Playgroup Victoria, performing knowledge translation for internal and external audiences, coordinating research collaborations, providing policy/advocacy advice, and designing and managing internal research and project evaluations. Her PhD was on the highly relevant topic, "Young Children's Experience of Video Communication." She has also been part of the Centre for Community Child Health's Policy, Equity and Translation group at Melbourne's Royal Children's Hospital, examining child development inequity using Victorian and national linked developmental and educational datasets including AEDI, LSAC, NAPLAN, and SEHQ.

Nancylee Merzel is the Playgroup Resourcing and Projects Coordinator at Playgroup Victoria, and led the Playgroup at Home LIVE project, the organization's online program response to COVID-19. She also coordinates the primary prevention programs and playgroup resourcing. Her qualification and experience cover training and assessment, business administration and management, and primary prevention program practitioner.

Deborah Njegac (BBSc, BSW) is the Manager Practice and Research at Playgroup Victoria. Deborah's social work background in the field of homelessness has

informed her work in the playgroup platform and emphasized the importance of the early years. Deborah places a strong emphasis on documentation of playgroup and the utilization of and theory of change for playgroup, thus increasing awareness of the value and benefits of playgroup. Deborah is committed to high-quality program documentation to guide successful implementation and delivery of projects.

References

- Australian Institute of Family Studies (2020). *Families in Australia Survey: Life during COVID-19 Report no. 1—Preliminary findings*.
<https://aifs.gov.au/projects/families-australia-survey-life-during-covid-19>
- Commerford, J., & Hunter, C. (2017). *Principles for high quality playgroups: Examples from research and practice*.
https://aifs.gov.au/cfca/sites/default/files/publication-documents/principles_for_high_quality_playgroups_0.pdf
- de Araújo, L. A., Veloso, C. F., Souza, M. de C., de Azevedo, J. M. C., & Tarro, G. (2020). The potential impact of the COVID-19 pandemic on child growth and development: A systematic review. *Jornal de Pediatria*, 97, 369-377.
<https://doi.org/10.1016/j.jped.2020.08.008>
- de Young, A., Paterson, R., March, S., Hoehn, E., Alisic, E., Cobham, V., Donovan, C., Middeldorp, C., Gash, T., & Vasileva, M. (2021). COVID-19 Unmasked Young Children Report 2: Impact of the second wave in Australia on the mental health of young children and parents. Brisbane. Queensland Centre for Perinatal and Infant Mental Health, Children's Health Queensland Hospital and Health Service.
- Earls, F., Raviola, G. J., & Carlson, M. (2008). Promoting child and adolescent mental health in the context of the HIV/AIDS pandemic with a focus on sub-Saharan Africa. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 49(3), 295-312. <https://doi.org/10.1111/j.1469-7610.2007.01864.x>
- Evangelou, M., & Sylva, K. (2007). Evidence on effective early childhood interventions from the United Kingdom: An evaluation of the Peers Early Education Partnership (PEEP). *Early Childhood Research and Practice*, 9(1), n1
- Gregory, T., Sincovich, A., Harman-Smith, Y., & Brinkman, S. (2017). *The reach of Playgroups across Australia and their benefits for children's development: A comparison of 2012 and 2015 AEDC data*.
<https://playgroupaustralia.org.au/wp-content/uploads/2016/05/Impact-of-playgroup-on-child-development-Feb-2017-FINAL-REPORT.pdf>

- Gross, S., Scott, J., Gale, J., & Bloomberg. (2020, October 28). A city offers harsh lessons after emerging from one of the world's longest lockdowns. *Fortune*. <https://fortune.com/2020/10/28/longest-lockdown-covid-melbourne-australia/>
- Hancock, K. J., Cunningham, N. K., Lawrence, D., Zarb, D., & Zubrick, S. R. (2015). Playgroup participation and social support outcomes for mothers of young children: A longitudinal cohort study. *PLoS ONE*, 10(7), 1-15. <https://doi.org/10.1371/journal.pone.0133007>
- Kinsella, E. (2020, September 2). *As Victoria endures prolonged coronavirus lockdown, mental health workers see devastating impacts of COVID-19*. <https://www.abc.net.au/news/2020-09-02/mental-health-crisis-coronavirus-victoria-lifeline-calls-rise/12588500>
- McClure, E., & Barr, R. (2016). Building family relationships from a distance: Supporting connections with babies and toddlers using video and video chat. In R. Barr & D. N. Linebarger (Eds.), *Media exposure during infancy and early Childhood: The effects of content and context on learning and development* (pp. 227–248). Springer International Publishing. https://doi.org/10.1007/978-3-319-45102-2_15
- McCurdy, K., & Daro, D. (2001). Parent involvement in family support programs: An integrated theory. *Family Relations*, 50(2), 113-121.
- Morelli, M., Cattelino, E., Baiocco, R., Trumello, C., Babore, A., Candelori, C., & Chirumbolo, A. (2020). Parents and children during the COVID-19 lockdown: The influence of parenting distress and parenting self-efficacy on children's emotional well-being. *Frontiers in Psychology*, 11, 2584. <https://doi.org/10.3389/fpsyg.2020.584645>
- O'Sullivan, D., Rahamathulla, M., & Pawar, M. (2020). The impact and implications of COVID-19: An Australian perspective. *The International Journal of Community and Social Development*, 2(2), 134–151. <https://doi.org/10.1177/2516602620937922>
- Pfefferbaum, B., Jacobs, A. K., Houston, J. B., & Griffin, N. (2015). Children's disaster reactions: The influence of family and social factors. *Current Psychiatry Reports*, 17(7), 1-6. <https://doi.org/10.1007/s11920-015-0597-6>
- Saladino, V., Algeri, D., & Auriemma, V. (2020). The psychological and social impact of Covid-19: New perspectives of well-being. *Frontiers in Psychology*, 11, 2550. <https://doi.org/10.3389/fpsyg.2020.577684>
- Sher, L. (2020). The impact of the COVID-19 pandemic on suicide rates. *QJM: An International Journal of Medicine*, 113(10), 707–712. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7313777/>

- Singer, D. G., Golinkoff, R. M., & Hirsh-Pasek, K. (Eds.) (2006). *Play = Learning: How play motivates and enhances children's cognitive and social-emotional growth*. Oxford University Press.
- Stark, A. M., White, A. E., Rotter, N. S., & Basu, A. (2020). Shifting from survival to supporting resilience in children and families in the COVID-19 pandemic: Lessons for informing US mental health priorities. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(S1), S133.
<https://psycnet.apa.org/record/2020-40856-001>
- Storen, R., & Corrigan, N. (2020). *COVID-19: A chronology of state and territory government announcements* (through 30 June 2020).
https://parlinfo.aph.gov.au/parlInfo/download/library/prspub/7614514/upload_binary/7614514.pdf
- Strange, C., Fisher, C., Howat, P., & Wood, L. (2014). Fostering supportive community connections through mothers' groups and playgroups. *Journal of Advanced Nursing*, 70(12), 2835–2846. <https://doi.org/10.1111/jan.12435>
- Tarasuik, J. C., Galligan, R., & Kaufman, J. (2011). Almost being there: Video communication with young children. *PLoS ONE*, 6(2), e17129.
<https://doi.org/10.1371/journal.pone.0017129>