AN ANTHROPOLOGICAL STUDY OF EMBODIMENT THEORY IN ADOLESCENTS THROUGH CULTURE, RELATIONSHIPS TO CARE, AND DAILY ACTIVITIES IN RURAL ECUADOR

by

CHRISTINA NOELLE LEE

(Under the direction of Susan Tanner)

ABSTRACT

This project takes up the call in biocultural anthropology to develop studies with impact on applied work in human health. Aiming to understand the global pattern of declining physical activity among rural adolescents, I argue that the continued exploration of embodiment theory as a promising direction in biocultural anthropology provides the necessary foundations to prioritize youth perspectives of their daily activities. I do this first by reviewing the past thirteen years of anthropological scholarship on physical activity to understand gaps in our current knowledge and look toward promising research directions. I then take the study of daily activities in youth to rural highland Ecuador, where I interview 18 care providers regarding their perceptions of youth in the community as they access their care systems. Here, I find that youth are perceived as both vulnerable and autonomous, but care leaders prioritize teaching as a mode of providing youth with autonomy over their entry into care systems including systems that emphasize youth leisure time and cultural experiences. I then apply the concept of embodiment to examine how youth voices are heard, how they themselves prioritize their activities, and how they reflect on their daily activities in terms of preferences and in terms of importance for family and community life.

This reveals how youth are navigating their globalizing world amidst familial and cultural expectations while maintaining control of their health and wellbeing. Lastly, I show that this study makes contributions to the biocultural synthesis by expanding on the flexibility of methods, theoretical foundations, and intentions with which researchers study applied human health.

INDEX WORDS: adolescents, care systems, daily activities, embodiment theory, physical activity

AN ANTHROPOLOGICAL STUDY OF EMBODIMENT THEORY IN ADOLESCENTS THROUGH CULTURE, RELATIONSHIPS TO CARE, AND DAILY ACTIVITIES IN RURAL ECUADOR

by

CHRISTINA NOELLE LEE

B.A., Taylor University, 2016

MPH, The University of Georgia, 2021

A Dissertation Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

DOCTOR OF PHILOSOPHY

ATHENS, GEORGIA

2024

AN ANTHROPOLOGICAL STUDY OF EMBODIMENT THEORY IN ADOLESCENTS THROUGH CULTURE, RELATIONSHIPS TO CARE, AND DAILY ACTIVITIES IN RURAL ECUADOR

by

CHRISTINA NOELLE LEE

Major Professor:	Susan Tanner
Committee:	Laurie Reitsema
	Jepkorir Rose Chepyator Thomson
	Bram Tucker
	Luci Matailo

Electronic Version Approved:

Ron Walcott
Vice Provost for Graduate Education and Dean of the Graduate School
The University of Georgia
August 2024

DEDICATION

I would like to dedicate this dissertation to my parents for their continued support. They have cooked for me, supported me financially, studied with me, and worried over me every step of the way; to my Grandpa and Grandma English for their constant prayers; to my Uncle Wayne, his commitment to his beliefs inspires me as I try to make a positive difference in the lives of those around me. Lastly, I would like to dedicate this to my Uncle Doug and Aunt Zella for their constant support. Knowing they are proud and invested in the work I do has kept me going even when I thought it may be better to quit. My Uncle Doug's passion for teaching will continue to inspire my work for many years.

ACKNOWLEDGEMENTS

I would like to acknowledge a multitude of people. Naming them all individually would be a book itself, so I will name them by groups. To my committee, thank you for your continued trust and support of this work even when I pushed against others' better judgement. To the bioanthropology community at the University of Georgia, thank you for the endless feedback and mentorship I have received both formally and informally throughout the years. To my graduate student peers in anthropology and beyond, thank you for your time, energy, excitement, and assistance in convincing me to continue through each challenge. To those associated with the writing programming here, thank you for helping me to expand my horizons and knowledge. My practice and engagement in these writing programs has in turn made me a better writer for myself and a better teacher. To undergraduate and graduate students who I have had the honor of teaching from time to time, thank you for helping me to find my passion. To those who supported me during fieldwork, I consider each of you as family. Thank you for your endless support and responding continuously and patiently to my endless questions. To those who have mentored me in various capacities over the years, thank you for supporting me in each leg of this journey.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

THE ADVANCEMENT OF BIOCULTURAL ANTHROPOLOGY THROUGH EMBODIMENT THEORY

Anthropological studies of physical activity span from evolutionary studies of comparative primate biology to studies of play and learning in rural childhoods. However, only recently have anthropologists attempted to bring together the biological, i.e. metabolism and energetics, and cultural, i.e. traditions and households, natures of activity. Furthermore, Hoke and Schell have made a call to biocultural anthropologists to continue expanding approaches that take culture seriously and, when possible, generate insights that can be applied to global public health (2020). This project takes up these calls by looking to understand the global pattern of declining physical activity among rural adolescents from a biocultural perspective. Currently, research from the World Health Organization (WHO, 2022b) and others suggests that these physical activity declines are both rapidly expanding globally and are a threat to current and future health of global populations (Kim & Kim, 2020; World Health Assembly, 2004). There remain calls to understand physical activity from youth perspectives and through qualitative and mixed method research in Latin America (Kline et al., 2017). Youth behaviors are particularly important as they represent current socioecological conditions in a region and act as a predictor of future adult behaviors (Reiches, 2019; Sawyer et al., 2012). This study highlights the voices of adolescents in rural highland Ecuador to explore the use of embodiment theory in not only how researchers study youth, but also how youth understand and conceptualize themselves in their ecological and cultural settings.

The biocultural synthesis

In 2020, the American Journal of Human Biology provided a special issue in which researchers revisited the definition and function of the biocultural synthesis in anthropology. This synthesis began as a call for biological researchers to better consider culture and the political economy in their work with *Building a New Biocultural Synthesis: Political-Economic Perspectives on Human Biology* (Goodman & Leatherman, 1998), with further led calls to better address the whole human within their lived experiences (Dressler, 2005; Leonard, 2020). In their call, Hoke and Schell (2020) place an important emphasis on the flexibility and opportunities within biocultural work and reflect on this work as an act of "doing" rather than "defining" biocultural. They write, "Importantly, this allows for greater openness and inclusivity which we believe will ultimately help the biocultural approach to expand its influence leading to more effective human biology research" (p. 2). They provide seven key actions of biocultural research: Biocultural anthropology "1. Examines interactions of evolutionarily derived human biology and constructed environments and the implications of those interactions for health;" "2. Uses a dialectical, ecological approach to consider the way that humans and their environments are co-constructed;" "3. Incorporates an understanding of political economy and history in considerations of contemporary and past human health and well-being;" "4. Engages seriously with the concept of culture and thinks creatively about how to operationalize it;" "5. Integrates methodologies and theory from all four traditional subfields of anthropology;" "6. By focusing on health and well-being, biocultural anthropology generates practical, applicable insights that extend the benefit of the work beyond the academe;" "7. Reveals and embraces human complexity across space and time, avoiding simplistic and deterministic explanations, and

remaining aware of and attuned to the context and limitations of knowledge production" (Hoke & Schell, 2020, p. 4).

In this project, I engage with three of these seven calls specifically: 1. "Engages seriously with the concept of culture and thinks creatively about how to operationalize it," which becomes clearly invoked in the defining of physical activity and use of methodology within embodiment theory as further discussed below; 2. "By focusing on health and well-being, biocultural anthropology generates practical, applicable insights that extend the benefit of work beyond the academe," which is best expressed in the introduction and the last chapter of this work as I review the applied work completed during the process of the research and in consideration of the results as they will benefit local care organizations; and 3. "Reveals and embraces human complexity across space and time, avoiding simplistic and deterministic explanations, and remaining aware and attuned to the context and limitations of knowledge production," (Hoke & Schell, 2020, p. 4) which is represented in this dissertation through how research is attuned to the youth experience of physical activity in rural Ecuador.

Definitions provide a place to begin to understand the biocultural aspects of physical activity. Table 1.1 provides a series of functional definitions of physical activity as understood and used in varying contexts. For example, while Ulijaszek (2018) emphasizes the practicality of physical activity for its applied use in anthropology and other fields, Brewis (2003) understands physical activity best as activity patterns that are elicited in childhood due to local cultural expectations. Meanwhile, I suggest that for this study, physical activity is based most importantly in human expression which may be defined and limited by constructs such as the environment and culture.

Table 1.1: This table represents some functional definitions of physical activity as they have been used in various biocultural disciplines. Physical activity is not limited to these definitions, but understanding a scoping view of how physical activity may be defined and therefore studied, helps to introduce and understand its practicality as a biocultural study topic in anthropology.

Theoretical approach(es)	Physical Activity Definitions	From
Kinesiology and Public Health	any movement of the body that results from the contraction of skeletal muscles and requires energy beyond what is needed at rest	Caspersen, 1985; *National health interview survey: Glossary*, 2017
Human Biology	"Used … to try to capture the integration of complex behaviors associated with human movement and relate them to measures of health and illness"	Ulijaszek, 2018, p. 84
Evolutionary Anthropology	often used synonymously with exercise and aerobic activity to measure energy expenditure while describing shifting lifestyle patterns, energetic responses to changing environments, or comparative biology	Reichlen, et al., 2016; Pontzer, 2015
Biocultural anthropology	Activities that represent cultural expectations, especially in childhood, as children learn to participate in community-life and the necessary skills, such as herding or childcare (more generally discussed as 'activity patterns' to account for sedentary activities)	Bock, 2002; Brewis, 2003; Lew-Levy et al., 2019
As I define it for this study	a biocultural manifestation of energy use determined by factors of influence traded between environmental pressures, societal values, and individual human expression	2024

Using this definition of physical activity, I include movement and a lack of movement. Combining both movement and lack of movement is usually termed daily activities, however overlooking the lack of activity in measures of physical activity may limit how research

understands the values and meanings behind activities. Therefore, this manner of understanding physical activity can bring new insight into the biocultural synthesis as anthropologists continue to explore culture in new ways and bring this extension of culture into how anthropologists understand human complexity in relation to daily behaviors and health. The question then is, to enact this term as part of the biocultural synthesis, how do I then operationalize this definition without simple or deterministic results? In this study, I do this using the theory of embodiment.

Embodiment theory

The concept of embodiment from psychological anthropology provides a model by which to understand how local environments lead to biological change (Csordas, 1990). Embodiment is a prominent theory in the human and social sciences (Farnell, 2014). This theory suggests humans and their biology do not just create culture and environment but are also impacted by culture and environment (Csordas, 1990), suggesting that humans change, interact, and react to their local culture and environment.

The concept of embodiment has recently been used in anthropological studies of physical activity. For example, research by McClure (2020) drew on the ideas of embodiment to identify matches and mismatches between how African American high school girls were expected to behave based on their environments and others' perceptions of their behaviors versus how they identified themselves through sport and athletics. Causes for mismatch ranged from parental pressures on schooling over sports, peers' perceptions of girls as being less athletically competent than boys, and body weight leading to negative stigmatization from peers. All these factors influenced the girls' daily activities as they tried to appease both external pressures and their felt self-identities relative to physical activities. McClure (2020) identified this mismatch as "unembodiment" because they demonstrated how youth may not internalize their embedded

culture or biology when it does not align with their own desires. As such, this theoretic framework provides the space and creativity necessary to understand the complexities of physical activity in adolescent lives.

Embodiment as a biocultural model is not new (Conching & Thayer, 2019; Gravlee, 2009) but continues to grow and expand in its use and effectiveness when paired with novel methods of investigation. I provide a conceptual framework of embodiment in Figure 1.1 to represent how it is invoked in the present research.

As with the research by McClure (2020), this research works with adolescent populations to understand how they are adapting to their ever-changing culture amidst urbanization and globalization. To work with adolescents, the research requires accessible methodology that fits within the theoretical frame of embodiment. As such, the present work includes interviews with adults to establish norms regarding the community culture and expectations of youth and focus groups with youth to understand how they themselves perceive physical activity in their daily lives. These focus groups are a critical part of a larger methodology named Q-methodology.

Figure 1.1: This figure provides a visual explanation of how embodiment theory can be operationalized at various scales to produce novel and expressive results. In this model, I focus on daily activities as the output that can be discussed, measured, and understood.

Q-methodology and subjectivity

Q-methodology uses a factor analysis technique which allows for the expression of participant subjectivity by the evaluation of variation in how participants perceive a topic through a range of possible statements (Brown, 2019; Watts & Stenner, 2012). The study of subjectivity is important because, as Brown writes, "The term subjectivity refers to the things that we say—silently to ourselves as in reveries or publicly to others as in conversation—from our own vantage point, and excluding that which is objective" (2019, p. 565). It is a sense of personhood on the individual level. Studying this personhood is challenging as humans tend to filter thoughts through words and actions, but the philosophy behind this methodology is monism between the mind and body, rather than dualism.

From this perspective, "subjectivity is a behavior or activity and it is activity that is best understood relative to its impact upon the immediate environment" which creates the behavior necessary to understand a person's viewpoint (Watts &Stenner, 2012, p. 26).

Contrary to dualism, monism suggests that

> "The objective mode of activity and the related pursuit of objective description is certainly something that ordinary people do on an everyday basis, but it is more immediately recognizable as the way in which science normally proceeds. A scientific focus on subjective mode, and subjective descriptions, is far less common. This is nonetheless what Q-methodology sets out to achieve. Its studies are typically concerned with those self-referential aspects of experience that are grouped in relation to the person or subject, and their own personal biography." (Watts & Stenner, 2012, p.30)

As such, one's actions and expressions can be taken at near face value being representative of their subjective mindset when elicited appropriately (Brown, 2019).

Subjectivity, therefore, becomes an investigative tool for meaning making in the social sciences. As reviewed by Spindler and Spindler in 1982, learning theories largely drawn from psychology are used to understand the passage of culture from adults to offspring. While many theories and tools to understand this passage have been used through the years, early work by Hallowell (1945, p. 174) as cited by Spindler and Spindler (1982) suggests that core to these theories is a relatively simplistic model to understand the act of influence on teaching and learning culture:

> "It is hard to see how culture – an abstract summation of the mode of life of a people – can exert influence except as it is a definable constituent of the activities of human individuals in interaction with each other. In the last analysis it is individuals who respond to and influence one another" (Hallowell, 1945, p. 174, as cited in Spindler & Spindler, 1982).

Here, researchers can understand culture in its most simplistic action as interaction. Models have since grown to adapt to not only interaction with each other, but also interaction with the environment as shown in the use of embodiment theory earlier (Csordas, 1990).

Within this concept of learning, it is also important to understand that Q-methodology prioritizes variation over consensus (Brown, 2019). In other words, this manner of factor analysis looks for intergroup variation and allows individuals to stand apart from the group if they do not fit within a clear boundary. Work in cultural consensus, of course, holds its own value in biocultural anthropology (Dressler, 2005). However, I find that prioritizing variation is a better course because the purpose of this research is to examine activities among adolescents who are learning the world for themselves, learning to express their ideas, and doing all of this amidst societal, familial, and global pressures. Q-method, as a method that prioritizes finding groups of likeness and a sense of variation to express subjectivity, has successfully worked with adolescent participants as a unique way to allow them to express their ever-developing ideas (Lim et al., 2021; Owens, 2016). This method is discussed in greater detail in Chapter four where it is operationalized with adolescents.

With this work, I aim to advance the biocultural synthesis in this manner of doing biocultural anthropology with adolescents in rural Ecuador. This theoretical framework and methodology aim to best express the adolescents' lived experiences through the activities of their daily lives.

Description of the study location

Ecuador places a focus on community health and wellbeing in the *Good Living National Plan* from 2013 and the *Plan Nacional de Desarrollo* established in 2017 (Consejo Nacional de Planificación, 2017; Republic of Ecuador National Planning Council, 2013). These are both based on the *sumak kawsay*, or good living, movement from Andean indigenous ideology. These national plans recognize the rights of the community to a safe, healthy, and sustainable life. In many cities in Ecuador, these rights are often aided through preventative strategies. In the case of

health, physical activity is emphasized in cities through well-lit and accessible park spaces and in rural regions through soccer and volleyball courts. Ecuador is, therefore, well suited for studies of physical activity and health that contribute to the country's human rights-based public policy. This is particularly relevant to rural regions because they have not yet been the focus of many activity studies but are likely to benefit in the long term from investment in the local youth populations (Kline et al., 2017).

This research takes place in Nabón county, Ecuador. Nabón county is a highland area with a central capital also called Nabón and surrounding rural communities of mestizos and four autonomous indigenous Quechua communities. In total, Nabón county has just over 15,000 inhabitants based on the 6th census (Datos del cantón, n.d.). Approximately 7% of the people live in the urban center, and the other 93% are dispersed throughout this large county and its many communities.

Many people live within traditionally agricultural economies and community structures, but the economies and related culture are shifting as people migrate for diverse occupational and economic opportunities (Cazar & Astudillo, 2007; Datos del cantón, n.d.; Instituto Nacional de Estadistica y Censos & Fondo de Población de las Naciones Unidas, 2001). Due to the diversity of populations both in economic opportunities and cultural identities between mestizos and indigenous groups between the county center and more rural and dispersed communities, this county offers a particularly salient place to study adolescent physical activity and health amid pressures from urbanization and globalization.

Adolescent study participants ranged from 10 to 17 years old, encompassing what the WHO (2022) defines as early and middle adolescence. Participants were also enrolled in the public-school in the county's urban center. Students from various parts of the county would

come to study in the urban center, thereby providing a diverse sample of lived experiences among participants. Students were invited to participate through announcements made in each classroom including the qualifying age groups and letters sent home to parents with a summary of the study. Adults enrolled in the study for interviews were all associated with local care organizations that worked with children and adolescents in the county. Adults were enrolled by snowball sampling, beginning at the health center and moving to the various organizations within the community as recommended by each interview participant.

Researcher statement

As a blonde-hair, blue-eye, and very pale white woman who was quick to burn to a lobster red in the mountain sun, I was very quickly marked as an outsider in the rural county of Ecuador. This, of course, was expected. I had experienced this typical outsider's experience in Ecuador and other Latin American countries, having lived and studied in Ecuador, Bolivia, and Peru in past years. However, what was unexpected for me was how long it took to be recognized as a semi-permanent member of this community. I expected that being visually distinct would work in my favor. The same blonde girl in town, nearly every day. However, as I was partnered with the health center, which had nurses and doctors on one to two-year rural rotations as part of their licensing to practice in Ecuador, the coming and going of faces was relatively normal. I was quick to fit into the rural health center community and the university research community in the city. Being recognized in the town, however, took much longer.

It wasn't until I adopted a dog that I walked through town daily and started organizing after school clubs, that I became more known as an individual amongst those in town. In fact, over a year into my dissertation research, I made a note in my research journal, 'February 22nd, 2023: I have become more recognizable now with Mora [my dog]. "The gringa with the little

black dog." There's also a rumor that I'm dating [a friend], so at least I'm becoming a part of the community.' Becoming part of the community gossip wheel felt like a critical step in my acceptance in town. As they would say, *"Pueblo pequeño, infierno grande"* or "Small town, big hell" when referring to the gossip that meant no one's private life stayed private for long. I was excited to finally join this *"infierno grande."*

At this point, I also became better understood as a researcher and someone who wanted to work with the youth in town. This was great news for those who wished their kids would learn more English or those who felt a foreigner's interest and focus on children was good to ensure their wellbeing, especially amidst several adolescent and young adult suicides during and following the pandemic. This further validated the importance of working with adolescents in the community as they became and remain a population of focus for current and future health and wellbeing of the community.

While there was always some hesitancy around my being an outsider, I found a wonderful community of people who consistently showed interest and support in my work as a researcher, or as someone who created a safe space for their child to play and learn after school. In the end, many sent me messages as soon as I had returned to the U.S. wondering why they had not seen me or, more importantly, my dog recently and asking if my move to the U.S. was permanent or if I would be back. Even my study participants asked that I return for their graduations from high school over the next few years.

As silly as these anecdotes of my own experience may appear, they in fact make up the most critical part of my fieldwork and of my analyses. Knowing that I worked with love and care, that my time was appreciated, that my smile when passing by my usual markets was

recognized, and that my barky little black dog was just as much a member of the community, if not more so, puts more meaning into this work than any academic article or accolade could.

I hope this work comes across with this in mind: that, while it aims to contribute to anthropology and theory, as any good science should, the most important contribution of this work is for those who contributed. Result dissemination to the community began with meetings in November and December of 2023 and continued with my bilingual dissertation defense offered online in 2024.

Layout of the central thesis

In this dissertation, I argue for the continued exploration of embodiment theory as a promising direction in biocultural anthropology. I do this through five chapters; the first provides insight into the current state of the biocultural synthesis and discusses embodiment theory as becoming a promising theory to continue exploring and expanding boundaries of this synthesis. The second is a scoping review on how anthropologists have studied physical activity in the past thirteen years. The aim of the scoping review is to develop a clear understanding of what anthropologists know about the study of physical activity along with future directions for the study. The third chapter looks to understand adult care provider perspectives of youth autonomy and/or vulnerabilities in Ecuador. This is done through a grounded analysis of seventeen interviews completed with adults who work within the public and private care systems of Nabón County. This chapter concludes with an eye toward the value of using multiple perspectives to understand physical activity, as it is clear that within this setting, physical activity cannot be easily untangled from health. The fourth chapter then takes on a view of physical activity and daily activities from the perspectives of the adolescents as they navigate community culture and family expectations in their ever-globalizing world. This chapter explores the questions of

embodiment theory in adolescents, suggesting they are experiencing patterns associated with globalization and able to embody the expectations of their families and local communities while maintaining their identities as individuals. In the last chapter, I suggest this research provides an opportunity to better understand how youth perceive their own worlds, the value of their activities, and, in turn, allows for greater exploration into the meaning of physical activity as both a biological and cultural act through the use of embodiment theory.

CHAPTER 2

LITERATURE REVIEW

ANTHROPOLOGICAL APPROACHES TO THE STUDY OF PHYSICAL ACTIVITY IN CHILDREN AND ADOLESCENTS: A SCOPING REVIEW[*]

[*]Lee, Christina Noelle & Tanner, Susan. To be submitted to the Journal of Human Biology

Abstract

Objective: Review of anthropological and interdisciplinary research on physical activity among children and adolescents over the last ten years; Methods: We conducted a scoping review of original research articles published in anthropological and related interdisciplinary research on physical activity among youth that resulted in 136 sources. We coded abstracts for central research topics, demographic focus of article, and research methods; Results: We identified seven main research themes and twenty research topics of interest to anthropology in the included articles, which also revealed a wide range of anthropological research questions and objectives. Most studies occurred in North America–United States and Canada–, and Europe (most commonly western European nations, such as England, Germany, and Portugal), and rely on quantitative methods to approach the topic; Conclusions: There is room for anthropology to make greater use of a biocultural understanding of physical activity in children and adolescents. This may be accomplished through various study frameworks, with the most promising being embodiment theory, along with mixed methods studies which provide both objective and subjective information on physical activity. This will allow anthropologists to address physical activity not just as energy and a precursor for health but also as a lived experience for youth.

Introduction

Physical activity is studied with diverse definitions and epistemological frameworks. The most common definition of physical activity is any movement produced by the skeletal muscle of the human body (Christenson, 1985, p. 126); however, this definition alone does not represent all the ways of studying, understanding, and experiencing physical activity. Physical activity may be assessed as a unit of energy (kilojoules, kJ), estimated by time spent in activity, or understood subjectively by individual perceptions of their daily routines, exercise practices, and sport

participation. Understanding physical activity from multiple epistemological perspectives provides greater insight into human livelihoods and the diversity of lived experiences as physical activity may occur in many ways: as a form of transportation like walking, as a form of community engagement like sport team participation, or as a form of daily tasks like cooking or cleaning. As such, this scoping review explores our current state of knowledge in physical activity research and related interdisciplinary studies, particularly in the areas of health and wellbeing and their interlinkages.

Within studies of physical activity as it relates to health, understanding culturally relevant concepts of physical activity become more important as trends in urbanization often lead to a decrease in transportation-based or occupation-based physical activity, and concepts of health become intertwined with physical activity as sport and exercise. Particularly in globalizing and urbanizing areas, physical activity has become prescriptively linked with health for those whose lifestyles do not promote sufficient daily physical activity to maintain health (Christiana et al., 2017; Paez et al., 2024).

To understand these evolving links between physical activity and health, anthropologists have joined the call to better address physical activity (Leonard, 2001; Malina & Little, 2008; Moffat, 2010). Within biological anthropology, life history theory provides a framework by which to understand physical activity as an action limited by energetic resources. The theory includes physical activity as part of the energetic balance across the domains of growth, maintenance, and reproduction (Charnov, 2001; Kuzawa, 2007). Within this framework, energetic balance includes considering how physical activity is related to humans' adaptations to ever-changing surroundings and energy needs (Pontzer, 2017; Ocobock 2016).

Anthropological research has also illustrated the complexity of the interactions between humans and our environments. Research has demonstrated how activity patterns may be shaped by subsistence or work obligations (Panter-Brick, 2003; Dufour & Piperata, 2008), life stage energy needs like lactation (Piperata & Dufour, 2007), or how urban planning and political forces have rapidly shaped opportunities for activity in growing metropolitan areas (Hills et al., 2019; Ulijaszek, 2018; Ulijaszek, 2023). For example, Ulijaszek (2018) argues how, in urban 'smart' environments, physical activity and by extension, long-term human health is being left behind as our need for fast-paced, car-adapted, and technology-oriented spaces increases and our walkability, agricultural space, and daily occupational fitness decreases. This research is largely directed toward how trends in urbanization relate to changing health and physical activity (as 'exercise') needs.

Related approaches situate activity and behavior within the larger social, political, ecological, and economic landscape, often employing socioecological models. These models examine how social determinants of health act and interact simultaneously across levels from the individual, family, community, or nations (Kreiger, 2001). While such studies have been conducted in diverse populations, providing necessary perspective to human variation, social determinant models often fail to consider the benefits and resilience of communities and culture to manage health even through times of great change (Larsson, 2013). Other theories and framework practices have begun investigating this human ability to manage health and may be worth continued exploration (i.e. resilience theory) (Barrio, 2016).

Even within anthropology, disciplinary specialization presents challenges to studying the interplay between individual biology and the broader social, cultural, political, and economic systems within socioecological models. For example, the cultural nature of activity as sport has

been most thoroughly researched within the Anthropology of Sport scholarship (Besnier et al., 2018) and field cases such as the political participation that community activities like soccer games may require of otherwise invisible community members like immigrant farmworkers in an agricultural town in the western United States (Santos Gómez, 2017). The anthropology of sport also reviews how human biology overlaps with ritual and societal expectations of behavior to create a sport (Besnier et al., 2018; Sands & Sands, 2010).

A promising research direction for untangling biocultural influences on physical activity and health may be found in the growing scholarship on children and adolescents. This is because these ages represent critical periods for human development, growth, and social and cultural learning (Silva et al., 2020; Worthman & Trang, 2018). Thus, childhood and adolescence provide an opportunity to study how youth behaviors shape and develop into adult behavioral patterns, health, and wellbeing while they undergo significant biological and cultural maturation (Brumbach et al., 2009; Worthman, 2019).

Research in anthropology often looks to youth development and behaviors to understand the relationships between biological and cultural maturation. For example, several researchers have studied how gender differences in adolescence begin to shape future health as expectations for youth activities, diets, and biological maturing begins necessitating changes to youth's energy balance (the difference between energy intake and energy expended) (Brumbach et al., 2009; Kramer, 2014; Reiches et al., 2013; Silva et al., 2021). Since behavioral changes between women and men's roles develop in middle childhood and are already firm by later childhood (Froehle et al., 2019; Lancy, 2018; Lew-Levy et al., 2019), many researchers have looked to how expectations of gendered adolescent work and participation in the household economy begin to determine how adolescents use their time and energy in their daily life (Gaskins, 2000/2008).

These insights into human development reveal the interwoven influence of biological development and sociocultural learning.

Another relevant approach understands physical activity broadly as a practice in daily life that uses energy and is representative of a kind of cultural and community decision-making process (Worthman et al., 2019). In this process, individuals, whether consciously or unconsciously, follow or reject expectations of behavior and learning thereby shaping culture through action or inaction (Urlacher, 2023; van Amsterdam & Knoppers, 2018).

Late childhood and adolescence, represent important periods to consider how physical activity represents the intersection of biology with all aspects of the social, cultural, natural, and built environments. Late childhood and adolescence are important formative periods where expectations, norms, and systems of value about adult behaviors are established (Brumbach et al., 2009; Worthman & Trang, 2018). Therefore, late childhood and adolescence are key to understanding community health (Leonard, 2001; Malina, 2001). In her review "Nutrition, Activity, and Health in Children", Darna Dufour (1997) concludes by stating:

> "…we do not have a very clear understanding of how social, cultural, and environmental differences affect the physical activity of children. The assumption seems to have been that some level (exactly what is unclear) of physical activity in children is biologically driven and therefore that social, cultural, and environmental differences are not relevant. It is quite clear, however, that the level of physical activity in children is a biocultural phenomenon and needs to be approached that way" (p. 561).

The objective of this scoping review is to identify the current state of anthropological research on physical activity in child and adolescent populations. This builds on current research trends looking at biocultural perspectives of physical activity in children and adolescents' developing lives. We present a review of the articles as they relate to key research topics within physical activity, followed by a review of study demographics and methodology identified across the published research used in this review. We then review the methodological advancements

and various epistemological models of physical activity to assess future directions in physical activity research for anthropology. Through the review, we identify areas worth expanding and exploring that anthropological approaches can address. Anthropological approaches of high potential utility include qualitative and mixed methods approaches and expanding work into various framework and theories, including socioecological frameworks and assemblage theory, life history and niche construction theory, and embodiment theory.

Methods

The purpose of this scoping review is to understand how physical activity is studied within the field of anthropology. According to Arksey and O'Malley (2005), the purpose of a scoping review can include disseminating research findings, identifying the current scope of a research field, determining if there is a need for systematic review within a set of literature, or identifying gaps in the research field. We followed the steps outlined by Arskey and O'Malley (2005) and expanded by Levac and colleagues (2010) for the methodology of this review.

We first identified the objective of the review, which was to examine the scope of research on physical activity during childhood and adolescence in anthropological research and related interdisciplinary works. While this review is focused on anthropology and is not comprehensive of the social sciences, we believe the additional journals provide important perspectives to how physical activity is understood for anthropologists as well as communicated in the broader social sciences. In total, we searched the anthropological database, AnthroSource, which includes journals recognized by the American Anthropological Association, and the following journals separately as they are not included in AnthroSource: Obesity, Social Science & Medicine, Health, Current Anthropology, Human Organization, American Journal of Human Biology, and American Journal of Biological Anthropology. We searched for English language

research articles published between Jan 2010 – Dec 2023 using the keywords "physical activity" and "sport" along with "adolescents" and "children." For this review, children and adolescents included participants ages 3 to 17. We selected these keywords because broader terms like "work" and "play" returned largely irrelevant articles referring to work conditions or psychosocial development.

In total, the search returned 7,691 results through the keyword search with date and language limitations set in the selected journals and database. We then conducted a title and abstract scan to limit articles to those that addressed physical activity or sport as any movement produced by the skeletal muscle of the human body. For example, we excluded research that traced the political and economic histories of sports or sport teams and symbolism of team mascots or events such as the Olympics. We further excluded articles describing intervention methods, reviewing intervention results, review articles (those not presenting cross-sectional, case, or ethnographic data/studies), book reviews, and articles that did not focus on physical activity or sport in children or adolescents. We also excluded conference poster abstracts from the search where they had not been removed by the electronic search specifications.

After the title and abstract review, 136 articles remained. Through the interactive process of the review, we identified several articles that did not appear in the original search on the topic, but which contribute directly to the topic and, as such, were included. These articles did not turn up in key word searches because they identified sedentary behaviors or learning behaviors rather than using "physical activity" as a key word, though physical activity remained prevalent in these articles. All articles included in the final review are provided in the appendix.

We used a grounded theory approach, which uses inductive, concept-driven, and interactive charting processes (Bernard, 2007) to identify relevant code topics, categories, and

relationships in MAXQDA (2024). The coding structure remained flexible through this process to continue addressing new concepts as they appeared in the articles. Our final code list included a breakdown of qualitative, quantitative, and mixed-method studies, descriptions of the study population including age, ethnicity, and geographic region, and descriptions of study components, which we refer to as study topics moving forward, including biological measures of health, socioeconomics, obesity, measures of local geography, etc. We discussed and defined each code to improve coding reliability across coders. After abstract coding was complete, we identified the most frequent topics, study populations, and methods using frequency tools in MAXQDA (2024).

Results

We begin the results with an overview of the main topics identified in the full dataset reviewing physical activity in childhood and adolescence as presented in Table 2.1. From there, we look at the demographic representation within the dataset. We review the methods used in each study and their purpose and utility.

Table 2.2: Topic categories as defined for assessment of study content in MAXQDA (2024). These definitions are not intended to be comprehensive of the categories themselves, but rather act as a guide to ensure that coding is performed the same across coders.

Code System > Study Topics	**Code Definitions**
Biocultural	The integration of biology and culture as understood from an anthropological perspective; includes attention to the physical acts of movement and social or cultural factors (religion, ethnicity, acts of gender roles, etc.)

Bioarchaeology	The study of human remains as they relate to past cultures and experiences.
Evolutionary human biology	The study of human biology to understand past and future trajectories of human movement in various contexts such as foraging, i.e., biomechanics.
Exercise, fitness, physical activity	Measures of physical fitness often represented as VO2max, cardiorespiratory fitness, or strength and tested though standardized fitness assessments.
Sport	Includes sport participation, formally or informally organized sport activities, and discussions of equity in sport.
Sedentary behaviors	Includes activities that do not require physical activity but consume time in daily life, such as work, sedentary transport, or time spent watching TV.
Weight loss	The concept that physical activity is critical to weight loss, most often represented with overweight or obese populations or population trajectories.
Food, diet, nutrition	A focus on the nutritional value of foods, food availability, food scarcity, or food diversity.
Obesity	Determined by BMI, body fat mass, or similar methods that are expected to determine a level of "fatness" in the population.
Biomarkers	Includes anthropometrics, body fat, skeletal morphology, musculature, and DNA.
Medical health, disease, research	A focus on cardiometabolic health, diabetes, health behavior (smoking), genetics, disease populations, excluding diet and injuries during activity.
Mental health	A focus on the relationship between physical activity and mental health defined as holistic wellness or the presence of mental illness.
Self-perception	How participants perceive themselves in relation to one of the topics (for example, physical activity, sport, or obesity) of the study.
Economics	Defined as monetary status and inclusive of socioeconomic status represented by geographically defined populations.
Family environment	A focus on the family setting and relationships including motivation, household structure, family behaviors, and occupations.
Social environment	A focus on relationships as identified by school, peer groups, or neighborhood public spaces.
Built environment	A focus on elements of the built and developed environment, such as safety, access to green space, or transportation methods based on built dependency.

Natural environment	A focus on the natural environment such as naturally occurring green space, rivers, or other naturally occurring environments.
Age group variation	A focus on how physical activity or other related measures vary by age in children and adolescents.
Gender variation	A focus on how physical activity or other related measures vary by gender in children and adolescents.

Some of this information is visually represented in the word frequency cloud provided in Figure 2.1. From the word cloud we learn that socioeconomics, environments, and health, all though a wide variety of terms, are prevalent in this review. For example, many core topics appear in the word cloud through words like “environment,” “socioeconomic,” “neighborhood,” “family,” “social,” and “medicine,” which then became several of the topic categories as they appear in Table 2.1, including “Family environment,” “Social environment,” “Natural environment,” “Economics,” and “Medical health, disease, research.” This cloud reveals common topics of “gender,” “body,” “composition,” “overweight,” “behavior” and “lifestyle.” These topics then developed into the categories “Gender variation,” “Exercise, fitness, physical activity,” “Sport,” “Sedentary behaviors,” “Obesity,” and “Weight loss.” Many words associated with quantitative assessments of physical activity through accelerometry, including “time,” “level,” and “moderate-to-vigorous,” also appear in the first 100 most frequent words. “Questionnaire” also occurs, noted 27 times as shown in Table A.1 in the appendix. “Schools,” “preschoolers,” “rural,” “China,” and “Tibetan” also provide some insight into common categories in demographics that center studies of children and adolescents around school populations and comparisons between urban and rural populations globally.

Figure 2.2: Word Cloud representing word frequencies of top 100 words as they appear in the titles and abstracts of articles included in the scoping review. (excluding common grammatical words such as “the, it, and” etc., verbs such as “are, were, is,” etc., and common abstract terms like “methods, results,” etc.). Larger words correspond to higher frequencies of a word identified across abstracts and titles, and smaller words correspond to lower frequencies.

Research topics

There has been a broad scope of research themes addressed in anthropological and related social science research focused on physical activity among youth between 2010 and 2023. A core correlation in these themes include the economic and spatial correlates of physical activity levels, determined by identifying correlations between the topics “economics,” “social environment,” and “natural environment” as seen in Table 2.2 (Brewer & Kimbro, 2014; Carroll-

Scott et al., 2013; Creighton et al., 2012; Elgar et al., 2016; Evans et al., 2012; Kimbro et al., 2011; Nevill et al., 2016; Noguiera et al., 2013; Oliver et al., 2023; Prados et al., 2023; Schmengler et al., 2022). For example, Oliver and colleagues (2023) assessed facilitators and barriers of children's adventurous play in Britain finding that, regardless of socioeconomics or geography, parental concern of risk and children's safety lead to a decrease in adventurous play. The authors conclude that concerns that limit their children's play may negatively impact children's physical and mental health (Oliver et al., 2023).

In Table 2.2, the most interrelated codes are "social environment" with "family environment" coded together in 18 separate abstracts. The next most related codes are "built environment" with "social environment" coded together 16 times. It should also be noted that "obesity" also related strongly to "biomarkers" at 11, "social environment" at 12, and "family environment" at 12. We can specifically identify an interrelationship between many of these topics in Rodrigues and colleagues' (2018) work as they note that social and family environments are correlated to physical activity and obesity in childhood, revealing that family behaviors like parental TV viewing and physical activity behaviors along with socioeconomic status impact children's physical activity and sedentary behaviors. Nevill and colleagues (2016) acknowledged deprivation, measured economically by zip code, as a key factor in obesity and physical activity in childhood.

Table 2. 3: This table represented the coding relationship between codes, placed both on the x and y axes to identify how many times codes overlap in a document across all documents (in this case, the document coding is set to capture codes within abstracts). The rate of coding relationships is noted in light blue to vibrant red boxes from least to most inter-related through coding, respectively. The numbers presented in the colored boxes represent how many times the topic categories are coded within the same document.

A second important overlap in key topics is how social environments, networks, and peer groups influence physical activity (Aalsma et al., 2012; Creighton et al., 2011; de la Haye et al., 2011; do Carmo et al., 2020; Larson et al., 2013; Macdonald-Wallis et al., 2011; Marques et al., 2014; Pabayo et al., 2011; Quinn et al., 2023; Van Amsterdam & Knoppers, 2018). For example, Mackdonald-Wallis and colleagues (2011) interpret how friendship networks influenced physical activity in children from 10 to 11 years old in the United Kingdom. Using network analysis, the researchers determined that children did tend to cluster in friendship groups of similar physical activity levels.

Another common theme is the investigation into how norms and values influence activity levels (Carroll et al., 2021; Chang et al., 2020; Ergler et al., 2013; Froehle et al., 2019; Kidokoro et al., 2022; Kramer & Greaves, 2011; Mollborn & Modile, 2022; Sayre et al., 2019; Silva et al.,

2013). For example, physical activities for youth are linked to norms about outdoor activities and spring in many places that experience seasonal variation, such as Portugal (Silva et al., 2013), New Zealand (Ergler et al., 2013) and Central China (Chang et al., 2020). Another approach to considering how norms and values shape physical activity is illustrated by Carroll and colleagues (2021) discussion of how the cultural significance of sport in New Zealand combined with discriminatory practices result in a situation where non-able-bodied children are unwelcome in sporting environments with their peers.

We also find that physical activity in children and adolescents is investigated along with self-perceptions of body, confidence, and enjoyment in physical activity (Davison & Deane, 2010; Elgar et al., 2016; Huh et al., 2011; Marques et al., 2014; McClure, 2020; Monaghan & Gabe, 2016; Pate et al., 2022; Ribeiro et al. 2024; Sabiston et al., 2022; van Amsterdam & Knoppers, 2018). For example, in a study of schoolchildren ages 10-12, Marques and colleagues explored a range of demographic, social, behavioral, and psychological variables to determine their relationship to physical activity. They found that a sense of physical and academic competence both positively correlate to time spent in physical activity for both girls and boys (Marques et al., 2014).

Meanwhile, many anthropologists look to how cultural expectations of physical activity for learning impact gender and aging norms for children through adolescents (Hunleth, 2019; Jirata, 2019; Nogueira et al., 2020; Sayre et al., 2019; Spencer et al., 2019; Tian, 2018). In a particularly unique example, Hunleth (2019) reviews ethnographic fieldwork with children ages 8 -12 living in households with people with tuberculosis and HIV. In this study, Hunleth suggests that children, though limited in their abilities to provide care, play in ways that create

imaginary or even performative care, showing the cultural and social responsibilities children felt and their value as caregivers in their home environment (2019).

Biomechanical models of physical activity, skill development, and physiological development are also present, revealing both a modern cross sectional and an evolutionary view of physical activity as it relates to human development (Drenowatz et al., 2010; Gregoricka, & Baker, 2023; Kramer & Greaves, 2011; Magalhães et al., 2022; Miller et al., 2018; Pate et al., 2022; Pitfield et al., 2019; Xia et al., 2023; Zhang et al., 2022). Pitfield and colleagues (2019) provide a bioarchaeological perspective of childhood development with skeletal markers of consistent load bearing in the arms beginning around 7 years old, which aligns with the cultural expectations of beginning work around this age in medieval times.

Each topic offers its own critical insight into physical activity studies and overlaps among topics allow us to understand the scope of work from an anthropological perspective. The scope of the research spans 20 identified topics of interest as presented in Table 2.1 and shown in relationship in Table 2.2. Unsurprisingly, the demographic and methodological scopes in research on physical activity follow suite in their breadth.

Demographic and geographic patterns

There are several demographic patterns that emerge in the research from the previous thirteen years. These range from large multinational, multisite comparative research on physical activity patterns among schoolchildren (de la Rie et al., 2023; Duncan et al., 2015; Evans et al., 2012; Jurak et al., 2015; Lee & Lim, 2022; Sorić et al., 2015), such as the 38-country cross-sectional comparison from Europe and North America (Marques et al., 2020), to research that focuses on a specific location, group or community (Downey, 2016; Froehle et al., 2019; Jirata, 2019; Kramer & Greaves, 2011; Ojiambo et al., 2013; Rivera-Morales et al., 2020). One such group includes an assessment of active foraging strategies by Brazilian street children by

Downey (2016). This study reviews how urban landscapes simplify foraging skills for children who become homeless without adult support well before the age of accepted independent living in an urban society.

A minority of research focused on only one gender. For example, eight articles focused only on girls (Bim et al., 2023; Drenowatz et al., 2010; Kramer & Greaves, 2011; Marques et al., 2016; McClure, 2020; Mota et al., 2011; Pate et al., 2022; Shaban, 2018) and only four articles focused only on boys (Lätt et al., 2016; Pastuszak et al., 2014; Rebeiro et al., 2024; Valente-Dos-Santos et al., 2015). An additional 21 articles addressed gender variation in physical activity levels or types of activities (Bondi et al., 2022; Chen & Phipps, 2021; Evans et al., 2018; Froehle et al., 2019; Jurak et al., 2015; Khatun et al., 2016; Larson et al., 2013; Lee & Lim, 2022; Lombardo & Otieno, 2021; Martinez-Gomez et al., 2010; Miller et al., 2018; Nogueira et al., 2020; Rietsch et al., 2013; Rodrigues et al., 2022; Rodrigues et al., 2023; Sabiston et al., 2022; Silva et al., 2016; van Loon et al., 2014; Venetsanou et al., 2019; Zhang et al., 2022; Zorilla-Revilla et al., 2022). As an example, Froehle and colleagues demonstrate that a gender-based division of labor begins among Hadza living within their ethnic communities in middle childhood and affects how children spend their time in various activities (2019). Other studies looked at how gender related to sport and exercise participation in youth finding that girls were more often influenced by their peers with low physical activity levels (Larson et al., 2013) and less likely to participate in sports or exercise (Rietsch et al., 2013).

Finally, the sample included studies from every continent, but the majority of the research was focused on North America (especially the Unites States and Canada) and Europe (particularly Western Europe). This is consistent with the recent reviews by Ramirez Varela and colleagues (2021) and Aubert and colleagues (2021) showing total physical activity research

publications are more commonly focused on North America, particularly the United States, and Europe.

Common methods

Quantitative approaches

Many articles drew heavily on wearable devices that collect multiple measures of physical activity including step counts or motion in multiple dimensions (accelerometers) to assess physical activity levels among adolescents. Nineteen articles included an objective measurement of activity such as an accelerometer or pedometer (Applehans et al., 2022; Bim et al., 2023; Davison & Deane, 2010; de Souza et al., 2022; de Souza et al., 2023; Fertig et al., 2022; Katzmarzyk et al., 2015; Kidokoro et al., 2022; Manco et al., 2019; de Lucena Martins et al., 2021; Muthuri et al., 2015; Pate et al., 2022; Rietsch et al., 2013; Van Loon et al., 2014; Venetsanou et al., 2019; Williams et al., 2016; Zorrilla-Revilla et al., 2022), and only 9 of these publications combined objective measures of physical activity (pedometer and accelerometer) with survey or interview methods of daily activities (Davison & Deane, 2010; Fertig et al., 2022; Katzmarzyk et al., 2015; de Lucena Martins et al., 2021; Muthuri et al., 2015; Rietsch et al., 2013; de Souza et al., 2022; de Souza et al., 2023; Venetsanou et al., 2019). For example, Rietsch and colleagues (2013) found that skeletal robustness was associated with activity levels captured with pedometers and BMI was associated with subjectively reported TV time. In Greece, Venetsanou and colleagues (2019) found that pre-school aged children had higher objectively measured physical activity levels when their parents reported under 1-hour of screen time for their pre-school children each day.

The fact that few studies combine objective and subjective assessments of physical activity among adolescents is important because there is scholarship demonstrating that subjective assessments of physical activity tend to underreport activity, especially activities that

wearable monitors indicate fall into the moderate to vigorous activity level categories (Leonard, 2003). For example, Muthuri and colleagues (2015) found no associations between direct measurement of activity and self-reported measures of physical activity and sedentary behavior overall among Kenyan children, but weak or moderate associations among youth that were classified as under or normal weight (p.240). Findings like these demonstrate the value of combining information on both subjective and objective measures of activity.

Several large, national and multinational studies contain expansive assessments of lifestyle, diet, and activity through surveys and questionnaires to understand the connection between physical activity, body size, and health outcomes (dos Santos et al., 2023; Katzmarzyk et al., 2015; Kim & Kim, 2020; Li, 2020; Magalhães et al., 2022; Marques et al., 2020; Prados et al., 2023; Rodrigues et al., 2022; Rodrigues et al., 2023; Schmengler et al., 2022; Sharman et al., 2021; Silva et al., 2021; Venetsanou et al., 2019). For example, Katzmarzyk and colleagues (2015) use parental reports of TV viewing and accelerometers and survey measurements of diet to understand behavioral risk factors of obesity among youth in a multi-country study.

Finally, there is a small but interesting theme that uses surveys and questionnaires to assess the perceptions surrounding activity. Davison and colleagues (2012) evaluated physical activity and parental support as it relates to social capital in youth. Davison and Deane (2010) show in their study in the United States that there is little association between parental expression of encouraging physical activity for weight loss and objectively measured activity among the girls in their study. These studies point to the need to study both objective and subjective measures of activity levels as well as considering what activities are viewed positively or negatively. Research like this has the potential to resituate activity into the social environment and show how the social and physical environment is embodied through activity.

Qualitative and mixed methods research

Scholarship that employs qualitative and mixed methods points to an important gap in understanding how a person's lived experience informs physical activity (Buliung et al., 2021; Carroll et al., 2021; de Souza et al., 2022; de Souza et al., 2023; Downey, 2016; Kramer & Greaves, 2011; McClure, 2020; Mollborn & Modile, 2022; Oliver et al., 2023; Parrish et al., 2022; Sharman et al., 2021; van Amsterdam & Knoppers, 2018). An example of this is McClure's (2020) ethnographic study of how gender, class, and other social identities inform physicality among African American women and girls. Similarly, Mollborn and Modile (2022) use interviews to understand how youth understand health "performance" as cultural capital linking the performance of healthy behaviors to moral worth.

By integrating mixed methods, Kramer and Greaves (2011) combined biological growth and activity data with ethnographic data from Pumé communities of Venezuela to understand how girls' activity levels are impacted by the environmental seasonality and occupational expectations on women in the communities. Such mixed methods studies provide greater context for the differences in human physical activity levels and expectations for daily activities in various environments. Although accomplished in different ways, these studies demonstrate the value of investigating the tension between the body and society, or the biocultural reality of physical activity (Kramer & Greaves, 2011; McClure, 2020; Mollborn & Modile, 2022).

Discussion

The main question driving this review is to identify the scope of research in anthropology that focuses on the study of physical activity among adolescents. In this section, we return to the results' key findings and review ways in which the field is led forward in two key ways: (1) research methods, and (2) research models/research frameworks.

Research Methods

We begin by reviewing what we have learned from methods in physical activity studies and how methodology may further drive physical activity research forward. Amid increased attention to wearable biomonitors that allow data collection without face-to-face interactions and cautions about recall error in survey methods to capture physical activity (Dhurandhar et al. 2015), it is not surprising that there has been an increase in the amount of research that includes objective measurements of activity. However, it is important to note that combining methods of data collected with devices along with surveys or interviews is not common over the previous 10 years and data collection by devices and/or surveys has come with a share of critiques as methods and models cause variation in systematic reviews (Hidding et al., 2018).

This ability to gather large amounts of data on individuals' daily behaviors can create rich databases of information and, in turn, new challenges to our handling of data (Savat, 2012). As data from activity wearables is built into smartphones, watches, and more, there exists a lot of data on human activity. Not all this data is open or accessible to researchers or the public and little may be known about much of the data that comes from smartphones or other wearable technology outside of the selling company. While there are incredible possibilities for such databases in studying human health, behavior, and variation, this also draws into question new ethical considerations of data management and biomonitoring (Bauer, 2008; Kukafta, 2019; Sui et al., 2023). The ability to track and intervene in human behavior with real-time biometric data suggests a need to constantly reevaluate the use and purposes of these devices and study designs through practices and frameworks in bioethics.

Future research will also need to turn toward qualitative and mixed-method analyses to better understand how structural, social, and individual factors hold influence over daily physical activity behaviors. As physical activity behaviors are actions that children and adolescents may

choose or be expected to complete, both objective and subjective measures of physical activity become critical to understand the lived experience of these actions. Since adolescents are also in the process of determining their own culture and setting expectations for themselves in their adult lives, their subjective perspectives on daily activities are particularly important to understand the state of their actions and reactions amidst their cultural and familial expectations, globalization, and new learned behaviors and experiences unique to their time and place (Brumbach et al., 2009; Worthman, 2019). As such, qualitative methods such as interviews and focus groups with children and adolescents and interactive surveys may provide critical opportunities to understand these subjective perspectives along with objective measures of activity and health.

Research Models

Interestingly, within anthropological studies, few topics overlap in both physical activity and cultural connections though it has been argued that the biocultural perspective is a critical strength to anthropological studies of physical activity and their relationship to lived human experiences (Dufour, 1997). The research topics identified in the scoping review fit into several established anthropological models of study, aka research frameworks, for exploring the biocultural and biosocial nature of activity. These research models include 1. socioecological framework and assemblage theory (Carroll et al. 2021), 2. life history theory and niche construction theory (Downey, 2016), and 3. embodiment (McClure 2021).

Socioecological framework and assemblage theory

First, we discuss that research commonly employs socioecological models. Models that include information about social and ecological contexts are familiar to anthropologists (Huss-Ashmore, 1985; Ready & Collings, 2020; Stinson et al., 2012; Wiley, 2004) and provide valuable examples of how physical activity is embedded in social, economic, and ecological

contexts. For example, Evans and colleagues (2012) determined that neighborhood green space, less common in economically disadvantaged neighborhoods, linked economic status and obesity in children because green spaces promoted physical activity. Exemplifying research within the socioecological model of health and disease, these studies show how environmental factors like neighborhood economics are critically linked to physical activity levels in youth.

Physical activity research within public and global health is receiving increased attention as population health research shows globally decreasing physical activity rates and the associated health concerns (Bauman et al., 2012; WHO, 2020). Within the physical activity scholarship, particularly in critical medical anthropology and public health approaches, socioecological models are useful to understand physical activity, health, and wellbeing (Armelagos et al., 2010; McLeroy et al., 1988).

There are several lines of research that examine the role of environments, including neighborhood traits, socioeconomic environments, and social networks in youth physical activity levels. For example, Creighton and colleagues (2011) study how international social networks, household economic structure, and access to public infrastructure like parks in Mexico relate to childhood activity levels. Carroll-Scott and colleagues (2013) found that the frequency of exercise among youth was associated with both their perceptions of their neighborhood and if their neighborhood had greenspace or playgrounds. These students' perceptions then correlated to their BMI status, which further demonstrates the value in studying both individual experiences along with the social and environmental context of physical activity.

Articles using assemblage theory were unique to the review; assemblage theory is the idea that health is formed by a series of encounters of relations, events, and affects (Duff, 2014) - within a socioecological framework. For example, Carroll and colleagues (2021) assess disabled

youth perspectives on their inclusion or exclusion from sport in New Zealand as they navigate interpersonal relationships, school, and cultural expectations of disability.

Many of the articles published between 2010-2023 examine how associations between the built, natural, and social environment create structural barriers or opportunities for physical activity. This research also illuminates how sedentary behaviors or low physical activity levels can also be understood as a result of economic, ecological, and political processes that have consequences for individual biology (Mollborn, & Modile, 2022; Scheper-Hughes & Lock, 1987). Scheper-Hughes and Lock are often credited for the development of the beginnings of these socioecological approaches with their three bodies approach (Scheper-Hughes & Lock, 1987).

The use of socioecological models and the movement toward assemblage theory in the realm of health and wellbeing provide critical insight into not only systematic understandings of physical activity across space and time but also within individual experiences. Other reviews of physical activity studies outside of anthropology, such as the 2012 review by Bauman and colleagues, also find that ecological models pointing to economic conditions, social environments, and built environments are critical to understanding physical activity.

Life history and niche construction theory

As noted in the results of the research topics, many topics within the physical activity literature in anthropology place precedence on family practices and the impact of those practices on childhood and adolescent physical activity and health (Table 2.2). Urlacher (2023) points to the importance of nutritional allocation to children in family settings as children remain dependent on others to receive sufficient nutrient intake until they learn to provide for themselves as he explores the current setting of research on energetics in childhood. The learning process itself, one of learning through practice, requires energetic output. This may be

understood as embodied capital in children as they invest in their learning for future use and wellbeing. The setting in which children use their energy also greatly impacts how they allocate their energy between growth, maintenance of health, development of systems such as the brain, and physical activity (Kuzawa, 2007; Urlacher & Kramer, 2018; Urlacher et al., 2019).

Within constrained patterns of energy use in children and adolescents, youth must learn to navigate their environments in ways that best use the resources available. In niche construction theory, one may argue that the environment itself forces the inhabitants to act according to resource availability and inhabitants then in turn inhabit and develop the environment according to their needs, creating a unique space in which humans act upon and are acted upon by the environment (Fuentes, 2013). For example, Downey (2016) draws on biocultural approaches and niche construction theory to show that children living independently on the streets of urban Brazil use the built environment to simplify their foraging strategies. Downey suggests that the urban environment in fact "evokes" foraging behavior by children as they navigate a resource-rich environment in which foraging is not based on learned complex skills, but rather is accessible with relatively little movement within the urban space (p. S58). From this example, niche construction theory provides a nuanced insight into human adaptations within constrained environmental settings by showing how physical activity is an adaptive practice and energy conservation strategy in various environments. Ulijaszek (2018) provides similar perspective but suggesting that physical activity must be planned and designed within the landscape with smart technologies to create a new experience in sociality allowing humans to interact within and through our technologically driven lives. These studies suggest that the environment in which we live lead to activity or inactivity with human adaptations designed to gain and conserve energy for biological necessity (Kuzawa, 2007; Urlacher & Kramer, 2018;

Urlacher et al., 2019). In regions of plenty or poor nutrient sources, this biologically driven behavior to conserve energy output leads to greater sedentism and, as such, greater health risk (Downey, 2016; Ulijaszek, 2018)

Embodiment

As physical activity is the physical manifestation of the person's motivations and intentions, it allows an opportunity to interrogate the middle ground between biology, individual agency, and the larger social, economic, cultural, and ecological environments. It represents an example of what Ingold & Palsson consider in their book *Biosocial Becomings*, where organisms are not "discrete and pre-formed entities but trajectories of movement and growth" (Ingold, 2013, p. 8) and activity is fundamental to becoming as "the nature with which we are born and which we develop is thoroughly biosocial, embodied through human activities." (Palsson, 2013, p. 24).

Building on this framework, the concept of bodies (Scheper-Hughes and Lock, 1987) and embodiment (Lock, 2001; Worthman & Kohrt, 2005) also deserve additional attention in the study of physical activity. Ingold (1996) discusses embodiment as the process of enskillment, or how humans move, learn, perceive, and interact with the world. An example of enskillment is understanding how different posture and walking patterns emerge and are reinforced through learning, locomotion over different landscapes, and how both create and are maintained by technology like shoes and tools for caring loads (Ingold, 1996).

Illustrating how the body is both the subject and object of culture (Csordas, 1990), Stephanie McClure (2020) illustrates how intersecting identities related to class, gender, and race shape how young women in the United States are able (or unable) to achieve their desires to be physically active and identify as athletes. McClure examines how African American high schooler girls balance their goals to be physically active with social, financial, and academic and

family demands and illustrates how these young women's physical activity levels are not easily reduced to simple explanatory frameworks. In-depth focal studies provide insight into individual behavior patterns and the conscientiousness of their actions within their set environment.

However, we still have room to grow in our incorporation of frameworks that develop localized understandings of physical activity as both biological and cultural in relationship to health and wellbeing in adolescents. As such, we recommend further exploration into the frameworks and theories discussed here, particularly, the theory of embodiment with physical activity as a visible, measurable, conscious, and unconscious marker of local cultural and ecological landscapes.

Conclusion and implications for future research

In this scoping review, we have found twenty unique topics of interest related to research in physical activity. Much of the overlap in these topics occurs in family and built environments revealing that the socioecological conditions of physical activity are core facets to the study in the past decade. While much of this work occurs in urban center with schoolchildren in Canada, the United States, and Western Europe, likely due to ease of access of large populations for quantitative analysis, there are some unique studies that reach beyond these spaces and populations. Such studies often also bring qualitative or mixed method methods to better understand the full lived experience of physical activity. Few studies also incorporate cultural and biological experiences of physical activity to undergo a full biocultural framework, though anthropology is well positioned for such works.

To move forward with integrative studies of physical activity, anthropology has an opportunity to bridge research between structures and lived experiences. With strengths in mixed method research, anthropology is also well-poised to develop innovative studies that combine

quantitative variables of human biology and health with lived experiences from individuals whose lives we draw from to better understand the health and conditions of the world. Combined with innovative theoretical framing that recognizes the importance of socio-ecological spaces and experiences, anthropology maintains an opportunistic positionality to better address not only physical activity as health on a global scale but also physical activity as experience and wellbeing with its diverse interpretations.

Limitations

This study is limited by those resources identified and the journals reviewed. Of course, there may be other articles of interest to this topic that fell outside the scope of this review or language limitations of this study. It is also limited to studies published after 2010 and as such, misses much of the developmental work of the 2000s that allowed for the expansion in physical activity research within anthropology.

CHAPTER 3

CARE SYSTEMS AND PHYSICAL ACTIVITY IN RURAL HIGHLAND ECUADOR: ADULT PERSPECTIVES[*]

[*]Lee, Christina Noelle & Matailo, Luci. To be submitted to the Pan American Journal of Public Health

Abstract

Objective: This article investigates how adults who work within systems of care perceive the adolescent and child experience in rural, highland Ecuador. Methods: We review 17 interviews conducted with 18 community leaders and professionals, all with roles that directly intertwine with the systems of care set up for children and adolescents in the county. We use a grounded theory system of inductive reasoning to code interviews for adult perceptions of youth. Results: We find that adults view youth both as autonomous and vulnerable. By emphasizing topics such as family care and educational opportunities, the community leaders pointed to the ways that youth were able to express their own autonomy in daily lives. Common themes of risk and vulnerability identified in the community included adolescent pregnancy, alcohol use, and a lack of economic opportunity in the community that leads to adult migration. Adults also suggest a need to better understand youth and integrate their needs and desires into their care systems. Conclusion: This research identified a multisectoral system of care aimed at youth that links hospitals, schools, and civic institutions and illustrates how questions of physical activity and youth leisure time quickly pivot to include overall discussions about youth health. Adults in leadership roles in this system of care emphasize that youth are both autonomous and vulnerable in their participation with the care systems. Meanwhile, they also suggest that for care to be best directed at youth, they need to include youth in discussions of care needs and acknowledge that youth bring their own knowledge and experiences to these interactions. This work reveals the value of including various community voices in the development and planning of care systems as well as within research to better understand the full context in which both adolescents and adults live and interact.

Introduction

This article investigates how adults who work within care systems in a highland region of rural Ecuador perceive activity and health in children and adolescents. There is a growing body of scholarship that recognizes the role of formal and informal care and care systems. Within ideations of care, humans build systems, programs, and create both formal and informal pathways to care based on our experiences in sociality (Loaiza, 2018). The formal systems of care are built, distributed, and interact in many ways, with current calls to better address multisectoral and intersectoral approaches to care (Amri et al., 2022).

Of particular interest in the context of this study, occurring in a rural county of highland Ecuador, may be the Health in All Policies (HiAP) approach which aims to consider the health implication of any given policy (Mahabir et al., 2022; Pan American Health Organization, 2017). This is a multisectoral approach that centers health and wellbeing in any public policy objectives. This approach stems from the World Health Organization's (WHO) call for sustainable action and health equity from a policy approach (2014a). Specifically, the WHO defines this as "an approach to public policies across sectors that systematically take into account the health implications of decisions, seeks synergies, and avoids harmful health impacts in order to improve population health and health equity" (WHO, 2014a, p. 7). For example, the WHO provides a summary of how this approach may promote health equity by beginning with the problem of air pollution. To solve the problem of air pollution, there is no one government agency that can act alone because the problem itself is multisectoral; it involves energy needs and uses in transport, urban planning, housing regulation, waste management, and industry to name a few of the key sectors. As such, this policy framework encourages all governmental organizations to work together for health equity in their policy systems (WHO, 2014b). In Ecuador, this is executed by

the federal government and coordinated by the Ministry of Social Development to oversee the Ministries of Health, Labor, Inclusion, Migration, and Housing (Mahabir et al., 2022). This policy integration is well suited and facilitated for Ecuador because of the ongoing use of an indigenous belief system known as *Sumak Kawsay* on both governmental and cultural levels of practice.

This concept is exemplified by the Ecuadorian policy model of *Sumak Kawsay*, or "Good Living." This policy suggests that all public systems work toward individual and community wellbeing grounded in the indigenous belief systems that permeate Ecuadorian culture (Altmann, 2017; Caria & Domínguez, 2015; Mahabir et al., 2022). This political system extends from the 2008 constitutional change that fore-fronted indigenous belief systems in Ecuador (Caria & Domínguez, 2015). While Sumak *Kawsay* has changed as political parties are voted in and out of government, the movement and its stance remain critical to understanding the care structure of Ecuador (Consejo Nacional de Planificación, 2017; Republic of Ecuador National Planning Council, 2013). For example, intentionally including public park spaces, river walks, and an extensive bike lane system in urban planning and any urban development projects illustrates how centering physical activity and health across sectors has been implemented. The effects of these urban planning practices that illustrate how *Sumak Kawsay* has been implemented in Cuenca, Ecuador are currently being studied (Barros-Gavilanes et al., 2020; Hermida et al., 2017).

In addition to formal care systems, informal care systems exist in households, communities, and regions. For example, children often begin caring for younger family members while simultaneously being cared for, blurring the expectations of the known and formalized systems of care. Hunleth (2019) further recognizes informal care systems in the imaginary and fantastical concepts of care that children have for their families. For example, in an interactive

play conducted during a workshop with children from households of people with TB and HIV in urban Zambia, children took their "father" to the health clinic and hospital. Children would return home unaccompanied at intervals to retrieve medications, blankets, and other necessities until the father was cured, though a doctor was never seen in the play (Hunleth, 2019). Such imaginative care speaks to the informality of systems that keep humanity committed to a culture of care both within, between, and at times without, the formal systems of care. It also demonstrates how care is informal social actions intersecting with formal health systems (Hunleth, 2019).

Children and adolescents hold particularly interesting spaces in these formal and informal environments as they grow into the expectations of their adulthood and further into their care systems as needed or prompted (Gaskins, 2000/2008; LeVine & New, 2008). In these spaces, children are known to have agency even in their own roles of caregiving as they help family and friends in real and imagined ways as demonstrated by Hunleth's study in Zambia, as youth take on care roles in the house and imagine their abilities to care as extending into the imaginative and fantastical to better care for their families (2019).

. Within youth studies in anthropology, we often identify ways in which youth act with autonomy to care for themselves, family, and others even in times or spaces of great stress or vulnerability (Hunleth, 2017; Hunleth, 2019; Taylor & Hickey, 2001; Weisner & Gallimore, 1977/2008; Whiting & Whiting, 1973/2008). For example, Taylor and Hickey reveal how youth develop their own family structures, community structures, identify aid, and simultaneously fend for themselves at the United States/Mexico border amidst the legalities and illegalities of the life and work they face (2001). This lived experience at the border is seen as particularly useful for the adolescents as they may take work that requires they cross the border; but, if caught, they are

not held in the United States long, but rather are sent back due to their status as minors, taking advantage of a system to better fend for themselves (Taylor & Hickey, 2001).

It is still important to recognize though, that children exist in inherently vulnerable spaces, being under legal age, under the power of others, and without control of their socioecological environments, where they need informal and formal care themselves (Bluebond-Langner & Korbin, 2007; Hunleth, 2017; Taylor & Hickey, 2001; Weisner & Gallimore, 1977/2008. As such, in youth studies there has been a push to not only center youth voices but also place them in the sociopolitical and socioecological settings in which they exist to allow all critical voices to be heard in systems and practices of care (Bluebond-Langer & Korbin, 2007).

Intersectoral and multisectoral care take the forefront of care strategies in rural communities. For example, a rural county approximately two hours outside of Cuenca, in the province of Azuay, systems of care become immediately visible in each community landscape with park and play spaces for children, health centers of varying sizes according to community needs, educational systems, and spaces for activities in arts and culture. Beyond the immediately visible care structures, a wide array of care systems exists in these communities for various purposes, yet all toward the goal of community wellbeing, or *Sumak Kawsay.* These spaces are dedicated to ensuring that children and adolescents are aware of their formal and sometimes even informal care opportunities. As such, we investigate how adult leaders in the local care systems understand youth culture, health, and physical activity. From interviews with these leaders, we see how physical activity and health are immediately and intimately connected within the community culture and lived experiences of youth in this county.

Methods

This research Nabón county, Ecuador has just over 15,000 inhabitants and is the economically poorest county in the Azuay Province (Datos del cantón, n.d.). Approximately 7% of the people live in the urban center, and the other 93% are dispersed throughout many communities in the geographically large and highly dispersed county. The public school system in the urban system serves youth living in the county center and many students who commute from their rural communities. There are also four rural communities with their own public schools and four indigenous communities each with their own elementary schools and a combined high school. There is a main health center in the urban center of the county that provides basic primary care, family care, psychology, dentistry, various therapies, a birthing center, and a 24-hour emergency room. Additionally, there are six other health centers dispersed through the rural areas which regularly provide primary care and dentistry and also receive regular visits from family doctors and phycologists (*GEOSalud, n.d.*).

In this paper, we review 17 interviews conducted with 18 community leaders and professionals, all with roles that directly intertwine with the systems of care set up for children and adolescents in the county. Two professionals working for the same care team chose to be interviewed together. Of these 17 interviews, only one represented a private institution while the rest represented various roles in public care institutions. Pseudonyms are used to represent speakers, and the public care institutions and teams are not named to maintain anonymity.

In these interviews, the lead researcher prompted participants to reflect on their experience with children and adolescents in the present community. The goal of these reflections was to understand how representatives of the systems of care view their relationships with youth and understand their perspectives of children and adolescents in the community. Semi-structured

interviews were conducted with a question guide for the interviewer, but the care professionals were encouraged to stray from the question or topic if they felt there was something more pressing to be discussed from their unique perspective. Interviews lasted from 15 to 45 minutes each.

The interviews were transcribed, cleaned, and coded using MAXQDA (2024) according to a grounded theory system of inductive reasoning (Bernard, 2007) in which we began with a core code – adult perspectives of youth – and allowed the coding structure to grow organically from this code. Interviews prompted further investigation into other topics, such as youth as autonomous, youth as vulnerable, and youth as contributors with their own knowledge and experiences. We also developed a second set of core codes for community systems of care. Each of the two main topics of "perspectives of youth" and "systems of care" are not mutually exclusive in the coding structure. More than one code may be used for any section of transcription to best represent the intent and perspective of the interviewed community leader. Further, rather than identifying the formal systems of care in the community by their names, we provide their often-overlapping intents. This is done to better protect the anonymity of those interviewed in a small community. While this article primarily addresses adult perspectives of youth, it should be noted that the shared coding structure with systems of care offered critical insights to the results (Table 3.1).

Table 3.1: Coding system for transcribed interviews. The table includes two core groups: 1. how youth are perceived by adults and 2. elements of the lived experience that take focus in the interview.

A. Adult perspectives of youth	1. Youth as vulnerable	2. Youth as autonomous	3. Youth as contributors with their own knowledge and experiences
	1. Teaching	2. Community participation	3. Leisure time
	4. Human rights	5. Culture	

Results

Adult perspectives of youth

Immediately notable within the transcriptions' coding structure is that adults view youth both as autonomous and vulnerable. Both codes co-occur in five of the 17 interviews. In four of the 17 interviews, adults view youth as contributing with their own experience and knowledge while still being vulnerable to their environmental or social conditions. In another four of the 17 interviews, youth are viewed as vulnerable, autonomous in their decision-making, and as bringing their own knowledge and experiences. While in two interviews youth are viewed both as autonomous and as bringing their own knowledge and experience, in one interview youth are noted as autonomous, and in one they are noted only as vulnerable.

Youth as vulnerable

A noted example in three interviews, care leaders talk with joy about when youth are taught to create “life plans” (a common public health practice to help youth consider the steps they may take toward a future they are proud of and dream of). In these life plans, youth are noted as dreaming of being soccer players, teachers, doctors, or mayors. Some dream of

migrating to the city or another country. A care leader, Lucía, clearly expressed that this opportunity to dream of their possibilities is always met with joy and encouragement from care leaders, who then discuss what a life plan for a future soccer player may look like. For example, José spoke with a student creating their life plan with their professional goal to be a doctor. José suggested that a doctor may consider graduating high school and going to university in a city before getting married and having children. José felt it important to explicitly discuss this with this youth because rates of adolescent pregnancies are fairly high in the county. He noted that if the student can plan their professional career first, they will still accomplish their dreams of becoming a professional and having a family, but it is important to consider not just what the dream is, but how we may reach it.

When speaking to the new challenges and vulnerabilities that adolescents face with globalization, including social media, online bullying, and navigating a life filled with modern technologies, one care leader says

> *"Ahora bien, si nosotros nos limitamos a decir en mis tiempos eso no pasaba ... pues ahí estamos limitando el ... desarrollo ... de ellos [jovenes] mismos no? Entonces yo creo que aquí es algo que es fundamental, es el activar mucho más la participación ciudadana de los chicos, la participación activa en todos los espacios que les involucren y saber qué es lo que necesitan."* -Rafaela
>
> (Now, if we limit ourselves to saying in my time that didn't happen... then we are limiting the... development... of [youth] themselves, right? So I think that here is something that is fundamental, it is to activate much more the citizen participation of the children, the active participation in all the spaces that involve them and knowing what they need. -Rafaela)

While care leaders are extremely open to the autonomy and experience of youth themselves, they still recognize that it is a time of social and cultural risks and work to mitigate the risks through promotion and prevention activities. Common themes of risk identified in community included adolescent pregnancy, alcohol use, and migration of parents causing the

disintegration of the nuclear family and core familial care structures for youth. Recalling the risk of migration to the nuclear family structure, Andres specifically notes that he finds himself acting as a father figure to many youths whose parents have migrated to cities or other countries for work and economic opportunity that they were unable to find in their community. This often leaves the children with aunts, uncles, and grandparents. As such, care leaders in formal systems also take on informal care roles toward youth.

Youth as autonomous

Empathy is central to both formal and informal care systems. In interviews, care leaders clearly express empathy as noted above, and they speak of the empathy of children and adolescents align with rural cultural norms of Sumak Kawsay and care for the common well-being in their communities (Altmann, 2017; Caria & Domínguez, 2015; Hunleth, 2017).

> *"Ya puedo observar que en realidad los niños, niñas y adolescentes son un poco más sociables, entre ellos, son un poco más empáticos, comparten, piensan en el bienestar común y no en el bienestar individual."* -Daniela
>
> (I can already observe that in reality children and adolescents are a little more sociable, among themselves, they are a little more empathetic, they share, they think about the common well-being and not about individual well-being. -Daniela)

This sense of community and empathy expressed by children and adolescents suggests that adolescents can autonomously express care in the informal care systems of the region. Their purpose is the informal care system cannot be understated, though less prevalent in this set of interviews, we have seen this autonomous act of empathy and care in action many times.

This sense of autonomy over their behaviors may also be thought of as something learned, particularly in the formal care system. In the quote below, Camila expresses how youth are taught to use and express their human rights with respect for others.

> *"Por ejemplo, tienes derecho a la educación, es un derecho irrenunciable. Entonces tu responsabilidad ante el derecho que tú tienes es asistir a clases con regularidad, poner atención. ... O por ejemplo, tienes derecho a expresar tu opinión? Obviamente sí, pero tu responsabilidad es hacerlo de forma asertiva para que las demás personas también te entiendan, sin gritar, sin violentar a las demás personas."* -Camila
>
> (For example, you have the right to education.; it is an inalienable right. So, your responsibility before the right that you have is to attend classes regularly, pay attention. ... Or for example, do you have the right to express your opinion? Obviously yes, but your responsibility is to do it assertively so that other people also understand you, without shouting, without violating other people. -Camila)

This teaching practice is meant to ensure that, while children and adolescents understand their basic rights, they also understand that they need to act autonomously to ensure those rights are being met and be prepared to speak out appropriately when not. The act of teaching itself recognizes that youth are vulnerable but aims to provide them with autonomy through education.

Similar to the importance of teaching children and adolescence about their rights to an education, another care leader points to the autonomy that many students take when they choose to continue their education in a semi-presential manner; students may continue their schooling through high school on weekends and dedicate their weekdays to family businesses. This system requires that students put in more schoolwork and family/household work outside of the structured school day and use their one or two school days a week to take responsibility for their learning. This care leader suggests that the students themselves often take responsibility for this decision, choosing to continue their education while working rather than dropping from school.

> *"… los jóvenes … que estudian en el sistema semipresencial … ellos mismo trabajan para … solventar sus gastos, les hace que ellos maduren más pronto, que sean más responsables. Hay casos, por ejemplo, de incumplimiento de tareas, de deserción escolar, … no hay. Entonces ahí en verdad, en el sistema a distancia, … se evidencia esta parte que los chicos maduran más pronto asumen más la responsabilidad y si es que están en el sistema eh semipresencial, es porque sienten la necesidad de … estudiar, de salir adelante."* -Catarina

> (… young people… who study in the semi-presential system… they themselves work to… cover their expenses, it makes them mature sooner, more responsible. There are no cases, for example, of noncompliance with homework, school dropouts …. So there in truth, in the distance system, ... this part is evident that the children mature sooner, they assume more responsibility and if they are in the semi-presential system, it is because they feel the need to ... study, to get ahead. -Catarina)

Lastly, María expressed her hopes and desires for the autonomy of youth as they express their culture and identity. She shares that the strength of autonomy in identity is something she believes youth have inherently due to their ancestral background as rural peoples and indigenous Americans.

> *"De decir tengo una identidad propia de la que me siento orgulloso y ... que a pesar de que he tenido influencia externa, no me desecho de eso. O sea, sigo manteniendo eso y no ha sido ahora. Ha sido cientos de años de aguantar, de resistir, eh, fuerzas externas. Creo que esa fortaleza tiene también los adolescentes. Sí, la misma energía, el mismo ímpetu que tienen ... de seguir les ... puede hacer lograr."* -María
>
> (To say, I have my own identity that I am proud of and that. And even though I have had outside influence, I don't get rid of it. I mean, I still maintain that, and it hasn't been now. It's been hundreds of years of enduring, resisting, uh, external forces. I think that teenagers also have that strength. Yes, the same energy, the same impetus that they have to follow can make them achieve. -María)

This strength and belief in youth's own sentiment and power of identity reveals a strong link to ancestral culture. The autonomy of youth to maintain a sense of identity even with outside influences is considered critical to their participation in community culture.

Youth as contributors with their own knowledge and experiences

Adults often point to a need to better understand youth and integrate their needs and desires into their care systems. This point is particularly apparent in moments discussing youth physical activity and sports. While adults may have begun providing sport instruction to meet their own goals, they ended up following the lead of the youth participants, which caused the program to flourish.

> *"La meta era ... Era al principio un aspecto muy técnico de un programa de entrenamiento muy sofisticado que se llama Error cero, basado en varias técnicas de medición y evaluaciones para tratar de conseguir a través del del entrenamiento, que los niños mejoren basado en calificaciones como cualquier programa. Pero a medida que avanzó el proyecto, pues nos dimos cuenta que los muchachos primero que no estaban preparados para recibir un ... sistema o un programa de ese tipo. ... Y segundo, porque la intención de los muchachos no era el progreso deportivo como tal, sino era disfrutar del momento de entrenamiento y jugar fútbol, que era lo que le gustaba. Sí. Entonces tuvimos que cambiar la metodología del entrenamiento para que esto funcione. ... Era jugar. Sí. Entonces miramos un poquito la página de la metodología y nos pusimos en la metodología global del fútbol basado en la parte lúdica."* - Andres
>
> (The goal was ... It was at first a very technical aspect of a very sophisticated training program called Zero Error, based on various measurement and evaluation techniques to try to achieve, through training, that the children improve based on ratings like any program. But as the project progressed, we realized that the boys were not prepared to receive a system or program of that type. ... And second, because the boys' intention was not sporting progress as such, but rather to enjoy the moment of training and playing soccer, which was what they liked. Yes. So, we had to change the training methodology to make this work. ... It was playing. Yes. Then we looked at the methodology page a little and we looked at the global methodology of soccer based on the recreational part. -Andres)

Similarly, in other environments beyond the soccer field, adults adapted to youth preferences in physical activity and leisure time opportunities, offering modern Latin dance alongside traditional dance classes and creating competitions in schools based on students' favorite sports rather than those most nationally or globally recognized.

In referring to the importance of learning from adolescents who offer their own knowledge and experiences, María nicely sums up her vision of the spirit of adolescence and how adults may continue to learn from this spirit in the community.

> *"Primerito, los adultos creo que a veces también debemos aprender un poco de la alegría, del desenfado, o sea, un poco ... de vivir el día a día también, ... no estar tan preocupados sobre el futuro. También nos hace falta. A veces creo que la alegría y ... un poco la energía que tienen para vivir, puede servir a nosotros. Deberíamos retomar ... el hacer las cosas con tanta pasión, o sea, enamorarse, amar con tanta pasión, meterse de cabeza, a veces sin miedo a los riesgos. Nos hace falta, no? A veces nosotros somos muy cuidadosos. No es que no quiero porque estoy pesando todos los riesgos y no me arriesgo y me quedo así, en una*

> *zona de confort ... Creo que eso nos falta. O sea, deberíamos aprender de ellos y decir sí, vaya suerte o muerte, voy a hacer tal cosa."* -María
>
> (First of all, adults, I think that sometimes we should also learn a little about joy, about carefreeness, that is, a little about... living day to day as well ... not being so worried about the future. We also need it. Sometimes I think that the joy and... a little bit of the energy that they have to live, it can be useful to us. We should get back to...doing things with so much passion, that is, falling in love, loving with so much passion, diving in headfirst, sometimes without fear of the risks. We need it, right? Sometimes we are very careful. It's not that I don't want to because I'm weighing all the risks and I don't take risks and I stay like this, in a comfort zone... I think we're missing that. In other words, we should learn from them and say yes, come luck or death, I'm going to do such a thing. - María)

This acknowledgment of youth's spirit for life and their willingness to take risks, while it may contrast with the vulnerabilities they face, provides them with opportunities to be fearless in their day-to-day, something María suggests we may all benefit from.

Discussion

In this article, we investigated how adults who work within systems of care perceive both the autonomy and vulnerabilities of children and adolescents in a highland region of rural Ecuador. The analysis of these interviews suggests that while youth are navigating new global challenges, care systems are available to them to learn their own sense of community, self, and wellbeing. Adults in these care systems feel strongly that the ability to teach youth in the community about potential risks, vulnerabilities, and their rights and responsibilities as citizens will help them to navigate their choices and challenges. In teaching youth, they both recognize their vulnerabilities and encourage their autonomy by providing them with the information necessary to access their care systems. This parallels the work seen in Taylor and Hickey's work *Tunnel Kids*, as children and adolescents access care by learning the pathways they can take relying on those who afford them access to these pathways in a border town in Mexico (2001).

Care leaders in the local Ecuadorian community also strongly encourage the autonomy of youth and the development of better communication between youth and adults to better address youth needs and desires so that care systems may better provide for them from youths' perspectives. This is particularly clear when looking at how sport and leisure time activities are offered and to what purpose they are offered in rural Ecuador. Both Hunleth (2017) and Mattingly (2008) express the ways in which communication from youth can improve and invoke care strategies. Mattingly uses the example of bringing in pop culture references specific to children's worlds, in this case Disney characters, to communicate care needs and processes in difficult care spaces (2008). Meanwhile, Hunleth brings forward the importance of children's imaginative spaces as critical to their care settings (2017; 2019).

These results also align with goals to better engage children in research, and we can consider how research models and methods for working with children could benefit formal care systems in their intent for horizontal communication and equity in care systems (Hunleth, 2011; Hunleth et al., 2022). In Ecuador, participants describe the ways they interact and teach children about their care systems through workshops, games, and art. We participated in one of these art days in which youth painted their self-portraits and wrote in their sense of core value to their community. We also led several workshops on the topic of life planning, allowing youth to dream of their future possibilities and identify sources of support within the community that may help them access those futures. Core to these interactions is the "meaning making" that revolves around youth understandings of care on their own terms and within their own life and practice (Hunleth, 2011). Hunleth discusses how particular research methods, such as focus groups, allow children to act as researchers on the topic rather than just subjects (2011). Similarly, the activities related to youth's access to care are meant to place them in control of their lived experience and

relate their own needs to the provided care pathways. While this emphasis on youth as actors in the process is clearly being enacted in practice, Hunleth and colleagues suggest that there is still a substantial gap in meaningful youth interactions when it comes to research in this topic (2022).

As youth face vulnerabilities, the training and support offered in their communities should aid in their development into their adult roles as community members. Research also suggests that the development of social care through one's own autonomy is a pathway by which they join in the sociality of life (Loaiza, 2018). Many interviewed participants expressed their hope at the further professionalization of youth in the county, so any professional position from teaching to government posts may be held by local residents in the future. This expression of hope in the younger generation also suggests a faith in youth's ability to navigate between their experiences with globalization and their identities in rural Ecuador.

Conclusion and implications for future research

In this article, we reviewed how adults perceive youth as both autonomous and vulnerable in the systems of care in rural highland Ecuador. We also discussed how adults aim to better communicate with youth to acknowledge that they bring their own knowledge and experiences to every interaction, from their political representation to their use of free time.

Youth in these care systems are taught to develop a sense of purpose, identity, and autonomy along with an ability to know their rights and express their needs. The allowance for youth to dream through "life projects" and consider how they may reach their goals is intended to instill a sense of autonomy while mitigating risks and vulnerabilities that youth are bound to face.

Further, researchers continue to recommend greater incorporation of youth not just in care practice but in research practices, providing them with the role of 'researcher' into the topics

of interest rather than passive participants (Hunleth et al., 2022). As such, anthropology and studies in care should take greater note of youth's own perspectives to understand their perceptions of the formal and informal care in their lived experiences.

Limitations

As this study occurred in a relatively small portion of a large and rurally dispersed county, we cannot suggest that this data is representative of how adults perceive youth in care systems across the county or beyond. Rather, it offers initial insight into the world of formal and informal care in rural highland Ecuador in a concentrated area. Though many of the care workers interviewed work well beyond the rural center, the sheer dispersion of the population in the county makes it difficult to generalize experiences.

CHAPTER 4

YOUTH IN A GLOBALIZING CULTURE: MAKING SPACES FOR THEMSELVES AND INVOLVEMENT IN ACTIVITIES AMIDST EXPECTATIONS, TRADITION, AND CHANGE[*]

[*]Lee, Christina Noelle. To be submitted to Youth and Society.

Abstract

Objective: The goal of this study is to describe how youth embody their familial expectations, personal desires, and learned culture through their daily physical activities in rural highland Ecuador. Methods: Adolescents who participated in this research were 10 to 17 years olds enrolled in a public school. Focus groups and interviews about common daily activities were conducted with adults and youth. Q-method, a type of factor analysis, was used to look for groups that reflect the diversity of adolescent perceptions about important activities in their daily lives. Here, youth ranked twenty-five activities according to the questions: “What are your favorite activities?” and “What activities that you do are most important or your family or community?” Results: Focus groups revealed that youth participate in a wide variety of daily activities and consider their physical activities to be related to more than sport or exercise, but also consider many of their activities and responsibilities in the home as physical activities. The first survey question “What are your favorite activities?” revealed highly individualized results that did not separate into groups. The second survey question “What activities that you do are most important or your family or community?” split into four clear groups: 1. emphasis on family and household responsibilities; 2. emphasis on culturally significant community events; 3. emphasis on studying in school to help the future economy of the family; 4. emphasis on cultural traditions but lack of emphasis activities in the family suggesting a greater priority on the community than the family when responding to the prompt. Conclusion: Youth in this population can both embody their cultural roles and expectations while maintaining health and expressing individuality. Future research should continue to emphasize methods that prioritize youths’ own perspectives.

Introduction

Globalization creates pressure on people and communities to hybridize their own culture with global influences along with the expansion of access to global cultures through media, consumerism, and social movements. This presents new challenges to community traditions but also offers opportunities for transformation (Harry, 2023). Research on declining daily activity patterns among adolescents often cites trends in globalization, such as more sedentary occupations and transportation methods, that ultimately may lead to poor cardiometabolic outcomes through the lifespan (Hallal et al., 2012; Howe et al., 2018; Leonard, 2001). Research also suggests that this decrease in activity during childhood, particularly in time in play, is detrimental to both physical and mental health (Gray, 2011; Worthman, 2019). Health trends in adolescence, like rising obesity and decreasing age at menarche, suggest that youth are currently experiencing a global social, environment, and economic transition due to these transformational trends in globalization and urbanization, such as transport, occupation, and household changes with the introduction of new technologies (Urlacher et al., 2019; Urlacher, 2023; Worthman & Trang, 2018).

Although some decrease in physical activity during adolescence is expected because of global trends in motorized transportation, modes of schooling and occupations, and new technologies (Gaskins, 2000/2008; Lancy, 2018), the current global trend in activity behaviors reveals a greater decrease in activity than is beneficial to adolescent health (Kline et al., 2017; Reiches, 2019). Studies reveal entangled relationships among factors associated with globalization and urbanization, such as motorized transportation, access to TV or internet, lack of access to safe play space, and increased time in sedentary activities like school (do Carmo et al.,

2020; McMurray et al., 2000; Rivera-Morales et al., 2020; Rodrigues et al., 2018; Ulijaszek, 2023; Urlacher & Kramer, 2018).

In adolescence, youth can establish patterns that may continue into their adult lives, especially because adult occupations and lifestyles are also increasingly sedentary (Hallal et al., 2012; Uijaszek, 2018; Winpenny et al., 2020). Because adolescence is an important transitional stage from childhood into adulthood, additional research on how youth understand and practice daily activities, balancing their goals with family and community obligations, and experience globalization may have implications for providing context to global declines in activity levels (Worthman et al., 2019). In order to understand these changing patterns and behaviors, research on adolescent preferences in activity behaviors is needed, along with their experienced environmental, social, and familial pressures, and peer group cultures.

Mental health among adolescents is a rising concern alongside the consequences of sedentism, while research suggests that there is a link between a youth's ability to enact their activity preferences and improved mental health (Gray, 2011; Worthman et al., 2019). However, many factors have been shown to influence how youth develop preferences around daily activities, such as parental expectations, household socioeconomic status, or access to technology and park space (Bauman et al., 2012; do Carmo et al., 2020).

Calls to study the lived experience of adolescents in the changing global landscape are prevalent in biocultural anthropology (Worthman & Trang, 2018; Worthman et al., 2019), and researchers still need new models and frameworks that advance our biocultural interpretations of health and wellbeing in urbanizing and globalizing contexts (Ulijaszek, 2018). So far, in anthropology, researchers understand the general pattern and range of variation in the biological life course through puberty (Ellison et al., 2012; Reiches et al., 2013; Reiches, 2019; Worthman

et al., 2019) and cultural life course through expectations of household and economic contribution in adolescence (Brumbach et al., 2009; LeVine & New, 2008).

Embodiment, or the idea that local cultures and environments become embedded in peoples' bodies, is a valuable tool to study physical activity. The concept of embodiment originated in psychology and moved through various subfields of anthropology in recent decades (Bourdieu, 1979; Csordas, 1990; Gravlee, 2009; Krieger, 2005; Krieger & Davey Smith, 2004; Mascia-Lees, 2011; McClure, 2020). This theory follows closely the practice of anthropological theory as understood by Geertz as noted in his essays of how individuals act as both self-reflective and expressive with others within their own cultural and environmental experiences (Geertz, 1973; Geertz, 1983). Embodiment suggests that youth live through and interpret their physical, social, and cultural environments and, in turn, their environments are expressed in their daily practices. In other words, daily activities can encompass cultural norms, globalizing changes, and people's own independent desires. Thus, embodiment can be used to understand how individuals experience their own bodies', decision-making, and cultural practices. Particularly in adolescence, embodiment provides a way to study how decision-making takes on a critical role in adolescent culture, meaning-making, and future behavioral patterns.

Studies of daily activities, including physical activities, present an opportunity to understand the experience of embodiment in youth populations by studying not just their own perceptions, but also their daily behaviors. Therefore, the goal of this research is to describe how youth embody their familial expectations, personal desires, and learned culture through their daily activities to address their sense of embodiment within their local environment.

Methods

This research takes place in Nabón county, Ecuador, a highland area with a central capital also called Nabón. In total, Nabón county has just over 15,000 inhabitants based on the 6th census (Datos del cantón, n.d.). Approximately 7% of the people live in the urban center, and the other 93% are dispersed throughout rural communities in this large county.

Many people in this county continue to live within traditionally agricultural economies, such as cattle production and large land crops such as corn, and community structures, such as extended families living together and working in the same business; however, the economies and related culture are shifting as people migrate for diverse occupational and economic opportunities (Cazar & Astudillo, 2007; Datos del cantón, n.d.; Instituto Nacional de Estadistica y Censos & Fondo de Población de las Naciones Unidas, 2001). Adolescent study participants ranged from 10 to 17 years old, encompassing what the World Health Organization (2022a) defines as early and middle adolescence. Participants were also enrolled in the public school in the county's urban center. While some youth who participated in this research lived in Nabón city, others also came to the urban center for school during the week but lived in the rural communities of Nabón county. Students were invited to participate in this research through classroom announcements and letters sent home to parents with a summary of the study.

This study relies on a sorting survey method known as Q-method. Q-method, based in inductive reasoning, is both a research framework and analytic method that brings forward the science of subjectivity. The goal is to operationalize individual and subjective behaviors into group norms and meaning-making concepts (Brown, 2019; Robbins & Krueger, 2000; Watts & Stenner, 2012). In this study, Q-method is used to look for groups that reflect the diversity of adolescent perceptions and experiences within their community. The visual and interactive

nature of the Q-sort also makes this method particularly appropriate for work in younger populations to assess subjective values/preferences of activities and behaviors even when they may be difficult to vocalize (Owens, 2016).

This methodology first requires a concourse (a nearly infinite set of values and opinions of a topic) to be narrowed into a Q-sample. After a narrowed list of relevant items (Q-sample) is established, individuals participate in a sorting activity (Q-sort) asking them to identify if they agree or disagree with the statements from the Q-sample. The Q-sort activity consists of participants placing items from the Q-sample into a bell-shaped curve of spaces in accordance with strong agreement (+4) to strong disagreement (-4) (Brown, 2019). The Q-sort used in this study along with the Q-sample is provided in Figure 4.1. In sum, the Q-sort provides a ranking system, or a forced distribution survey, by which groups may then be identified in their likeness or difference of agreement and/or disagreement based on factor analysis (Watts & Stenner, 2012).

The concourse should be developed from a wide array of related methods, such as related articles, focus groups, discussion, literature, or whatever may prove most relevant to the intended question being asked of participants (Brown, 2019). In this case, I developed the concourse through 10 months of participant observation in the community, interviews with adults (Chapter 3), and, most importantly, from focus groups with adolescents from 10 to 17 years old, both girls and boys.

Participant observation is the process of interacting or participating in the daily life of the study participants as a member of their community to the researcher's capability (Bernard, 2007). In this study, this meant that I lived in the urban center area, volunteering at adolescent focused activities at the school and in the health center and attending community events. I also completed intentional walk studies throughout the community and timed observations in the center square

to record the patterns, norms, mobility, and common activities of children, adolescents, and adults in visible and public spaces. These observations aided in identifying key activities included in the concourse.

Four focus groups were performed. One focus group included three adolescent girls from 13 to 17 years old, another included three adolescent boys from 13 to 17 years old. The last two included six girls and two boys 10 to 12 years old; these two focus groups required mixing genders in the same focus group due to difficulties in scheduling with the younger participants. Initial focus groups along with activities identified in participant observation created a concourse of 80 individual activities. I then developed the Q-sample using activity groupings quickly identifiable in the concourse. For example, I placed all organized sports into one category, caring for people (siblings, cousins, or neighbors) as another category, and caring for the agrarian household (caring for animals) as another category. Sample statements were selected based on the frequency they were mentioned in focus groups, interviews, or observed within the community. I then performed a thematic analysis to ensure a wide array of activities were included, paying attention to activities that may not have been frequently mentioned but were necessary to represent the social context of community, family, leisure time, and responsibilities. The final Q-sample (Figure 4.1) had 25 activities that were representative of daily life for students 10-17 years old.

The Q-sorting activity asked youth to organize the items from the Q-sample according to their agreement with the questions 1. “What are your favorite activities?” and 2. “What activities that you do are most important to your family or community?” Ten youth completed this activity. To identify youth’s subjective understandings of their physical activity as it related to their familial and community expectations or their own desires, the Q-sort was directed by two

independent questions, both with the same Q-sample of statements. Since the Q-sample included only daily activities, students were encouraged to think of this as a ranking of their favorite activities or to add the statement "I like …" or "I contribute by …" to each Q-statement so they fall along the axis of most agree (+4) and most disagree (-4). The explanation of the ranking system depended largely on the age and stage in school of each individual student. Upon completing each survey, I reviewed the statements with the student and asked prompting questions both to ensure the student understood the Q-sort activity well and to add a deep-dive investigation into several of the activities that students either hesitated to rank or were quick to rank in the Q-sort.

After the completion of the Q-sorts, factor analysis was done with a free online tool designed for Q-sorts called Ken-Q Analysis (Banasick, 2023). Each set of Q-sorts was analyzed independently as they responded to different prompts. The grouping of subjects by their subjectivity within each of the prompts is determined by their significance on the loading points of particular statements, thereby creating groups (Brown, 2019; Robbins & Krueger, 2000; Watts & Stenner, 2012).

After the Q-sorts are analyzed by factor analysis, best practice would not be just the researcher, but also the participants themselves, who review the results to determine if they in agreement with the researcher's interpretation of the groupings (i.e. what makes them a group based on the results of the analysis). The Q-sorts were analyzed with a principal component analysis to identify the appropriate number of factors for the Q-sorts (Robbins & Krueger, 2000; Watts & Stenner, 2012). While identifying factors that fall above 1 in the eigenvalue acts as a gold standard to identifying the appropriate number of factors, this is not always possible depending on the Q-sort. In this case, in the first survey question, four factors fall above a value

of one in eigenvalue, yet three of the factors are bipolar, suggesting that their similarities are best identified by their differences. This suggests that the first question elicited highly individual results and that groups are not the best way to understand the response to the question in this survey. The second survey question had four factors above one in eigenvalue, and using these four factors provided a clear split in the groups that could be assessed by their group similarities. This is further discussed in the results.

Following the Q-sort analysis, a subgroup of seven of the original participants met to discuss the results.

Worst/ Least				Neutral				Best/ Most
-4	-3	-2	-1	0	1	2	3	4
---------								---------
---------	--------						--------	---------
---------	--------	--------				--------	--------	---------
---------	--------	--------	--------		--------	--------	--------	---------

1. Dance/ Traditional dance	2. Jog/ Run	3. Videogames	4. Parties and events in the family	5. Visit with friends or partners	6. Traditional games
7. Go to the pool/ Swim	8. Ride a bicycle, roller skates, or skateboard	9. Go to the nearest city	10. Parties and events in the town	11. Watch television/ Watch a movie	12. Work in the business or job with the family
13. Participate in *mingas**	14. Wash plates	15. Sing	16. Sports: soccer, volleyball, indoor soccer, basketball	17. Tend to the animals	18. Eat with the family
19. Go to church mass	20. Study in the elementary or high school	21. Work in the fields planting, cutting plants, etc.	22. Cook	23. Go on a small trip to visit a place or people	24. Draw/ Paint/ Color
25. Take care of siblings, cousins, nieces and nephews, or neighbors					

**Mingas* are traditional gatherings where a community works together to better an aspect of the community, such as help plow fields, create a park, or maintain water lines. These usually occur on Saturdays and are often accompanied by *Pampamesas*, where everyone brings food and drink to share, often traditional foods and drinks.

Figure 4.1: The forced distribution table presented here is the same as that presented to survey participants. This was presented on a large poster board with cards that could be moved into any open spot to match the participant's ranking. The spots with lines are not open for cards to be placed. The 25 activity statements included in the Q-sample is provided below the table. The cards were shuffled before each question. The statements and table were provided in Spanish but are presented here in English.

Results

The results are presented in the order that they were identified through the process of operationalizing Q-methodology. First, I review how the concourse was identified through discussions with the study participants and narrowed into the Q-sample through analysis of focus groups, interviews, and observations. Next, I review the survey results of the two questions asked, in the same order they were asked to the study participants. Lastly, I discuss the implications of the survey results as I understood them and as the adolescents understood them in the second focus group.

Concourse exploration

As mentioned in the methods, concourse exploration began with participant observation in which I observed several categories of daily activities of youth in the community while I conducted walking studies and volunteering within the community. Core categories of my observations included family activities, youth responsibilities with family and neighbors, leisure activities, and community activities in which adolescents were not always immediately visible, though families were present. I found these categories appropriate for youth participation in sports and other extracurricular activities, visiting with friends between classes or in the town square, youth caring for family members and businesses, and how they did or did not participate in community festivals and events.

These notes from participant observation were particularly important to understand how youth used and occupied public spaces for their own purpose and activities. Some spaces were clearly used as intended, such as soccer fields or basketball courts. The town square, however,

held space for a myriad of activities including caring for siblings, gossiping with friends, meeting romantic partners, and socializing with family members.

Another activity that emerged as important in observations, interviews, and focus groups was community events. These included *mingas* (events where families would volunteer with their local community to accomplish some work for the common good such as fixing water lines or prepping agricultural fields), which were often followed by *pampamesas* (community wide social gatherings centered around the sharing of traditional foods and drinks). Youth noted that these events included, at times, prioritizing the community over school attendance or drinking alcohol with family and adult community members. The time away from school and participation in adult activities such as drinking were noted as critical to community culture and values as adolescents move into adulthood and societal roles, but the adult community leaders (Chapter 3) also identified aspects of these activities like missing school or drinking alcohol as a risk to youth health and wellbeing.

Focus groups provided greater specifics to how adolescents understand their daily activities in relationship to their time, energy, individuality, family, and community. What is important to note during these focus groups is that I always started with two questions about physical activity: "what is it?" and "why is it important?" All focus groups were quick to note that physical activity is represented by sports and exercise and is important to cardiovascular and muscular health. When they would speak more personally of their own activities though, this understanding of physical activity would quickly shift to the ability to destress and distract with a large variety of activities and keep their health in balance.

Q-Sample Determination

As noted above, the Q-sample was determined by a frequency analysis of the activities listed in focus groups with youth, key points discussed in interviews with adults, and notes from

participant observation. I then performed a thematic analysis to ensure the activities represented the population socially with the categories of community, family, leisure time, and responsibilities. A few activities, though not high in frequency, were kept from focus group discussions due to youth's emphasis on their importance for local culture, examples being *mingas* and traditional games.

Q-sort results

What are your favorite activities?

The "What are your favorite activities" prompt revealed a wide range of "most" and "least" favorite activities among the sample of youth indicating individualized results. When divided into groups using principal component analysis, the groups became bipolar, grouped by significant differences rather than similarities, and many groups included only one participant. As such, the principal component analysis failed to identify factors that grouped participants, but rather revealed that these results are best discussed as being unique to each individual's preferences. Individuals most often identify their favorite activities as those that provide them with time to destress. Examples of the diversity of these activities include videogames, caring for animals, painting, visiting new places, cooking, playing sports, etc. Interestingly, studying in school remained nearly neutral in most participants' Q-sorts. The least favorite activities similarly showed extreme variation from participating in church mass, playing videogames, visiting with friends, and washing plates.

What activities that you do are most important or your family or community?

There was more agreement around "What activities that you do are most important or your family or community?". Factor analysis found that the variation in how youth sorted activities in response to this prompt split into four factors. The first factor contained a group of four youth who emphasized important activities as those related to family and household

responsibilities, such as caring for siblings, cousins, nephews, nieces, and neighbors (this presented as a distinguishing statement for this group), cooking, washing plates (this presented as a highly distinguishing statement for this group), eating with the family, and working in the family business. These youth also ranked leisure time activities (watching TV or movies) as less important to family and community (Figure 4.2). This group had mixed ages and genders.

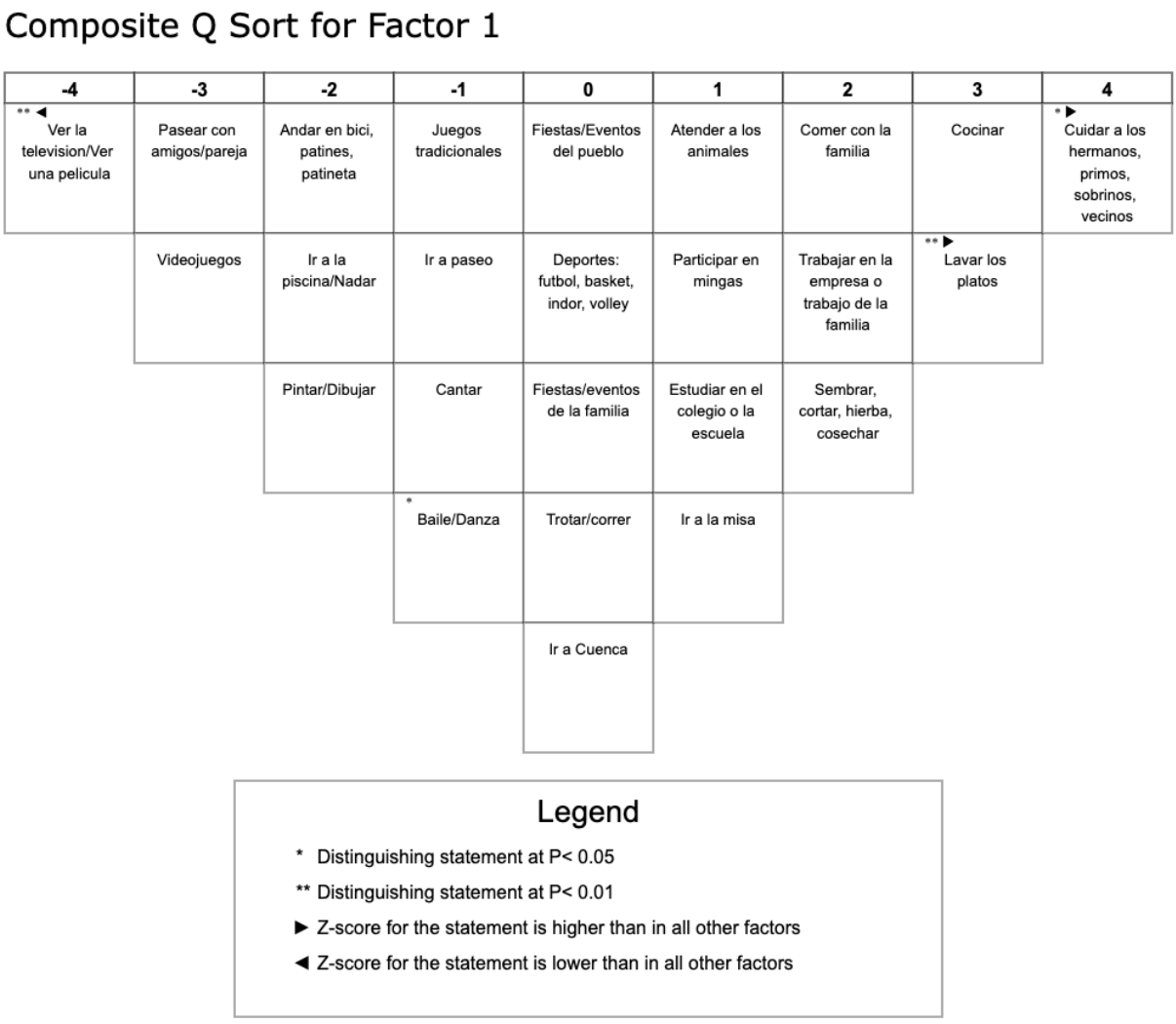

Figure 4.2: This figure is a composite Q-sort of participants that sorted into factor one. It reveals several key statements and their placement on the board to help identify how these individuals are grouped together through similar subjective statements.

Factor two contained two participants who prioritized community-oriented events that are also likely to be culturally significant, such as parties, events in the town, church mass, and traditional games. Interestingly though, participating in *mingas* ranked as a distinguishing statement but on the low end of the board, suggesting that this was not an identifying statement for how they participate in the community. Also representative of the low end of the board is visiting Cuenca, the nearby capital of the province, which was often referred to as an activity inaccessible to those without excess money (Figure 4.3). Similar to factor one, the participants included in this factor represent both genders (girl and boy) and one early adolescent (10 to 12 years old) as well as one middle adolescent (13 to 17 years old).

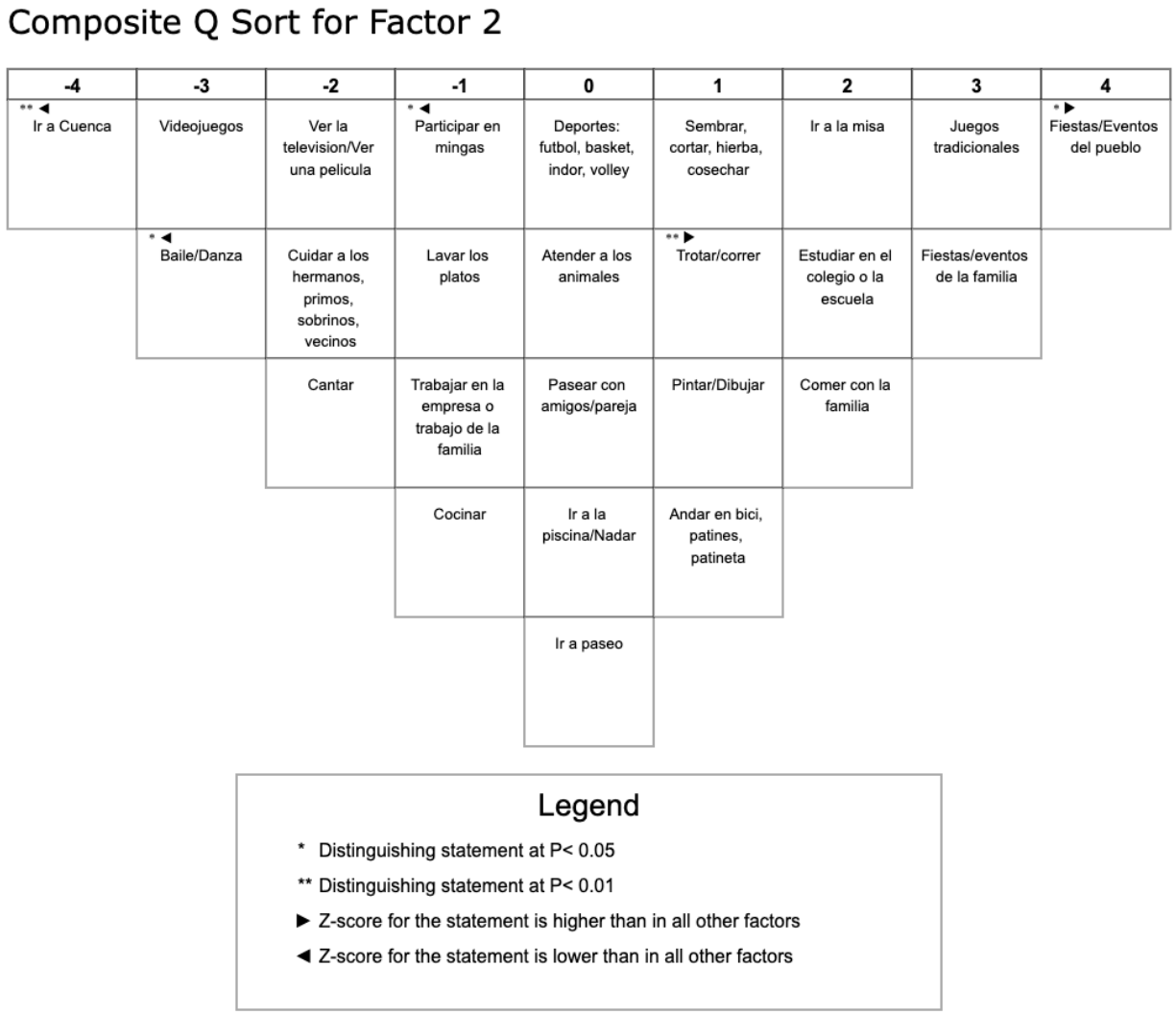

Figure 4.3: This figure is a composite Q-sort of participants that sorted into factor two. It reveals several key statements and their placement on the board to help identify how these individuals are grouped together through similar subjective statements.

Factor three included three participants. This composite Q sort suggests that identifying factors of this group includes studying in school as very important for the family and community (Figure 4.4). Participants often discussed the importance of studying to help the family economically in the future. Meanwhile, a distinguishing statement of disagreement is that playing videogames or participating in town events and parties are important to how they

contribute to the family or community. Working in the family business and going to church mass also rank highly in this factor though the placement of these statements is not significant. Interestingly, both genders are represented in this factor but only middle adolescents (13 -17 years old).

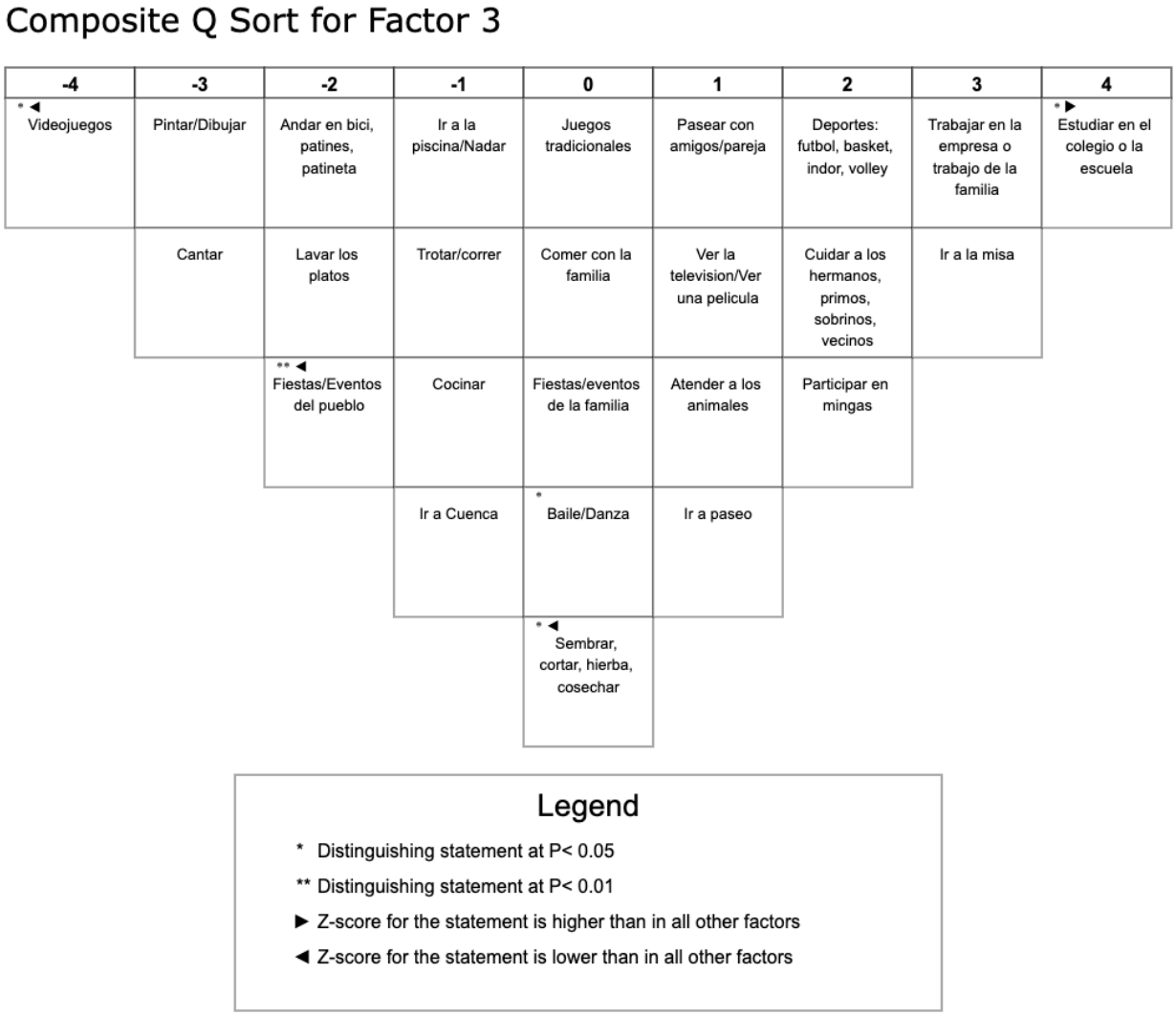

Figure 4.4: This figure is a composite Q-sort of participants that sorted into factor three. It reveals several key statements and their placement on the board to help identify how these individuals are grouped together through similar subjective statements.

Lastly, though factor four included only one participant. Like the second group, this youth ranked their participation in family events and parties as important to family and community. Also, they ranked dance (traditional dance) as important to their family or community. When asked about dance, they responded that it was important for cultural

traditions. Interestingly, this group represents the highest ranking for participating in *mingas* (Figure 4.5), suggesting this youth may have placed a greater priority on the community than the family when responding to the prompt.

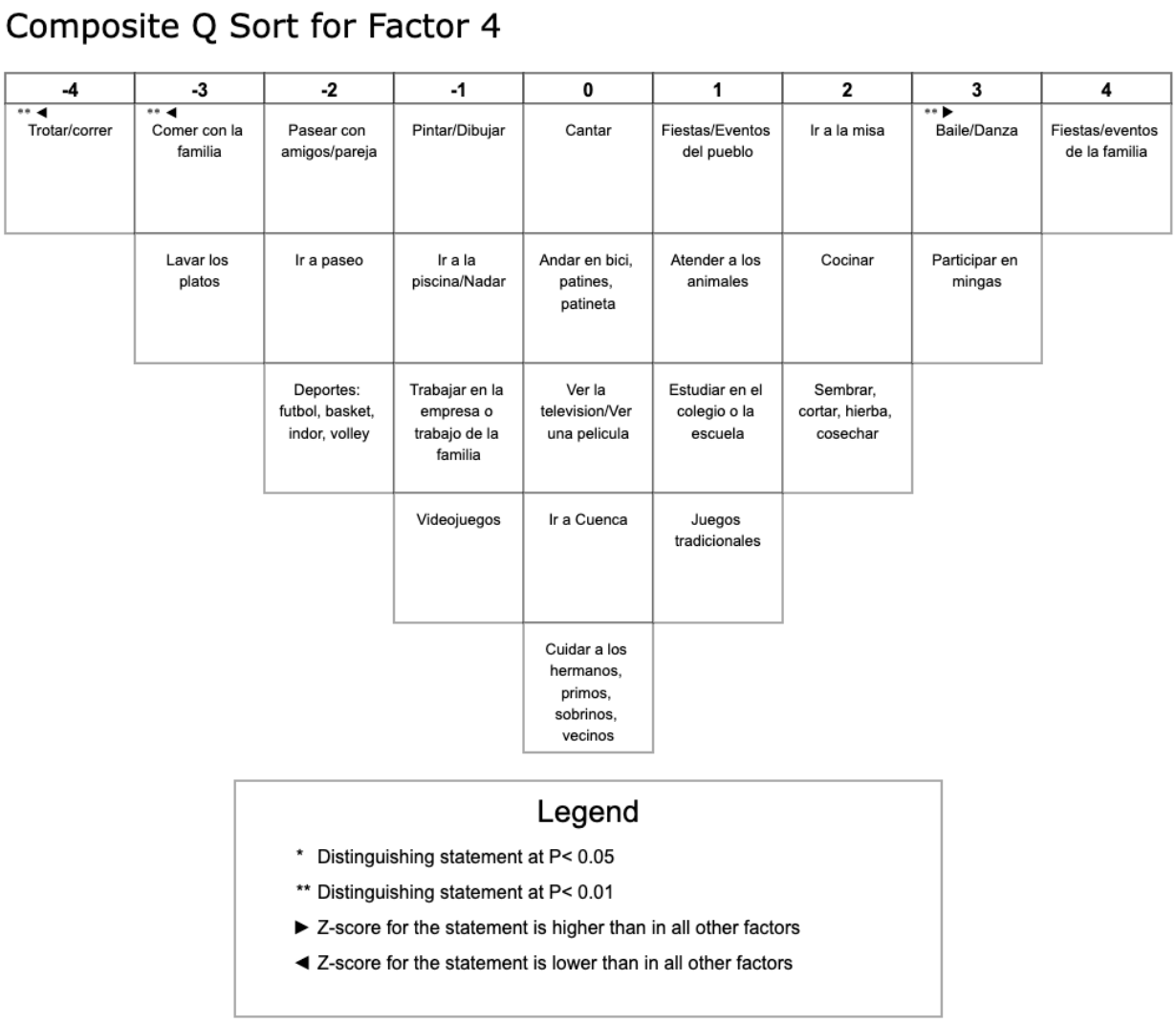

Figure 4.5: This figure is a composite Q-sort of the participant that sorted into factor four. It reveals several key statements and their placement on the board to help identify how this individual differed from the other factor groupings.

Follow-Up Focus Group

The final focus groups revealed several additional themes related to the lack of gender-based patterns in the Q-sort activity, the holistic nature of health and physical activity, and the role of local culture in youth's lives. First, the fact that gender and age were not important grouping variables in the Q-sort activity led to a discussion of the role of gender in the community. The youth participating responded that they do not find gender roles to be a determinant factor of their activities and responsibilities. Rather, they reported that they felt they could express themselves in both their preferred activities and family responsibilities without taking on a 'gendered' role. They also suggested that their experience might contrast with rural communities where gender roles may remain strict, but they feel that their family units emphasize working together in whatever manner is necessary to support each other (i.e. men can cook, and woman can work in the business as needed without it standing out as a taboo).

Health and wellbeing were also core themes of our discussion. When discussing the activities that they enjoy, specifically being in a rural community, they pointed to the fact that they get fresh air, a great diversity of food, and incredible landscapes. They also suggest that simple tasks outside the house, like taking care of the animals, is how they destress and distract themselves from any stress or problems they may face at home or school.

Adolescent participants understood culture as language, clothing, and food, which they lamented possibly losing, but also as an identity and set of values. These values included solidarity, respect, justice, and honesty, which could continue even if other traditions and practices are lost. This shares agreement in the Q-sorts of those who suggest that their

participation in church mass, town events and parties, traditional dances, and *mingas* are all important to how they contribute to their community. While they suggest that they do feel pressure to change and adapt with globalization, they do not want to lose their sense of identity and culture. One participant specifically responded to a prompt about how we can maintain culture by saying "*Yo la llevo la cultura en mi corazón*" (I carry the culture in my heart).

Discussion

The results presented above reveal several key findings related to physical activity in this population, globalization, and embodiment amidst cultural change. Through observation, interviews, and focus groups, along with the survey and follow-up focus group discussion, I believe this study presents a critical work in Q-methodology, aiding in revealing its possible uses for youth populations globally.

The first finding, that youth in this sample felt they could express their individual preferences related to activities, has implications for understanding how youth are able to embody their goals and preferences. The lack of intra-group similarities did not seem to negatively impact their sense of place in the community because they did form groups around the many ways youth felt they contributed to their family and community. Interestingly, this finding differs from research using similar methods focused on African American high-school girls in the U.S. South (McClure, 2020). In this research, the girls faced a sense of "unembodiment" as they could not match their own sense of self to others' expectations (McClure, 2020). This speaks to the importance of further cross-cultural examination of how and what leads to youth being able to embody (or not) their preferences about physical activity.

The results also suggest that youth in this sample can express their individual preferences while also embodying their cultural roles and expectations. This dual practice may be related to

the ways that youth here are experiencing globalization (Harry, 2023). This idea, that globalization can lead to flexibility, comes from research by Joe Harry (2023) that suggests that peoples are able to discern and implement those elements of globalization that they find attractive through global media or consumer culture while maintaining their own sense of rural identify (2023). Here, youth in this sample may express wellbeing through their ability to embody their roles and expectations while contributing to their family and community and while maintaining their health by managing stress and remaining active. In this sample, it is possible that the embodiment of their local culture and values provides them with space to be active in their daily activities whether through sport or caring for livestock.

Interestingly, unlike many other studies in anthropology (Froehle et al., 2019; Gaskins, 2000/2008; Lew-Levy et al., 2019; Rogoff et al., 1975/2008; Wenger 1989/2008) the adolescents in this group did not present any taboo in crossing potential gender roles, such as women and girls maintaining the household and men and boys maintaining economic roles outside the household. While many rural studies reveal strong gender roles and associated play and games with those roles, these participants suggested that their parents did not participate in the idea of household or community gender roles but rather emphasized everyone's ability to help in their own way. They suggested their parents shared household and economic roles and participated in both roles as needed. If one person showed preference for a household role, such as cooking, they could take on that role regardless of age or gender.

Further, the fact that youth of all ages consistently linked physical activity to "destressing and distracting" could be interpreted as a nod to mental health. However, for these students, the focus group discussions suggested this appeared to be much more all-encompassing of their own health, family health and relationships, the importance of escapism and sociality. For example,

the activities noted in this category ranged from singing, dancing, taking care of family animals and livestock, playing videogames, talking with friends on the cellphone, and trips with family to visit and learn about other parts of the county and their natural features. Youth also noted traditional activities and games as important to include because of their cultural significance. This is better situated in the traditional systems and understanding of health and wellness of the Andes known as *Sumak Kawsay* (often translated to Good Living) which emphasizes harmonious relationships with people and the earth (Altmann, 2017; Caria & Domínguez, 2015).

Finally, this research demonstrates the value of including the voices, perspectives, and values of youth in research on physical activity. To better address the biological and cultural changes youth are experiencing amid globalization, researchers need to employ a biocultural framework to understand how globalization and urbanization impact daily behaviors in youth populations. By studying the lived experiences of youth through their behaviors, researchers will be better able to address how social change impacts youth lives.

Conclusion and implications for future research

Based on this study, embodiment theory provides a strong grounding to understand youth perspectives and lived experiences amidst globalizing change when paired with methods that explicitly study subjectivity. In this community, these participants can embody their sense of culture and responsibility while maintaining their health, wellbeing, and individuality as adolescents in an ever-globalizing world. Seeing their daily activities as a time to destress and distract from stressful environments or situations is emphasized across genders and ages in this study. Their activities also encompass cultural values of respect, honesty, solidarity, and justice as they identify their activities to be important to their family and community. This also presents

in clear alignment with local concepts of wellbeing as one's wellbeing is greatly impacted by harmony with oneself, one's family, community, and the earth (Altmann, 2017).

Greater theorization and incorporation of methods that provide insight to intra-group subjectivity may be the best way forward to understand and address adolescent health needs globally (McClure, 2020). As researchers have known for a while, a global problem such as physical activity or decreasing physical activity does not promote a single solution, but rather needs to be grounded in local concepts of culture, identity, and care (Kline et al., 2017). Embodiment theory and inclusive methodologies that allow youth perspectives to take the forefront of not just data but also analysis of that data can provide rich information that research otherwise may not recognize through quantitative or adult-focused methods alone.

Limitations

As often occurs in human research with youth, not all youth wanted to participate in all aspects of the research. As such, not all who participated in the focus groups participated in the survey. This sample of adolescents also represents a highly motivated group of individuals with equally motivated caretakers who provided consent for the children to participate in the study after school, often interfering with their usual schedules and responsibilities. While this may limit the generalizability of the results, it does not limit the evidence that including youth perspectives in research on physical activity will provide unique insights into questions about globalization and declining physical activity levels.

CHAPTER 5

CONCLUSION

Summary of findings

This research contributes to calls to better understand global declines in physical activity among youth. In the first chapter, I discussed calls to understand physical activity from qualitative and mixed method perspectives in Latin America. Specifically, I argued that my research addresses three of the critical components of biocultural research that Hoke and Schell outlined in their recent synthesis (2020). This research 1. "Engages seriously with the concept of culture and thinks creatively about how to operationalize it" as I have done with physical activity; 2. "By focusing on health and well-being, biocultural anthropology generates practical, applicable insights that extend the benefit of work beyond the academe" as I have shown in Chapter 3 and further expanded in the implications below; and 3. "Reveals and embraces human complexity across space and time, avoiding simplistic and deterministic explanations, and remaining aware and attuned to the context and limitations of knowledge production" as I have done by including both adults and youth within the community in the study and researching and conducting participant observation in Ecuador for about two years to better grasp the local context, and resolved in my recommendations for future studies on the topic of physical activity (Hoke & Schell, 2020, p. 4).

In Chapter 2, I determined that the anthropological literature on physical activity in youth populations draws heavily on quantitative measures of activity through surveys and wearable devices particularly in North America and Europe. Anthropology draws on multiple theoretical

lenses for physical activity studies including1. socioecological frameworks and assemblage theory (Carroll et al. 2021), 2. life history theory and niche construction theory (Downey, 2016; Fuentes, 2013), and 3. embodiment (Ingold, 2013; McClure, 2020). Each theoretical framing provides a unique and valid approach to study physical activity. The literature review in Chapter 2 demonstrated a lack of qualitative or mixed methods research, also indicating a significant gap in our understanding of how physical activity relates to subjective experiences. For example, rather than understanding physical activity through numbers related to caloric expenditure or energetic efforts, physical activity may also be understood as cultural transmission (Spindler & Spindler, 1982) and a subjective practice in values (Brown, 2019). As such, greater investigation with qualitative and mixed methods work continues to be critical to expand our biocultural understanding of physical activity.

Chapter 3 explored how community leaders working with youth understood youth's participation in their care systems. I showed that while adults recognize youth's vulnerabilities, they also focus on how education allows youth to achieve autonomy in their care while remaining supported by community structures. Simultaneously, adult leaders in these care systems regularly said they look for greater opportunities to include youth in the conversations regarding needs and planning within their community. Within Ecuador, as a nation that prioritizes the practice of "Health in All Policies" (Mahabir et al., 2022; Pan American Health Organization, 2017), the idea of ensuring that all community structures prioritize health and wellbeing is critical. This research illustrated how this concept is exemplified as access to care systems in youth meant more than just health centers and schools, but also included cultural and religious institutions that felt that youth health was a top priority in their work.

In Chapter 4, I presented youth as they understood their own patterns and values within their daily physical activity practices. These practices allow a place for youth to feel connected not only to their communities, but also to themselves as they refer to their activities as necessary for their wellbeing. The use of embodiment theory here suggests that youth can embody their individual needs and identities as they may be shifting away from traditional community structures with greater access to global information through social media and other sources. Meanwhile, they are still able to embody their sense of culture, community, and family responsibility by recognizing these activities as a critical piece of what keeps them well. For example, participants recognized that their household responsibilities were critical not only to how they supported their families but also to their own health and wellbeing. Some participants prioritized their participation in community cultural events, identifying their participation as meaningful for how they contribute to their own community. These results draw on Andean and Kichwa concepts of wellbeing, *Sumak Kawsay,* that emphasize harmony within the family, community, and connection with the earth (Altmann, 2017).

Implications

This dissertation holds two core implications for anthropology and public health. First, studying youth experiences from multiple perspectives provides a way to understand how youth embody their personal, familial, and cultural values. Second, studying physical activity from multiple perspectives and with mixed methods provides a broader understanding of physical activity and its direct relationship to health in the community.

Chapter 2 illustrates the gap present in how anthropology studies physical activity from a biocultural perspective. Most research relies on either only quantitative or qualitative measures of physical activity, when in reality, this research argues physical activity is best understood as a

biocultural experience. As such, studies using mixed methodologies have a better opportunity of capturing the lived experiences that create physical activity. Few studies also use qualitative methods to look beyond cultural norms of physical activity, such as acts of learning gender roles through play and games (Lew-Levy et al., 2019; Tian, 2018), into the subjective experience of physical activity amongst individuals within a group.

The only known study included in the sample to take a mixed method approach to physical activity is McClure's (2020) research with African American high school girls. This research examines how the girl's perceptions of their sport identities as they do or do not align with others' perceptions and expectations of their behavior. McClure (2020) introduces the term "unembodiment" to explain how the girls are not able to achieve their stated goal and values. In contrast, my research looks beyond sport into the activities of daily life to understand the subjective experience of youth in rural Ecuador. In this context, I found that youth are able to align their activities with their values and others' perceptions.

As these studies are held in different locations and with different populations but with the same theoretical framework and with methods that allow a sense of priority to be given to subjectivity, it is interesting that the results present with very different conclusions, going so far as to require a new term from McClure to describe the results as an experience of "unembodiment" (2020).

There may be several explanations as to why this variation occurs. First, the difference in parental expectations of sport and education between youth in the United States, being highly structured, and youth in Ecuador, being highly flexible within my study participants could certainly account for this difference. Next, the differences of defining an identity through sport versus through daily activities presents two different manners of understanding how youth

embody their various identities. Sport develops stricter boundaries to identity, where physical and daily activities may encompass both individual passions like sport and practices in the household like tending to animals, both of which one could consider as important to their subjective experience, as I show in Chapter 4.

Even in studies of subjective experience, there is a highly qualitative expectation in the research methodology. For example, Mollborn and Modile (2022) use interviews to understand how youth understand health as cultural capital linking the performance of healthy behaviors to moral worth. However, a relatively unexplored strength of biocultural anthropology is the combination of qualitative and quantitative measures to explore both human experience and human biology. This also presents a further opportunity to explore human variation. For example, in McClure's study (2020) and my own, we use qualitative and mixed methods to understand subjectivity. However, if we were to pair these methods with accelerometry or indirect calorimetry, we may further explore how human biology relates to the lived experience and as such develop stronger models by which to understand human variation as a core tenant of biocultural research (Hoke & Schell, 2020). The start of such studies may be seen in Kramer and Greaves work with Pumé girls as they use both quantitative measures of growth and physical activity along with ethnography to understand the experience of girls within the local environment on energy use (2011).

Second, this work serves as an example of how including diverse methods and voices in research can impact how researchers understand youth and physical activity. The majority of research on physical activity in youth draw on methods such as surveys or objective assessments of activity levels with wearable monitors as noted in Chapter 2 with nineteen unique studies opting to use wearables (Applehans et al., 2022; Bim et al., 2023; Davison & Deane, 2010; de

Souza et al., 2022; de Souza et al., 2023; Fertig et al., 2022; Katzmarzyk et al., 2015; Kidokoro et al., 2022; Manco et al., 2019; de Lucena Martins et al., 2021; Muthuri et al., 2015; Pate et al., 2022; Rietsch et al., 2013; Van Loon et al., 2014; Venetsanou et al., 2019; Williams et al., 2016; Zorrilla-Revilla et al., 2022). There were also several global studies of variation in physical activity. For example, Marques and colleagues provide a 38-country comparison from Europe and North America with surveys to understand composite health in school children (2020).

In contrast, this work combines ideas about physical activity from both adults and youth through interviews, focus groups, and surveys. This holistic approach to understand adult and youth perspectives impacted the results of the research. This is consistent with other scholarship that compares adult and youth perspectives on care. For example, Hunleth (2017) notes that adults explain their decisions to allow a few family members to migrate with children to a nearby city by suggesting that the city will provide greater educational opportunities. However, children note that their migration is necessary to care for their family members, and the children see themselves as primary caregivers to those who migrate to the city for more consistent healthcare access (Hunleth, 2017).

In fact, a core finding of my work is that research on physical activity, when given the space and opportunity to emphasize local voices, quickly transforms into research that encompasses all concepts of health. Adults working in care systems would point not only to physical activity, but also to the importance of leisure time activities to protect youth from sociocultural vulnerabilities that are common in the region, such as early pregnancy or alcoholism. Adults also note that youth need to be included in the decision-making and planning that occurs when preparing programming to aid in their care through local formal and informal systems (Chapter 3). Meanwhile, youth are quick to acknowledge that not just physical activities,

but also daily activities, such as caring for farm animals or helping in the household, are critical to their own wellbeing, to destress and distract (Chapter 4). As such, realigning physical activity research with health and wellbeing is a good way to continue work across disciplines and ensure practical applications of work. The WHO (2022b) defines physical activity as merely a facet of a network that encompasses health as a concept and an experience.

These understandings may be a result of the study location as Ecuador emphasizes a Health in All Policies approach to governance and policy. This suggests that with any policy made in any sector, health should be at the forefront of concern and benefit (Pan American Health Organization, 2017; World Health Organization, 2014a). This also aligns with the local *Sumak Kawsay* or Good Living practices that were integrated into the 2008 constitution and have since been a part of national planning with each new presidential term (Mahabir et al., 2022). This emphasis stems from indigenous beliefs of wellbeing as a sense of harmony with oneself, one's family and community, and with the earth (Caria & Domínguez, 2015; Mahabir et al., 2022).

Overall, from this study, I identify an advantage in working with a variety of community members to gain multiple perspectives of a single concept. In this case, physical activity holds meaning for many facets of health and wellbeing, care systems in the region, and youth's own perspectives of their daily lives and health as they relate to community culture, family expectations, and individual values. These seemingly disparate groups are united through the perspective of *Sumak Kawsay* or Good Living, allowing youth to embody their sense of self and sense of place in their families and communities.

Strengths

To engage seriously and creatively with the concept of culture (Hoke & Schell, 2020, p. 4), I used physical activity as a biocultural experience that can be subjectively understood and even measured. I operationalized the theory of embodiment to understand youth's own lived experiences. The project also drives forward the theory of embodiment by using it to understand how local environment and the ways that youth navigate their time, energy, and expectation translate into physical activity and other daily behaviors.

By understanding youths' lived experiences from their own perspectives and experiences of embodiment, this study reveals a new way to allow youth to guide the research as active rather than passive participants (Hunleth et al., 2022). This was done through a mixed methods research design, incorporating interviews, participant observation, focus groups, and a forced distribution survey (Q-methodology). Critical to the methods was the sharing of results with youth in a final focus group to understand how they perceived the results in comparison to how I perceived the results, giving preference to youth perceptions (Chapter 4). This also supports the research that suggests that Q-methodology is an effective method to study youth subjectivity (Owens, 2016).

Turning back to developing work that goes beyond the academe, this two-year research, provided me with an exceptional opportunity in participation with the health center, human rights committee, and other university projects to continue educating on topics of health and wellbeing within adolescents. I held art, English, and sport clubs at the local schools in which the students and I learned and practiced skills that interested the students, while I also developed several presentations and workshops for the adolescent healthcare team. Lastly, I teamed with tourism and the health center to organize hikes to local archaeological sites with local youth to learn more about their local history and nature paths.

Limitations

There is no doubt that beginning this research at the tail end of a pandemic was not an ideal start. At the beginning of my time in Ecuador, many were distrustful of public spaces, masks were required outside of the home, and schools had not returned to in-person classes. This meant that I was slow to get to know the community and to be known in the community. I spent much of my time with the health center's adolescent team, preparing presentations and workshops for an unknown future date when classes would be in-person again. I also conducted house visits with medical teams to understand the standard of living, occupational practices, and expansiveness of this rural county. Unfortunately, this timing also meant that my study was slow to gain local approval, and I could not recruit enough participants to effectively conduct accelerometry to measure energy use in the adolescents, which would have brought an interesting quantitative element to the study.

Further limitations occurred most simply at the familial level. Since many adolescents had roles to fulfill in their families, they could not participate in my study after school hours. As school hours are crucial to education, I did not intrude on that learning time with my study. This meant that those available to participate in my study had some flexibility in their household roles and often had supportive parental and legal figures who allowed them that flexibility.

My sample also did not include those adolescents who did not attend school or weren't motivated to participate in research on physical activity. While youth who didn't participate were often curious about my job and ongoing activities, they maintained their status as "outsiders" choosing not to participate rather vocally. This meant that the sample was skewed toward those adolescents who were highly motivated. This does mean that the results are not generalizable across all youth in the area, but instead provide insight into a motivated youth sample.

Conclusion

This study reveals the knowledge researchers gain by emphasizing flexibility and innovation in biocultural research. Understanding the embodied experience of youth, with their opportunities and risks as they are understood both by adults and youth themselves, provides necessary insight into how researchers move forward in research and practice. Revealing how youth can navigate between their cultural and familial expectations and globalizing influences suggests that they can and do create a space for themselves and their wellbeing. This use of subjectivity in research with youth will remain important through continued exploration into physical activity patterns and decreases globally.

REFERENCES

Aalsma, M. C., Carpentier, M. Y., Azzouz, F., & Fortenberry, J. D. (2012). Longitudinal effects of health-harming and health-protective behaviors within adolescent romantic dyads. *Social Science & Medicine, 74*(9), 1444-1451. https://doi.org/10.1016/j.socscimed.2012.01.014

Altmann, P. (2017). Sumak Kawsay as an element of local decolonization in Ecuador. *Latin American Research Review, 52*(5), 749-759. https://doi.org/10.25222/larr.242

Amri, M., Chatur, A., & O'Campo, P. (2022). An umbrella review of intersectoral and multisectoral approaches to health policy. *Social Science & Medicine, 315*, 115469. https://doi.org/10.1016/j.socscimed.2022.115469

Arksey, H. & O'Malley, L. (2005). Scoping studies: Toward a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19-32. https://doi.org/10.1080/1364557032000119616

Armelagos, G. J., Leatherman, T., Ryan, M., & Sibley, L. (1992). Biocultural synthesis in medical anthropology. *Medical Anthropology, 14*(1), 35-52. https://doi.org/10.1080/01459740.1992.9966065

Aubert, S., Brazo-Sayavera, J., Gonzalez, S. A., Janssen, I., Manyanga, T., Oyeyemi, A. L., Picard, P., Sherar, L. B., Turner, E., & Tremblay, M. S. (2021). Global prevalence of physical activity for children and adolescents; inconsistencies, research gaps, and recommendations: a narrative review. *International Journal of Behavior, Nutrition, and Physical Activity, 18*(1), 81. https://doi.org/10.1186/s12966-021-01155-2

Banasick, S. (2023). Ken-Q analysis (version 2.0.1) [Computer software]. https://doi.org/10.5281/zenodo.8310377

Barros-Gavilanes, G., Barros, M.-J., & Barros, P. (2020). *Estimating health economics impact of cycling in Cuenca, Ecuador* IEEE ANDESCON, Quito, Ecuador.

Bauer, S. (2008). Societal and ethical issues in human biomonitoring--a view from science studies. *Environmental Health, 7 Suppl 1*(Suppl 1), S10. https://doi.org/10.1186/1476-069X-7-S1-S10

Bauman, A. E., Reis, R. S., Sallis, J. F., Wells, J. C., Loos, R. J., Martin, B. W., & Lancet Physical Activity Series Working Group. (2012). Correlates of physical activity: Why are

some people physically active and others not? *Lancet, 380*(9838), 258-271. https://doi.org/10.1016/S0140-6736(12)60735-1

Bernard, R. (2007). *Research methods in anthropology: Qualitative and quantitative approaches*. AltaMira Press.

Besnier, N., Brownell, S., & Carter, T.F. (2018). *The Anthropology of Sport: Bodies, Borders, and Biopolitics.* University of California Press.

Bim, M. A., de Pinto, A. d. A., Claumann, G. S., & Pelegrini, A. (2023). Mediation effects of lean mass and fat mass on the relationship between body mass index and handgrip strength. *American Journal of Human Biology,* e24004. https://doi.org/10.1002/ajhb.24004

Bluebond-Langner, M., & Korbin, J. E. (2007). Challenges and opportunities in the anthropology of childhoods: An introduction to "children, childhoods, and childhood studies". *American Anthropologist, 109*(2), 241-246. https://doi.org/10.1525/AA.2007.109.2.241

Bondi, D., Robazza, C., Lange-Küttner, C., & Pietrangelo, T. (2022). Fine motor skills and motor control networking in developmental age. *American Journal of Human Biology, 34*(8), e23758. https://doi.org/https://doi.org/10.1002/ajhb.23758

Bock, J. (2002). Learning, life history, and productivity: Children's lives in the Okavango Delta, Botswana. *Human Nature, 13*(2), 161-197. https://doi.org/10.1007.s12110-002-1007-4

Bourdieu, P. (1984). *Distinction: A social critique of the judgement of taste* (R. Nice, Trans.): Harvard University Press.

Brewer, M., & Kimbro, R. T. (2014). Neighborhood context and immigrant children's physical activity. *Social Science & Medicine, 116*, 1-9. https://doi.org/10.1016/j.socscimed.2014.06.022

Brewis, A. (2003). Biocultural aspects of obesity in young Mexican schoolchildren. *American Journal of Human Biology, 15*(3), 446-460. https://doi.org/10.1002/ajhb.10161

Brown, S. R. (2019). Subjectivity in the human sciences. *The Psychological Record, 69*(4), 565-579. https://doi.org/10.1007/s40732-019-00354-5

Brumbach, B. H., Figueredo, A. J., & Ellis, B. J. (2009). Effects of harsh and unpredictable environments in adolescence on development of life history strategies: A longitudinal test of an evolutionary model. *Human Nature, 20*(1), 25-51. https://doi.org/10.1007/s12110-009-9059-3

Buliung, R., Hess, P., Flowers, L., Moola, F. J., & Faulkner, G. (2021). Living the journey to school: Conceptual asymmetry between parents and planners on the journey to school.

Social Science & Medicine, 284, 114237. https://doi.org/10.1016/j.socscimed.2021.114237

Caria, S., & Domínguez, R. (2015). Ecuador's "Buen vivir": A new ideology for development. *Latin American Perspectives, 43*(1), 18-33. https://doi.org/10.1177/0094582x15611126

Carroll, P., Witten, K., & Duff, C. (2021). "How can we make it work for you?" Enabling sporting assemblages for disabled young people. *Social Science & Medicine*, 113213. https://doi.org/10.1016/j.socscimed.2020.113213

Carroll-Scott, A., Gilstad-Hayden, K., Rosenthal, L., Peters, S. M., McCaslin, C., Joyce, R., & Ickovics, J. R. (2013). Disentangling neighborhood contextual associations with child body mass index, diet, and physical activity: The role of built, socioeconomic, and social environments. *Social Science & Medicine, 95*, 106-114. https://doi.org/10.1016/j.socscimed.2013.04.003

Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: Definitions and distinctions for health-related research. *Public Health Reports, 100*(2), 126–131. http://www.jstor.org/stable/20056429

Cazar, J., & Astudillo, J. (2007). *Situación de salud de Nabón, provincia de Azuay y los objectivos de desarrollo del milenio relacionados con la salud*. https://www3.paho.org/ecu/index.php?option=com_docman&view=download&category_slug=politicas-sistemas-y-servicios-de-salud&alias=46-situacion-de-salud-de-nabon-provincia-del-azuay-y-los-objetivos-de-desarrollo-del-milenio-relaciona&Itemid=599

Chang, Z., Wang, S., & Zhang, X. (2020). Seasonal variations in physical activity and sedentary behavior among preschool children in a Central China city. *American journal of human biology*, e23406. https://doi.org/10.1002/ajhb.23406

Charnov, E. L., Turner, T. F., & Winemiller, K. O. (2001). Reproduction constraints and the evolution of life histories with indeterminate growth. *Proceedings of the National Academy of Sciences of the United States of America, 98*(16), 9460-9464. http://doi.org/10.1073/pmas.161294498

Christiana, R. W., Battista, R. A., James, J. J., & Bergman, S. M. (2017). Pediatrician prescriptions for outdoor physical activity among children: A pilot study. *Preventative Medicine Reports, 5*, 100-105. https://doi.org/10.1016/j.pmedr.2016.12.005

Conching, A. K. S., & Thayer, Z. (2019). Biological pathways for historical trauma to affect health: A conceptual model focusing on epigenetic modifications. *Social Science & Medicine, 230*, 74-82. https://doi.org/10.1016/j.socscimed.2019.04.001

Consejo Nacional de Planificación. (2017). *Plan nacional de desarrollo 2017-2021-Toda una Vida*. Secretaría Nacional de Planificación y Desarrollo. https://www.gob.ec/sites/default/files/regulations/2018-10/Plan%20Nacional%20de%20Desarrollo%20Toda%20Una%20Vida%202017%20-%202021.pdf

Csordas, T. J. (1990). Embodiment as a paradigm for Anthropology. *Ethos, 18*(1), 5-47. https://doi.org/10.1525/eth.1990.18.1.02a00010

Creighton, M. J., Goldman, N., Teruel, G., & Rubalcava, L. (2011). Migrant networks and pathways to child obesity in Mexico. *Social Science & Medicine, 72*(5), 685-693. https://doi.org/10.1016/j.socscimed.2010.12.006

Datos del cantón. (n.d.). Nabón alcaldía. https://www.nabon.gob.ec/datos-del-canton/

Davison, K. K., & Deane, G. D. (2010). The consequence of encouraging girls to be active for weight loss. *Social Science & Medicine, 70*(4), 518-525. https://doi.org/10.1016/j.socscimed.2009.10.061

Davison, K. K., Nishi, A., Kranz, S., Wyckoff, L., May, J. J., Earle-Richardson, G. B., Strogatz, D. S., & Jenkins, P. L. (2012). Associations among social capital, parenting for active lifestyles, and youth physical activity in rural families living in upstate New York. *Social Science & Medicine, 75*(8), 1488-1496. https://doi.org/10.1016/j.socscimed.2012.06.002

de la Haye, K., Robins, G., Mohr, P., & Wilson, C. (2011). How physical activity shapes, and is shaped by, adolescent friendships. *Social Science & Medicine, 73*(5), 719-728. https://doi.org/10.1016/j.socscimed.2011.06.023

de la Rie, S., Washbrook, E., Perinetti Casoni, V., Waldfogel, J., Kwon, S. J., Dräger, J., Schneider, T., Olczyk, M., Boinet, C., & Keizer, R. (2023). The role of energy balance related behaviors in socioeconomic inequalities in childhood body mass index: A comparative analysis of Germany, the Netherlands, the United Kingdom, and the United States. *Social Science & Medicine, 317*, 115575. https://doi.org/10.1016/j.socscimed.2022.115575

de Lucena Martins, C. M., Lemos, L., de Souza Filho, A. N., Bezerra, T. A., Soares, I. A. A., Mota, J. G., Bandeira, P. F. R., Mota, J., Tassitano, R. M., & Duncan, M. J. (2021). Adherence to 24-hour movement guidelines in low-income Brazilian preschoolers and associations with demographic correlates. *American Journal of Human Biology, 33*(4), e23519. https://doi.org/10.1002/ajhb.23519

de Souza, A. A., Bandeira, P. F. R., Vale, S. M. C. G., da Cunha, G. L., Mota, J. A. P. S., & de Lucena Martins, C. M. (2023). Paths towards a healthier BMI among short and adequate sleepers: A pathway network analysis considering movement behaviors in low-income preschoolers. *American Journal of Human Biology, 35*(9), e23915. https://doi.org/10.1002/ajhb.23915

de Souza, L. V., de Meneck, F., Parizotto, G. P., & Franco, M. (2022). Low birth weight and its relation to physical fitness parameters in children: Its negative effect on muscle strength

and cardiorespiratory endurance. *American Journal of Human Biology, 34*(1), e23595. https://doi.org/10.1002/ajhb.23595

Dhurandhar, N. V., Schoeller, D., Brown, A. W., Heymsfield, S. B., Thomas, D., Sorensen, T. I., Speakman, J. R., Jeansonne, M., Allison, D. B., & Energy Balance Measurement Working, G. (2015). Energy balance measurement: when something is not better than nothing. *International Journal of Obesity (London), 39*(7), 1109-1113. https://doi.org/10.1038/ijo.2014.199

do Carmo, A. S., Rodrigues, D., Nogueira, H., Mendes, L. L., dos Santos, L. C., Gama, A., Machado-Rodrigues, A. M., Silva, M.-R. G., Rosado-Marques, V., & Padez, C. (2020). Influence of parental perceived environment on physical activity, TV viewing, active play and Body Mass Index among Portuguese children: A mediation analysis. *American Journal of Human Biology*, e23400. https://doi.org/10.1002/ajhb.23400

dos Santos, E. A., Cavalheiro, L. A. M., Rodrigues, D., Machado-Rodrigues, A., Silva, M.-R., Nogueira, H., & Padez, C. (2023). Is more prolonged sun exposure associated with healthier life habits and obesity indicators in Portuguese children? *American Journal of Human Biology, 35*(9), e23918. https://doi.org/10.1002/ajhb.23918

Downey, G. (2016). Being human in cities: Phenotype bias from urban niche construction. *Current Anthropology, 57*(S13), S52-S64. https://doi.org/10.1086/685710

Drenowatz, C., Eisenmann, J. C., Pfeiffer, K. A., & Wickel, E. E. (2010). Maturity-related differences in physical activity among 10- to 12-year old girls. *American Journal of Human Biology*, 22(1), 18-22. https://doi.org/10.1002/ajhb.20905

Dressler, W. W. (2005). What's cultural about biocultural research? *Ethos, 33*(1), 20-45. https://doi.org/10.2307/3651913

de Munck, V. (2000). *Culture, self, and meaning*. Waveland Press.

Duff, C. (2014). *Assemblages of health: Deluze's empiricism and the ethology of life*. Springer.

Dufour, D.L. (1997) Nutrition, activity, and health in children. *Annual Review of Anthropology, 26*(1), 541-565. https://doi.org/10.1146/annurev.anthro.26.1.541

Dufour, D.L., & Piperata, B.A. (2008). Energy expenditure among farmers in developing countries: What do we know? *American Journal of Human Biology, 20*(3):249-58. https://doi.org/10.1002/ajhb.20764.

Dufour, D. L. & Piperata, B. A. (2018). Reflections on nutrition in biological anthropology. *American Journal of Physical Anthropology, 165*(4), 855-864. http://doi:10.1002/ajpa.23370

Duncan, M. J., Birch, S. L., Eyre, E., Bryant, E., Rutten, C., Boen, F., & Seghers, J. (2015). Comparisons in ambulatory physical activity in children from the United Kingdom and Belgium. *Annals of Human Biology, 42*(3), 290-292. https://doi.org/10.3109/03014460.2014.944568

Elgar, F. J., Xie, A., Pförtner, T.-K., White, J., & Pickett, K. E. (2016). Relative deprivation and risk factors for obesity in Canadian adolescents. *Social Science & Medicine, 152*, 111-118. https://doi.org/10.1016/j.socscimed.2016.01.039

Ellison, P. T., Reiches, M. W., Shattuck-Faegre, H., Breakey, A., Konecna, M., Urlacher, S., & Wobber, V. (2012). Puberty as a life history transition. *Annals of Human Biology, 39*(5), 352-360. https://doi.org/10.3109/03014460.2012.693199

Ergler, C. R., Kearns, R. A., & Witten, K. (2013). Seasonal and locational variations in children's play: Implications for wellbeing. *Social Science & Medicine, 91*, 178-185. https://doi.org/10.1016/j.socscimed.2012.11.034

Evans, G. W., Jones-Rounds, M. L., Belojevic, G., & Vermeylen, F. (2012). Family income and childhood obesity in eight European cities: The mediating roles of Neighborhood characteristics and physical activity. *Social Science & Medicine, 75*(3), 477-481. https://doi.org/10.1016/j.socscimed.2012.03.037

Evans, J. R., Wilson, R., Coleman, C., Man, W. Y. N., & Olds, T. (2018). Physical activity among indigenous Australian children and youth in remote and non-remote areas. *Social Science & Medicine, 206*, 93-99. https://doi.org/10.1016/j.socscimed.2018.04.018

Farnell, B. (2012). *Dynamic embodiment for social theory: I move therefore I am*. Routledge.

Fertig, A. R., de Brito, J. N., Trofholz, A. C., & Berge, J. M. (2022). Maternal employment and child weight-related health. *Social Science & Medicine, 310*, 115303. https://doi.org/10.1016/j.socscimed.2022.115303

Froehle, A. W., Wells, G. K., Pollom, T. R., Mabulla, A. Z. P., Lew-Levy, S., & Crittenden, A. N. (2019). Physical activity and time budgets of Hadza forager children: Implications for self-provisioning and the ontogeny of the sexual division of labor. *American Journal of Human Biology, 31*(1), e23209. https://doi.org/10.1002/ajhb.23209

Fuentes, A. (2013). Blurring the biological and social in human becomings. In T. Ingold & G. Palsson (Eds.), *Biosocial becomings: Integrating social and biological anthropology* (pp. 42-58). Cambridge University Press. https://doi.org/https://doi.org/10.1017/CBO9781139198394

Gaskins, S. (2008). Children's daily lives among the Yucatec Maya. In R. A. LeVine & R. S. New (Eds.), *Anthropology and child development: A cross-cultural reader*. (pp. 280-288). Blackwell Publishing.

Geertz, C. (1973). *The interpretations of culture: Selected essays*. Basic Books.

Geertz, C. (1983). *Local knowledge: Further essays in interpretive anthropology*. Basic Books.

GEOSalud. (n.d.) Ministerio de Salud Pública. https://geosalud.msp.gob.ec

Goodman, A. H., & Leatherman, T. L. (Eds.). (1998). *Building a new biocultural synthesis: Political-economic perspectives on human biology*. University of Michigan Press. https://doi.org/10.3998/mpub.10398.

Gravlee, C. C. (2009). How race becomes biology: Embodiment of social inequality. *American Journal of Physical Anthropology, 139*, 47-57. http://doi:10.1002/ajpa.20983

Gray, P. (2011). Decline of play and the rise of psychopathology in children and adolescents. *American Journal of Play, 3*(4), 443-463.

Gregoricka, L. A., & Baker, B. J. (2023). Investigating mobility and pastoralism in Kerma-period communities upstream of the fourth cataract, Sudan. *American Journal of Biological Anthropology, 182*(2), 279-299. https://doi.org/10.1002/ajpa.24827

Hallal, P. C., Andersen, Lars B., Bull, F. C., Guthold, R., Haskell, W., & Ekelund, U. (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

Harry, J. (2023). Globalizations and local adaptations: A cultural anthropological perspective. *The Journal of International Social Research, 16*(107). https://doi.org/10.17719/jisr.2023.123378

Hermida, M. A., Neira, M., Cabrera-Jara, N., & Osorio, P. (2017). Resilience in Latin American Cities: Behaviour vs. Space quality in the riverbanks of the Tomebamba River. *Procedia Engineering, 198*, 467-481. https://doi.org/10.1016/j.proeng.2017.07.101

Hidding, L. M., Chinapaw, M. J. M., van Poppel, M. N. M., Mokkink, L. B., & Altenburg, T. M. (2018). An Updated Systematic Review of Childhood Physical Activity Questionnaires. *Sports Medicine, 48*(12), 2797-2842. https://doi.org/10.1007/s40279-018-0987-0

Hills, A. P., Farpour-Lambert, N. J., & Byrne, N. M. (2019). Precision medicine and healthy living: The importance of the built environment. *Progress in Cardiovascular Diseases, 62*(1), 34-38. https://doi.org/10.1016/j.pcad.2018.12.013

Hoke, M. K., & Schell, L. M. (2020). Doing biocultural anthropology: Continuity and change. *American Journal of Human Biology, 32*(4), e23471. https://doi.org/10.1002/ajhb.23471

Howe, C. A., Casapulla, S., Shubrook, J. H., Lopez, P., Grijalva, M., & Berryman, D. E. (2018). Regional variations in physical fitness and activity in healthy and overweight Ecuadorian adolescents. *Children (Basel), 5*(8), 104. https://doi.org/10.3390/children5080104

Huh, J., Riggs, N. R., Spruijt-Metz, D., Chou, C.-P., Huang, Z., & Pentz, M. (2011). Identifying patterns of eating and physical activity in children: A latent class analysis of obesity risk. *Obesity, 19*(3), 652-658. https://doi.org/10.1038/oby.2010.228

Hunleth, J. (2011). Beyond on or with: Questioning power dynamics and knowledge production in 'child-oriented' research methodology. *Childhood, 18*(1), 81-93. https://doi.org/10.1177/0907568210371234

Hunleth, J. (2017). *Children as caregivers: The global fight against tuberculosis and HIV in Zambia*. Rutgers University Press.

Hunleth, J. (2019). Zambian children's imaginal caring: On fantasy, play, and anticipation in an epidemic. *Cultural Anthropology, 34*(2), 155-186. https://doi.org/10.14506/ca34.2.01

Hunleth, J. M., Spray, J. S., Meehan, C., Lang, C. W., & Njelesani, J. (2022). What is the state of children's participation in qualitative research on health interventions?: A scoping study. *BMC Pediatrics, 22*(1), 328. https://doi.org/10.1186/s12887-022-03391-2

Huss-Ashmore, R., & Johnston, F. E. (1985). Bioanthropological research in developing countries. *Annual Review of Anthropology, 14*(1), 475-528. https://doi.org/10.1146/annurev.an.14.100185.002355

Ingold, T. (1996) Situating action V: The history and evolution of bodily skills. *Ecological Psychology, 8*: 171-182. https://doi.org/10.1207/s15326969eco0802_5

Ingold, T. Prospect (2013). Introduction. *Biosocial becomings: Integrating social and biological anthropology*, T. Ingold and G. Palsson (Eds.). (pp. 1-21) Cambridge University Press.

Instituto Nacional de Estadistica y Censos, & Fondo de Población de las Naciones Unidas. (2001). *Cantón Nabón*. Retrieved from Quito, Ecuador: https://www.ecuadorencifras.gob.ec/documentos/web-inec/Bibliotecas/Fasciculos_Censales/Fasc_Cantonales/Azuay/Fasciculo_Nabon.pdf

Jirata, T. J. (2019). The cultural spaces of young children: Care, play and learning patterns in early childhood among the Guji people of Ethiopia. *Global Studies of Childhood 9*(1), 42-55. https://doi.org/10.1177/2043610618817317

Jurak, G., Sorić, M., Starc, G., Kovač, M., Mišigoj-Duraković, M., Borer, K., & Strel, J. (2015). School day and weekend patterns of physical activity in urban 11-year-olds: A cross-cultural comparison. *American Journal of Human Biology, 27*(2), 192-200. https://doi.org/10.1002/ajhb.22637

Katzmarzyk, P. T., Barreira, T. V., Broyles, S. T., Champagne, C. M., Chaput, J.-P., Fogelholm, M., Hu, G., Johnson, W. D., Kuriyan, R., Kurpad, A., Lambert, E. V., Maher, C., Maia, J., Matsudo, V., Olds, T., Onywera, V., Sarmiento, O. L., Standage, M., Tremblay, M. S., Tudor-Locke, C., Zhao, P., Church, T. S., & the ISCOLE Research Group. (2015).

Relationship between lifestyle behaviors and obesity in children ages 9–11: Results from a 12-country study. *Obesity, 23*(8), 1696-1702. https://doi.org/10.1002/oby.21152

Khatun, A., Mukhopadhyay, A., & Bose, K. (2016). Adiposity and body composition in relation to physical activity status among Muslim adolescents of North 24 Parganas, West Bengal. *Journal of the Indian Anthropological Society., 51*(3), 168-176.

Kidokoro, T., Tian, X., Fuku, N., Waiganjo, L. B., Rintaugu, E. G., Kigaru, M. D., & Mwangi, F. M. (2022). Segmented physical activity and sedentary behavior patterns among children in Maasai village and Nairobi city. *American Journal of Human Biology, 34*(3), e23649. https://doi.org/10.1002/ajhb.23649

Kim, T., & Kim, J. (2020). Linking adolescent future expectations to health in adulthood: Evidence and mechanisms. *Social Science & Medicine, 263,* 113282. https://doi.org/10.1016/j.socscimed.2020.113282

Kimbro, R. T., Brooks-Gunn, J., & McLanahan, S. (2011). Young children in urban areas: Links among neighborhood characteristics, weight status, outdoor play, and television watching. *Social Science & Medicine, 72*(5), 668-676. https://doi.org/10.1016/j.socscimed.2010.12.015

Kline, L., Jones-Smith, J., Miranda, J. J., Pratt, M., Reis, R. S., Rivera, J. A., Sallis, J. F., & Popkin, B. M. (2017). A research agenda to guide progress on childhood obesity prevention in Latin America. *Obesity Reviews, 18,* 19-27. http://doi:10.1111/obr.12572

Kramer, K. L. (2014). Why what juveniles do matters in the evolution of cooperative breeding. *Human Nature, 25*(1), 49-65. https://doi.org/10.1007/s12110-013-9189-5

Kramer, K. L., & Greaves, R. D. (2011). Juvenile subsistence effort, activity levels, and growth patterns: Middle childhood among Pumé foragers. *Human Nature, 22*, 303-326. https://doi.org/10.1007/s12110-011-9122-8

Krieger, N. (2005). Embodiment: A conceptual glossary for epidemiology. *Journal of Epidemiology and Community Health, 59*(5), 350-355. http://doi:10.1136/jech.2004.024562

Krieger, N. & Davey Smith, G. (2004). "Bodies count," and body counts: Social epidemiology and embodying inequality. *Epidemiology Review, 26*, 92-103. http://doi:10.1093/epirev/mxh009

Kuzawa, C. W. (2007). Developmental origins of life history: Growth, productivity, and reproduction. *American Journal of Human Biology, 19*(5), 654-661. https://doi.org/10.1002/ajhb.20659

Lancy, D. F. (2018). *Anthropological perspectives on children as helpers, workers, artisans, and laborers*. New York, NY: Palgrave Macmillan.

Larson, N. I., Wall, M. M., Story, M. T., & Neumark-Sztainer, D. R. (2013). Home/family, peer, school, and neighborhood correlates of obesity in adolescents. *Obesity, 21*(9), 1858-1869. https://doi.org/10.1002/oby.20360

Larsson, P. (2013), "The rhetoric/reality gap in social determinants of mental health", *Mental Health Review Journal*, *18*(4), 182-193. https://doi.org/10.1108/MHRJ-04-2013-0013

Lätt, E., Mäestu, J., Rääsk, T., Jürimäe, T., & Jürimäe, J. (2016). Cardiovascular fitness, physical activity, and metabolic syndrome risk factors among adolescent Estonian boys: A longitudinal study. *American Journal of Human Biology, 28*(6), 782-788. https://doi.org/10.1002/ajhb.22866

Lee, S., & Lim, Y. (2022). The gendered playing field: Family socioeconomic status and national gender inequality in adolescents' out-of-school physical activity. *Social Science & Medicine, 305,* 115062. https://doi.org/10.1016/j.socscimed.2022.115062

Leonard, W.R. (2001), Assessing the influence of physical activity on health and fitness. *American Journal of Human Biology, 13*: 159-161. https://doi.org/10.1002/1520-6300(200102/03)13:2<159::AID-AJHB1024>3.0.CO;2-C

Leonard, W. R. (2003). Measuring human energy expenditure: what have we learned from the flex-heart rate method? *American Journal of Human Biology, 15*(4), 479-489. https://doi.org/10.1002/ajhb.10187

Leonard, W. R. (2020). Re-examining biocultural approaches in human biology. *American Journal of Human Biology, 32*(4), e23475. https://doi.org/10.1002/ajhb.23475

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: Advancing the methodology. *Implementation Science, 5*, 69. https://doi.org/10.1186/1748-5908-5-69

LeVine, R. A & New, R. S. (2008) Introduction: Middle and later childhood: Work, play, participation, and learning. In R. A. LeVine & R. S. New (Eds.), *Anthropology and child development: A cross-cultural reader*. (pp. 247-250). Blackwell Publishing.

Lew-Levy, S., Boyette, A. H., Crittenden, A. N., Hewlett, B. S., & Lamb, M. E. (2019). Gender-typed and gender-segregated play among Tanzanian Hadza and Congolese BaYaka hunter-gatherer children and adolescents. *Childhood Development*, 91(4), 1284 https://doi.org/10.1111/cdev.13306

Lim, S., Bang, H., & Ark, A. (2021). Using Q methodology to explore American Adolescents' self-images and images of their parents. *The Family Journal, 30*(1), 67-84. https://doi.org/10.1177/1066480720986501

Loaiza, J. M. (2018). From enactive concern to care in social life: Towards an enactive anthropology of caring. *Adaptive Behavior, 27*(1), 17-30. https://doi.org/10.1177/1059712318800673

Lombardo, M. P., & Otieno, S. (2021). The associations between digit ratio, aerobic fitness, physical skills, and overall physical fitness of elite youth distance runners. *American Journal of Human Biology, 33*(1), e23448. https://doi.org/10.1002/ajhb.23448

Macdonald-Wallis, K., Jago, R., Page, A. S., Brockman, R., & Thompson, J. L. (2011). School-based friendship networks and children's physical activity: A spatial analytical approach. *Social Science & Medicine, 73*(1), 6-12. https://doi.org/10.1016/j.socscimed.2011.04.018

Magalhães, K. C. S., Matias, T. S., Araujo, R. H., Werneck, A. O., Ferrari, G., Luz, L. G. O., Fernandes, R. A., Barbosa, D. S., Ronque, E. R. V., Cyrino, E. S., & Silva, D. R. (2022). Clusters of obesogenic behaviors and metabolic risk according to somatic maturity status among adolescents. *American Journal of Human Biology, 34*(9), e23778. https://doi.org/10.1002/ajhb.23778

Mahabir, D. F., Shankardass, K., Freiler, A., O'Campo, P., Brisbois, B., & Muntaner, C. (2022). How and why buy-in for health in all policies was facilitated in Ecuador: A realist case study of Plan Nacional para el Buen Vivir. *International Journal for Equity in Health, 21*(1), 108. https://doi.org/10.1186/s12939-022-01703-7

Malina, R.M. (2001), Physical activity and fitness: Pathways from childhood to adulthood. *American Journal of Human Biology, 13*: 162-172. https://doi.org/10.1002/1520-6300(200102/03)13:2<162::AID-AJHB1025>3.0.CO;2-T

Malina, R.M. & Little, B.B. (2008), Physical activity: The present in the context of the past. *American Journal of Human Biology, 20*: 373-391. https://doi.org/10.1002/ajhb.20772

Manco, L., Pinho, S., Albuquerque, D., Machado-Rodrigues, A. M., & Padez, C. (2019). Physical activity and the association between the FTO rs9939609 polymorphism and obesity in Portuguese children aged 3 to 11 years. *American Journal of Human Biology, 31*(6), e23312. https://doi.org/10.1002/ajhb.23312

Marques, A., Bordado, J., Tesler, R., Demetriou, Y., Sturm, D. J., & de Matos, M. G. (2020). A composite measure of healthy lifestyle: A study from 38 countries and regions from Europe and North America, from the Health Behavior in School-Aged Children survey. *American Journal of Human Biology, 32*(6), e23419. https://doi.org/10.1002/ajhb.23419

Marques, A., Branquinho, C., & De Matos, M. G. (2016). Girls' physical activity and sedentary behaviors: Does sexual maturation matter? A cross-sectional study with HBSC 2010 Portuguese survey. *American Journal of Human Biology, 28*(4), 471-475. https://doi.org/10.1002/ajhb.22814

Marques, A., Sallis, J. F., Martins, J., Diniz, J., & Carreiro Da Costa, F. (2014). Correlates of urban children's leisure-time physical activity and sedentary behaviors during school

days. *American Journal of Human Biology*, *26*(3), 407-412. https://doi.org/10.1002/ajhb.22535

Martinez-Gomez, D., Ruiz, J. R., Ortega, F. B., Casajús, J. A., Veiga, O. L., Widhalm, K., Manios, Y., Béghin, L., González-Gross, M., Kafatos, A., España-Romero, V., Molnar, D., Moreno, L. A., Marcos, A., Castillo, M. J., Sjöström, M., & the HELENA study group (2010). Recommended levels and intensities of physical activity to avoid low-cardiorespiratory fitness in European adolescents: The HELENA study. *American Journal of Human Biology*, *22*(6), 750-756. https://doi.org/10.1002/ajhb.21076

Mascia-Lees, F. E. (Ed.) (2011). *A companion to the anthropology of the body and embodiment*. West Sussex, United Kingdom: Blackwell Publishing Ltd.

Mattingly, C. (2008). Pocahontas goes to the clinic: Popular culture as lingua franca in a cultural borderland. *American Anthropologist*, *108*(3), 494-501. https://doi.org/10.1525/aa.2006.108.3.494

McClure, S. (2020). Living unembodiment: Physicality and body/self discontinuity among African American adolescent girls. *Ethos, 48*(1), 3-28. https://doi.org/10.1111/etho.12266

McLeroy, K. R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education Quarterly, 15*(4), 351-489. https://doi.org/10.1177/109019818801500401

McMurray, R. G., Harrell, J. S., Deng, S., Bradley, C. B., Cox, L. M., & Bangdiwala, S. I. (2000). The Influence of physical activity, socioeconomic status, and ethnicity on the weight status of adolescents. *Obesity Research, 8*(2), 130-139. https://doi.org/10.1038/oby.2000.14

Mead, M. (2008). The ethnography of childhood. In R. A. LeVine & R. S. New (Eds.), *Anthropology and child development: A cross-cultural reader*. (pp. 22-27). Blackwell Publishing.

Miller, M. J., Agarwal, S. C., Aristizabal, L., & Langebaek, C. (2018). The daily grind: Sex- and age-related activity patterns inferred from cross-sectional geometry of long bones in a pre-Columbian muisca population from Tibanica, Colombia. *American Journal of Physical Anthropology, 167*(2), 311-326. https://doi.org/10.1002/ajpa.23629

Moffat, T. (2010). The "childhood obesity epidemic": Health crisis or social construction?. *Medical Anthropology Quarterly, 24*(1), 1-21. https://doi.org/ 10.1111/j.1548-1387.2010.01082.x

Mollborn, S., & Modile, A. (2022). "Dedicated to being healthy": Young adults' deployments of health-focused cultural capital. *Social Science & Medicine, 293,* 114648. https://doi.org/10.1016/j.socscimed.2021.114648

Monaghan, L. F., & Gabe, J. (2016). Embodying health identities: A study of young people with asthma. *Social Science & Medicine, 160*, 1-8. https://doi.org/10.1016/j.socscimed.2016.05.013

Mota, J., Santos, R., Pereira, M., Teixeira, L., & Santos, M. P. (2011). Perceived neighbourhood environmental characteristics and physical activity according to socioeconomic status in adolescent girls. *Annals of Human Biology, 38*(1), 1-6. https://doi.org/10.3109/03014460.2010.486769

Muthuri, S. K., Wachira, L.-J. M., Onywera, V. O., & Tremblay, M. S. (2015). Direct and self-reported measures of physical activity and sedentary behaviours by weight status in school-aged children: Results from ISCOLE-Kenya. *Annals of Human Biology, 42*(3), 237-245. https://doi.org/10.3109/03014460.2014.932847

National health interview survey: Glossary. (2017). Centers for Disease Control and Prevention. https://www.cdc.gov/nchs/nhis/physical_activity/pa_glossary.htm

Nevill, A. M., Duncan, M. J., Lahart, I., & Sandercock, G. (2016). Modelling the association between weight status and social deprivation in English school children: Can physical activity and fitness affect the relationship? *Annals of Human Biology, 43*(6), 497-504. https://doi.org/10.3109/03014460.2015.1115126

Nogueira, H., Costeira e Pereira, M. M., Costa, D., Gama, A., Machado-Rodrigues, A., Silva, M.-R., Marques, V. R., & Padez, C. M. (2020). The environment contribution to gender differences in childhood obesity and organized sports engagement. *American Journal of Human Biology, 32*, e23322. https://doi.org/ 10.1002/ajhb.23322

Ocobock, C. (2016), The allocation and interaction model: A new model for predicting total energy expenditure of highly active humans in natural environments. *American Journal of Human Biology, 28*: 372-380. https://doi.org/10.1002/ajhb.22797

Ojiambo, R., Gibson, A. R., Konstabel, K., Lieberman, D. E., Speakman, J. R., Reilly, J. J., & Pistsiladis, Y. P. (2013). Free-living physical activity and energy expenditure of rural children and adolescents in the Nandi region of Kenya. *Annals of Human Biology, 40*(3), 318-323. https://doi.org/10.3109/03014460.2013.775344

Oliver, B. E., Nesbit, R. J., McCloy, R., Harvey, K., & Dodd, H. F. (2023). Adventurous play for a healthy childhood: Facilitators and barriers identified by parents in Britain. *Social Science & Medicine, 323*, 115828. https://doi.org/10.1016/j.socscimed.2023.115828

Owens, L. (2016). The use of Q sort methodology in research with teenagers. In J. Prior & J. V. Herwegen (Eds.), *Practical Research with Children* (pp. 18). Routledge.

Pabayo, R., Belsky, J., Gauvin, L., & Curtis, S. (2011). Do area characteristics predict change in moderate-to-vigorous physical activity from ages 11 to 15 years? *Social Science & Medicine, 72*(3), 430-438. https://doi.org/10.1016/j.socscimed.2010.09.039

Paez, D. C., Florez, J., Gomez, M. T., Garcia, D., Arango-Paternina, C. M., & Duperly, J. (2024). Curricular and pedagogical approaches to physical activity prescription training: A mixed methods study of the “Exercise is Medicine” workshops in Columbia. *BMC Medical Education, 24*(1), 79. https://doi.org/10.1186/s12909-23-04999-3

Palsson, G. Prospect (2013). Ensembles of biosocial relations. *Biosocial becomings: Integrating social and biological anthropology*, T. Ingold and G. Palsson (Eds.). (pp. 22-41). Cambridge University Press.

Pan American Health Organization. (2017). *The sustainable health agenda for the Americas 2018-2030: A call to action for health and well-being in the region*. Pan American Health Organization. https://www.paho.org/en/sustainable-health-agenda-americas-2018-2030

Parrish, S., Lavis, A., Potter, C. M., Ulijaszek, S., Nowicka, P., & Eli, K. (2022). How active can preschoolers be at home? Parents' and grandparents' perceptions of children's day-to-day activity, with implications for physical activity policy. *Social Science & Medicine, 292*, 114557. https://doi.org/10.1016/j.socscimed.2021.114557

Pastuszak, A., Lewandowska, J., Buśko, K., & Charzewska, J. (2014). Effect of elevated physical activity on changes in body composition and subcutaneous fat distribution in boys aged 10 to 16 years: A longitudinal study. *Anthropological Review, 77*(1), 45-55. https://doi.org/10.2478/anre-2014-0004

Pate, R. R., Dowda, M., Dishman, R. K., Gorab, J., Bucko, A., & Saunders, R. P. (2022). Longitudinal association of biological maturation with physical activity behaviors in girls transitioning from 5th to 7th grade. *American Journal of Human Biology, 34*(7), e23737. https://doi.org/10.1002/ajhb.23737

Piperata, B. A., & Dufour, D. L. (2007). Diet, energy expenditure, and body composition of lactating Ribeirinha women in the Brazilian Amazon. *American Journal of Human Biology, 19*(5), 722-734. https://doi.org/10.1002/ajhb.20628

Pitfield, R., Deter, C., & Mahoney, P. (2019). Bone histomorphometric measures of physical activity in children from medieval England. *American Journal of Physical Anthropology, 169*(4), 730-746. https://doi.org/10.1002/ajpa.23853

Pontzer, H. (2015). Constrained Total Energy Expenditure and the Evolutionary Biology of Energy Balance. *Exercise and Sport Science Reviews, 43*(3), 110-116. https://doi.org/10.1249/JES.0000000000000048

Pontzer, H. (2017). The crown joules: energetics, ecology, and evolution in humans and other primates. *Evolutionary Anthropology, 26*(1), 12-24. http://doi.org/10.1002/evan.21513

Prados, M. J., Nicosia, N., & Datar, A. (2023). Impact of built, social, and economic environments on adolescent obesity and related health behaviors. *Obesity, 31*(4), 1085-1094. https://doi.org/10.1002/oby.23682

Quinn, E. A., Sangmo, J., Burack, S., & Childs, G. (2023). Childhood growth and education migration among ethnic Tibetan children from Nepal. *American Journal of Biological Anthropology, 180*(3), 427-441. https://doi.org/10.1002/ajpa.24652

Ramirez Varela, A., Cruz, G. I. N., Hallal, P., Blumenberg, C., da Silva, S. G., Salvo, D., Martins, R., da Silva, B. G. C., Resendiz, E., Del Portillo, M. C., Monteiro, L. Z., Khoo, S., Chong, K. H., Cozzensa da Silva, M., Mannocci, A., Ding, D., & Pratt, M. (2021). Global, regional, and national trends and patterns in physical activity research since 1950: A systematic review. *International Journal of Behavior Nutrition and Physical Activity, 18*(1), 5. https://doi.org/10.1186/s12966-020-01071-x

Ready, E., & Collings, P. (2021). "All the problems in the community are multifaceted and related to each other": Inuit concerns in an era of climate change. *American Journal of Human Biology, 33*(4), e23516. https://doi.org/10.1002/ajhb.23516

Reiches, M. W. (2019). Adolescence as a biocultural life history transition. *Annual Review of Anthropology, 48*(1), 151-168. https://doi.org/10.1146/annurev-anthro-102218-011118

Reiches, M. W., Moore, S. E., Prentice, A. M., Prentice, A., Sawo, Y., & Ellison, P. T. (2013). The adolescent transition under energetic stress: Body composition tradeoffs among adolescent women in The Gambia. *Evolution, Medicine, and Public Health, 2013*(1), 75-85. https://doi.org/10.1093/emph/eot005

Republic of Ecuador National Planning Council. (2013). *Good living national plan 2013-2017: Summarized version*. Quito, Ecuador: Senplades. https://www.planificacion.gob.ec/wp-content/uploads/downloads/2013/12/Buen-Vivir-ingles-web-final-completo.pdf

Ribeiro Jr, E., Neave, N., Marsili, B. K., Figueiredo, E. C. G., Martino-Andrade, A. J., & de Moraes, R. N. (2024). Prenatal androgenization (2D:4D) predictions of tennis match-play success in junior players: A search for physiological explanations. *American Journal of Human Biology, 36*(1), e23979. https://doi.org/10.1002/ajhb.23979

Rietsch, K., Eccard, J. A., & Scheffler, C. (2013). Decreased external skeletal robustness due to reduced physical activity? *American Journal of Human Biology, 25*(3), 404-410. https://doi.org/10.1002/ajhb.22389

Rivera-Morales, J., Sotuyo, S., Vargas-Guadarrama, L. A., De Santiago, S., & Pasquet, P. (2020). Physical activity and cardiorespiratory fitness in Tarahumara and Mestizo adolescents from Sierra Tarahumara, Mexico. *American Journal of Human Biology*, e23396. https://doi.org/10.1002/ajhb.23396

Robbins, P., & Krueger, R. (2000). Beyond bias? The promise and limits of Q-method in Human Geography. *The Professional Geographer, 52*(4), 636-648. https://doi.org/10.1111/0033-0124.00252

Rodrigues, D., Machado-Rodrigues, A., Gama, A., Nogueira, H., Silva, M.-R. G., & Padez, C. (2022). The Portuguese economic crisis is associated with socioeconomic and sex disparities on children's health-related behaviors and obesity: A cross-sectional study. *American Journal of Human Biology, 34*(12), e23796. https://doi.org/https://doi.org/10.1002/ajhb.23796

Rodrigues, D., Machado-Rodrigues, A. M., Gama, A., Silva, M.-R. G., Nogueira, H., & Padez, C. (2023). Body size, form, composition, and a healthy lifestyle associates with health-related quality of life among Portuguese children. *American Journal of Human Biology, 35*(8), e23902. https://doi.org/10.1002/ajhb.23902

Rodrigues, D., Padez, C., & Machado-Rodrigues, A. M. (2018). Child participation in sports is influenced by patterns of lifestyle-related behaviors. *American Journal of Human Biology, 30*, e23142. http://doi.org/ 10.1002/ajhb.23142

Rogoff, B., Sellers, M. J., Pirrotta, S., Fox, N., & White, S. H. (2008). Age and responsibility. In R. A. LeVine & R. S. New (Eds.), *Anthropology and child development: A cross-cultural reader*. (pp. 251-263). Blackwell Publishing.

Sabiston, C. M., Doré, I., Lucibello, K. M., Pila, E., Brunet, J., Thibault, V., & Bélanger, M. (2022). Body image self-conscious emotions get worse throughout adolescence and relate to physical activity behavior in girls and boys. *Social Science & Medicine, 315*, 115543. https://doi.org/10.1016/j.socscimed.2022.115543

Sands, R. R. & Sands, L. R. (2010). *The Anthropology of sport and human movement: A biocultural perspective*. Lexington Books.

Santos Gómez, H. (2014). *Immigrant farmworkers and citizenship in rural California: Playing soccer in the San Joaquin Valley*. LFB Scholarly Publishing LLC.

Savat, D. (2012). *Uncoding the digital: Technology, subjectivity and action in the control society*. Springer.

Sawyer, S. M., Afifi, R. A., Bearinger, L. H., Blakemore, S.-J., Dick, B., Ezeh, A. C., & Patton, G. C. (2012). Adolescence: A foundation for future health. *The Lancet, 379*(9826), 1630-1640. https://doi.org/10.1016/s0140-6736(12)60072-5

Sayre, M. K., Pike, I. L., & Raichlen, D. A. (2019). High levels of objectively measured physical activity across adolescence and adulthood among the Pokot pastoralists of Kenya. *American Journal of Human Biology, 31*(1), e23205. https://doi.org/10.1002/ajhb.23205

Schmengler, H., Peeters, M., Stevens, G. W. J. M., Kunst, A. E., Delaruelle, K., Dierckens, M., Charrier, L., Weinberg, D., Oldehinkel, A. J., & Vollebergh, W. A. M. (2022). Socioeconomic inequalities in adolescent health behaviours across 32 different countries

– The role of country-level social mobility. *Social Science & Medicine, 310*, 115289. https://doi.org/10.1016/j.socscimed.2022.115289

Shaban, L. H. (2018). Do mothers affect daughter's behaviors?: Diet, physical activity, and sedentary behaviors in Kuwaiti mother-daughter dyads. *Ecology of Food and Nutrition, 57*(2), 109-123. https://doi.org/10.1080/03670244.2017.1418337

Sharman, M. J., Jose, K. A., Tian, J., Venn, A. J., Canary, J., Banks, S., Ayton, J., & Cleland, V. J. (2021). Childhood factors related to diverging body mass index trajectories from childhood into mid-adulthood: A mixed methods study. *Social Science & Medicine, 270*, 113460. https://doi.org/10.1016/j.socscimed.2020.113460

Scheper-Hughes, N., & Lock, M. M. (1987). The mindful body: A prolegomenon to future work in medical anthropology. *Medical Anthropology Quarterly, 1*(1), 6-41.

Silva, A. L., Teles, J., Olivares, L. F., & Fragoso, I. (2021). Energy intake and expenditure in children and adolescents, contributions of biological maturity. *American Journal of Human Biology, 33*(6), e23529. https://doi.org/10.1002/ajhb.23529

Silva, D., Werneck, A. O., Collings, P., Tomeleri, C. M., Fernandes, R. A., Ronque, E., Venturini, D., Barbosa, D. S., Coelho-E-Silva, M. J., Sardinha, L. B., & Cyrino, E. S. (2016). Cardiorespiratory fitness is related to metabolic risk independent of physical activity in boys but not girls from Southern Brazil. *American Journal of Human Biology, 28*(4), 534-538. https://doi.org/10.1002/ajhb.22826

Silva, P., Seabra, A., Saint-Maurice, P., Soares-Miranda, L., & Mota, J. (2013). Physical activity intensities in youth: The effect of month of assessment. *Annals of Human Biology, 40*(5), 459-462. https://doi.org/10.3109/03014460.2013.788211

Sorić, M., Starc, G., Borer, K. T., Gregor, j., Kovač, M., Strel, J., & Mišigoj-Duraković, M. (2015). Associations of objectively assessed sleep and physical activity in 11-year old children. *Annals of Human Biology, 42*(1), 31-37. https://doi.org/10.3109/03014460.2014.928367

Spencer, P. R., Sanders, K. A., & Judge, D. S. (2019). Determinants of objectively measured physical activity in rural East Timorese children. *American Journal of Human Biology, 31*(4), e23247. https://doi.org/10.1002/ajhb.23247

Spindler, G., & Spindler, L. (1982). Do anthropologists need learning theory? *Anthropology & Education Quarterly, 13*(2), 109-124. https://doi.org/10.1525/aeq.1982.13.2.05x1828h

Stinson, S., Bogin, B., O'Rourke, D., & Huss-Ashmore, R. (2012). Human biology: An evolutionary and biocultural perspective. Ch 1 in *Human Biology: An Evolutionary and Biocultural Perspective*, S. Stinson, B. Bogin, and D. O'Rouke (Eds.). (pp. 3-22) Wiley-Liss, Inc.

Sui, A., Sui, W., Liu, S., & Rhodes, R. (2023). Ethical considerations for the use of consumer wearables in health research. *Digit Health, 9*, 20552076231153740. https://doi.org/10.1177/20552076231153740

Taylor, L. & Hickey, M. (2001). *Tunnel Kids.* The University of Arizona Press.

Tian, X. (2018). Generating Pastoral skills through work and play in the daily life of Maasai children in Kenya. *Journal of Ethnobiology, 38*(2), 170-186. https://doi.org/10.2993/0278-0771-38.2.170

Ulijaszek, S. (2023). Obesity and environments external to the body. *Philosophical Transactions of the Royal Society London B Biological Sciences, 378*(1885), 20220226. https://doi.org/10.1098/rstb.2022.0226

Ulijaszek, S. (2018). Physical activity and the human body in the (increasingly smart) built environment. *Obesity Reviews, 19 Suppl 1*, 84-93. https://doi.org/10.1111/obr.12790

Urlacher, S. S. (2023). The energetics of childhood: Current knowledge and insights into human variation, evolution, and health. *American Journal of Biological Anthropology, 181*(S76), 94-117. https://doi.org/10.1002/ajpa.24719

Urlacher, S. S., & Kramer, K. L. (2018). Evidence for energetic tradeoffs between physical activity and childhood growth across the nutritional transition. *Science Reports, 8*(1), 369. https://doi.org/10.1038/s41598-017-18738-4

Urlacher, S. S., Snodgrass, J. J., Dugas, L. R., Sugiyama, L. S., Liebert, M. A., Joyce, C. J., & Pontzer, H. (2019) Constraint and trade-offs regulate energy expenditure during childhood. *Science Advances, 5*, eaax1065. https://doi.org/10.1126/sciadv.aax1065.

Valente-Dos-Santos, J., Coelho-E-Silva, M. J., Castanheira, J., Machado-Rodrigues, A. m., Cyrino, E. S., Sherar, L. B., Esliger, D. W., Elferink-Gemser, M. T., & Malina, R. M. (2015). The effects of sports participation on the development of left ventricular mass in adolescent boys. *American Journal of Human Biology, 27*(4), 530-537. https://doi.org/10.1002/ajhb.22681

van Amsterdam, N., & Knoppers, A. (2018). Healthy habits are no fun: How Dutch youth negotiate discourses about food, fit, fat, and fun. *Health, 22*(2), 128-146. https://doi.org/10.1177/1363459316688517

van Loon, J., Frank, L. D., Nettlefold, L., & Naylor, P.-J. (2014). Youth physical activity and the neighbourhood environment: Examining correlates and the role of neighbourhood definition. *Social Science & Medicine, 104*, 107-115. https://doi.org/10.1016/j.socscimed.2013.12.013

Venetsanou, F., Kambas, A., Gourgoulis, V., & Yannakoulia, M. (2019). Physical activity in pre-school children: Trends over time and associations with body mass index and screen

time. *Annals of Human Biology, 46*(5), 393-399. https://doi.org/10.1080/03014460.2019.1659414

Watts, S., & Stenner, P. (2012). *Doing Q methodological research: Theory, method and interpretation*. Sage.

Weisner, T. S. & Gallimore, R. (2008). Child and sibling caregiving. In R. A. LeVine & R. S. New (Eds.), *Anthropology and child development: A cross-cultural reader*. (pp. 264-269). Blackwell Publishing.

Wenger, M. (2008). Children's work, play, and relationships among the Girama of Kenya. In R. A. LeVine & R. S. New (Eds.), *Anthropology and child development: A cross-cultural reader*. (pp. 289- 306). Blackwell Publishing.

Whiting, J. W. M. & Whiting, B. B. (2008). Altruistic and egoistic behavior of children in six cultures. In R. A. LeVine & R. S. New (Eds.), *Anthropology and child development: A cross-cultural reader*. (pp. 270-279). Blackwell Publishing.

Wiley, A. S. (2004). *An ecology of high-altitude infancy: A biocultural perspective*. Cambridge University Press.

Williams, K. D., Subedi, J., Jha, B., Blangero, J., Williams-Blangero, S., & Towne, B. (2016). Quantitative physical activity assessment of children and adolescents in a rural population from Eastern Nepal. *American Journal of Human Biology, 28*(1), 129-137. https://doi.org/10.1002/ajhb.22762

Winpenny, E. M., Smith, M., Penney, T., Foubister, C., Guagliano, J. M., Love, R., Clifford Astbury, C., van Sluijs, E. M. F., & Corder, K. (2020). Changes in physical activity, diet, and body weight across the education and employment transitions of early adulthood: A systematic review and meta-analysis. *Obesity Reviews, 21*(4), e12962. https://doi.org/10.1111/obr.12962

World Health Assembly. (2004). *Global strategy on diet, physical activity and health*. Geneva, Switzerland: World Health Organization. https://www.who.int/publications/i/item/9241592222

World Health Organization. (2022a). *Adolescent health*. https://www.who.int/health-topics/adolescent-health#tab=tab_1

World Health Organization. (2014a). Helsinki statement of health in all policies 2013. *Contributing to social and economic development: Sustainable action across sectors to improve health and health equity*.

World Health Organization. (2022b). Physical activity. *Fact Sheets*. https://www.who.int/news-room/fact-sheets/detail/physical-activity

World Health Organization. (2014b). *What you need to know about health in all policies*. https://cdn.who.int/media/docs/default-source/mca-documents/rmncah/health-in-all-policies-key-messages-en.pdf?sfvrsn=a4982d1_1

Worthman, C. M. (2019). Shared and local pathways in suffering and resilience: Keeping the body in mind. *Transcultural Psychiatry, 56*(4), 775-785. https://doi.org/10.1177/1363461519862700

Worthman, C., & Kohrt. B. (2005). Receding horizons of health: Biocultural approaches to public health paradoxes. *Social Science & Medicine*. 61:861-878. https://doi.org/ 10.1016/j.socscimed.2004.08.052

Worthman, C. M., Dockray, S., & Mareau, K. (2019). Puberty and the evolution of developmental science. *Journal of Research on Adolescence, 29*(1), 9-31. https://doi.org/10.1111/jora.12411

Worthman, C. M., & Trang, K. (2018). Dynamics of body time, social time and life history at adolescence. *Nature, 554*(7693), 451-457. https://doi.org/10.1038/nature25750

Xia, X., Li, Y., & Chen, S. (2023). Association between muscle strength and executive function in Tibetan adolescents at high altitude in China: Results from a cross-sectional study at 16–18 years of age. *American Journal of Human Biology, 35*(12), e23956. https://doi.org/10.1002/ajhb.23956

Zhang, F., Bi, C., Yin, X., Chen, Q., Liu, Y., Li, Y., Sun, Y., Zhang, T., Yang, X., & Li, M. (2022). Roles of age, sex, and weight status in the muscular fitness of Chinese Tibetan children and adolescents living at altitudes over 3600 m: A cross-sectional study. *American Journal of Human Biology, 34*(2), e23624. https://doi.org/10.1002/ajhb.23624

Zorrilla-Revilla, G., Rodrigues, D., Machado-Rodrigues, A. M., Mateos, A., Rodríguez, J., & Padez, C. (2022). Sex-specific differences in somatic investment and strategies of physical activity among Portuguese schoolchildren. *American journal of human biology, 34*(2), e23626. https://doi.org/10.1002/ajhb.23626

(2024). MAXQDA Plus 24 (24.2.0 version). [MacBook desktop software]. Verbi gmbH Berlin. https://www.maxqda.com

APPENDIX

Articles Included in Scoping Review

Aalsma, M. C., Carpentier, M. Y., Azzouz, F., & Fortenberry, J. D. (2012). Longitudinal effects of health-harming and health-protective behaviors within adolescent romantic dyads. *Social Science & Medicine, 74*(9), 1444-1451. https://doi.org/10.1016/j.socscimed.2012.01.014

Appelhans, B. M., French, S. A., Martin, M. A., Lui, K., & Janssen, I. (2022). Attenuated efficacy of pediatric obesity treatment during the COVID-19 pandemic. *Obesity, 30*(1), 45-49. https://doi.org/10.1002/oby.23313

Bim, M. A., de Pinto, A. d. A., Claumann, G. S., & Pelegrini, A. (2023). Mediation effects of lean mass and fat mass on the relationship between body mass index and handgrip strength. *American Journal of Human Biology,* e24004. https://doi.org/10.1002/ajhb.24004

Blaes, A., Baquet, G., Van Praagh, E., & Berthoin, S. (2011). Physical activity patterns in French youth—From childhood to adolescence—Monitored with high-frequency accelerometry. *American Journal of Human Biology, 23*(3), 353-358. https://doi.org/10.1002/ajhb.21142

Bondi, D., Robazza, C., Lange-Küttner, C., & Pietrangelo, T. (2022). Fine motor skills and motor control networking in developmental age. *American Journal of Human Biology, 34*(8), e23758. https://doi.org/10.1002/ajhb.23758

Brewer, M., & Kimbro, R. T. (2014). Neighborhood context and immigrant children's physical activity. *Social Science & Medicine, 116*, 1-9. https://doi.org/10.1016/j.socscimed.2014.06.022

Briody, J. (2021). Parental unemployment during the Great Recession and childhood adiposity. *Social Science & Medicine, 275*, 113798. https://doi.org/10.1016/j.socscimed.2021.113798

Brown, D. E., Katzmarzyk, P. T., & Gotshalk, L. A. (2018). Physical activity level and body composition in a multiethnic sample of school children in Hawaii. *Annals of Human Biology, 45*(3), 244-248. https://doi.org/10.1080/02014460.2018.1465121

Buliung, R., Hess, P., Flowers, L., Moola, F. J., & Faulkner, G. (2021). Living the journey to school: Conceptual asymmetry between parents and planners on the journey to school. *Social Science & Medicine, 284*, 114237. https://doi.org/10.1016/j.socscimed.2021.114237

Cain, K. L., Millstein, R. A., Sallis, J. F., Conway, T. L., Gavand, K. A., Frank, L. D., Saelens, B. E., Geremia, C. M., Chapman, J., Adams, M. A., Glanz, K., & King, A. C.

(2014). Contribution of streetscape audits to explanation of physical activity in four age groups based on the Microscale Audit of Pedestrian Streetscapes (MAPS). *Social Science & Medicine, 116*, 82-92. https://doi.org/10.1016/

Carroll, P., Witten, K., & Duff, C. (2021). "How can we make it work for you?" Enabling sporting assemblages for disabled young people. *Social Science & Medicine, 288*, 113213. https://doi.org/10.1016/j.socscimed.2020.113213

Carroll-Scott, A., Gilstad-Hayden, K., Rosenthal, L., Peters, S. M., McCaslin, C., Joyce, R., & Ickovics, J. R. (2013). Disentangling neighborhood contextual associations with child body mass index, diet, and physical activity: The role of built, socioeconomic, and social environments. *Social Science & Medicine, 95*, 106-114. https://doi.org/10.1016/j.socscimed.2013.04.003

Carver, A., Timperio, A., Hesketh, K., & Crawford, D. (2010). Are children and adolescents less active if parents restrict their physical activity and active transport due to perceived risk? *Social Science & Medicine, 70*(11), 1799-1805. https://doi.org/10.1016/j.socscimed.2010.02.010

Chambers, T., Pearson, A. L., Kawachi, I., Rzotkiewicz, Z., Stanley, J., Smith, M., barr, M., Ni Mhurchu, C., & Signal, L. (2017). Kids in space: Measuring children's residential neighborhoods and other destinations using activity space GPS and wearable camera data. *Social Science & Medicine, 193*, 41-50. https://doi.org/10.1016/j.socscimed.2017.09.046

Chang, Z., Wang, S., & Zhang, X. (2020). Seasonal variations in physical activity and sedentary behavior among preschool children in a Central China city. *American Journal of Human Biology,* e23406. https://doi.org/10.1002/ajhb.23406

Chen, K., & Phipps, S. (2021). "Why can't you sit still?" The effect of daily physical activity on childhood inattention/hyperactivity and the educational gender gap. *Social Science & Medicine, 284*, 114232. https://doi.org/10.1016/j.socscimed.2021.114232

Creighton, M. J., Goldman, N., Teruel, G., & Rubalcava, L. (2011). Migrant networks and pathways to child obesity in Mexico. *Social Science & Medicine, 72*(5), 685-693. https://doi.org/10.1016/j.socscimed.2010.12.006

Datar, A., Nicosia, N., & Shier, V. (2014). Maternal work and children's diet, activity, and obesity. *Social Science & Medicine, 107*, 196-204. https://doi.org/10.1016/j.socscimed.2013.12.022

Davison, K. K., & Deane, G. D. (2010). The consequence of encouraging girls to be active for weight loss. *Social Science & Medicine, 70*(4), 518-525. https://doi.org/10.1016/j.socscimed.2009.10.061

Davison, K. K., Nishi, A., Kranz, S., Wyckoff, L., May, J. J., Earle-Richardson, G. B., Strogatz, D. S., & Jenkins, P. L. (2012). Associations among social capital, parenting for active lifestyles, and youth physical activity in rural families living in upstate New York. *Social Science & Medicine, 75*(8), 1488-1496. https://doi.org/10.1016/j.socscimed.2012.06.002

de Chaves, R. N., Baxter-Jones, A., Santos, D., Gomes, T. N., dos Santos, F. K., de Souza, M. C., Diego, V. P., & Maia, J. (2014). Clustering of body composition, blood pressure and physical activity in Portuguese families. *Annals of Human Biology, 41*, 159-167. https://doi.org/https://doi.org/10.1016/j.socscimed.2012.06.002

de la Haye, K., Robins, G., Mohr, P., & Wilson, C. (2011). How physical activity shapes, and is shaped by, adolescent friendships. *Social Science & Medicine, 73*(5), 719-728. https://doi.org/10.1016/j.socscimed.2011.06.023

de la Rie, S., Washbrook, E., Perinetti Casoni, V., Waldfogel, J., Kwon, S. J., Dräger, J., Schneider, T., Olczyk, M., Boinet, C., & Keizer, R. (2023). The role of energy balance related behaviors in socioeconomic inequalities in childhood body mass index: A comparative analysis of Germany, the Netherlands, the United Kingdom, and the United States. *Social Science & Medicine, 317*, 115575. https://doi.org/10.1016/j.socscimed.2022.115575

de Lucena Martins, C. M., Lemos, L., de Souza Filho, A. N., Bezerra, T. A., Soares, I. A. A., Mota, J. G., Bandeira, P. F. R., Mota, J., Tassitano, R. M., & Duncan, M. J. (2021). Adherence to 24-hour movement guidelines in low-income Brazilian preschoolers and associations with demographic correlates. *American Journal of Human Biology, 33*(4), e23519. https://doi.org/10.1002/ajhb.23519

de Souza, A. A., Bandeira, P. F. R., Vale, S. M. C. G., da Cunha, G. L., Mota, J. A. P. S., & de Lucena Martins, C. M. (2023). Paths towards a healthier BMI among short and adequate sleepers: A pathway network analysis considering movement behaviors in low-income preschoolers. *American Journal of Human Biology, 35*(9), e23915. https://doi.org/10.1002/ajhb.23915

de Souza, A. A., Clark, C. C. T., Mota, J., Tassitano, R. M., Duncan, M. J., & Martins, C. M. d. L. (2022). Movement behaviors in short versus adequate nocturnal sleepers: A compositional analysis of preschoolers. *American Journal of Human Biology, 34*(5), e23694. https://doi.org/10.1002/ajhb.23694

de Souza, L. V., de Meneck, F., Parizotto, G. P., & Franco, M. (2022). Low birth weight and its relation to physical fitness parameters in children: Its negative effect on muscle strength and cardiorespiratory endurance. *American Journal of Human Biology, 34*(1), e23595. https://doi.org/10.1002/ajhb.23595

do Carmo, A. S., Rodrigues, D., Nogueira, H., Mendes, L. L., dos Santos, L. C., Gama, A., Machado-Rodrigues, A. M., Silva, M.-R. G., Rosado-Marques, V., & Padez, C. (2020). Influence of parental perceived environment on physical activity, TV viewing, active play and Body Mass Index among Portuguese children: A mediation analysis. *American Journal of Human Biology*, e23400. https://doi.org/10.1002/ajhb.23400

dos Santos, F. K., Gomes, T. N. Q. F., Damasceno, A., Prista, A., Eisenmann, J., & Maia, J. A. R. (2013). Physical activity, fitness and the metabolic syndrome in rural youths from Mozambique. *Annals of Human Biology, 40*(1), 15-22. https://doi.org/10.3109/03014460.2012.720708

dos Santos, E. A., Cavalheiro, L. A. M., Rodrigues, D., Machado-Rodrigues, A., Silva, M.-R., Nogueira, H., & Padez, C. (2023). Is more prolonged sun exposure associated with healthier life habits and obesity indicators in Portuguese children? *American Journal of Human Biology, 35*(9), e23918. https://doi.org/10.1002/ajhb.23918

Downey, G. (2016). Being human in cities: Phenotype bias from urban niche construction. *Current Anthropology, 57*(S13), S52-S64. https://doi.org/10.1086/685710

Drenowatz, C., Eisenmann, J. C., Pfeiffer, K. A., & Wickel, E. E. (2010). Maturity-related differences in physical activity among 10- to 12-year old girls. *American Journal of Human Biology, 22*(1), 18-22. https://doi.org/10.1002/ajhb.20905

Duncan, M. J., Birch, S. L., Eyre, E., Bryant, E., Rutten, C., Boen, F., & Seghers, J. (2015). Comparisons in ambulatory physical activity in children from the United Kingdom and Belgium. *Annals of Human Biology, 42*(3), 290-292. https://doi.org/10.3109/03014460.2014.944568

Elgar, F. J., Xie, A., Pförtner, T.-K., White, J., & Pickett, K. E. (2016). Relative deprivation and risk factors for obesity in Canadian adolescents. *Social Science & Medicine, 152*, 111-118. https://doi.org/10.1016/j.socscimed.2016.01.039

Ergler, C. R., Kearns, R. A., & Witten, K. (2013). Seasonal and locational variations in children's play: Implications for wellbeing. *Social Science & Medicine, 91*, 178-185. https://doi.org/10.1016/j.socscimed.2012.11.034

Evans, G. W., Jones-Rounds, M. L., Belojevic, G., & Vermeylen, F. (2012). Family income and childhood obesity in eight European cities: The mediating roles of Neighborhood characteristics and physical activity. *Social Science & Medicine, 75*(3), 477-481. https://doi.org/10.1016/j.socscimed.2012.03.037

Evans, J. R., Wilson, R., Coleman, C., Man, W. Y. N., & Olds, T. (2018). Physical activity among indigenous Australian children and youth in remote and non-remote areas. *Social Science & Medicine, 206*, 93-99. https://doi.org/10.1016/j.socscimed.2018.04.018

Evaristo, O. S., Moreira, C., Lopes, L., Abreu, S., Agostinis-Sobrinho, C., Oliveira-Santos, J., Oliveira, A., Mota, J., & Santos, R. (2019). Cardiorespiratory fitness and health-related quality of life in adolescents: A longitudinal analysis from the LabMed Physical Activity Study. *American Journal of Human Biology, 31*(6), e23304. https://doi.org/10.1002/ajhb.23304

Fertig, A. R., de Brito, J. N., Trofholz, A. C., & Berge, J. M. (2022). Maternal employment and child weight-related health. *Social Science & Medicine, 310*, 115303. https://doi.org/10.1016/j.socscimed.2022.115303

Froehle, A. W., Wells, G. K., Pollom, T. R., Mabulla, A. Z. P., Lew-Levy, S., & Crittenden, A. N. (2019). Physical activity and time budgets of Hadza forager children: Implications for self-provisioning and the ontogeny of the sexual division of labor. *American Journal of Human Biology, 31*(1), e23209. https://doi.org/10.1002/ajhb.23209

Gomes, T. N., dos Santos, F. K., Katzmarzyk, P. T., & Maia, J. (2017). Active and strong: physical activity, muscular strength, and metabolic risk in children. *American Journal of Human Biology, 29*(1), e22904. https://doi.org/10.1002/ajhb.22904

Gregoricka, L. A., & Baker, B. J. (2023). Investigating mobility and pastoralism in Kerma-period communities upstream of the fourth cataract, Sudan. *American Journal of Biological Anthropology, 182*(2), 279-299. https://doi.org/10.1002/ajpa.24827

Harrington, D. M., Gillison, F., Broyles, S. T., Chaput, J.-P., Fogelholm, M., Hu, G., Kuriyan, R., Kurpad, A., LeBlanc, A. G., Maher, C., Maia, J., Matsudo, V., Olds, T., Onywera, V., Sarmiento, O. L., Standage, M., Tremblay, M. S., Tudor-Locke, C., Zhao, P., Katzmarzyk, P. T., & for the, I. R. G. (2016). Household-level correlates of children's physical activity levels in and across 12 countries. *Obesity, 24*(10), 2150-2157. https://doi.org/10.1002/oby.21618

Huh, J., Riggs, N. R., Spruijt-Metz, D., Chou, C.-P., Huang, Z., & Pentz, M. (2011). Identifying patterns of eating and physical activity in children: A latent class analysis of obesity risk. *Obesity, 19*(3), 652-658. https://doi.org/10.1038/oby.2010.228

Hunleth, J. (2019). Zambian children's imaginal caring: On fantasy, play, and anticipation in an epidemic. *Cultural Anthropology, 34*(2), 155-186. https://doi.org/10.14506/ca34.2.01

Jirata, T. J. (2019). The cultural spaces of young children: Care, play and learning patterns in early childhood among the Guji people of Ethiopia. *Global Studies of Childhood 9*(1), 42-55. https://doi.org/10.1177/2043610618817317

Jurak, G., Sorić, M., Starc, G., Kovač, M., Mišigoj-Duraković, M., Borer, K., & Strel, J. (2015). School day and weekend patterns of physical activity in urban 11-year-olds: A cross-cultural comparison. *American Journal of Human Biology, 27*(2), 192-200. https://doi.org/10.1002/ajhb.22637

Kambas, A., Venetsanou, F., Avloniti, A., Giannakidou, D. M., Gourgoulis, V., Draganidis, D., Chatzinikolaou, A., Fatouros, I., & Michalopoulou, M. (2015). Pedometer determined physical activity and obesity prevalence of Greek children aged 4-6 years. *Annals of Human Biology, 42*(3), 231-236. https://doi.org/10.3109/03014460.2014.943286

Katzmarzyk, P. T., Barreira, T. V., Broyles, S. T., Champagne, C. M., Chaput, J.-P., Fogelholm, M., Hu, G., Johnson, W. D., Kuriyan, R., Kurpad, A., Lambert, E. V., Maher, C., Maia, J., Matsudo, V., Olds, T., Onywera, V., Sarmiento, O. L., Standage, M., Tremblay, M. S., Tudor-Locke, C., Zhao, P., Church, T. S., & the ISCOLE Research Group. (2015). Relationship between lifestyle behaviors and obesity in children ages 9–11: Results from a 12-country study. *Obesity, 23*(8), 1696-1702. https://doi.org/10.1002/oby.21152

Khatun, A., Mukhopadhyay, A., & Bose, K. (2016). Adiposity and body composition in relation to physical activity status among Muslim adolescents of North 24 Parganas, West Bengal. *Journal of the Indian Anthropological Society., 51*(3), 168-176.

Kim, H. J., Jae, S. Y., Choo, J., Yoon, J. K., Kim, S.-H., Königstein, K., Schmidt-Trucksäss, A., & Franklin, B. A. (2019). Mediating effects of exercise capacity on the association between physical activity and health-related quality of life among adolescents with

complex congenital heart disease. *American Journal of Human Biology, 31*(6), e23297. https://doi.org/10.1002/ajhb.23297

Kim, T., & Kim, J. (2020). Linking adolescent future expectations to health in adulthood: Evidence and mechanisms. *Soc Sci Med, 263*, 113282. https://doi.org/10.1016/j.socscimed.2020.113282

Kidokoro, T., Tian, X., Fuku, N., Waiganjo, L. B., Rintaugu, E. G., Kigaru, M. D., & Mwangi, F. M. (2022). Segmented physical activity and sedentary behavior patterns among children in Maasai village and Nairobi city. *American Journal of Human Biology, 34*(3), e23649. https://doi.org/10.1002/ajhb.23649

Kimbro, R. T., Brooks-Gunn, J., & McLanahan, S. (2011). Young children in urban areas: Links among neighborhood characteristics, weight status, outdoor play, and television watching. *Social Science & Medicine, 72*(5), 668-676. https://doi.org/10.1016/j.socscimed.2010.12.015

Kracht, C. L., & Staiano, A. E. (2022). Thinking inside the box: The future of young children's physical activity and the home environment. *Social Science & Medicine, 301*, 114930. https://doi.org/10.1016/j.socscimed.2022.114930

Kramer, K. L., & Greaves, R. D. (2011). Juvenile subsistence effort, activity levels, and growth patterns: Middle childhood among Pumé foragers. *Human Nature, 22*, 303-326. https://doi.org/10.1007/s12110-011-9122-8

Kryst, Ł., Żegleń, M., & Artymiak, P. (2023). Forced migration and integration - comparison of physical fitness of children from Poland and Ukraine as an indicator of general health. *American Journal of Human Biology, 35*(7), e23888. https://doi.org/10.1002/ajhb.23888

Kryst, Ł., Żegleń, M., Artymiak, P., Kowal, M., & Woronkowicz, A. (2023). Analysis of secular trends in physical fitness of children and adolescents (8–18 years) from Kraków (Poland) between 2010 and 2020. *American Journal of Human Biology, 35*(3), e23829. https://doi.org/10.1002/ajhb.23829

Kuzik, N., Carson, V., Andersen, L. B., Sardinha, L. B., Grøntved, A., Hansen, B. H., Ekelund, U., & the International Children's Accelerometry Database Collaborators (2017). Physical activity and sedentary time associations with metabolic health across weight statuses in children and adolescents. *Obesity, 25*(10), 1762-1769. https://doi.org/10.1002/oby.21952

Larson, N. I., Wall, M. M., Story, M. T., & Neumark-Sztainer, D. R. (2013). Home/family, peer, school, and neighborhood correlates of obesity in adolescents. *Obesity, 21*(9), 1858-1869. https://doi.org/10.1002/oby.20360

Lätt, E., Mäestu, J., Rääsk, T., Jürimäe, T., & Jürimäe, J. (2016). Cardiovascular fitness, physical activity, and metabolic syndrome risk factors among adolescent Estonian boys: A longitudinal study. *American Journal of Human Biology, 28*(6), 782-788. https://doi.org/10.1002/ajhb.22866

Lee, S., & Lim, Y. (2022). The gendered playing field: Family socioeconomic status and national gender inequality in adolescents' out-of-school physical activity. *Social Science & Medicine, 305*, 115062. https://doi.org/10.1016/j.socscimed.2022.115062

Li, M. (2020). Adolescent college expectation and nutritional health in adulthood: The hidden power of social position. *Social Science & Medicine, 265*, 113482. https://doi.org/10.1016/j.socscimed.2020.113482

Lombardo, M. P., & Otieno, S. (2021). The associations between digit ratio, aerobic fitness, physical skills, and overall physical fitness of elite youth distance runners. *American Journal of Human Biology, 33*(1), e23448. https://doi.org/10.1002/ajhb.23448

Macdonald-Wallis, K., Jago, R., Page, A. S., Brockman, R., & Thompson, J. L. (2011). School-based friendship networks and children's physical activity: A spatial analytical approach. *Social Science & Medicine, 73*(1), 6-12. https://doi.org/10.1016/j.socscimed.2011.04.018

MacKenzie, J., Brunet, J., Boudreau, J., Iancu, H.-D., & Bélanger, M. (2015). Does proximity to physical activity infrastructures predict maintenance of organized and unorganized physical activities in youth? *Preventive Medicine Reports, 2*(2), 777-782. https://doi.org/10.1016/j.pmedr.2015.09.005

Magalhães, K. C. S., Matias, T. S., Araujo, R. H., Werneck, A. O., Ferrari, G., Luz, L. G. O., Fernandes, R. A., Barbosa, D. S., Ronque, E. R. V., Cyrino, E. S., & Silva, D. R. (2022). Clusters of obesogenic behaviors and metabolic risk according to somatic maturity status among adolescents. *American Journal of Human Biology, 34*(9), e23778. https://doi.org/10.1002/ajhb.23778

Manco, L., Pinho, S., Albuquerque, D., Machado-Rodrigues, A. M., & Padez, C. (2019). Physical activity and the association between the FTO rs9939609 polymorphism and obesity in Portuguese children aged 3 to 11 years. *American Journal of Human Biology, 31*(6), e23312. https://doi.org/10.1002/ajhb.23312

Marques, A., Bordado, J., Tesler, R., Demetriou, Y., Sturm, D. J., & de Matos, M. G. (2020). A composite measure of healthy lifestyle: A study from 38 countries and regions from Europe and North America, from the Health Behavior in School-Aged Children survey. *American Journal of Human Biology, 32*(6), e23419. https://doi.org/10.1002/ajhb.23419

Marques, A., Sallis, J. F., Martins, J., Diniz, J., & Carreiro Da Costa, F. (2014). Correlates of urban children's leisure-time physical activity and sedentary behaviors during school days. *American Journal of Human Biology, 26*(3), 407-412. https://doi.org/10.1002/ajhb.22535

Marques, A., Branquinho, C., & De Matos, M. G. (2016). Girls' physical activity and sedentary behaviors: Does sexual maturation matter? A cross-sectional study with HBSC 2010 Portuguese survey. *American Journal of Human Biology, 28*(4), 471-475. https://doi.org/10.1002/ajhb.22814

Martinez-Gomez, D., Ruiz, J. R., Ortega, F. B., Casajús, J. A., Veiga, O. L., Widhalm, K., Manios, Y., Béghin, L., González-Gross, M., Kafatos, A., España-Romero, V., Molnar, D., Moreno, L. A., Marcos, A., Castillo, M. J., Sjöström, M., & group, o. b. o. t. H. s.

(2010). Recommended levels and intensities of physical activity to avoid low-cardiorespiratory fitness in European adolescents: The HELENA study. *American Journal of Human Biology, 22*(6), 750-756. https://doi.org/10.1002/ajhb.21076

McClure, S. (2020). Living unembodiment: Physicality and body/self discontinuity among African American adolescent girls. *Ethos, 48*(1), 3-28. https://doi.org/10.1111/etho.12266

Michelet, A. (2016). What makes children work? The participative trajectory in domestic and pastoral chores of children in Southern Mongolia. *Ethos*, *44*(3), 223-247. https://doi.org/10.1111/etho.12130

Miller, M. J., Agarwal, S. C., Aristizabal, L., & Langebaek, C. (2018). The daily grind: Sex- and age-related activity patterns inferred from cross-sectional geometry of long bones in a pre-Columbian muisca population from Tibanica, Colombia. *American Journal of Physical Anthropology, 167*(2), 311-326. https://doi.org/10.1002/ajpa.23629

Mollborn, S., & Modile, A. (2022). "Dedicated to being healthy": Young adults' deployments of health-focused cultural capital. *Social Science & Medicine, 293*, 114648. https://doi.org/10.1016/j.socscimed.2021.114648

Monaghan, L. F., & Gabe, J. (2016). Embodying health identities: A study of young people with asthma. *Social Science & Medicine, 160*, 1-8. https://doi.org/10.1016/j.socscimed.2016.05.013

Mota, J., Santos, R., Pereira, M., Teixeira, L., & Santos, M. P. (2011). Perceived neighbourhood environmental characteristics and physical activity according to socioeconomic status in adolescent girls. *Annals of Human Biology, 38*(1), 1-6. https://doi.org/10.3109/03014460.2010.486769

Mota, J., Soares-Miranda, L., Silva, J. M. E., Dos Santos, S. S., & Vale, S. (2012). Influence of body fat and level of physical activity on rate-pressure product at rest in preschool children. *American Journal of Human Biology, 24*(5), 661-665. https://doi.org/10.1002/ajhb.22294

Muthuri, S. K., Wachira, L.-J. M., Onywera, V. O., & Tremblay, M. S. (2015). Direct and self-reported measures of physical activity and sedentary behaviours by weight status in school-aged children: Results from ISCOLE-Kenya. *Annals of Human Biology, 42*(3), 237-245. https://doi.org/10.3109/03014460.2014.932847

Nevill, A. M., Duncan, M. J., Lahart, I., & Sandercock, G. (2016). Modelling the association between weight status and social deprivation in English school children: Can physical activity and fitness affect the relationship? *Annals of Human Biology, 43*(6), 497-504. https://doi.org/10.3109/03014460.2015.1115126

Nhantumbo, L., Ribeiro Maia, J. A., Dos Santos, F. K., Jani, I. V., Gudo, E. S., Katzmarzyk, P. T., & Prista, A. (2013). Nutritional status and its association with physical fitness, physical activity and parasitological indicators in youths from rural Mozambique. *American Journal of Human Biology, 25*(4), 516-523. https://doi.org/10.1002/ajhb.22403

Nogueira, H., Gama, A., Mourão, I., Marques, V., Ferrão, M., & Padez, C. (2013). The associations of SES, obesity, sport activity, and perceived neighborhood environments: Is

there a model of environmental injustice penalizing Portuguese children? *American Journal of Human Biology, 25*(3), 434-436. https://doi.org/10.1002/ajhb.22384

Nogueira, H., Costeira e Pereira, M. M., Costa, D., Gama, A., Machado-Rodrigues, A., Silva, M.-R., Marques, V. R., & Padez, C. M. (2020). The environment contribution to gender differences in childhood obesity and organized sports engagement. *American Journal of Human Biology, 32*, e23322-e23322. https://doi.org/10.1002/ajhb.23322

Nuviala Nuviala, A., Pérez Turpin, J. A., Tamayo Fajardo, J. A., & Fernández Martínez, A. (2011). School-age involvement in sport and perceived quality of sport. *Collegium Antropologicum, 35*(4), 1023-1029. https://hrcak.srce.hr/file/112324

Ojiambo, R., Gibson, A. R., Konstabel, K., Lieberman, D. E., Speakman, J. R., Reilly, J. J., & Pistsiladis, Y. P. (2013). Free-living physical activity and energy expenditure of rural children and adolescents in the Nandi region of Kenya. *Annals of Human Biology, 40*(3), 318-323. https://doi.org/10.3109/03014460.2013.775344

Oliver, B. E., Nesbit, R. J., McCloy, R., Harvey, K., & Dodd, H. F. (2023). Adventurous play for a healthy childhood: Facilitators and barriers identified by parents in Britain. *Social Science & Medicine, 323*, 115828. https://doi.org/10.1016/j.socscimed.2023.115828

Oliveira, T., Pizarro, A., Costa, M., Fernandes, L., Gustavo, M., & Ribeiro, J. C. (2017). Cardiorespiratory fitness, but not physical activity, is associated with academic achievement in children and adolescents. *Annals of Human Biology, 44*(4), 309-315. http://doi.org/10.1080/03014460.2017.1308010

Pabayo, R., Belsky, J., Gauvin, L., & Curtis, S. (2011). Do area characteristics predict change in moderate-to-vigorous physical activity from ages 11 to 15 years? *Social Science & Medicine, 72*(3), 430-438. https://doi.org/10.1016/j.socscimed.2010.09.039

Parrish, S., Lavis, A., Potter, C. M., Ulijaszek, S., Nowicka, P., & Eli, K. (2022, 2022/01/01/). How active can preschoolers be at home? Parents' and grandparents' perceptions of children's day-to-day activity, with implications for physical activity policy. *Social Science & Medicine, 292*, 114557. https://doi.org/10.1016/j.socscimed.2021.114557

Pastuszak, A., Lewandowska, J., Buśko, K., & Charzewska, J. (2014). Effect of elevated physical activity on changes in body composition and subcutaneous fat distribution in boys aged 10 to 16 years: A longitudinal study. *Anthropological Review, 77*(1), 45-55. https://doi.org/10.2478/anre-2014-0004

Pate, R. R., Dowda, M., Dishman, R. K., Gorab, J., Bucko, A., & Saunders, R. P. (2022). Longitudinal association of biological maturation with physical activity behaviors in girls transitioning from 5th to 7th grade. *American Journal of Human Biology, 34*(7), e23737. https://doi.org/10.1002/ajhb.23737

Pereira, S., Katzmarzyk, P. T., Gomes, T. N., Souza, M., Chaves, R. N., Santos, F. K., Santos, D., Bustamante, A., Barreira, T. V., Hedeker, D., & Maia, J. A. (2018). Resemblance in physical activity levels: The Portuguese sibling study on growth, fitness, lifestyle, and health. *American Journal of Human Biology, 30*(1), e23061. https://doi.org/10.1002/ajhb.23061

Pereira, S. A., Seabra, A. T., Silva, R. G., Katzmarzyk, P. T., Beunen, G. P., & Maia, J. A. (2010). Prevalence of overweight, obesity and physical activity levels in children from Azores Islands. *Annals of Human Biology, 37*(5), 682-691. https://doi.org/10.3109/03014461003639223

Parfenteva, O. I., Groth, D., Sheffler, C., & Zaharova, M. F. (2019). Influence of the A/T polymorphism of the FTO gene and sport specializations on the body composition of young Russian athletes. *Anthropologischer Anzeiger, 76*(5), 401-408. https://doi.org/10.1127/anthranz/2019/0943

Pietrobelli, A., Pecoraro, L., Ferruzzi, A., Heo, M., Faith, M., Zoller, T., Antoniazzi, F., Piacentini, G., Fearnbach, S. N., & Heymsfield, S. B. (2020). Effects of COVID-19 lockdown on lifestyle behaviors in children with obesity living in Verona, Italy: A longitudinal study. *Obesity, 28*(8), 1382-1385. https://doi.org/10.1002/oby.22861

Pitfield, R., Deter, C., & Mahoney, P. (2019). Bone histomorphometric measures of physical activity in children from medieval England. *American Journal of Physical Anthropology, 169*(4), 730-746. https://doi.org/10.1002/ajpa.23853

Prados, M. J., Nicosia, N., & Datar, A. (2023). Impact of built, social, and economic environments on adolescent obesity and related health behaviors. *Obesity, 31*(4), 1085-1094. https://doi.org/10.1002/oby.23682

Quinn, E. A., Sangmo, J., Burack, S., & Childs, G. (2023). Childhood growth and education migration among ethnic Tibetan children from Nepal. *American Journal of Biological Anthropology, 180*(3), 427-441. https://doi.org/10.1002/ajpa.24652

Ribeiro Jr, E., Neave, N., Marsili, B. K., Figueiredo, E. C. G., Martino-Andrade, A. J., & de Moraes, R. N. (2024). Prenatal androgenization (2D:4D) predictions of tennis match-play success in junior players: A search for physiological explanations. *American Journal of Human Biology, 36*(1), e23979. https://doi.org/10.1002/ajhb.23979

Rietsch, K., Eccard, J. A., & Scheffler, C. (2013). Decreased external skeletal robustness due to reduced physical activity? *American Journal of Human Biology, 25*(3), 404-410. https://doi.org/10.1002/ajhb.22389

Rivera-Morales, J., Sotuyo, S., Vargas-Guadarrama, L. A., De Santiago, S., & Pasquet, P. (2020). Physical activity and cardiorespiratory fitness in Tarahumara and Mestizo adolescents from Sierra Tarahumara, Mexico. *American Journal of Human Biology,* e23396. https://doi.org/10.1002/ajhb.23396

Rodrigues, D., Machado-Rodrigues, A., Gama, A., Nogueira, H., Silva, M.-R. G., & Padez, C. (2022). The Portuguese economic crisis is associated with socioeconomic and sex disparities on children's health-related behaviors and obesity: A cross-sectional study. *American Journal of Human Biology, 34*(12), e23796. https://doi.org/10.1002/ajhb.23796

Rodrigues, D., Machado-Rodrigues, A. M., Gama, A., Silva, M.-R. G., Nogueira, H., & Padez, C. (2023). Body size, form, composition, and a healthy lifestyle associates with health-related quality of life among Portuguese children. *American Journal of Human Biology, 35*(8), e23902. https://doi.org/10.1002/ajhb.23902

Rodrigues, D., Padez, C., & Machado-Rodrigues, A. M. (2018). Child participation in sports is influenced by patterns of lifestyle-related behaviors. *American Journal of Human Biology, 30,* e23142. https://doi.org/ 10.1002/ajhb.23142

Sabiston, C. M., Doré, I., Lucibello, K. M., Pila, E., Brunet, J., Thibault, V., & Bélanger, M. (2022). Body image self-conscious emotions get worse throughout adolescence and relate to physical activity behavior in girls and boys. *Social Science & Medicine, 315*, 115543. https://doi.org/10.1016/j.socscimed.2022.115543

Sayre, M. K., Pike, I. L., & Raichlen, D. A. (2019). High levels of objectively measured physical activity across adolescence and adulthood among the Pokot pastoralists of Kenya. *American Journal of Human Biology, 31*(1), e23205. https://doi.org/10.1002/ajhb.23205

Schmengler, H., Peeters, M., Stevens, G. W. J. M., Kunst, A. E., Delaruelle, K., Dierckens, M., Charrier, L., Weinberg, D., Oldehinkel, A. J., & Vollebergh, W. A. M. (2022). Socioeconomic inequalities in adolescent health behaviours across 32 different countries – The role of country-level social mobility. *Social Science & Medicine, 310*, 115289. https://doi.org/10.1016/j.socscimed.2022.115289

Sebire, S. J., Jago, R., Wood, L., Thompson, J. L., Zahra, J., & Lawlor, D. A. (2016). Examining a conceptual model of parental nurturance, parenting practices and physical activity among 5–6 year olds. *Social Science & Medicine, 148*, 18-24. https://doi.org/10.1016/j.socscimed.2015.11.022

Shaban, L. H. (2018). Do mothers affect daughter's behaviors?:Diet, physical activity, and sedentary behaviors in Kuwaiti mother-daughter dyads. *Ecology of Food and Nutrition, 57*(2), 109-123. https://doi.org/10.1080/03670244.2017.1418337

Sharman, M. J., Jose, K. A., Tian, J., Venn, A. J., Canary, J., Banks, S., Ayton, J., & Cleland, V. J. (2021). Childhood factors related to diverging body mass index trajectories from childhood into mid-adulthood: A mixed methods study. *Social Science & Medicine, 270*, 113460. https://doi.org/10.1016/j.socscimed.2020.113460

Siegel, S. R., Malina, R. M., Peña Reyes, M. E., Cárdenas Barahona, E. E., & Cumming, S. P. (2011). Correlates of physical activity and inactivity in urban Mexican youth. *American Journal of Human Biology, 23*(5), 686-692. https://doi.org/10.1002/ajhb.21197

Silventoinen, K., Maia, J., Jelenkovic, A., Pereira, S., Gouveia, E., Antunes, A., Thomis, M., Lefevre, J., Kaprio, J., & Freitas, D. (2021). Genetics of somatotype and physical fitness in children and adolescents. *American Journal of Human Biology, 33*(3), e23470. https://doi.org/10.1002/ajhb.23470

Silva, A. L., Teles, J., Olivares, L. F., & Fragoso, I. (2021). Energy intake and expenditure in children and adolescents, contributions of biological maturity. *American Journal of Human Biology, 33*(6), e23529. https://doi.org/10.1002/ajhb.23529

Silva, D., Werneck, A. O., Collings, P., Tomeleri, C. M., Fernandes, R. A., Ronque, E., Venturini, D., Barbosa, D. S., Coelho-E-Silva, M. J., Sardinha, L. B., & Cyrino, E. S. (2016). Cardiorespiratory fitness is related to metabolic risk independent of physical

activity in boys but not girls from Southern Brazil. *American Journal of Human Biology, 28*(4), 534-538. https://doi.org/10.1002/ajhb.22826

Silva, P., Seabra, A., Saint-Maurice, P., Soares-Miranda, L., & Mota, J. (2013). Physical activity intensities in youth: The effect of month of assessment. *Annals of Human Biology, 40*(5), 459-462. https://doi.org/10.3109/03014460.2013.788211

Sorić, M., Starc, G., Borer, K. T., Gregor, j., Kovač, M., Strel, J., & Mišigoj-Duraković, M. (2015). Associations of objectively assessed sleep and physical activity in 11-year old children. *Annals of Human Biology, 42*(1), 31-37. https://doi.org/10.3109/03014460.2014.928367

Spencer, P. R., Sanders, K. A., & Judge, D. S. (2019). Determinants of objectively measured physical activity in rural East Timorese children. *American Journal of Human Biology, 31*(4), e23247. https://doi.org/10.1002/ajhb.23247

Super, S., Verkooijen, K., & Koelen, M. (2021). A salutogenic perspective on sport-for-development research. *Social Science & Medicine, 268*, 113376. https://doi.org/10.1016/j.socscimed.2020.113376

Tanaka, C., & Tanaka, S. (2013). Objectively-measured physical activity and body weight in Japanese pre-schoolers. *Annals of Human Biology, 40*(6), 541-546. https://doi.org/10.3109/03014460.2013.815802

Tan, X. (2018). Generating Pastoral skills through work and play in the daily life of Maasai children in Kenya. *Journal of Ethnobiology, 38*(2), 170-186. https://doi.org/10.2993/0278-0771-38.2.170

Toselli, S., Brasili, P., Luliano, T., & Spiga, F. (2014). Anthropometric variables, lifestyle and sports in school-age children: Comparison between the cities of Bologna and Crotone. *HOMO - Journal of Comparative Human Biology, 65*(6), 499-508. https://doi.org/10.1016/j.jchb.2014.05.005

Urlacher, S. S. (2023). The energetics of childhood: Current knowledge and insights into human variation, evolution, and health. *American Journal of Biological Anthropology, 181*(S76), 94-117. https://doi.org/10.1002/ajpa.24719

Valente-Dos-Santos, J., Coelho-E-Silva, M. J., Castanheira, J., Machado-Rodrigues, A. m., Cyrino, E. S., Sherar, L. B., Esliger, D. W., Elferink-Gemser, M. T., & Malina, R. M. (2015). The effects of sports participation on the development of left ventricular mass in adolescent boys. *American Journal of Human Biology, 27*(4), 530-537. https://doi.org/10.1002/ajhb.22681

van Amsterdam, N., & Knoppers, A. (2018). Healthy habits are no fun: How Dutch youth negotiate discourses about food, fit, fat, and fun. *Health, 22*(2), 128-146. https://doi.org/10.1177/1363459316688517

van Loon, J., Frank, L. D., Nettlefold, L., & Naylor, P.-J. (2014). Youth physical activity and the neighbourhood environment: Examining correlates and the role of neighbourhood definition. *Social Science & Medicine, 104*, 107-115. https://doi.org/10.1016/j.socscimed.2013.12.013

Venetsanou, F., Kambas, A., Gourgoulis, V., & Yannakoulia, M. (2019). Physical activity in pre-school children: trends over time and associations with body mass index and screen time. *Annals of Human Biology, 46*(5), 393-399. https://doi.org/10.1080/03014460.2019.1659414

Vitályos, G. Á., Zsákai, A., Utczás, K., & Bodszár, É. B. (2010). Body shape as the mirror of the habitual physical activity. *Anthropologiai Közlemények, 51 (2010)*, 59-67. https://real-j.mtak.hu/6560/1/AnthropologiaiKozlemenyek_51.pdf#page=61

Williams, K. D., Subedi, J., Jha, B., Blangero, J., Williams-Blangero, S., & Towne, B. (2016). Quantitative physical activity assessment of children and adolescents in a rural population from Eastern Nepal. *American Journal of Human Biology, 28*(1), 129-137. https://doi.org/10.1002/ajhb.22762

Xia, X., Li, Y., & Chen, S. (2023). Association between muscle strength and executive function in Tibetan adolescents at high altitude in China: Results from a cross-sectional study at 16–18 years of age. *American Journal of Human Biology, 35*(12), e23956. https://doi.org/10.1002/ajhb.23956

Yang, X., Yin, X., Huang, W., Duan, Z., Wu, H., Li, Y., Li, M., Zhang, T., Zhou, C., & Xu, H. (2023). Distribution of cardiorespiratory fitness in children and adolescents at different latitudes. *American Journal of Human Biology, 35*(9), e23908. https://doi.org/10.1002/ajhb.23908

Yeh, C. Y., Chen, L. J., Ku, P. W., & Chen, C. M. (2015). Modelling the vicious circle between obesity and physical activity in children and adolescents using a bivariate probit model with endogenous regressors. *Journal of Biosocial Science, 47*(1), 61-74. https://doi.org/ 10.1017/S0021932013000722

Żegleń, M., Kryst, Ł., Kuszewska, G., Kowal, M., & Woronkowicz, A. (2023). Association between physical fitness and normal weight obesity in children and adolescents from Poland. *American Journal of Human Biology, 35*(11), e23953. https://doi.org/10.1002/ajhb.23953

Zhang, F., Bi, C., Yin, X., Chen, Q., Liu, Y., Li, Y., Sun, Y., Zhang, T., Yang, X., & Li, M. (2022). Roles of age, sex, and weight status in the muscular fitness of Chinese Tibetan children and adolescents living at altitudes over 3600 m: A cross-sectional study. *American Journal of Human Biology, 34*(2), e23624. https://doi.org/10.1002/ajhb.23624

Zhang, Y. X., Chen, M., Xue, L. H., Zhao, J. S., & Chi, Z. H. (2013). Comparison of body shape and physical activity among adolescents with normotensive and elevated blood pressure in Shandong, China. *Annals of Human Biology, 40*(1), 88-93. https://doi.org/10.3109/03014460.2012.740073

Zorrilla-Revilla, G., Rodrigues, D., Machado-Rodrigues, A. M., Mateos, A., Rodríguez, J., & Padez, C. (2022). Sex-specific differences in somatic investment and strategies of physical activity among Portuguese schoolchildren. *American Journal of Human Biology, 34*(2), e23626. https://doi.org/10.1002/ajhb.23626

Table A.2: This table provides the top 100 words according to the most frequently occurring in the titles and abstracts included in this study. It provides the number of times each word appears along with each word's rank in descending order from most frequent to least frequent. The table excludes common grammatical words such as "the," "it," "and," etc., verbs such as "are," "were," "is," etc., and common abstract terms like "methods," "results," etc.

Word	Frequency	Rank
physical	522	1
children	500	2
activity	466	3
adolescents	172	4
body	163	5
girls	159	6
health	159	6
time	140	8
social	133	9
boys	123	10
fitness	106	11
weight	106	11
human	95	13
mass	94	14
levels	88	15
behaviors	85	16
status	79	17
school	73	18
active	71	19
strength	69	20
differences	67	21
fat	64	22
risk	64	22

mvpa	63	24
childhood	58	25
parents	58	25
play	57	27
sedentary	56	28
child	55	29
overweight	55	29
activities	52	31
healthy	52	31
medicine	52	31
youth	52	31
environment	51	35
neighborhood	50	36
exercise	46	37
low	46	37
relationship	46	37
family	45	40
gender	45	40
sex	43	42
sport	42	43
young	42	43
patterns	41	45
socioeconomic	41	45
growth	40	47
sleep	40	47
adolescent	39	49
development	39	49
regression	39	49

metabolic	38	52
sports	38	52
behavior	36	54
life	36	54
influence	34	56
perceived	34	56
model	33	58
future	32	59
lifestyle	32	59
cardiorespiratory	31	61
days	31	61
level	31	61
positive	31	61
variation	31	61
preschoolers	30	66
role	30	66
tibetan	30	66
work	30	66
energy	28	70
cross-sectional	27	71
performance	27	71
questionnaire	27	71
adolescence	26	74
environmental	26	74
changes	25	76
living	25	76
moderate	25	76
composition	24	79

food	24	79
height	24	79
maturity	24	79
daily	23	83
home	23	83
schools	23	83
adiposity	22	86
environments	22	86
longitudinal	22	86
score	22	86
biological	21	90
duration	21	90
moderate-to-vigorous	21	90
networks	21	90
rural	21	90
skills	21	90
tests	21	90
china	20	97
diet	20	97
motor	20	97
movement	20	97