

# HEROs: Design of a Mixed-Methods Formative Research Phase for an Ecocultural Intervention to Promote Healthy Eating and Activity Behaviors in Rural Families With Preschoolers

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## ABSTRACT

**Objective:** To describe the mixed-methods formative research phase in the development of the *Healthy Environments Study* (HEROs), a technology-based, interactive family intervention to promote healthy eating and activity behaviors for young children in the home environment.

**Design:** A mixed-method iterative approach, using ecocultural theory as a framework, will guide the development of both quantitative and qualitative formative research assessments.

**Setting:** Rural eastern Colorado.

**Participants:** Low-income families (n = 200) with preschool-aged children enrolled at 6 *Head Start*/preschool centers.

**Main Outcome Measures:** Quantitative and qualitative methodologies will garner insights into 4 key topic areas: (1) food behaviors and environments (Remote Food Photography Method, parent focus group, and survey), (2) physical activity behaviors and environments (parent interview and survey), (3) mobile device use (parent survey and interview), and (4) daily life (ecocultural family interview and teacher/staff group discussions).

**Analysis:** Results will be interpreted in combination to allow for a holistic understanding of participant behaviors, beliefs, attitudes and values related to each of the 4 topic areas. Collectively, outcomes will provide a comprehensive picture of preschoolers' daily life and inform intervention design and strategies to enhance preschoolers' eating and activity behaviors in the home environment.

**Key Words:** child, ecocultural theory, formative research, mixed methods, mobile devices, nutrition environment (*J Nutr Educ Behav.* 2018;■■:■■–■■.)

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## INTRODUCTION

Obesity, a multidimensional problem with roots in conception that track

into adulthood, is represented disproportionately among children and families from low socioeconomic and minority backgrounds, particularly in

rural areas that have limited access to food, activity, and health-related services.<sup>1</sup> Early childhood is a critical juncture at which to address developing habits and promote the adoption of desired behaviors for optimal growth, development, and health and to prevent obesity. Environments where children live, learn, and play shape their eating behaviors and activity patterns. Culturally tailored, effective interventions are needed that can positively affect the environments (home, preschool, and community) in which young children's eating and activity behaviors develop and in which growth occurs.

Daily routines provide structure and stability for children and support optimal growth and development.<sup>2-5</sup> Ecocultural theory (ECT), developed by

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Priorities for formative research phase

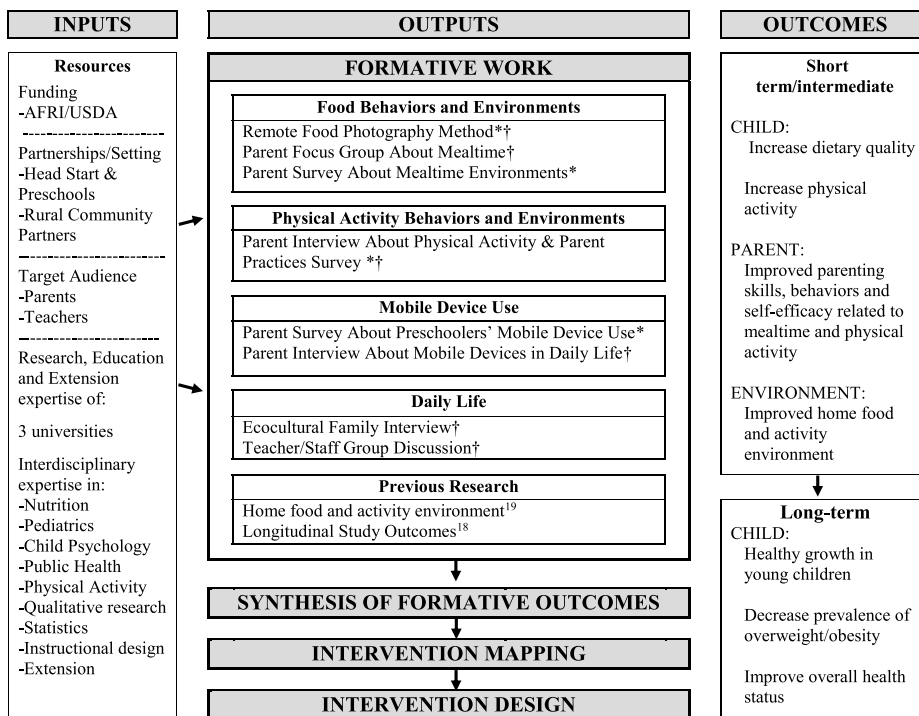
Understanding:

Food Behaviors and Environments

Physical Activity Behaviors and Environment

Mobile Device Use

Daily Life



**Figure.** HEalthy EnviRONments (HEROs) Formative Research Plan Through an Ecocultural Lens. AFRI indicates Agriculture and Food Research Initiative; USDA, US Department of Agriculture. \*Quantitative method; †Qualitative method.

Weisner,<sup>6</sup> posits that the sociocultural environment of the child and family can explain individual differences in behaviors and outcomes. Furthermore, ECT can be used to understand the daily routines of families as well as how these routines are shaped by the social and environmental context. Ecocultural theory has been employed to inform the development of qualitative interview guides to assess the relationship between daily routines and children's health outcomes<sup>7,8</sup>; however, no studies have applied ECT to daily routines related to eating and physical activity.

To gain in-depth insights into the multiple dimensions of family life associated with healthy growth and development, and how these aspects may influence effective intervention development, a comprehensive formative research approach is integral to intervention design. Too often, formative research is conducted and/or reported at a minimal level.<sup>9,10</sup> However, thorough formative research can yield a much greater understanding of key factors related to health behaviors in the target audience, as well as potential barriers to the proposed intervention, or its facilitators,

all of which are crucial for successful intervention development.<sup>11,12</sup> A comprehensive mixed-methods approach with the goal of integrating quantitative and qualitative data can provide a holistic picture of families' daily life.<sup>13</sup> Specifically, a mixed-methods iterative design provides a mechanism to facilitate the development of culturally sensitive interventions and evidence-based practices and can be used throughout a multiyear project to conduct formative research and test theories, as well as develop and validate evaluation instruments and intervention programs.<sup>14,15</sup>

The overall objective of the HEalthy EnviRONments study (HEROs) is to develop and test a technology-based, interactive family intervention to promote healthy eating and activity behaviors (and ultimately weight outcomes) for young children in the home environment. Ecocultural theory is the proposed framework for informing and designing the HEROs intervention. In addition, a mixed-methods iterative design approach<sup>15,16</sup> will be used throughout the entirety of HEROs to understand the interactions between individual behaviors and environments. This article out-

lines the formative research phase of HEROs and the methodologies proposed to garner insights into 4 key topic areas: food behaviors and environments, physical activity behaviors and environments, mobile device use, and daily life.

**METHODS**  
**Study Design**

The quantitative and qualitative methods associated with the mixed-method formative research phase of HEROs are outlined as a logic model presented in the Figure. The study is approved by Colorado State University's Institutional Review Board.

**Participant Recruitment**

The target audience for this project is rural families enrolled in *Head Start* in eastern Colorado, because this is a population with high rates of obesity and limited access to health services, healthy foods, or opportunities for physical activity.<sup>17</sup> Specifically, the audience includes rural, low-income families with preschool-aged children enrolled in 6 *Head Start*/preschool centers (approximately 775 families)

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