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The Sidama Model of Human Development

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Abstract

Human ontogeny has been shaped through evolution, resulting in markers of physical, cognitive, and social development that are widely shared and often used to demarcate the lifespan. Yet, development is demonstrably biocultural and strongly influenced by context. As a result, emic age categories can vary in duration and composition, constituted by both common physical markers as well as culturally meaningful indicators, with implications for our understanding of the evolution of human life history. Semi-structured group interviews ($n=24$) among Sidama adults and children, as well as individual interviews with children ($n=30$), were used to identify age categories across the lifespan and to specifically investigate acquisition of sociocultural skills and cognitive development. Ten major age categories were identified, covering birth through death. These largely map onto patterning of human universals, but specific cultural beliefs and behaviors were indicated as important markers of development. Adults and children are oriented toward the dynamic relationships between physical development and acquisition of skills tied to social and cultural success. Culture, ecology, and ontogeny are co-determinants of human development, and the interactions among them should be considered in studies examining human life history and its evolution.

Keywords Life history theory · Child development · Agropastoralists · Sub-Saharan Africa

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Life history theory (LHT) is an evolutionary theoretical framework that centers on energy allocation (Charnov, 1993; Stearns, 1992). The two main categories of energetic expenditure are somatic and reproductive; somatic effort broadly refers to growth and survival/maintenance, whereas reproductive effort includes mating, parenting, and inclusive fitness (Hill & Kaplan, 1999; Stearns, 1992). Since energy allocated to one category cannot be used by another, there are competing demands that, along with natural selection and the limiting factor of time, shape the life course of a species. This framework allows for predictions of important events across the lifespan, including length of gestation, age at weaning, age at menarche, age at first reproduction, number of offspring, menopause, senescence, and the duration of the lifespan. The primary expectation of LHT is that strategies of a species (or an individual) should reflect the best possible allocation of energy across the lifespan that will maximize reproductive success.

Among humans, this has resulted in a unique ontogeny characterized by several phenotypic transitions, including social, physical, and cognitive developmental changes across the lifespan. However, because human development is produced not only by interactions between widely shared genetics and locally specific biologies but also by cultural context, there may be significant variation in how these phases are represented. Culture can play an important role in shaping biology (Goodman, 2013); as a result, emic demarcations of the lifespan tend to integrate universals of human development and culturally meaningful indicators of development (Bogin, 1999; Bogin et al., 2016; Harkness & Super, 1983; Lancy, 2008; Lancy & Grove, 2015; Mead, 1947; Meehan et al., 2016; Piaget, 1963; Whiting & Edwards, 1988; Whiting & Whiting, 1975). Elucidation of age categories across cultures contributes to our understanding of human evolution since the factors believed to shape various stages of ontogeny likely influence life history outcomes. In other words, local models of the lifespan provide insight into how culture and biology "mutually constitut[e]" human development (Harris & McDade, 2018), along with inputs from the physical environment. This study examines age categories among Sidama agropastoralists of southern Ethiopia. Although previous work has described social expectations of children and adults (Brögger, 1986; Hamer, 1987), little research has investigated how human development is understood by Sidama adults and children. We present here an integrated model of Sidama conceptions of the lifespan and test the hypothesis that *Sidama age categories will generally map onto the universals of human development (i.e., emergence of adult teeth, cognitive transitions, onset of puberty) but with variation that reflects local beliefs on child- and personhood development.*

Age Categories across the Lifespan

Although our shared ontogeny predicts much of development, extensive intercultural variation exists; thus there is widespread agreement that human development is best understood within a bio- or eco-cultural framework (Harkness & Super, 1983; Hewlett & Lamb, 2005; Lancy, 2008; Mead, 1947; Montgomery, 2009; Whiting & Edwards, 1988; Whiting & Whiting, 1975). Nonetheless, the human lifespan is largely conceived of as having two primary stages—childhood and adulthood. Child-

hood is typically further demarcated into several sub-stages: infancy, early childhood, middle childhood, and late childhood/adolescence. Adulthood is sometimes divided into the reproductive and postreproductive phases. These stages are briefly outlined below.

Infancy

There has long been an emphasis on infancy in the anthropology of human development (Hewlett, 1991; Hrdy, 1999; Konner, 1976; LeVine et al., 1994), with attention to the rapid physical, social, and cognitive changes that occur across this phase. Infants are completely dependent on others for survival (Meehan et al., 2016) but uniquely equipped to elicit caregiving (Hrdy, 1999, 2016). How this caregiving manifests varies significantly across cultures and ecologies, with implications for development. For example, holding behaviors range widely—in many small-scale societies, infants are rarely out of physical contact with a caregiver (Crittenden & Marlowe, 2008; Konner, 1976), while minority world infants are frequently placed in holding "devices," such as strollers or cribs.[1]

Eco-cultural context also affects physical development. Timing of walking can vary by more than a year across cultures. Among Ache hunter-gatherers, most children do not begin walking independently until close to two years of age, approximately one year later than !Kung children; this is because Ache parents discourage physical exploration due to environmental risk (Kaplan & Dove, 1987) while !Kung engage their young children in energetic gymnastics intended to hasten walking (Konner, 1976; Takada, 2005).

Weaning, although variable in definitions and timing (Meehan et al., 2016), generally marks the end of infancy and depends on multiple eco-cultural factors, including subsistence mode (Sellen & Smay, 2001) and modernization (Veile & Kramer, 2015). Full weaning—at least in small-scale societies—often happens around two to three years of age, usually in preparation for a younger sibling (Hawkes et al., 1997; Hill & Hurtado, 1996).

(Early) Childhood

By childhood, offspring are typically mobile and increasingly independent. Growth continues to be relatively rapid but has slowed from infancy; brain growth will continue until around age seven (Bogin, 1999). Thus, the approximate range for childhood is from three to seven years of age. During this phase, children often join playgroups as soon as they are physically able (Konner, 1976, 2010). Playgroup composition in small-scale societies is more heterogeneous than in minority world populations (Konner, 2010), where children are typically grouped with same-age, same-sex playmates. Age and sex diversity may allow for earlier skill acquisition as

[1] Here, *minority world* refers to populations residing in "developed" countries, alternatively termed WEIRD populations—those that are Western, educated, industrialized, rich, and democratic (Gurven & Lieberman, 2020). *Majority world* is an alternative term for populations living in regions or countries often labeled as "developing" (Alam, 2008).

children in these groups scaffold emerging abilities by teaching and learning from their near-peer caregivers (Konner, 2010; Maynard, 2002). Playgroups may also free mothers to engage in labor activities or have another child (Lancy & Grove, 2011; Page et al., 2021), again illustrating how culture may affect life history trajectories.

Juvenility (Middle–Late Childhood)

Juvenility represents an especially interesting time in development. Growth slows significantly (Bogin, 1999), but survival is still uncertain and reproductive maturity is several years off. Although children gain social, cultural, and cognitive skills across all of dependency, it is at the onset of juvenility that we see a marked cognitive transition—children begin to "make sense" (Lancy & Grove, 2011; Rogoff et al., 1975). The biological event *adrenarche* may underpin this transition (Campbell, 2006; Del Giudice et al., 2009). Adrenarche is indicated by the hormone dehydroepiandrosterone and its sulfate, and it is associated with factors tied to the "age of reason" (Rogoff et al., 1975). These include capacity for learning and improved memory (Majewska, 1995), greater social orientation (Campbell, 2006), and increased attention to sex roles (Del Giudice et al., 2018). Timing of adrenarche varies within and between cultures, suggesting eco-cultural context has an important influence on its programming (Helfrecht et al., 2018).

Juvenility further includes rising autonomy, expansion of logical skills, greater peer orientation, improved social competency, and development of cooperative and dispute resolution skills (Hartup, 1989; Lancy & Grove, 2011). Children in small-scale societies start contributing to their own survival though independent food collection and contributions to the household economy (Crittenden et al., 2013; Hill & Hurtado, 1996; Kramer, 2002). Particularly for girls, sibling care is expected and begins early (Lancy & Grove, 2011; Weisner & Gallimore, 1977); Aka hunter-gatherer children as young as five may act as caregivers for their younger siblings. Although both physical and psychological competencies associated with juvenility contribute to capacity, cultural norms and ecological context predict when and how children become helpers (Konner, 2010).

Adolescence

The pubertal event typically signifies onset of adolescence; children become biologically, but perhaps not socially, capable of reproduction (Bogin, 1999). Age of onset is highly variable—four to five years' difference in timing among individuals living in comparable conditions is possible (Tanner, 1962). Heredity is an important factor, but variation may reflect differences due to environment (Chisholm et al., 2005; Ellis & Garber, 2000). In Dominica, for example, girls whose parents separated during their childhood were significantly more likely to reach menarche earlier than those whose fathers remained present (Quinlan, 2003), suggesting stress from the social context is an influence on timing.

Activities become increasingly gender-segregated and more specifically aligned with adult social roles across adolescence (Howell, 2010). As a result, these may vary in time commitment, with girls sometimes experiencing a greater workload than

boys (Lancy, 2008). Providing assistance allows adolescents to acquire cultural and economic skills essential to adult reproductive and social success, and they can often meet or exceed their own nutritional needs by mid-adolescence (Bogin, 2010).

Adulthood

Adulthood is often defined by when it is socially sanctioned to marry and reproduce; for many hunter-gatherers, one attains adulthood with the birth of the first child and associated ability to care for a family (Howell, 2010). In minority world countries, such as the United States, adulthood is a legal status, defined by attainment of a certain age. Among the Maasai, adulthood cannot be attained until an individual has been circumcised (Esho et al., 2013). In general, adulthood reflects acquisition of reproductive capacity coupled with skills necessary for survival in a given environment. Hence, its timing is dependent on physical, cognitive, and social maturation coupled with cultural norms, and onset is often earlier for women than for men (Lancy & Grove, 2015).

Adulthood also includes a postreproductive period, particularly for women, due to cessation of reproductive capacity tied to biological or cultural menopause. This phase is frequently identified as being of evolutionary significance and is usually associated with positive outcomes for both mothers and children (LeVine et al., 1994; Sear et al., 2000). Hadza grandmothers, for example, offset reductions in maternal foraging by nursing mothers to improve the welfare of weaned children; this supplementation has been posited as responsible for shaping some of the unique facets of human life history, including the postreproductive phase as well as our prolonged childhood dependency (Hawkes et al., 1997). Yet, grandmaternal presence and activities are highly variable, depending on eco-cultural factors such as postmarital residence rules, death, or competing interests (Helfrecht et al., 2020). Consequently, it is clear that we cannot ignore the effects of culture on age categorization as well as the evolution of our ontogeny.

Study Population

Sidama are the largest ethnic population in southern Ethiopia, and their traditional territory recently received status of regional statehood, the Sidama National Regional State (SNRS). Sidamaland, part of the Great Rift Valley, lies in the area between Lake Awassa and Lake Abaya, the northern and southern boundaries, respectively (Brögger, 1986; Hamer, 1987). Few studies have examined the Sidama life course, but some insights on specific stages can be gleaned from previous work. During infancy, Sidama children are generally breastfed on demand. Parents report that exclusive breastfeeding is desirable until the child reaches six months of age, but many children receive foods (often a maize porridge) before that time. Early introduction of solid food allows others to assist in feeding children but may contribute to increased rates of malnutrition (Tessema et al., 2013). Sidama toddlers can often be found playing around their homes under the supervision of slightly older children. Since several homes are often placed around a central courtyard, children find their first friends in

these shared spaces. Not long after, children begin to take on the responsibilities that will shape their future.

Young boys are responsible for cattle herding on their home territory from approximately age seven until puberty (Brögger, 1986). The father-son dynamic is a key relationship, consisting of both respect and authority, as the son is trained by the father in herding cattle and gardening, the foundations of Sidama life (Hamer, 1987). As boys reach adolescence, they begin to take more active and independent roles in herding and gardening. Those who show initiative and achievement are recognized for their hard work and seen as better prepared for adulthood (Hamer, 1987). Similarly, adults with traditional knowledge on saving and reproducing resources are referred to as *minjataamo* (m)/*minjataame* (f);[2] these future-oriented individuals are respected for their knowledge (Dira & Hewlett, 2016).

Sisters have important roles in the lives of their siblings, particularly at the time of their brothers' promotion to elderhood,[3] when both eldest and youngest sisters have specific jobs to perform (Hamer, 1987). There is little description of young girls' everyday lives, but segregation of children by sex starts relatively early. Around middle childhood, when children take a larger role in the household economy, girls are discouraged from playing with boys; this is due to a strong proscription against sexual contact prior to marriage, as virginity is tied to a woman's bridewealth (Hamer, 1987).

Consistent with practices of early sex segregation, obtaining information about pubertal transitions is challenging because of the cultural belief that menstruation is brought on by sexual intercourse. "For a girl to menstruate before marriage is considered unusual, and given the early age of present-day marriages (fourteen to fifteen), this normally does not happen" (Hamer, 1987:68). More recent research indicates that relatively early marriage persists, with many girls marrying around 16–17 years old (Hailu & Regassa, 2008). Close to 80% of Sidama women reported marriage before the age of 18 (Ezra, 2003). While marriages are not arranged per se, parents play an influential role in determining their child's spouse, both to ensure their child's future and because marriage represents an alliance between families (Hamer, 1987).

At marriage, parents provide their son with a plot of land; due to clan exogamy, women are traditionally ineligible to inherit property (Hamer, 1987). Men participate in group work, which are considered desirable opportunities as these cooperatives may assist, for example, in farming or house construction. Women are largely responsible for household chores such as fetching firewood or water. As children grow, they begin to assist in these activities. Despite the segregation of the sexes and the patriarchal foundations of Sidama culture, men and women need each other for success, and this serves to balance the dynamic of the relationship (Hamer, 1987).

[2] Hereafter, masculine nouns are reported first, followed by the feminine spelling.

[3] An age category wherein men have the wealth to distribute to their sons, the authority to aid in decision-making around policy and disputes, and the wisdom to guide others through their insights.

Methods

Study Sample

The data for this project come from Loqqe *kebele* (also known as Bushulo), a peri-urban village situated in a lowland environment just south of Hawassa, the capital city of SNRS. Sidama agropastoralists specialize in raising enset ("false banana"; *weese* in Sidaamu Afoo) and cattle, but maize is also an important staple crop in Loqqe. Gardens in Loqqe are generally smaller than in other regions due to its proximity to Hawassa. Similarly, few households have cattle, despite their importance (along with garden size) as a traditional measure of household wealth (Brögger, 1986; Hamer, 1987). Although the majority still practice farming as their primary occupation, many men reported working as day laborers, fishermen, or in professional positions. Economic stress, specifically monetary and nutritional concerns, is widespread. This is reflected in children's nutritional status. More than half of children sampled in Loqqe have *z*-scores of −2 SD or lower on one or more measures of height-, weight-, or BMI-for-age, suggesting that moderate stunting, underweight, and/or caloric deficiency, respectively, is widespread (Gall et al., 2022). Exact rates of school attendance for Loqqe were not available at the time of data collection but, regionally, only 36% of residents in the broader area currently attend school or have in the past (Central Statistical Agency, 2007); the overwhelming majority have not received any formal education. However, this is likely dependent on age and sex. Of a sample of 30 Loqqe children between five and twelve years of age, 23 attended school while several others had previously attended but dropped out. Boys were more likely than girls to be currently enrolled.

The first author led the fieldwork with the assistance of a translator who speaks Sidaamu Afoo, the Sidama language. Although not local to Loqqe, the 35-year-old male translator is the brother-in-law of the principal of a primary school in the village. The principal provided our introduction to local officials and facilitated our welcome to the community. Consent/assent forms and interview questions were translated from English to Sidaamu Afoo and then discussed to ensure accuracy of the translation and understanding of the interview goals. Historically, Sidaamu Afoo was not a written language; in the early 1990s, however, there was a movement to textualize the language using the Latin alphabet, and it is now commonly used in both work and school settings. The second author, a native Sidaamu Afoo speaker, provided the correct spellings for all age categories and concepts, in addition to aiding in study design and implementation. Study procedures were reviewed and approved by Washington State University's Institutional Review Board and in-country approval was obtained from Hawassa University in Ethiopia. On-site approvals were obtained through conversations with local officials and community members before data collection commenced.

Age Category Interviews

Semi-structured group interviews with adults and children were conducted to broadly define age categories across the lifespan (Table 1). Participants were recruited on

Table 1 Group interview composition and number of age categories identified by each group

Group ID*	Total	Women	Men	No. of age categories
1 A	10	1	9	10
2 A	10	10	0	11
3 A	6	4	2	11
4 A	4	0	4	9
5 A	2	1	1	5
6 A	4	1	3	9
7 A	11	0	11	9
8 A	3	3	0	11
9 A	8	0	8	11
10 A	8	4	4	12
11 A	6	3	3	11
12 A	4	4	0	11
13 A	4	2	2	11
14 A	12	12	0	11
15 C	10	5	5	7
16 C	8	2	6	9
n	110	52	58	

* Adult (A), Child (C)

an encounter basis and via word of mouth. Participant ages were not collected, but interviewees were grouped by whether they were adults (i.e., married) or children. Interviews were conducted in several different sub-villages to enhance potential heterogeneity of the sample and generally lasted 30–45 min. The use of group interviews encourages participants to challenge each other, discuss answers, and come to consensus (Kitzinger, 1994). On occasion, discussion was dominated by a few speakers, but debate and correction when speakers disagreed was more frequent. Willingness to discuss certain taboo topics, such as puberty, varied among groups, but participants would generally explain why these could or could not be addressed. Group composition occasionally fluctuated as participants attended to other demands or joined an interview in progress. Village norms dictate that coming and going as needed or interested is appropriate. Final counts are based on the individuals who completed the interview. Although the gender of the translator could have influenced responses from interviewees, the presence of a woman (the first author) coupled with variety in composition of the groups whenever possible (i.e., mixed gender, single gender, similar ages) likely helped to mitigate extant age and sex hierarchies. Age categories were also verified in informal settings, where the first author would often ask if a child fell into a specific age category (e.g., "Is Meseret *shiima beetto?*" "Is Tesfaye *wedellicha*?").

To elicit age categories, participants were asked, "What do you call a child after it is born? That is, what is the first stage of child development after birth?" Next, participants were asked to describe the social/behavioral, physical, or cognitive traits that mark the category and/or are acquired across the phase (i.e., "What can a child in this age category do?" or "How could I, a stranger to this community, know a child is in this age category?"). Participants were then asked to define the chronological age span. Since many Sidama do not track birthdates or subsequent age of their children, these chronological demarcations are rough estimates. Children of a known age were often identified in order to indicate who might be starting or finishing a certain phase.

When the phase was clearly delineated, participants were asked, "What the next stage is called? How do you know someone has entered that stage? What markers are there (social, physical, cultural) that indicate that transition?" This process was repeated until the entire lifespan had been described.

Cognitive and Sociocultural Skill Acquisition Interviews

Because childhood is a period of rapid change to cognitive and sociocultural skills, a second round of group interviews ($n=8$) was conducted with adults to further refine the age categories identified in the interviews described above and to evaluate when certain skills are acquired (Table 2). These interviews focused on cognitive development (e.g., reasoning, "good sense") and socioemotional skills (e.g., cooperation, dispute resolution, knowledge of sex differences) identified in the developmental literature (Cillessen & Bellmore, 2002; Harris, 1998; Hartup, 1989; Ladd, 1999). To assess cognitive development, participants were asked, for example, "When do you first see that children have the ability to reason? Are changes in understanding and/or reasoning associated with the different age categories? At onset of which age category do you see the most changes in how children think?" Examples of the questions asked to understand skill acquisition include, "At what age do children begin to cooperate independently? When do kids start to contribute to the household economy? At what age does their contribution become significant?"

Finally, 30 children (15 girls) between the ages of five and twelve (mean = 8.6 years old) were interviewed individually about their age category and development. Example questions included: "Do you have good sense? What is good sense?" "Can you and your friends cooperate? What activities do you do that require cooperation?" "Can you herd cattle/goats? Do you work in the garden?" "What is the most important thing to learn at your age?" These interviews were intended to ensure inclusion of social, cultural, and cognitive development from children's perspectives in descriptions of the age categories.

Analysis

Thematic analysis was used to derive consensus on the age categories and their composition. The names provided for each age category were used as a starting point, but greater attention was given to the markers of the stage (e.g., motor or social skills,

Table 2 Composition of groups interviewed regarding acquisition of cognitive and sociocultural skills

Group	Total	Women	Men
1	5	1	4
2	8	5	3
3	7	7	0
4	8	5	3
5	5	5	0
6	7	0	7
7	6	4*	2
8	13	12	1
n	59	39	20

* Two of the participants were adolescent girls

chronological age range). Once key themes were derived from these and agreed upon by the authors, names for the categories were examined for group agreement; those names used by the majority of the groups were considered to be the most culturally salient. When the name for the category differed but the associated skills and age ranges were the same, these common markers were considered to reflect a shared understanding of the stage. Name variations for these categories and/or inconsistencies in how categories were delineated are noted in the results.

Results

The number of age categories across the lifespan identified by the groups ranged from a minimum of five to as many as twelve (Table 3). The majority of groups ($n = 10$) identified ten stages of development, using the same terms, skills/activities, and age ranges to describe these age categories. These are *mu're qaaqqo* or *danqa qaaqqo*, *daaima*, *qaaqqo*, *shiima beetto*, *jawa beetto*, *qeedhicha*/*qeedhitte*, *wedellicha*/*wedellitte*, *mancho*/*manchote*, *geercho*/*geerchote*, and *dooda* (*doodino*/*dooddino*). Although these ten were the most commonly referenced, half the groups outlined eleven age categories. This was due to subdividing *mancho*/*manchote* and/or *geercho*/*geerchote* into multiple categories.

Agreement and Differences between Groups

The two children's groups identified seven and nine age categories, respectively, but whether this is significantly fewer than the adult groups cannot be determined due to the discrepancy in sample sizes (two children's groups versus fourteen adult groups; Table 1). The child group that outlined seven stages described *daaima* using the term *qaaqqo* and the entire period preceding *qeedhicha/qeedhitte* as *oosicho/oosote*, which can be considered a synonym for *qaaqqo.* They also ended the lifespan with *geercho/geerchote*, rather than *dooda.* The children's group that outlined nine stages similarly reduced the number of childhood categories; they described the period following *mu're qaqqo* as *shiima beetto*, and this phase persisted from 5 months to 4 years old, when a child became *jawa beetto.* Subsequent stages mirrored the adult groups.

Excluding the children's groups, those groups composed entirely of women (groups 2, 8, 12, and 16) consistently described 11 age categories whereas men-only groups (groups 4, 7, and 9) described 9 to 11 age categories (Table 1). Mixed-gender groups had the greatest variation, with the number of age categories ranging from 5 to 12; the two mixed-gender children's groups also fell within this range, offering seven and nine age categories, respectively, to delineate the lifespan. The smallest number of age categories (5) was described by an elderly couple, suggesting the value of more moderately sized focus groups in eliciting emic age categories through discussion and debate.

The First Year

The first stage of life is called *mu're qaaqqo* or *danqa qaaqqo* (these have the same meaning); this phase lasts until children are approximately four months old. Multiple groups reported that this stage does not technically begin until a child is given a name, which is usually when they are three (girls) or four (boys) days old. Children in this age range can only be breastfed with their mother's help; they cannot hold up their own heads, and they cannot see well or differentiate among individuals.

Table 3 Sidama age categories across the lifespan

Age Category	Age Range	Markers
Mu're or *danqa qaaqqo*	Birth to 4 months	Can only breastfeed with mother's help; initially cannot hold up head; cannot see well or differentiate among individuals
Daaima	5–12 months	Starts with *daaxaxa*; teeth emerge; start to eat food; recognize mothers; start babbling; begin crawling and pulling up to walk
Qaaqqo	1–<5 years	Toddler phase—can walk and run; requires supervision; does not know right from wrong; begins to help family and follow instructions; returns home when called
Shiima beetto	5–<12 years	Capable of following instructions and taking on chores and responsibilities; development of "good sense"; spend increasing time with friends; start school with onset; get taller/heavier and begin to lose teeth; expected to engage in more sex-specific activities
Jawa beetto	12–<15 years (until onset of adolescence)	Pre-adolescent phase; capable of harder work at the garden and at home; some signs of pubertal development (i.e., breast growth in girls, increase in chest size in boys); significant change in cognitive abilities/reasoning
Qeedhicha/qeedhitte	~15–23 years (m), ~15–18 years (f)	Clear signs of puberty emerge; onset/duration can depend on heredity; both genders expected to know full range of skills necessary to maintain own household
Wedellicha/wedellitte	Begins with marriage; 18–25 (m), 14–18 (f); lasts ~10 years	Complete independence from parents; son "takes his part" (i.e., his inheritance of garden/herd) at this time and builds his home; daughters marry and move to husband's family
Mancho/manchote	Adulthood	Complete economic/social independence; men have established herds/gardens and participate in cultural meetings/ceremonies; women prepare cultural foods for ceremonial exchange; endpoint is when a woman has completed her reproductive years and at least one of her children has reached marriageable age; can be broken into *maggaareessa/maggaareette mancho* and *jawa mancho/manchote*
Geercho /geerchote	Elderhood	Clear indications of aging (walking with a cane, white hair/balding, fatigue, loss of teeth, vision loss); frequently sought for advice and to act as judge; some gain ability to predict during this time
Dooda (very old) (*doodino /dooddino*)	Near death	Very old and "like a child" once more; known to be close to death; women are believed to reach this age more quickly due to stress from repeated pregnancies

> Mu're qaaqqo can only breastfeed. They cannot see properly or speak so mother carries them close, up high. When they can see, their mother carries them lower in their arms.

> Danqa qaaqqo cannot see, they cannot open their eyes. They need help to take the breast and cannot have food. They cannot hold up their heads.

Because these young infants are considered vulnerable, regular monitoring is essential.

> Mothers must keep aware of his breathing because saliva can get into his throat and cause coughing. This can be dangerous so parents must keep close to the baby.

It was also noted that mother's travel should be limited.

> If you have to go any distance, you must return immediately to care for him.

Mothers also prefer to keep infants largely inside during this early time in development, to reduce exposure to environmental risks and minimize insults to health.

The end of this stage occurs when children are either old enough to begin taking food or starting to crawl, markers indicating the start of the next stage, *daaima.* Daaima is evident when children are able to sit propped up with blankets and pillows, a process called *daaxaxa*. Over this period, as baby teeth emerge, children start to eat food (*la'aato*) in addition to breastmilk, allowing mothers to leave them at home occasionally.

> Before, he only drank breastmilk. But now, we can mix foods together and give him a porridge.

> Mothers can now go farther distances by preparing some food for the baby.

Daaima can easily recognize their mothers from others, babble, take the breast to nurse themselves, and begin crawling and pulling themselves up to stand.

> When other women come out, the baby looks to see if it is his mother or someone else.

> This is when children start babbling. They're not quite using words but trying to call their mother's or father's names.

Danqa/mu're qaaqqo and daaima together comprise the first year of a child's life.

Whether Tiger or Lamb, He'll Touch It

The next stage, lasting from approximately one to five (or so) years of age, is most frequently referred to as *qaaqqo.* (As noted above, the terms *oosicho* or *oosote* also

emerged; these terms, which translate literally to "kids," were defined in the same way as qaaqqo, but qaaqqo was more commonly noted.) Qaaqqo was demarcated from daaima by the child's ability to walk (a toddler is called *kaxxino qaaqqo*). During this phase, a child is weaned. Qaaqqo touch everything and are often noisy—a family must pay more attention to this child because they do not know right from wrong, may try to throw or break things, and if they stray too far from the family compound, they may be unable to find their way home. Several participants noted the risk of children trying to touch fire.

> He'll touch anything! Whether tiger or lamb, he'll touch it.
>
> If he goes far from home, he doesn't know how to come back.
>
> The family must give much more attention because he still doesn't know right from wrong.

Across this stage, however, children gain the ability to begin helping their families with small tasks and will return home when called by their mothers.

> She can do simple tasks to help her family. I can send her to tell someone that I am having a coffee ceremony.

It was also noted that qaaqqo can run quickly, grow taller, and lose the facial roundness that is typical of infants. Toward the end of this phase, they start to lose their deciduous teeth.

Developing a Worldview

Sidama children's understanding of the world is shaped first and foremost by their parents. Parents expressed that their children gain their ideology by observing and then imitating the activities of their mothers (if girls) and fathers (if boys) (Dira & Hewlett, 2016). One group of men reported:

> At the very beginning, they get some experience and knowledge from being with their parents. For example, I had many experiences with my father. Enset—when I wanted to learn to propagate enset, my father taught me how to prepare it. I stood close by and learned from him. A child learns to make things from their parents. Girls learn from their mothers. They learn how to prepare enset. A mother calls her child to stand near her and learn how to prepare, how to scrape the leaves, pound it, and so on.

Later, around age seven, children may attend school, and this is believed to expand their worldview by increasing their range of experience (although much of their time is still spent playing with friends, often children from neighboring homes).

The shifting worldview of children becomes especially evident during the next stage of development, *beetto*, which lasts from approximately six to fifteen years of

age (endpoint varies by sex). *Beetto* essentially means child, or not yet adolescent, and this phase is broken into two parts, *shiima beetto* and *jawa beetto. Shiima* and *jawa* refer to small and big, respectively. Shiima beetto begins when children are approximately five to seven years old and lasts until a child is approximately ten to twelve years old.

During this time, children are recognized as having improved capacity to follow instructions. Specifically, by closely observing their parents and then through practice and correction, children obtain important cultural, sex-specific skills across this phase, such as how to cultivate weese or herd cattle (if boys) or how to scrape and pound weese (if girls). Young boys identified as shiima beetto have acquired enough knowledge to herd small cows/goats within short distances; shiima beetto girls can be sent to run errands.

> Beetto can identify good from bad and can do what parents ask of them. They know it's bad if they don't follow instructions.

> Boys are able to keep cattle and learn to do garden work, not hard work but they can help. Girls can fetch water, not from a far distance. But they can go to the market and collect firewood.

Children reported similar activities. One 9-year-old boy said:

> I can weed corn, throw [plant] corn, follow my parent's instructions, and help my brother. We work together. . . . I love all the work of the garden—weeding, throwing, and preparing rows.

A 9-year-old girl reported:

> I can clean my house, fetch water, collect wood, and herd goats.

There are some moderate indicators of physical development as children in this age range grow taller and heavier and have started to lose their teeth. Teeth are usually buried around a child's birth area as this connects them to a happy place; if they are no living at their birthplace, teeth can be thrown in that direction.

Children's understanding and reasoning ability are believed to increase incrementally with each stage. Shiima beetto can identify right from wrong; for example, a child knows that they cannot allow their cow to eat at someone else's garden.

> At this time, he can keep cattle. He can tell when the cow leaves our property to eat at someone else's garden. He knows good from bad and has good sense to identify right and wrong.

As previously observed, children spend significant time with their elders and listen to what they discuss and how they solve challenges. This is especially evident in how "good sense" is understood by both adults and children. A child with good sense (*wodana darino*) is generally defined as having the ability to follow their parents'

instructions, understanding what is necessary to do and why, watching and listening carefully when someone does something (especially an elder), being able to clearly explain something, and showing evidence of learning. One child noted that

> When somebody, like an elder, says something and you remember what they tell you, that is good sense.

This was echoed by several other participants—the ability to learn from others is closely tied to good sense. Wodana darino emerges between four and six years of age, at the end of qaaqqo and around onset of shiima beetto.

Skills indicating shifts in children's thinking and reasoning ability—such as emotional control, rising independence from parents, cooperation, knowledge of good/bad or right/wrong, conflict resolution, ability to delay gratification, and knowledge of sex differences—were overwhelmingly reported to appear during the shiima beetto phase. There was, however, some variation noted in the timing of these skills' emergence. For example, children in the shiima beetto age category reported the ability to control emotions, such as calming themselves down when crying or upset, but adults noted that although this increases across shiima beetto, it is generally found more consistently at the emergence of jawa beetto, the subsequent stage of development.

> For example, these two kids, when they create some difficulties, this one [12-year-old] can control himself more than this guy [10-year-old]. It starts when they are younger, with shiima beetto, but it increases incrementally.

Clarifications were also made regarding rising independence; although children frequently played with neighboring friends as shiima beetto, they will start playing together at a greater distance from the safety net of home, often herding cattle together or fetching water, with onset of jawa beetto. Shiima beetto are also becoming keenly aware of sex differences. When children were asked they if could prepare culturally important foods, including *tima* (a flatbread made from enset or maize), most girls at this age stated that they could while boys noted that "it is the duty of girls" or "no, I'm a boy, it's not my concern," indicating that gender role inculcation is well underway.

In contrast to girls in much of the majority world, many shiima beetto girls were not responsible for care of younger children. A couple of children under age ten reported that they could take care of younger ones but struggled to articulate how. This changes, however, as they approach (or self-identify as) jawa beetto. When those who said they knew how to care for younger children were asked how they care for them, three distinct themes emerged—protection from danger, keeping them clean, and providing food. One 9-year-old girl said:

> I am careful about the main road. An accident could happen—a car, motorcycles, a horse and carriage, cattle. I protect them from danger.

An 11-year-old girl reported:

> When they wear dirty clothes, I ask, "Why are you wearing dirty clothes?" I ask their parents and then I wash them. Little kids also go toilet in the fields. I tell their parents about it. It's dangerous because of the flies on the feces that could spread disease.

Transitioning to Adolescence

Jawa beetto begins around 12 and lasts until a child is ~15 years old. Jawa beetto is a pre-adolescent period in which it is expected that children can work hard at the garden and at home but have not yet developed a significant interest in the opposite sex; however, this interest does emerge across this phase. Girls begin to show some breast development at this time, while boys become somewhat stronger and broader in the chest but do not yet have facial hair. As jawa beetto, girls can transport crops to market, carry larger containers of water, and take on more household responsibilities; boys can help plow fields and travel long distances with cattle. Both sexes are increasingly independent.

> Jawa beetto can keep the house, carry water, take more responsibility. They help their family. They become stronger.

> Wherever their mother or father goes, the child goes and helps, carries things for them.

> Girls experience a little breast development. Boys get a little stronger and broader. The growth spurt is starting but they do not yet have facial hair.

> Jawa beetto can plow the land, do harder work and go far distances. They can go to the market, buy what is needed and bring it home. . . . You can tell someone is jawa beetto by their body. They are bigger. We know based on the size of the child and our experience.

Several interview participants noted that children become much more reasonable and sensible at the onset of this phase. Cognitive ability was noted as a "night and day" difference from that of younger children.

> At this age, children can learn more deeply, by using their minds and remembering better.

Cooperation, fundamental to adult success, also becomes much more apparent around this age—young children may play games requiring cooperation, but it is not until jawa beetto that real cooperative work emerges. Sidama highly value the advice of elders, and a mediator is typically used in resolving conflict. Thus, while young children may fight and resolve these incidents on their own (typically by forgetting about the fight), older children know the importance of bringing in a mediator for conflict resolution.

> When there is conflict, we talk to a third person who makes a decision about how to resolve it. I also sometimes act as a mediator.

> You need a third person. They are our friend. They take turn listening to the faults and then they resolve the fight.

This is an essential sociocultural skill since relationships developed across adolescence become the foundations for cooperatives critical to social, reproductive, and economic success during adulthood. Causes of disputes range from access to or theft of toys to the rules of the football game to gossip and insults.

Preparing for Adulthood

Following jawa beetto, age ranges start to diverge for boys and girls, with girls believed to start the subsequent stage of adolescence several years before boys. In general, onset of *qeedhicha*/*qeedhitte* is between the ages of 15 and 18, but it was sometimes noted to start as young as 12–13 for girls and as late as 18 for boys. Qeedhicha/qeedhitte lasts until approximately 23 to 25 years of age. Some suggested earlier transition to qeedhicha/qeedhitte is due to cultural shifts tied to pressure from increasing development in the region; others noted the influence of heredity or wealth.

> If dad was late in onset of qeedhicha, his son may also be late.

> If parents are rich, their children's bodies may mature ahead of their age.

This is the period of adolescence when obvious signs of puberty appear. For boys, indicators include facial hair, the Adam's apple, and deepening of the voice. For girls, continued breast development and onset of menstruation occur. Both sexes experience a growth spurt, pimples/acne, and the emergence of pubic and underarm hair.

This is also when girls are expected to know the skills necessary to maintaining their own homes, and boys their own gardens and cattle, in preparation for the next phase, *wedellicha*/*wedellitte*.

> Qeedhitte take responsibility for themselves—feeding themselves, working in the fields. Girls work in the house, cleaning, carrying water, or bringing things to market. And before school, helping her mother. They are learning the skills to prepare for their own family and marriage.

> Qeedhicha are close to marriage. He can work with his relatives—do hard work at the garden. He can organize work with his *de* [garden cooperative]. They can rotate working together in the fields.

Qeedhicha/qeedhitte and wedellicha/wedellitte were sometimes coupled or only one would be referenced, but the majority of groups ($n = 11$) indicated that qeedhicha/qeedhitte precedes wedellicha/wedellitte. Two groups only described qeedhicha/qeedhitte (although one noted that wedellicha/wedellitte was a part of qeedhicha/

qeedhitte). The other two groups only mentioned wedellicha/wedellitte. The literal translation of qeedhicha/qeedhitte indicates an older adolescent who is ready for marriage, but not yet married. As such, it may be considered a stand-alone stage, a transition point, or part of the process of becoming wedellicha/wedellitte. Evidence of increasing independence shows up in multiple ways, one of which was noted as a behavior change wherein "Girls no longer obey their mothers."

Taking Your Part

Wedellicha/*wedellitte* corresponds to marriage and starting a family, as well as greater formal interaction with society. Men, in particular, forge important social relationships during this time; both sexes start participating in rituals.

> Wedellicha is the age of marriage. You become more involved with married people. When someone dies, you can prepare food, you start participating in these cultural rituals.

> He has social connections. He participates on his own. He does all things independently—builds his house, participates in funerals.

> In Sidama culture, there is a meeting place. He starts to go there. He can share his ideas there. He must balance married life with maintenance of his social connections.

Age of onset again can vary significantly between the sexes. The Sidama have traditionally asserted that menstruation is instigated by sexual intercourse, and thus it is expected that a woman will not start menstruating until after she is married (Hamer, 1987). As a result, women typically marry between the ages of 14 and 18, whereas men are usually between 18 and 25 years old. Because puberty tends to occur later and marriage earlier in this population than in the minority world, these two events often do correspond. Interviewees noted, however, that some girls had started menstruating but did not want their parents to know for fear of being accused of sex before marriage.

With marriage comes complete independence from parents, and it is at this time that a young man "takes his part"—his portion of his parents' garden and cattle/goats, as well as a home site—and builds his house.

> He prepares his house, he has left his parents' house. He starts his independent life. It is shameful after marriage to continue living with your parents. He takes his property from his family, his family gives cows or goats, a plot of land—this is his inheritance.

A woman moves to her husband's family, who has given gifts to the bride's family. This stage can last up to ten years, until *mancho*/*manchote* status is achieved.

> She has married, has a child. She starts leading an independent life. She has departed from her parents and has her own home. She's started interacting with society and works with society.

Established Independence and Expertise

Several categories mark the various stages of adulthood, most of which have to do with one's community relationships and status. The first stage following marriage was largely agreed to be *mancho*/*manchote*. This stage recognizes complete economic and social independence, wherein adults hold all responsibility for their own families. Men have established their herds and gardens and are participating in meetings and ceremonies. At this phase, their expertise and advice may be sought by other community members.

> Mancho can solve problems on his own. He can administer from his local area, perhaps at the government level. He is more involved with social cohesion and interaction. He can be a mediator. Wedellicha could not do this because it's very difficult.

> He can solve problems, advise others, and negotiate. People come to talk to him and talk through their difficulties. He gives advice. Women do the same thing—connect socially.

As noted by the informant, women also participate in ceremonies, such as funerals, celebrations, and weddings, and can prepare foods to exchange with other women, perhaps upon the birth of a child.

During this phase, a couple usually has several children. One woman noted, "I was like a chicken, I had so many children!" By the end of the manchote stage, a woman has had her last pregnancy and at least one of her children has typically reached marrying age.

Some groups followed mancho/manchote—or even broke the stage itself into two components—with *maggaareessa/maggaareette mancho* and *jawa* (or *galfata*, "settled one") *mancho/manchote.* The definitions and age ranges for these were variable. Of the eight groups that identified maggaareessa/maggaareette mancho, four noted it as the stage following wedellicha/wedellitte. Three indicated that it was a stage following mancho/manchote. One noted that a maggaareesa/maggaareette mancho represents a "typical" mancho/manchote—that is, the definition of magaareesa mancho/manchote mirrored that of mancho/manchote.

> Magaareesa mancho has at least one but up to four children. They can solve some difficulties.

> You get some gray hair at this level. Your kids are qeedhicha, they are old enough to get married.

Jawa mancho indicates that the community acknowledges someone as a full adult, capable of offering guidance and support to the younger generation. This designation may come with age but is more indicative of meeting a level of social expectation. Jawa mancho are even-keeled individuals who can look fairly at both sides of a conflict.

> In Sidama culture, society can give you jawa mancho status. Maybe your grandpa was very wise and you're following in his footsteps in your activities or your speaking. It indicates a cultural level but it doesn't replace physical development.

Leadership

Mancho/manchote is followed by *geercho*/*geerchote*, when clear indications of aging have emerged (e.g., walking with a cane, white hair/balding, increasing fatigue, loss of teeth, vision loss).

> Your hair is gray, you're stooped over and tired. You can't do much, can't go to the market or into the village. You stay at the house.

> Geercho can't work but has responsibilities in the local area. His vision is failing, he cannot hear very well.

Geercho are frequently sought out to advise others who are facing challenges. They are important leaders within their community, not just providing advice but also acting as judge when necessary.

> People come to him for advice and guidance. He offers good guidance for people because he has much experience.

> People bring him their difficulties for their help. He can solve any challenges.

Geercho could be followed by a phase called *bututa geercho*, which is associated with being a grandparent and possibly a great-grandparent. The ability to predict things, such as when Fiche Cambalaalla (Sidama New Year) should be celebrated, emerges at this time for some gifted men (*masaalano*). While women do not offer predictions, they are also considered good speakers/advisors at this stage of life.

Reaching the End

Late in life, when someone is very old and can no longer do anything on their own, they are considered *doodino*/*doooddino* and are known to be close to death.

> Dooda can't do anything. He is helped by his children, or other kinfolk if he hasn't children. He has only days.

> Dooda become like a child again. They are crawling and close to death. He cannot clothe himself, he cannot use the toilet.
>
> Dooda are like mu're qaaqqo. They can't understand anything.

As is the case with the other adult categories, there are significant age differences for men and women; in general, women are believed to age much more quickly (due to the stress of repeated pregnancies coupled with food shortages) and to reach death sooner than men.

Discussion

Life history theory suggests that the human lifespan is determined by optimizing energy allocation to maximize reproductive potential within our given environments. The unique human niche means that our environments are not just physical but also cultural, allowing for feedback that may aid in our survival and reproduction. As a result, we experience both widely shared phenotypic shifts as well as more nuanced transitions that may reflect our specific eco-cultural contexts. As noted by Keith and colleagues (2012), the parameters of the life course reflect the dynamic relationship between individual lives and cultural context more broadly; in other words, both processes of time and changes in social roles shape our lives. This suggests that culture and biology jointly influence our understanding of life stages, which is evidenced here. As predicted, Sidama age categories are delineated by widely shared markers of human life history, indicative of physical, social, and cognitive development—these include infancy (mu're qaaqqo and daaima), early childhood (qaaqqo), juvenility (shiima beetto and jawa beetto), adolescence (qeedhicha/qeedhitte), adulthood (mancho/manchote), and senescence (geercho/geerchote). Yet, more culturally salient markers—such as the ability to develop and maintain social cooperatives or prepare foods for rituals—are also key and emerge in categories such as wedellicha/wedellitte, as well as subdivisions of mancho/manchote (e.g., jawa mancho's role as a mediator). It is thus evident that broad life-history designations do not fully reflect the more nuanced observations provided by emic categorizations of the lifespan. Importantly, adults and children largely agree on how these categories are understood, suggesting the power of cultural transmission in shaping human ontogeny. Some of the unique aspects of Sidama childhood and adulthood are highlighted below.

Childhood

Infancy is universally a time of rapid change—children go from complete dependence on mothers to some physical and nutritional independence (Meehan et al., 2016). While these changes all fall broadly under the category of infancy, Sidama denote important landmark changes in infant abilities. *Daaxaxa* (when children are able to sit supported by blankets and pillows), for example, is an indicator of rising physical independence, specifically from mothers, as children with this capacity can now be fed by others. This transition is denoted by a change from mu're qaaqqo to

the age category daaima. Aka foragers similarly delineate infancy into at least two age categories, *molèpè* and *dibénda* (Hewlett, 1991). These phases indicate birth until crawling and crawling to walking, respectively. Although seemingly tied to mobility, dibénda reflects when infants may be left for brief periods in the care of others, allowing mothers to work more easily. Multiple phases of infancy are common across majority world cultures (Lancy & Grove, 2015) and may be associated with subsistence-level economies engaged in high rates of cooperative care, suggesting that eco-cultural context significantly informs emic models of infant development.

During juvenility, Sidama children are expected to make moderate contributions to the household economy. This mirrors developmental expectations around the world, where children's rising social, cognitive, and physical capacities are capitalized upon to set the stage for inculcation of roles and responsibilities. As noted by Lancy (1996), a Kpelle mother categorizes a "good" child as one who follows through on chores, brings water when asked, minds younger siblings, and does not complain when asked to plant rice. Among Sidama, the cultural and physical landscape necessitates that shiima beetto and jawa beetto learn how to herd cattle, weed gardens, and properly prepare weese (enset)—skills specific to Sidama culture. These skills are learned largely through instruction, observation, and imitation of their same-sex parent. As a result, it is also during this time that sex-specific activities and orientations begin to emerge (see also Hamer 1987), a common occurrence in the majority world (Lancy, 2012; Lancy & Grove, 2015). Urbanization and globalization, however, are affecting the skills and values emphasized during this age category. As noted by our participants, formal education is increasingly considered essential to expanding children's worldviews and opportunities. This is contributing to a shift in cultural values, particularly for girls, in the foci of skill development across both shiima and jawa beetto.

Even greater sex role divergence is found in the subsequent period of pre-adulthood. The qeedhicha/qeedhitte phase is one of transition, centered almost entirely on being prepared for marriage. Although physically indicated by pubertal development, the sociocultural expectations are marked—it is at this time that adolescent boys and girls are expected to have the abilities necessary for adult independence. For girls, this includes a command of typical household tasks. Boys must demonstrate their ability to work hard at the garden. Ultimately, this requires not only a mastery of the skills referenced above but also a complete and coordinated social, physical, and cognitive transition to adulthood. Similar examples can be found in the majority world literature; for example, potential Warao bridegrooms must be able to make a canoe in addition to having skills in fishing, hunting, and gardening to have any hope of gaining a bride (Wilbert, 1976). This contrasts with ideas of legal or biological adulthood that are standard in the minority world and again illustrates the role of culture in shaping the lifespan.

Adulthood

Sidama describe multiple stages of adulthood (magaareessa/maggaareette mancho and jawa mancho/manchote) and of senescence (i.e., geercho, bututa geercho, doodino/dooddinno), designations largely missing in minority world populations but not without some parallels (e.g., grandparenthood). Given the importance of elders

and cooperation in Sidama culture (Brögger, 1986; Hamer, 1987), it is not surprising that the period between adulthood and senescence/death has a wider range of variation that reflects more attention to the strategic impact of these individuals than to life history outcomes. The common conception of magaareesa/maggareette mancho status is largely the same as that of mancho/manchote, wherein an individual has attained full adult status. In contrast, jawa mancho/manchote is a status that does not necessarily come with time. Those who attain this status are sought out for their advice, regardless of their age. Similarly, there is a category for individuals who are recognized not just for their age but for their wisdom—minjataamo/minjataame; these are specific to Sidama values of resource saving and consideration of the future and are comparable to findings in Japan, where wisdom is not necessarily tied to age (Grossmann et al., 2012). Among Japanese, this is attributed to the importance of interpersonal harmony, a value widely shared among majority world cultures.

The final stage of life, when one is close to death, is called doodino/dooddino and was identified by 14 of the 16 groups. Given that recent estimates put life expectancy at birth for women at 60 and for men at 63 (Areru et al., 2020), it is somewhat surprising that the overwhelming majority of participants identified the doodino/dooddino age category. However, the !Kung—"They are old and don't know how they are going to feed themselves"—and the Herero—"Crying for food and sleeping in shit because too weak to go to bush"—note similar challenges associated with old age (Keith et al., 2012). This suggests that examinations of the average lifespan may not fully reflect the greater attention to aging individuals found in smaller-scale societies.

Conclusion

The Sidama model of human development provides an illustration of the role of culture and ontogeny in our understanding of the lifespan. By examining how stages are bound, we gain insight into how previous experience with the physical and cultural environments shapes subsequent patterns of development. Although development is a continuous state and segmentation may be "somewhat arbitrary" (Collins, 1984:2), the variation evident both within and between populations highlights the importance of cross-cultural research, particularly in identifying what aspects of biocultural interactions underlie an individual's life history. Because physical development may be mismatched with social, emotional, and cognitive development, age categorization may increasingly be a matter of cultural construction. A thorough knowledge of how cultural age categories are conceived and applied is thus essential not only to the ethnographic record but also in forwarding our understanding of how intersections between culture and biology have shaped and continue to shape the evolution of human life history.

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Declarations

Conflicts of Interest/Competing Interests Not applicable.

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Consent to Participate Following explanation of the proposed research to participants and prior to data collection, informed assent was obtained from child participants and parent permission obtained from all adults.

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