

You Don't Have to Know Where Your Kids Are, Just Where They Aren't: Exploring Free-Range Parenting in the Bolivian Amazon



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Over the last few decades, parenting norms, particularly in the United States and Western Europe, have shifted strongly in favor of intensive parenting techniques, which place emphasis on constant direct supervision as well as constant protection from risks of harm (Ashton-James, Kushlev, & Dunn, 2013; Thomas, Stanford, & Sarnecka, 2016). These norms have been further intensified in response to stricter legal consequences associated with “neglect” and an increase in the availability of written resources and online media focused on improving parenting skills (Radey & Randolph, 2009). As an alternative to intensive parenting styles and tightening social norms, “free-range” parenting has emerged as an alternative strategy. This movement, first popularized in the United States by the pediatrician and author Spock (1946), suggests children can and should function independently (i.e., limited parental supervision) as they age and develop. However, how these strategies help or hurt child learning is still not fully understood.

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This chapter will explore the relationship between parenting preferences and variation in child mobility, which predicts navigation and spatial reasoning among Tsimane children (Davis & Cashdan, 2019). Using qualitative and quantitative data, we aim to explore (1) whether parenting really is “free range,” (2) how a “free-range” parenting style affects children’s mobility, and (3) whether gender differences in travel distance (generally favoring males) and increased harm avoidance (generally favoring females) are also found in a “free-range” environment.

Why Mobility Matters

A growing body of research suggests spatial skills and strategies are related to greater performance in mathematics and science (Geary, Saults, Liu, & Hoard, 2000; Newcombe, 2010). Further, findings suggest that spatial reasoning can be taught, leading to improvements in success in the skills critical for performance in science, technology, engineering, and mathematics—STEM fields (Goldin-Meadow, Cook, & Mitchell, 2009; Uttal et al., 2013). Given that sex differences in many spatial tasks favor males cross-culturally (Gaulin, 1992; Levine, Huttenlocher, Taylor, & Langrock, 1999; I. Silverman et al., 2000; Vashro, Padilla, & Cashdan, 2016; Voyer, Voyer, & Bryden, 1995), that males range farther than females cross-culturally (Cashdan & Gaulin, 2016; Gaulin & Hoffman, 1988), and that navigating large ranges is, quite simply, a spatially demanding task (Jacobs, Gaulin, Sherry, & Hoffman, 1990; Sherry & Hampson, 1997; Silverman et al., 2000), it has been suggested that mobility may play an important role in the development of spatial skills.

However, despite evolutionary arguments offering logical explanations for why sex differences in spatial abilities and mobility might exist (Ecuyer-Dab & Robert, 2004; Miner, Gurven, Kaplan, & Gaulin, 2014; Silverman et al., 2000; Vashro & Cashdan, 2015), the sex differences are not invariant across societies, and limited samples from non-W.E.I.R.D. (Western, educated, industrialized, rich, democratic; (Henrich, Heine, & Norenzayan, 2010) societies leave many unanswered questions regarding the effect environmental variation and cultural norms—such as how children are parented and what restrictions are placed on girls and women—could have on mobility and the spatial competencies associated with it.

Study Population: Where Childhood Isn’t WEIRD

The Tsimane forager-horticulturalists live in lowland Bolivia within the Beni Department of the Bolivian Amazon. The Tsimane described in this chapter live between 60 and 70 km (crow’s flight) from San Borja and Yucumo, two market towns with greater access to wage labor opportunities and commercial goods. Travel to and from the market towns is mostly conducted by boat and, depending on seasonality and river depth, can take between 13 and 20 hours (using an outboard motor).

The Tsimane are a natural fertility population, and—unlike many Western societies—Tsimane children spend much of their time in mixed age, mixed sex peer groups working, learning, and playing. Tsimane children also have greater freedom to explore than is typical in Western societies, and their tropical forest environment presents different spatial challenges. The environment is navigationally challenging, with visibility often limited by cloud and tree canopy cover and with most travel on small footpaths and along winding rivers and tributaries that can change seasonally. Daily life for Tsimane children depends largely on age (Stieglitz, Gurven, Kaplan, & Hooper, 2013). As children age, they begin to assist their families with subsistence activities, such as fishing, hunting, and other skill-based tasks. By 9 years old, Tsimane children are helping with gardening, foraging, and other domestic tasks (e.g., collecting water). All these activities require both boys and girls to spend considerable time walking and working in the densely forested areas surrounding their villages.

Many Tsimane children attend school, but Tsimane formal education should be classified as performing at the lower end of a graded “educational continuum” relative to schools in industrialized countries (Davis, 2014). Classes in Tsimane elementary schools are conducted roughly 4 hours per day and 5 days per week. This allows for considerable time outside of school hours to engage in subsistence and foraging behaviors, as well as play (Stieglitz et al., 2013).

Factors that Affect Mobility

Mobility has costs, as well as benefits, making it particularly important to understand what intrinsic and extrinsic factors might influence whether, at what age, and how often people are mobile. These factors include, among other things, individual characteristics, cultural variation, and environmental influences.

Harm avoidance Harm avoidance plays a significant role in shaping travel patterns and spatial performance, particularly among females who are more fearful generally (Campbell, 1999) and more cautious about navigation specifically. Given that women must manage both the energetic costs of carrying infants (Jones, 1986) and the risk of getting lost or hurt, it is not surprising that men report higher self-confidence and lower anxiety when encountering novel environments (Devlin & Bernstein, 1995; Lawton, 1994).

Recent studies among adults and children have supported the notion that harm avoidance is associated with a more cautious style of spatial exploration. In the United States, more harm-avoidant adults explored a virtual environment with greater cautiousness (e.g., increased number of pauses, revisiting of previously traversed areas), which was associated with poorer navigation in that environment (Gagnon, Cashdan, Stefanucci, & Creem-Regehr, 2016). The same appears to be true of children in Western societies: fearful children explored a maze more slowly, with a trend to poorer navigational recall (Schmitz, 1997).

Cultural variation and childhood Cross-culturally, middle childhood (ages 6–11) is distinguished by the broadening of the child’s social world and learning opportunities outside of the family (Hewlett, Fouts, Boyette, & Hewlett, 2011; Lancy, 2014; Lew-Levy, Lavi, Reckin, Cristóbal-Azkarate, & Ellis-Davies, 2018). Evidence from the United States (Hart, 1979; Matthews, 1987) and several small-scale, non-Western societies (Whiting & Edwards, 1973) have reported striking sex differences that favor boys in range size—the total area of travel—during middle childhood. In many foraging societies, sex segregation begins to increase during this stage as children begin to participate in adult activities, identifying with adults of their same sex and imitating their behaviors (Draper, 1976; Endicott & Endicott, 2008; Flannery, 1953; Gallois et al., 2015; Wallace & Hoebel, 1952). Adolescence (ages 12–18), on the other hand, is less about preparing for adult work roles than about preparing for adult mating and marriage (Schlegel, 1995), which may have further implications for boys’ self-initiated motivations for travel (Miner et al., 2014). Although gender differences in children’s range size and spatial ability are not unique to Western societies, modern Western societies are highly unusual in matters affecting children’s spatial experiences. Childhood differences and predispositions can be amplified or muted by culture, parenting, and the child’s local environment.

Cultural variation in parenting How and when females can move through space may be determined by social constraints on mobility and exploration, particularly during critical phases of child development. These cultural patterns are also affected by the sources from which parents get their information.

In the United States, parents report getting most of their parenting advice from books and family members (Radey & Randolph, 2009). In contrast, Tsimane parents are less reliant on learning parenting techniques from books, arguments from authority (religious and political authorities), and formal schools. This distinction alone may contribute to the Tsimane developing a more accurate perception of environmental and social risks for their children than is the case in industrialized societies, particularly for girls, whose mobility is restricted in other populations (Clark, 2015; James & Embrey, 2001; Katz, 2014).

Forager children are typically given far greater latitude for independent spatial exploration than are children in the West. For Tsimane children, it is reasonable to expect that as early as middle childhood, children are frequently engaging in higher-risk activities away from the home (e.g., hunting, gathering, and fishing), and parents begin giving less verbal instruction to their children (Cristia, Dupoux, Gurven, & Stieglitz, 2019).

Environmental variation Risks—as perceived by both children and their parents—may have profound effects on spatial exploration and reasoning. Recent findings showed that infants around 1 year old associate snakes with fear (DeLoache & LoBue, 2009), suggesting that humans may have an evolved predisposition for avoiding dangerous animals. Inclement weather often deters people from taking certain routes or traveling during certain times of the day (Khattak & De Palma,

1997; Kilpeläinen & Summala, 2007), and studies show humans overestimate the distance between themselves and the environmental obstacles they perceive as dangerous (Stefanucci & Storbeck, 2009; Wu et al., 2019). The magnitude and nature of these environmental risks may also shape parental constraints on children’s mobility.

Method

Sample

The study was conducted with 35 parents (21–60 years, 60% female) and 83 of their children (6–18 years, 51% female) from one upriver Tsimane community. Data collection required visiting individual households to conduct interviews and recruit subjects. The distance of homes from our project area (village center) ranged from 0.1 to 8 km away ($M = 2.3$ km, $Mdn = 2.9$ km) and often required river crossings with small canoes.

In all, this study collected data on ~ 58% of the children in the villages who were listed on the census as alive in 2015 by the Tsimane Health and Life History Project (Gurven et al., 2017). Though the project updates the census every few years, migration and mortality made determining the exact number of children in and around the villages difficult.

Age Ages for every child were collected and cross-validated through three channels: individual interviews, parent interviews, and census data. Children were also categorized into one of two developmental stages, middle childhood (6–11 years) or adolescence (12–18 years; see Table 1).

Table 1 Study sample characteristics

	Total sample		Middle childhood (6–11)		Adolescence (12–19)	
	<i>N</i>	Mean (SD)	<i>N</i>	Mean (SD)	<i>N</i>	Mean (SD)
<i>Child demographics</i>						
Sex (% female)	84	51%	51	49%	44	21%
Age of child (yrs)	84	10.68(3.6)	51	8.24(2.4)	33	5.69(3.2)
<i>Parent demographics</i>						
Gender (% female)	84	69%				
Age of parents (yrs)	35	38.92(10.6)				
<i>Mobility</i>						
Average daily distance (km)	50	5.26(2.6)	26	5.21(2.6)	7	5.31(2.7)
Time in bounds (%)	32	87.70(23.4)	16	89.58(20.1)	16	85.83(27.4)

Harm avoidance We assessed child and parent harm avoidance in three domains: physical harm, spatial anxiety, and social anxiety. We had separate interviews for children and their parents.

Children For physical harm, we asked the following questions: (1) Do you get worried you will see or be hurt by animals (e.g., snakes, jaguars, leopards) when you are traveling in the forest? (2) Do you worry about being injured when you are traveling alone? Answers range from rarely = 0, sometimes = 0.5, to often = 1 and were summed to create a scale of harm avoidance from 0 to 1. To assess spatial anxiety, we asked: (3) Are you concerned that, if you take a new route, you might get lost? Answers range from rarely = 0, sometimes = 0.5, to often = 1. Finally, to assess social anxiety, we asked: (4) When you visit communities that you don't know well, do you feel safer if you go with other people or do you feel comfortable going alone? Responses were coded 1 = comfortable going alone and 2 = prefer to go with others.

Parents An interview with qualitative and forced choice Likert scale questions was conducted with 35 pairs of parents (70 people in total) whose children had participated in the study. Questions discussed parents' concerns, preferences, and personal experiences regarding child safety, exploration, and being lost.

From the forced choice Likert scale questions, we created a composite variable called "Worry about child safety" by asking the following questions: (1) When your child is in a place you do not know well, are you worried they might become lost? Answers range from rarely = 0, sometimes = 0.5, to often = 1. We also asked: (2) Do you worry about your children getting lost when they travel alone or without adult supervision? Answers range from rarely = 0, sometimes = 0.5, to often = 1. Finally, we asked: (3) Do you worry about your children getting hurt when they travel alone or without adult supervision? Answers range from rarely = 0, sometimes = 0.5, to often = 1.

Mobility We measured daily mobility and percentage of time within the village boundary. Participants were given QStarz BT-Q1000XT GPS data loggers on randomly selected days during the study period. Each GPS unit was placed inside a small, water-resistant travel case and secured to a lanyard that each child wore around their neck. After 3 days, participants returned the device, and the individual's tracks were recorded using QStarz GIS software on a laptop. Children were then asked to recall places visited, time spent out of the community, and purpose of travel (e.g., work, school, or play) during the tracking period. The following variables were calculated from the track data: (a) average daily distance traveled and (b) percentage of time spent inside and outside village boundaries. To confirm whether children spent their time within village bounds or outside of the village, a perimeter polygon was calculated using GPS points for each house in the same village (Fig. 1).

Each GPS unit required approximately 2 hours of charging via a solar panel and 12-volt battery. There was variable availability of solar and stored battery power due to cloud cover and tropical storms, and on some days, weather conditions also inter-



Fig. 1 Satellite image of houses within the village used to construct the community’s boundaries. Numbers indicate location of different family homes

ferred with the ability of the units to maintain contact with satellites. Of the 68 individuals we tested, we discarded the data from 14 individuals due to poor battery charging, incomplete tracks, and damaged GPS units.

Statistical methods We first assessed the effects of gender and age on each of the variables of interest. We then used linear regression to determine associations between parent and child reported harm avoidance, child development, and gender. All statistical analyses and graphics were performed in R, version 3.4.3 (R Foundation for Statistical Computing, Vienna, Austria). Graphical representations were produced in R package ggplot2.

Outliers Tracks from three females were removed from the GPS data. Two had traveled extensively in a motorized canoe, and one child’s data was removed because she lived outside the designed boundaries of the community. The removal of their data did not significantly affect the results.

Results

See Table 1 for demographics of the sample; the average age of girls and boys was similar, both overall and within each developmental stage. All parents interviewed had no fewer than two children.

Does “Free-Range” Parenting Really Exist?

Parents reported being equally concerned about the safety of their daughters and their sons ($t(82) = 0.21, p = 0.834$), and there was no significant difference in the restrictions parents placed on travel within the village ($t(82) = 0.37, p = 0.714$) or outside the village by gender ($t(82) = -0.44, p = 0.659$). However, parents were clear that in many cases boys and girls would not need to travel to certain areas. Parents also expressed in interviews that girls and boys could travel together.

Parental restrictions based on personal knowledge During interviews, most parents stated that they often do not know where their children are, but they did know where their children aren't. Parents remembered in detail the times they themselves had been lost, recalling the time of year, the amount of time they were lost, where they were going, and how they found their way home. When asked whether their children had ever been lost, nearly every parent said no. Of those who did report their children being lost, two resulted in fatalities, and one occurred during a rain-storm when a child was going for firewood. The parent stated that they quickly recovered their child and brought them home.

We next asked parents how old their children would have to be in order to travel to and around some higher-risk areas, such as the river or forest. The mean age parents gave for allowing their child to travel to and around the river alone ($M = 10.85, SD = 2.30$) was significantly lower than the mean age children could travel into and around the forest alone ($M = 15.70, SD = 2.30$), $t(43) = -1.68, p = 0.097, d = 2.70$). However, many parents said they couldn't answer questions about the appropriate age at which children could go certain places, because their children had not reached that age yet. We received that answer from 20% of parents when we asked about travel to the river and 50% when we asked about travel to the forest. In these instances, the parents stated they would not know until their children had reached the appropriate age.

Does a “Free-Range” Parenting Style Affect Children’s Mobility?

During the interviews, parents explained that children were not allowed to go to new places alone. Regardless of the location, all parents insisted that children would visit a new place with adults or older siblings first. And, when those places were in the

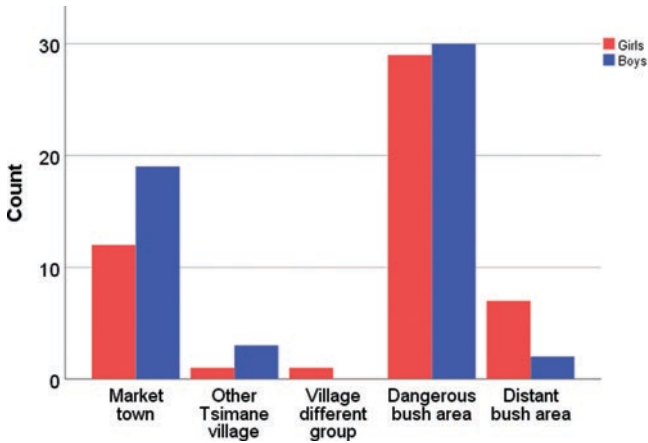


Fig. 2 Frequency of reported restricted areas for sons and daughters

forest or distant villages, parents stated that children could only go with parents or an adult caregiver first.

Controlling for age and sex, parents who gave their children more freedom within the village also were more likely to allow for greater freedom outside the village ($r(84) = 0.33, p = 0.002$). However, those parents also reported greater worry for child safety when their children were outside the village ($r(84) = 0.36, p < 0.001$) or visited new places alone ($r(84) = 0.25, p = 0.020$).

Parents also reported that they did not allow their children to travel alone to certain areas, such as the market town (Fig. 2). More parents restricted solo travel to the market town for their sons than for their daughters. Parental concerns about children visiting the market town were more varied for sons than daughters (Fig. 3) and included the market town being too far, too far and risk of environmental hazards (e.g., wild animals, dangerous terrain), too far and interpersonal risk (e.g., physical harm), and too far and that their sons would get lost. For daughters, an overwhelming majority of the responses regarding restrictions focused on places being too far and a risk of environmental hazards (Fig. 3).

Children agree with parental concerns about risks When interviewed, over 90% of children agreed that they could not and would not go to unfamiliar places alone for the first time. Older children who were interviewed—particularly those who had traveled farther from home—expressed a preference for traveling with others. Most also reported that they were not as good as their parents or other Tsimane adults at finding their way. Younger children, on the other hand, were more likely to report they were good at finding their way, though this response referred to travel within a much smaller range.

Children were also asked (1) whether their parents worried about their safety and (2) whether their parents should worry about their safety. There was no effect of age ($\beta = 0.22, p = 0.828, 95\% \text{ CI } [-0.03, 0.04]$) or gender ($\beta = 0.08, p = 0.784, 95\% \text{ CI }$

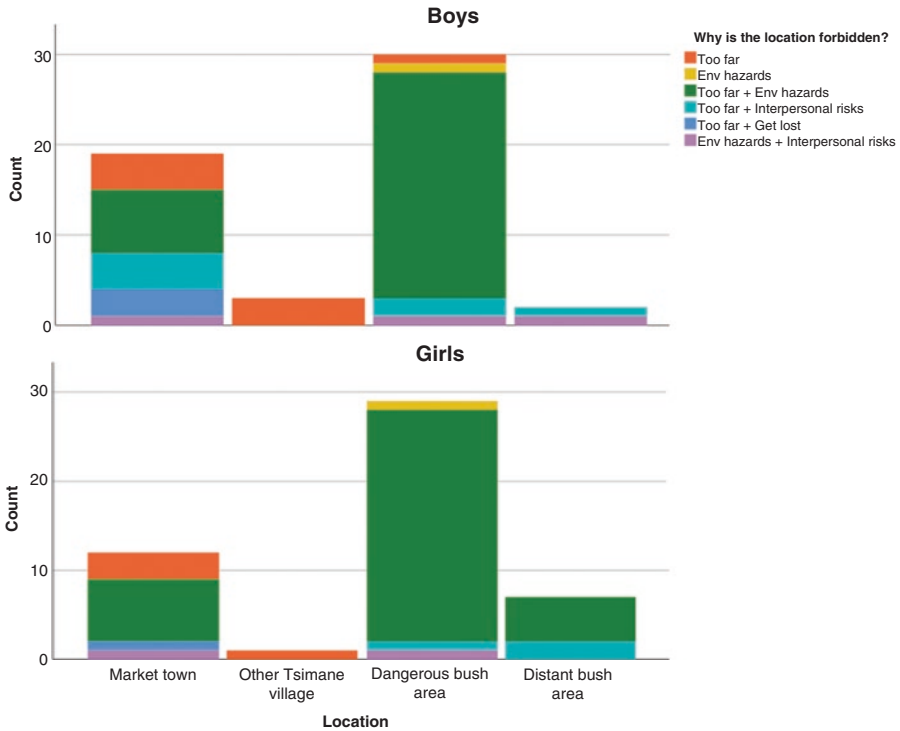


Fig. 3 Reasons parents provided for their children's travel restrictions

[−0.15, 0.35]) on whether children thought their parents should worry about them. Across all ages, boys and girls stated that their parents do and should worry “sometimes” or “often” (Fig. 4). Children also expressed a preference to travel with others. Only adolescents stated that they could travel with similarly aged peers, rather than older siblings, family members, or parents.

Does “Free-Range” Parenting Produce Gender Differences?

We first report findings from our child interviews and child mobility, which have been discussed further in Davis & Cashdan (2019). We then turn to the adult interviews, to understand how parenting is related to children's views and behavior.

Child reported harm avoidance Boys and girls reported similar levels of harm avoidance regarding physical harm (threat from injury and from dangerous animals) and spatial anxiety (concern about getting lost). They differed only in reported social harm avoidance (feeling safer going with others to communities they don't know well), with girls being more concerned.

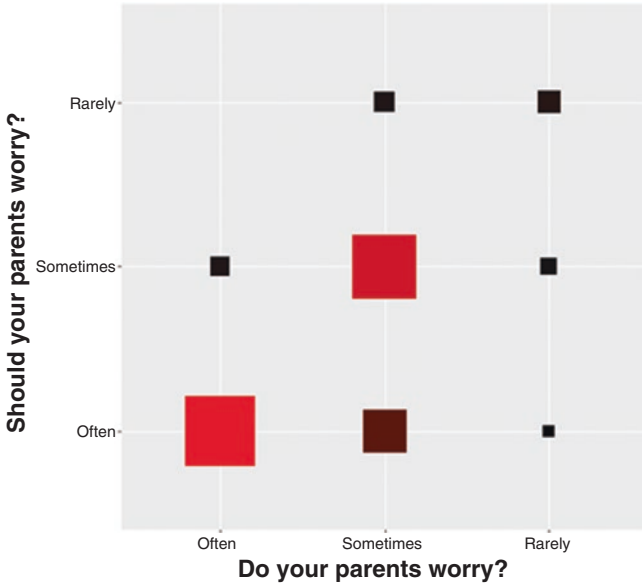


Fig. 4 Relationship between children’s interview responses to two questions: (1) Do your parents worry about your safety? (2) Should your parents worry about your safety? *Note.* Larger square size indicates the frequency of the response pair. The lighter color red indicates more responses among similarly sized squares. There was a slightly greater frequency of the response Often/Often than among those who answered Sometimes/Sometimes

Mobility and exploration by age and gender The daily mobility of boys and girls was similar. Daily distance traveled by boys was 5.28 ± 2.58 km, and for girls it was 5.23 ± 2.63 km ($N = 50$). There was not a significant difference for mean daily distance traveled by age group ($\beta = 0.11, p = 0.466, 95\% \text{ CI } [-0.14, 0.30]$) or gender ($\beta = 0.31, p = 0.833, 95\% \text{ CI } [-1.40, 1.73]$) ($d = 0.02$; Fig. 5). Travel outside the village involves different activities and risks, and so we also looked at children who spent at least 1% of their time outside the village. Among this group, there were no gender differences, but older children spent more time outside their village (age: $\beta = -0.48, p = 0.045, 95\% \text{ CI } [-7.91, -0.90]$; gender: $\beta = -0.27, p = 0.25, 95\% \text{ CI } [-41.75, 11.50]$).

Discussion

“Free-range” parenting does exist but perhaps not in the way it is presented in W.E.I.R.D. societies. Tsimane parents report worrying about their children, and they do restrict where, when, and how children can travel. Though parents allow their children to roam without constant supervision, children do not travel to new or distant locations without going with a parent or other adult first.

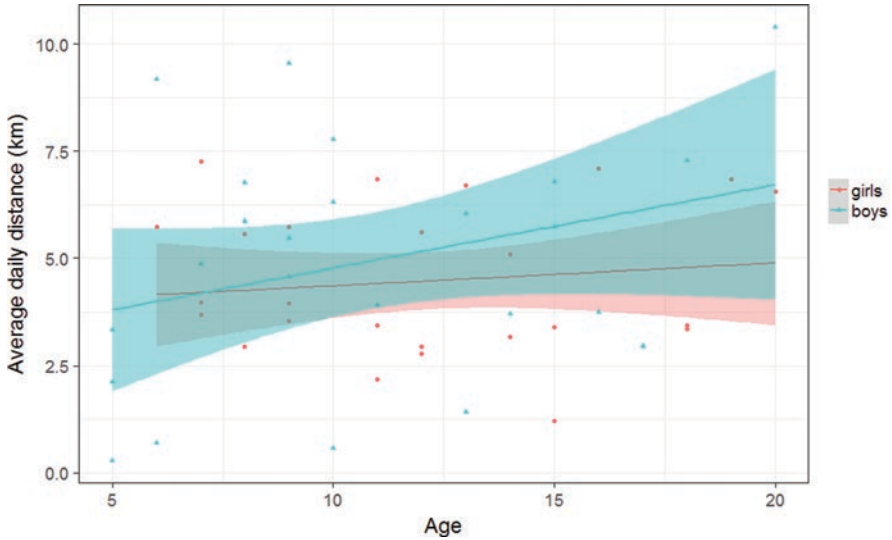


Fig. 5 Age by average daily distance traveled by girls (red) and boys (blue) in a Tsimane village ($N = 50$). There is no significant gender difference in daily mobility patterns for children between the ages 6 and 19 years. Variance in travel distance is greater for boys across the sample

Personal Knowledge and Experience

Parents report using individual experience to determine when a child is mature enough to travel alone to places in and out of their community, rather than depending on social norms and age specific benchmarks. Further, children report that they know their parents worry about them and that their parents should worry about them. These responses highlight that children, as well as parents, are aware of the environmental dangers and risks associated with solo or novice traveling. For example, the Maniqui River is wide and has a fast current. Felled logs often get swept into the currents and obstruct travel paths during the rainy season, and caiman can also be found along the river and in the river's smaller tributaries. However, as children age, they begin fetching water, washing clothes, and bathing in the streams without their parents. The mean age parents reported children could visit the river alone was 10.85 years; this average reflects not only risks but also the need to use canoes to travel across tributaries to reach other parts of the village, which requires skill and the strength to maneuver the canoe and pole. Occurring even later, the mean age for going to the forest alone was 15.70 years old, which is due to the dangers associated with getting lost as well as environmental threats like dangerous animals and weather. Every single person interviewed reported being fearful of jaguars when in the forest alone, regardless of age.

Interestingly, parents more frequently reported restricting their sons' travel to the market town than their daughters'. Miner et al. (2014) found that boys increased

travel in adolescence during mate-seeking years. Thus, limiting a boy's travel to a city where he can easily meet mates seems counter-intuitive. Unlike Miner et al., we did not find a significant gender difference in adolescents' travel to the market town (although we found a trend in the same direction favoring boys' increased travel); however, the lack of gender difference in self-reported travel is likely an artifact of our sample size¹ and age range. Reported restrictions for boys to travel to the market town are most likely because there is a greater probability of boys traveling unaccompanied. Girls do not travel to the market town without parents or closely related kin, and because men do nearly all the river navigating—which provides access to the market town—it is more likely that boys will begin traveling alone or with friends during their teen years. Further, an increase in offboard motor use on canoes has made the journey to the market town easier, faster, and more accessible to younger, less experienced boys. Reasons for restricting travel for sons included distance and environmental hazards, both related to the journey's approximately 70 km river distance. Parents also cited interpersonal dangers as a reason their sons should not travel alone to the market town. Reasons cited were strangers, alcohol, and the unknown in the market town.

Mobility in a “Free-Range” World

Our previous findings showed that Tsimane children's harm avoidance was not related to mobility among Tsimane children (Davis & Cashdan, 2019). Unlike in W.E.I.R.D. populations, there was no significant difference by gender for reported harm avoidance, daily mobility, or average time spent in the village. As Tsimane children age, they begin to travel from home with greater frequency and spend more time outside the village. As they age, Tsimane children also report slightly higher harm avoidance, suggesting that as they travel more, they become more cognizant of potential risks and dangers.

Given these findings, we suggest the lack of gender differences in harm avoidance and mobility between Tsimane boys and girls is likely to be a result of parenting behaviors, or child training practices (Barry III, Child, & Bacon, 1959), in this society. Being productive and knowledgeable are both culturally valued traits among the Tsimane. Understanding how to navigate the forests and rivers is a complex and risky task, but it is necessary for learning how to become productive hunters, foragers, and horticulturalists. Thus, children are given the opportunity to explore freely within spaces, first introduced by parents or other experienced alloparents, that continue to expand throughout childhood.

¹We had a relatively small sample of boys and girls over the age of 12 ($N = 7$) who visited the market town. The lack of significance was likely due to limited power in our sample.

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