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UNCOVERING THE HIDDEN MEANING OF CANNY CONSUMPTION PRACTICES: LINKS TO INDIGENOUS VIEWS ABOUT THE NATURAL WORLD

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by

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Abstract

Uncovering The Hidden Meaning Of Canny Consumption Practices: Links To Indigenous Views About The Natural World

Claudia. L. Castañeda-Leche

The goals of my dissertation are first to gain a better understanding of the variety and breadth of a set of environmental practices that I call *canny consumption practices*, and second to provide empirical evidence that *canny practices* are part of Indigenous-descent families' daily activities and their connections to Indigenous principles which consider all living entities—human and non-human—to be persons and part of one body. Twenty Indigenous-descent mothers or fathers from rural and urban communities of Guatemala were interviewed together with their pre-teen or teenage children. Parents' responses to the semi-structured interviews showed that canny practices are indeed part of Guatemalan Indigenous-descent families' daily lives and that these cultural practices are aligned with Indigenous Worldview principles. These findings are important for research that focuses on Indigenous-descent communities, particularly in the developmental field, because they bring a culturally relevant lens to explore the development of Indigenous-descent children's environmental concepts.

Dedication

To the loves of my life, Victor and Marcela, you are my safe space. Graduate school was a thousand-mile journey that made us grow as individuals and made us stronger as a family. Thank you for encouraging me to take the first step and supporting me every step since.

To my Granddad, mi abuelito Güicho, you are the inspiration for this work. You were with me on this journey. I felt and heard your voice, especially when writing the discussion of my study; those words are your wisdom, your lessons.

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Uncovering the Hidden Meaning of Canny Consumption Practices: Links to Indigenous Views about the Natural World

I begin with a quote from José Andrés, founder of World Central Kitchen:

> *"They taught me today a big lesson. I am in a very remote part of Guatemala at the tip of the Volcano. This community may be humble in means, but everybody came with a glass, a cup, a plate, with their fork."*
> <holding up a small bucket, he said> *"And, this is all the garbage. This is the way food aid should be given. We can not be creating more and more trash and more waste."* [1]

His point was that because of the mindful ways that people in this Guatemalan community use their resources, the amount of garbage they collected was minimal. In line with José Andrés's remarks, in my dissertation, I focus on a set of practices that I have termed *canny consumption practices* and defined as environmentally friendly practices where resources and products, both natural and manufactured, are used with care and in unconventional ways, with the objective of maximizing their utility to avoid wasteful behaviors. Even though there is limited empirical evidence of the variety and breadth of *canny practices* in Indigenous communities, I argue that *canny practices* are an understudied concept with important value in environmental dialog and developmental research. This is particularly true about research related to how Indigenous-descent children develop ideas about the environment.

[1] Howard, R 2022, 'We Feed People', National Geographic, May 9, 2022 viewed 14th March 2023, https://films.nationalgeographic.com/we-feed-people

Groundwork on children's development of environmental concepts has mainly focused on mainstream practices (e.g., recycling) and operated from a Western paradigm (i.e., *human-centered* worldview) even when working with diverse communities. This is in spite of the strong evidence demonstrating that cultural differences in human-nature worldviews are connected to how adults and children think about and interact with nature (Atran & Medin, 2008; Medin & Bang, 2014; Medin, Ojalehto, Marin, & Bang, 2013).

Mainstream practices such as "the three R's" of the environment: reduce, reuse, and recycle (Oskapm, 2000), often take a central stage in the environmental literature. Focusing on these practices is problematic because, for some, these practices might not be culturally relevant. For example, from the mainstream perspective, "reuse" often implies buying products made of reusable materials (e.g., buying Hydroflasks). In many Latine and Indigenous-descent communities, "reuse" may take the form of repurposing resources (e.g., using old clothes as rags), which is one of many ways people avoid wasteful behaviors and care for resources (Coral-Verdugo, 1996). Additionally, from the mainstream perspective, it is expected that plastic bottles should be recycled, which requires access to specific infrastructures and economic means that are not available to everyone. However, for someone who does not have access to recycling services and operates outside mainstream views, saving a plastic bottle to use later (e.g., to store water or use it as a planter) might make more sense and be more aligned with their community values.

In addition to informing mainstream environmental practices, Western worldviews are also often used as a conceptual framework to study children's understanding of the environment. In most European-descent communities, there is an assumption that humans and nature are separate entities (Shoreman-Ouimet & Kopnina, 2016), and that humans have agency over the natural world. In contrast, most Indigenous-heritage communities operate under a *nature-centered* worldview that sees all living entities—human and non-human—as one body, interrelated and deeply connected by time, space, and spirit (Cajete, 2000; 2005; Shoreman-Ouimet & Kopnina, 2016).

Another contrast worth mentioning relates to the concept of Intergenerational learning. In Indigenous-descent communities, Intergenerational learning is a rich cultural practice where children learn values and practices through interactions with elders and parents (Burns, 2016, Hanks, 2007, Hoff, 2007). In contrast, recent research in Western communities has shown that intergenerational learning often involves children teaching parents about recycling and other environmental practices (Ballantyne et al., 2001; Duval & Zint, 2007).

Inevitably, the Western approach used in research about non-European heritage communities, particularly in developmental studies, has left us with limited knowledge of how children of non-European heritage learn and develop ideas about the environment. To address this gap in the literature, I support the paradigm shift recommended by Medin and Bang (2014) where Indigenous worldviews and relevant cultural practices are at the center of research when working with Indigenous-descent

communities. With the intention of setting the stage for future research on Indigenous-descent children's development of environmental concepts, the focus of my dissertation is first to gain a better understanding of the variety and breadth of *canny practices* that are part of Indigenous-descent families' daily activities, and second to investigate connections between canny practices and Indigenous Worldviews about nature.

In the following paragraphs, I first define *canny consumption practices* and situate my work in the context of families' daily activities. Then, I elaborate on the research on how Indigenous views about nature differ from Western views. Next, I present supporting evidence that connects *canny consumption practices* with Indigenous worldviews about nature. Finally I introduce my methodological approach and the current study.

Canny Consumption Practices in Daily Activities

Canny practices can be characterized as environmentally friendly practices where natural and manufactured resources and products are used with care and in unconventional ways with the objective of maximizing their utility to avoid wasteful behaviors. Studies provide some insight into the breadth and diversity of *canny practices*. For example, in one study, the vast majority of middle-class Mexican women reported reusing and repurposing objects, such as empty glass containers for flowers or storing cereals (Corral-Verdugo, 1996). In a different study at a public university in California, Latine and Indigenous-heritage college students reported using hominy cans as planters, using expired milk to make custard or cheese, and

watering plants with the water they used for cooking (Hernandez, 2017). These examples illustrate some innovative ways people of Latine descent use and care for their resources.

Research on Indigenous populations has highlighted everyday practices and family endeavors as the main avenues through which Indigenous children absorb the values and practices of their communities (Rogoff, 2017). In fact, I first became interested in *canny practices* after I saw my daughter cutting a toothpaste tube in half. This is something that I do myself and learned from my grandfather. When I asked her why she was doing it, she responded, "Because you do it and there is still stuff inside." Like myself, my daughter picked up this practice simply by being around family members who enacted it. This is in contrast to mainstream practices (such as the three Rs) that are part of the mainstream rhetoric and often part of the academic curriculum. This example illustrates how cultural practices are passed down to younger generations without necessarily being explicitly taught.

Western researchers have not generally categorized *canny practices* as environmentally friendly practices despite their alignment with mainstream conservation efforts to reduce waste and pollution, perhaps because, in some groups, they have been associated with experiences of economic hardship, such as war and the great depression (Johnson, Bowker, & Cordell, 2004), and in some instances, even considered an obstruction of progress (Melosi, 1981). These assertions are problematic, especially because there is no clear empirical evidence to date on why people engage in *canny practices*. Also, the fact that similar *canny practices* were

reported by people from different geographical areas and economic contexts suggests that *canny practices* do not arise solely out of economic need.

Relationship with Nature in Indigenous Communities

In Indigenous-descent communities, children's participation in daily activities and rituals teaches them to live in close relationship with the natural world (Battiste, 2000). These activities happen in culturally rich contexts, which provide meaning to rituals and everyday practices (Cajete, 2000; Marchand & Wendell, 2014; Rogoff, 2003). In her memoir, Rigoberta Menchu (1983) explains that in Guatemala, Quiche Mayan children's teachings start in the womb. While mothers worked in the fields, they took the time to talk to their unborn children, telling them things like, "You must never abuse nature and you must live your life as honestly as I do" (Montejo, 2001, p. 180). Bolin (2006) recorded similar observations with the Chillihuani community. In this Andean community in Peru, young children learn important ecological knowledge and honor every aspect of the natural world while doing chores at home, in the fields, and in the pastures. These practices and activities are likely to form the foundation for cultivating a nature-centered worldview that ultimately shapes how children understand, think about, and act on the environment.

This literature provides a useful context for other research studies that have found cultural differences in how Indigenous-descent and European-descent children reason about nature. For example, Unsworth et al. (2012) found that compared to European-descent children, Menominee children were more likely to take an

ecological perspective when asked to explain why or how different species might go together. More specifically, when describing relationships among different species, Menominee children tended to relate species together based on their interactions within the natural world (e.g., bees and bears are related because bears eat honey, which is made by bees) (Ross et al., 2003). In contrast, European-descent children tended to relate species together based on taxonomic properties (e.g., bees and flies are related because they are both insects). It is important to highlight that if researchers had begun with the assumption that identifying taxonomic relations was the "correct" answer, Indigenous-descent children would have "scored" notably lower than their European-descent counterparts, contributing further to a deficit perspective.

Research on Indigenous populations that excludes an Indigenous perspective risks possible misinterpretations of how children in Indigenous communities develop ideas about the environment. Evidence of possible misinterpretations can be seen in Boeve-de Pauw and Van Petegem's (2013) study. This study examined differences in 10- to 13-year-olds' perspectives on the use of resources (which they call utilization values) and their environmental practices. This study included children from three different cultural communities: Flanders, Guatemala, and Vietnam. The expectation was that children with low scores on utilization of nature questions (e.g., "Nature is always able to restore itself" and "We must build more roads so people can travel to the countryside") would have high scores on environmental practices questions (e.g., "To save energy, I turn off the light when they are not needed"). In support of their hypothesis, children from Flanders and Vietnam tended to support restrictions in

using natural resources (low scores in utilization values) and reported engaging in environmentally conscious practices (high scores in environmental practices). In contrast, Guatemalan children supported the utilization of nature (high scores) but also reported engaging in environmental practices at an even higher rate than Flemish and Vietnamese children. The authors interpreted that for Guatemalan children, environmentally conscious behaviors are not tied to the same utilization values as for Flemish and Vietnamese children (Boeve-de Pauw & Van Petegem, 2013). Furthermore, the apparent incongruence between Guatemalan children's ideas and practices could be better resolved by interpreting their responses within the Indigenous human-nature worldview perspective that urges people to treat and use nature with the same respect as they would treat a family member.

Differences in human-nature worldviews have implications for how people perceive their relationship with the natural world. Western worldviews operate from a *human-centered* perspective which sees humans and nature as fundamentally separate (Shoreman-Ouimet & Kopnina, 2016) and perpetuates the idea that nature needs human intervention to survive and/or thrive. In contrast, Indigenous worldviews operate from a *nature-centered* perspective that sees all living entities—human and non-human—as one body, interrelated and deeply connected by time, space, and spirit (Cajete, 2000; 2005; Shoreman-Ouimet & Kopnina, 2016).

Two core principles of the Indigenous worldviews are: 1) *Being one with nature* and 2) *Personhood* of all entities on earth and the cosmos. *Being one with nature* refers to the understanding that everything on earth and in the cosmos is alive

and interconnected (Cajete, 2000; 2005; Shoreman-Ouimet & Kopnina, 2016). *Personhood* of non-human entities refers to the understanding that, like humans, *all* living and non-living entities on earth and in the cosmos have their own spirit or *nawal*, in Mayan (Hart, 2008), identity and personality (Robinson, 2014) from whom humans must learn life lessons (McDaid, et al., 2023).Recognizing and understanding that *all* entities have personhood, are alive, and interconnected reinforces Indigenous principles of using nature with *respect and reciprocity*. In practice, the principle of respect and reciprocity means to always give thanks, take what is needed and only what is given, and give back when something is taken (Cajete, 2000; Kimmerer, 2013; Monani & Adamson, 2017; Turner, 2005).

Links between Canny Practices and Indigenous Worldviews

The Indigenous principle of *respect and reciprocity* fits well with the goals of *canny practices* of finding mindful ways of using natural resources and manufactured products to avoid wasteful behaviors. In other words, maximizing the utility of resources by repurposing them rather than discarding them is a way to show *respect and reciprocity* to these resources.

As discussed earlier, some have argued that *canny practices* arise purely out of economic need (Johnson et al., 2004). However, there is some empirical evidence suggesting that canny practices are instead connected to the principle of *respect and reciprocity*. Corral-Verdugo (1996) interviewed Mexican women about their reusing practices and asked them to explain the motives behind these practices. The vast majority of women reported that they reused these items because it was part of their

customs—not because of poverty. In a different study, Hernandez (2017) recalled the story of one focus group participant who recalled hearing his grandmother say that being respectful of all involves *no ser desperdiciado* (not being wasteful).

Evidence of links between the practice of *not being wasteful and* the principle of *respect and reciprocity* is found in moral fables in Mayan creation stories. One story in the Popol Vuh describes how when the wooden people[2] did not show respect for the animals and objects that helped them, "their earthen jars, their griddles, their pots, their grinding stones, all rose up and struck their faces" (Montejo, 2001, p. 184). Montejo (2001) explains that within Mayan values, everything —both animate and inanimate—must be respected and that wasteful behaviors are considered disrespectful and abusive. To illustrate, he explains that traditionally the grinding stone was the only cooking utensil that could not be returned to earth because it was not made of clay, and to avoid being wasteful, it is passed from mother to daughter. Today, while Guatemalan families rarely use grinding stones, they are considered a family heirloom and are never discarded.

Together, this work suggests that in Indigenous-descent communities, finding ways to maximize the utility of resources and avoid wasteful behaviors might be rooted in the principle of *respect and reciprocity*. *Canny practices* may serve as one of the many avenues by which these nature-centered cultural values are passed down

[2] The Popol Vuh describes wooden people as abusers who exploit animals and resources without consciousness of the rights and value of other beings which include objects. They are people made of wood without minds, souls, or feelings.

from generation to generation within these communities. Although my proposed study is largely exploratory, I predict that the majority of families will report engaging in at least one *canny practice*.

Methodological Approach

Investigating how children from Indigenous-descent populations learn cultural ideas and practices about the environment is challenging methodologically and conceptually. Methodologically, it is difficult because, in Indigenous communities, lessons and values about nature are deeply embedded in everyday practices and activities that are rarely discussed and usually difficult to articulate. Conceptually, as previously discussed, it is difficult because current work on this topic has been centered on ideas that do not align with Indigenous principles and concepts (e.g., measuring the extent to which children endorse mainstream practices like recycling).

To address these challenges, in my dissertation, I avoided a rigid question-answer interview approach because it does not align with Indigenous forms of communication and could exacerbate already existing power dynamics and be considered disrespectful (McKivett, Paul, & Hudson, 2019). Instead, I used a semi-guided interview approach and "*pláticas*" (chat-like conversations) as a relational building tool where parents are positioned as experts. In Indigenous and Latine communities, *pláticas* are how personal, familiar, and cultural lessons are shared (Fierros & Delgado-Bernal, 2016). As explained by Marchand and Wendell (2014): "Stories are essential to Indigenous people. They teach, entertain, and communicate with the listener. It is how we learn" (p. 73). To address the conceptual challenges, I

centered my research questions around Indigenous principles, experiences, and ways of living (Estrada, 2012; Rigney, 1999; Smith, 2013, Wilson, 2008).

It is important to position myself in relation to this research. Although I was born and raised in Guatemala, I had very limited understanding of my Indigenous roots. It wasn't until I attended community college in the US that I first learned about the atrocities committed against Indigenous communities during the Guatemalan Civil War. This painful awakening pushed me to connect with and learn more about my Indigenous roots and opened my eyes to the many ways that Indigenous communities have been violated. Therefore, designing and conducting this study with the utmost respect and with cultural and ecological validity was my priority. To accomplish these goals, I spent several summers building relationships in Indigenous communities in rural areas of Guatemala. These crucial experiences gave me a deeper understanding of what it means to connect with and be part of the natural world from an Indigenous perspective and made it possible for me to ensure cultural and ecological validity. The development of the interview protocol and content was a truly collaborative community endeavor. This study results from extensive piloting, guidance, and feedback from elders and Indigenous community members in Guatemala, scholars who come from Indigenous backgrounds, as well as my academic advisors on my dissertation committee.

The Current Study

The current study places Indigenous perspectives at the forefront by investigating *canny consumption practices* and their connections to Indigenous

Worldviews principles. As such, it is centered around the following three research questions:

1. Do Guatemalan Indigenous parents from rural and urban areas report engaging in *canny consumption practices*? If so, what type of practices do they report?
2. What ideas about their relationship with the natural world do Indigenous-descent parents from urban and rural areas of Guatemala share when talking about their everyday practices?
3. Do the same parents who talk about Indigenous views of nature also talk about engaging in *canny consumption practices*, even if they don't make an explicit connection between the two?

Method

Participants

This study includes 20 Indigenous-descent families, half from urban and half from rural areas of Guatemala. The interview included mothers or fathers and their pre-teen or teenage children. Children attended a boarding school in Guatemala City that serves Indigenous-descent youth from low-income communities. All started attending this boarding school in 3rd grade; 80% of students were in middle school, and 20% were in high school. Students visit their families two weeks in Spring (i.e. Holy Week) and 4 weeks in Winter (Christmas break), except for the academic year of 2021-22 due to COVID restrictions.The students were seven boys and 13 girls, ranging from 11 to 17 years of age (Rural M = 14 years old, SD = 1.49 and Urban M = 14; SD = 1.78) Table 1 has additional demographic information.

Parents from rural areas had lived in their communities for generations. Six of these families lived in Chimaltenango, the ancestral land of Mayan Kaqchikel people, 3 in the ancestral land of Mayan Q'eqchi' people (e.g., Alta Verapaz, Baja Verapaz, and Coban), and one family lived in Chiquimula, the ancestral land of Mayan Ch'orti people. Parents in the rural group had an average of 3.7 (*SD* = 2.58) years of formal schooling ranging from 0 to 6 years. They reported occupations as farmers (*n* = 4), merchants (*n* = 2), stay-at-home mothers (*n* = 2), and craftswomen (*n* = 2). Of the urban parents, more than half (*n* = 6) were born in Guatemala City. Of those who were born elsewhere, they had lived in the city between 5 to 13 years (*M* = 10; *SD* = 3.56). Parents in the urban group had an average of 4.5 years (*SD* = 3.41) of formal schooling, ranging from 0 to 9 years. Parents' occupations included merchants (*n* = 5), stay-at-home mothers (*n* = 2), cooks (*n* = 2), and one construction worker.

Procedure

The original idea for this study was to visit families at their homes in Guatemala, but this plan needed to be changed because of COVID restrictions. Instead, families received a video invitation on the school chat platform. In the video, a school administrator introduced me, I briefly explained the focus of my study. I also explained that it was a family interview and that I would like to interview them together with their child on WhatsApp (see Appendix A for the original script). To facilitate the process and avoid long-distance charges, interested parents contacted a member of our team who was a community member and a former student of the school. Parents and their children who agreed to participate scheduled a 30-minute

WhatsApp conversation with me. Recognizing the likely distrust of outsiders resulting from the severity of the abuse many Indigenous communities have experienced, IRB approved verbal consent from our participants. Details of the consent are in Appendix B. Participants received a $1.50 US dollars (Q10.00 GT) calling card to cover the airtime use and a $15.00 US-dollar (Q100.00 GT) grocery basket as a token of our appreciation for their time. Additionally, honoring parents' preferences, they had the option to speak Spanish or their Mayan language during the interviews. Two parents spoke in Mayan Kaqchikel in those instances, their children helped translate into Spanish. All children were on the WhatsApp call and encouraged to participate, but questions were mainly directed to the parents. The data reported in this study only includes parents' responses.

The family semi-structured interview covered three general areas: (1) how families understand and live their relationship with the natural world, (2) the scope and nature of their engagement in canny consumption practices, and (3) the extent to which canny practices are connected to families' worldviews about nature. The interviewer, the author of this dissertation, used an semi-structured interview protocol to ensure all topics of interest were discussed. The goal was to position families as experts and to help them to feel comfortable sharing their experiences. Thus, the interviewer introduced the topics and encouraged elaboration by saying things such as "that is very interesting," "I did not know about that" or "could we talk about that?" There were instances where topics arose spontaneously; then, to keep the conversation more natural, the interviewer adjusted the order of the conversation. In

the next paragraphs, I include excerpts in English to illustrate the topics discussed in the interview. The full English and Spanish versions of the interview protocol are presented in Appendix C.

Personal experiences and elders' lessons are central to Indigenous learning. To honor those practices, I started the conversation by referring to the lessons I learned from my elders and how those have informed my study. This is an excerpt from the interview script: *One day talking to my dad, he told me that our elders and grandparents think that people ought to respect and care for Mother Nature. To me, those lessons are important, and I want to know more.*

To learn how parents understand and live their relationship with the natural world, I introduced the topic with questions such as: *Were there ways that your elders or parents showed respect and gratitude to nature?* Also, considering that *maiz* is an integral part of life for Guatemalans and that farming and raising animals is part of many Indigenous-descent families, I asked parents about what *maiz* means to them and whether farming and raising animals was part of their family's routines. Then, I introduced the topic of canny consumption practices by saying: *Something else that I would like to talk about is how you and your family use and care for the things that you have.* Another topic I discussed with parents was their familiarity with the current conceptualization of environmentalist ideas such as climate change. I introduced the topic by saying: *Lately, there has been a lot of talk about how people need to start taking care of the environment and that the climate is changing. Growing up, I did*

not hear much about it. What about you? When necessary, I asked follow-up questions to expand on each topic. See Table 2 for a list of follow-up questions.

Background questions were asked at the end of the interview. This decision was made thinking that some parents might be more comfortable disclosing personal information after building rapport and centering their experiences. Some questions included: *Where do you live? Are you from there, too? Did you go to school?* See Appendix C for semi-structured interview protocol.

Coding

All conversations were transcribed and reviewed by three research assistants: one alumnus of the boarding school who is a bilingual Spanish-Kaqchilkele native speaker and identifies as Guatemalan Mayan Kaqchikele, and two US students who are bilingual Spanish-English native speakers of Latine descent. One was Mexican descent and the other one was Peruvian and Mexican descent. To answer the three main questions, I developed two coding schemes (1) Nature of Canny Consumption Practices and (2) Worldviews of Nature.

Two coders worked on the Nature of Canny Practices schemes. Once that coding was finished, three coders worked on Worldviews of Nature schemes. Cohen's Kappa interrater reliability was used for Nature of Canny Consumption Practices schemes (McHugh, 2012). G-Index agreement was used for reliability of mentions of Worldviews of Nature because the goal was to determine the presence or absence of each code for each utterance (Bonett, 2022). Once coders reached a substantial agreement (.74 - .99) on G-Index calculations or substantial (.77 - .89)

Cohen's Kappa interrater reliability on 20% of the cases, they proceed to resolve the disagreements by consensus. Then, they divided the remaining transcripts and code independently. Coders met regularly to discuss and resolve statements that were particularly difficult to code or might have multiple interpretations. G-Index calculations and Cohen's Kappas interrater reliability are reported in the corresponding section. All three members of the coding team were blind to the questions, hypotheses, and goals of this study.

Nature of Canny Consumption Practices

As discussed earlier, *canny consumption practices* are characterized as environmentally friendly practices where resources, both natural and manufactured products, are cared for and used with the intention of maximizing their utility or avoiding wasteful behaviors. This conceptualization of *canny practices* resulted from mindful observations and conversations with members of my cultural and academic community as well as deep reflection on my own experiences. This coding consists of four main parts: (1) identifying mentions of *canny practices*, (2) coding the type of resource or product mentioned in each canny practice, (3) coding the goals mentioned for each *canny practice*, and (4) coding the ways of using and caring for resources and products in each *canny practice*.

Identifying Canny Practices. First, one pair of coders identified statements where parents mentioned *canny practices;* then, they grouped them into one of three categories: (1) Repetitions, (2) Prompted, and (3) Spontaneous. G- Index agreement was substantial for both identifying and categorizing canny practices:.74 (Simple

Agreement 85%) and .75 (Simple Agreement 87%), respectively. Only the spontaneous mentions of *canny practices* were analyzed. In this scheme, one statement could have more than one *canny practice*. Consider this excerpt, "The water we used to wash clothes; we put it in a bucket. Then, we use it to flush the toilet or sprinkle it on the sidewalk to settle the dust." In this case, water was counted as a resource and coded twice because it was used in two *canny practices,* (1) to flush the toilet and (2) to settle the dust.

Types of Resources or Products in Canny Practices. Coders identified the type of resources and products used in each *canny practice* using one of four categories: (1) Natural Resources, (2) Manufactured Products, (3) Food, and (4) Utilities. This scheme aims to capture the frequency of different types of resources and products mentioned in *canny practices.* Examples of types of resources and products coded are shown in Table 3. Cohen's Kappa interrater reliability was high, at .89 (simple agreement 95%).

Goals of Canny Consumption Practices. Each *canny practice* was coded in one of four ways parents described the goals of their canny practices: (1) Extend the Use, (2) Give a Different Use, (3) Use Everything, and (4) Use Only What is Needed. Examples of types of goals of *canny practices* coded are shown in Table 4.Cohen's Kappa interrater reliability was substantial at .77 (simple agreement 85%).

Types of Use and Care. In this group, we considered two unique characteristics of canny practices: those that involve: (1) Innovative use, and (2) Careful use of products and resources. Coders focused on the description of the canny

practices and coded them into one of the two categories in this group. Cohen's Kappa interrater reliability was .82 (simple agreement 90%).

Innovative ways to use resources and products. Canny practices were coded as innovative if they involved finding unconventional ways of using resources and products. Some examples include saving vegetable peels to make broth, repurposing water to flush the toilet or using old clothes to make bed sheets.

***Careful use of resources and products*.** Canny practices were coded as careful if they involved being mindful of how resources and products are utilized. Some examples include picking up beans or maiz off the ground, removing clothes from the sun to prevent discoloration.

Type of Worldview about Nature

There are three main groups of codes in this coding scheme (1) Indigenous Worldviews, (2) Western Worldviews, and (3) Availability of Resources. The coding categories were developed based on the literature on Indigenous Knowledge (Cajete, 2000; Kimmerer, 2013; Monani & Adamson, 2017; Turner, 2005) and western worldviews (Gognon & Thompson, 1994, but all see Kopina & Shoreman-Ouimet, 2013; Shoreman-Ouimet & Kopina, 2016), as well as extensive discussion with scholars in the field.

Identifying Talk about Worldviews. As a first step, three coders identified excerpts where parents talked about human-nature relationships, then they grouped them into one of three categories: (1) Repetitions, (2) Prompted, and (3) Spontaneous. Only spontaneous statements were analyzed. Excerpts ranged from one phrase to a

full explanation. Parents' worldviews were expressed as experiences, stories, anecdotes, or explanations related to themselves, their elders, or other community members. G- Index agreement for the three pairs of coders was at least substantial for both the identifying step .83 (Simple Agreement 92%), and the categorizing step 73 (Simple Agreement 77%).

In this scheme, one excerpt could express more than one principle or idea of parents' worldviews. Consider this excerpt: "When getting water out of the well, you need to be very careful, so the water does not get disturbed (upset)." In this example, coders identified and coded two statements (1) "you need to be very careful" and (2)" so the water does not get disturbed." Each statement was coded into a different category.

Indigenous Worldviews. This group includes four categories (1) Respect and Reciprocity, (2) Being One with Nature, (3) Personhood, and (4) Everything has a Purpose. These categories stem from Indigenous Cosmologies literature (Cajete, 2000; Kimmerer, 2013; Monani & Adamson, 2017; Turner, 2005). The G- Index agreement was excellent for all categories. Table 5 provides details of coding categories and G-Index agreement scores.

Western Worldviews. This group has two coding categories: (1) Nature is Dependent on or Separate from Humans, and (2) Nature is for Human Use. These ideas are based on Environmental literature (Shoreman-Ouimet & Kopnina, 2016, Schultz, 2002, Schultz & Zelezny, 1990). The G-Index agreement was excellent for

both categories. Table 6 provides details of coding categories and G-Index agreement scores.

Availability of Resources. This group includes three categories: (1) Family Subsistence, (2) Economic Constraints, and (3) Scarcity of Products. The categories in this group aim to address the assumption that canny practices may arise from economic hardship (Johnson et al., 2004). Considering that there is scant literature on the topic of canny practices and why people engage in them, the categories capture instances where parents talked about availability, scarcity, or dependence on resources. The G-index agreement was excellent for all categories. Table 7 provides details of coding categories and G-Index agreement scores.

Ambiguous. This category includes all utterances that were identified as codable in the first step but did not fit in any of the Indigenous Worldviews, Western Worldviews, or Availability of Resources categories. G-Index agreement was .82 (Simple Agreement 91%). Some examples include. “My aunt used to tell me stories.” “We planted maiz, then beans, and then pumpkins.”

Additional Codes. Several additional codes of interest emerged that were orthogonal to the coding of worldviews. These codes were not mutually exclusive. They were coded whenever they occurred, usually for utterances that were also coded in one of the main three main categories. These additional codes included: (1) Intergenerational Learning, (2) Mention of Christian God, and (3) Mention of Mother Earth or Mother Nature. The G-Index agreement was excellent for all categories. Table 8 provides details of coding categories and G-Index agreement scores.

Results

This study aimed to investigate the extent to which Indigenous-descent parents from rural and urban communities discuss engaging in *canny consumption practices* and their characteristics, as well as to explore links between *canny practices* and parents' understanding of their relationship with the natural world. Repetitions and responses directly prompted by the researcher were excluded from tables, figures, and analyses to assure the validity and avoid overestimation in our results (Osborn & Blanchard, 2009, Credé, 2010 Tsoukas, 1989).

First, I present findings on the number of *canny practices* that parents discussed and their characteristics. I continue with findings on parents' ideas about their relationship with nature, and end with links between parents' talk about *canny practices* and talk about their relationship with the natural world.

Frequency and Types of Canny Practices Discussed

This section focuses on four characteristics of *canny practices:* (1) how many different *canny practices* parents mentioned, (2) the type of resource or product mentioned in each *canny practice*, (3) the goals mentioned for each *canny practice*, and (4) ways of using and caring for resources and products in each *canny practice*.

Frequency of Canny Practices Mentioned

Every parent mentioned at least three *canny practices* during the interview; the mean frequency of canny practices for parents in rural areas was 18.4 and for

parents in urban areas was 17.9. An independent sample t-test showed no significant difference between communities, $t(18) = 0.16$, $p = 0.88$, $d = .071$.

Types of Resources and Products in Canny Practices

Casegraphs were used to capture individual parents' data, following Rogoff et al. (1993). Casegraphs and within-subject ANOVAs were based on the number and types of *canny practices* parents reported engaging in during daily activities. *Canny practices* involved four different types of resources and products: (1) natural resources, (2) manufactured products, (3) food, and (4) utilities.

The casegraphs in Figure 1 describe the total number of canny practices each parent spontaneously mentioned in the interview. Each column represents a parent; the order of columns is based on canny practices involving natural resources because they were the most frequently mentioned by all parents. More than half (57%) of canny practices mentioned involved natural resources), about one-third (36%) involved manufactured products. Food-related canny practices accounted for 7% of all practices mentioned. Practices involving utilities were extremely rare; two parents each mentioned one practice in this group.

To ask whether the type of resources mentioned varied by community, I conducted a 3 (Type of resource/product: Natural Resources, Food, and Manufactured Products) x 2 (Community Type: Rural and Urban) mixed ANOVA, excluding utilities because they were mentioned so rarely. The dependent measure was the frequency of each type of *canny practice*. Results showed a main effect of type of resource or product, $F(2,36) = 30.61$, $p = .001$, $\eta^2 = .63$. Bonferroni tests showed that

parents mentioned *canny practices* involving Natural Resources (*M* = 10.40, *SD* = 5.96) more than Food (*M* = 1.15, *SD* = 1.31; 95% *CI* of mean difference [5.54, 12.96], *p* =.001) and more than Manufactured Products (*M* = 6.50, *SD* = 2.72; 95% *CI* of mean difference [.67, 7.44], *p* = .03). The mean frequency of each type of *canny practice* can be found in Table 9. No other main effects or interactions were significant.

Goals of Canny Practices

Next, I analyzed parents' talk about the goals of canny practices. Parents' goals for their *canny practices* included: (1) Extending the Use, (2) Giving a Different Use, (3) Using Everything, and (4) Using Only what is Needed. Table 9 shows the mean frequency of mention of each type of *canny practice* goal. Overall, the most frequent goal was Extending the Use (*M* = 7.7), then Giving a Different Use (*M*= 5.8), and Using Everything (*M*=4.0). Using Only what is Needed was rare (*M* = 0.65); thus, I excluded this category from the analysis.

I conducted a 3 (Goals of Canny Practices: Extend the Use, Different Use, and Use Everything) x 2 (Community: Rural and Urban) mixed ANOVA. The dependent measure was the mean frequency of each type of goal of canny practices. Results showed a main effect of goal type $F(2,36) = 4.10$, $p = .04$, $\eta^2 = .17$. Pairwise comparisons using Bonferroni tests showed that parents mentioned finding ways to Extend the Use (*M* =7.70, *SD* = 4.53) more than Using Everything (*M* = 4.00, *SD* = 3.10; 95% *CI* of mean difference [.67, 7.44], *p* =.03) as goals in their *canny practices.* No other main effects or interactions were significant.

Type of Use and Care

The third coding scheme considers two unique characteristics of canny practices: those that involve (1) Innovative use and (2) Careful use of products and resources. I conducted a 2 (Type of Use and Care: Innovative Use and Careful Use) x 2 (Community Type: Rural and Urban) mixed ANOVA. The dependent measure was the mean frequency of Type of Use and Care. Results revealed a main effect of type of use and care $F(2,18)= 4.80$, $p = .04$, $\eta^2 = .21$. Parents mentioned Careful Use (M = 10.45, SD = 5.55) more than Innovative Use (M = 7.05, SD = 3.83; 95% CI of mean difference [.14, 6.66], p =.04) when describing *canny practices.*

I further explored the relationship between parents' type of use and care of resources with the parents' goals of *canny practices,* by computing bivariate correlations across both sets of codes. Findings showed that parents' Innovative Use of resources and products was positively associated with both parents' goals of Giving a Different use, r (18) =.55, p = .02 95% CI [.14, .80] and Using Everything, r (18) =.52, p = .02, 95% CI [.10, .78]. Findings also showed a positive correlation between parents' Careful Use of resources and Extending the Use of resources and products r (18) =.45, p = .05, 95% CI [.03, .74].

Relationship with the Natural World

In this section, I present findings related to parents' statements about their relationship with the natural world. I focused on three groups of codes: (1) Indigenous worldviews, (2) Western worldviews, and (3) Availability of resources.

Indigenous Worldviews, Western Worldviews, and Availability of Resources

The Indigenous worldview has four categories: (1) Respect and Reciprocity, (2) Personhood, (3) Everything has a Purpose, and (4) One with Nature. Western worldview has two categories: (1) Nature Depends on Humans and (2) Nature for Human Use. Availability of resources has three categories: (1) Family Subsistence, (2) Economic Constraints and (3) Scarcity of Products.

The casegraph in Figure 2 describes the frequency of statements coded in each main group and in the corresponding subcategories. Each line corresponds to one parent. The order is based on the highest to the lowest frequency of parents' mentions of Respect and Reciprocity because all parents (n = 20) mentioned it in the interview. This family order remains the same across all other categories. Within Indigenous worldview codes, every parent (n =20) mentioned at least one category in this group. The average number of statements of Respect and Reciprocity was 12.05 times (range = 4 to 37). Overall, 50% of codable statements were related to this principle. Almost all parents (n = 18) mentioned Personhood, averaging 3.05 times (range = 0 to 9) which accounts for 13% of the codable statements. Within the Western worldview codes, about half of the parents (n = 11) talked about Nature Depending on Humans, with an overall average of 1.70 statements (range = 0 to 2), which was an average of 7% of all codable statements. Similarly, the majority (n =14) of parents talked about at least one category of availability of resources. Parents mentioned the Availability of Resources in an average of 5.50 statements (range 17 to 110), which constituted a mean of 23% of all codable statements.

To ask about patterns in mentions of type of worldview, I conducted a 3 (Type of worldview: Indigenous, Western, and Availability of Resources) x 2 (Community: Rural and Urban) mixed ANOVA. The dependent measure was the mean frequency of each type of statement. Results showed a main effect of type of worldview F (2,36)= 46.72, p = .001, η^2 = .72. As with the analyses of *Canny Practices*, there was no main effect of community. Pairwise comparisons using Bonferroni tests showed that parents mentioned Indigenous Worldviews (M =16.70, SD = 9.11) more than Western Worldviews (M = 2.05, SD = 1.96; 95% CI of mean difference [9.28,20.01], p =.001) and more than Availability of Resources (M = 5.50 SD = 15.12; 95% CI of mean difference [7.34, 15.06], p =.001). Parents also mentioned Availability of Resources more than Western Worldviews. The mean frequency of the main groups can be found in Table 10. No other main effects or interactions were significant.

Intergenerational Learning

Next, I explored how often intergenerational learning comments came up while parents talked about their relationship with nature. In a mixed 3 (Type of Worldview: Indigenous, Western, Availability of Resources) x 2 (Community: Rural and Urban) ANOVA on the mean frequency of intergenerational learning statements, I found a main effect of the type of worldview statements, F(2,36) = 39.76, p = .001, η^2 = .69. Pairwise comparisons showed that Intergenerational Learning was mentioned more often when talking about Indigenous Worldviews (M = 14.75, SD = 9.51), than Availability of Resources (M = 3.90 SD = 4.10; 95% CI of mean difference [7.35, 14.35], p =.001) and more than Western Worldviews (M =.1.20, SD

= 1.77; 95% *CI* of mean difference [9.26, 17.84], p =.001). The mean frequency of the main groups can be found in Table 11.

Taking a closer look at mentions of intergenerational learning while discussing Respect and Reciprocity, an independent sample t-test with a mean frequency of intergenerational learning statements as a dependent variable and community as a grouping variable showed a trend, t (18) =1.98, p = .06, d = .88. Intergenerational learning comments happened marginally more when parents from rural areas talked about Respect and Reciprocity principles (M = 19.40, SD = 10.59) than with parents from urban areas; 95% *CI* of mean percentage difference [-.51, 16.71].

Additional Codes

Considering the additional codes of parents' references to the Christian God and Mother Earth (or Mother Nature), I asked how often these references came up when talking about Indigenous principles, Western principles, or Availability of Resources. Descriptively, parents mentioned the Christian God most often when discussing Indigenous worldviews of nature (M = 3.20, SD = 3.07). Of the times when "God" was mentioned, 88% of the times were in the context of a statement about Indigenous worldviews. Reference to Mother Earth or Mother Nature happened rarely (M = .75, SD = 1.92), but again these mentions were slightly more common in the context of Indigenous worldview statements. Fifty-six percent of the mentions of "Mother Earth" or "Mother Nature" were in the context of statements about Indigenous worldviews.

Links between Canny Practices and Parents' Relationship with Nature

In this section, I explore connections between parents' discussions of *canny practices* and their discussions of Indigenous worldviews. To ask whether the same parents who mention many *canny practices* are also likely to discuss more Indigenous worldviews, I considered the frequency of parents' mentions of Indigenous Worldviews only after the interviewer introduced the topic of *canny practices.*

To test my prediction that discussions of Indigenous worldview statements would be related to mentions of Canny practices, I conducted a Pearson correlation between these two measures. There was a significant positive association between Indigenous Worldview statements (after the introduction of canny practices in the interview) and the number of spontaneous *canny practices* parents mentioned r (18) =.52, p = .02, suggesting that the predicted link is present. Figure 3 shows this significant correlation.

Discussion

With the intention of setting the stage for future research on Indigenous-descent children's development of environmental concepts, the focus of this study was, first, to gain a better understanding of the variety and breadth of *canny practices* that are part of Indigenous-descent families' daily activities; and second, to investigate connections between canny practices and Indigenous Worldviews about nature. In the next sections, I elaborate on and interpret the findings. I also offer possible directions to expand the understanding of canny practices and how they can be used in developmental research about children's ideas about the environment.

Canny Practices as a Daily Activity

As predicted, all families described *canny practices* as part of their daily activities. Findings also provided valuable information about the breadth and depth of canny practices. Most of the *canny practices* parents reported involved natural resources (e.g., water, raw vegetables, and fruits) as well as manufactured products (e.g., reusing empty soap and milk plastic containers). Using prepared foods (e.g., tortillas and leftover foods), and utilities in *canny practices* were also mentioned, though less prevalent than using natural resources and manufactured products. It is interesting but unsurprising that using natural resources in *canny practices* was the most mentioned category because it includes raw resources that are essential to basic survival needs.

Most of the items in the manufactured products category included single-use items (e.g., laundry detergent containers). Furthermore, the *canny practices* described in this group are essential in reducing waste likely to end up in watersheds and surrounding areas. This is particularly important because rural communities, especially those in low- and middle-income countries like Guatemala, often lack basic waste management infrastructure (Mihai, et. al., 2021). As mentioned before, using only what is needed is one of the many ways Indigenous people show respect to all members in the community, which includes more-than-human entities (Cajete, 2000; Kimmerer, 2013; Monani & Adamson, 2017; Turner, 2005). Considering this view, it does make sense that *canny practices* involving food were also sometimes mentioned. For example, one father described his wife's mindful ways of preparing food, "My

wife is very careful. She only cooks enough food for the day, and everyone has to finish their food." This example illustrates how this mother planned carefully to make sure everyone was fed and no food was wasted.

Only two parents each mentioned utilities in their *canny practices*. They were parents from urban areas where water and electricity are paid services. One parent talked about not wasting water. The other parent talked about electricity, "With lights if we still can see, we do not turn the light on." The fact that utilities were rarely mentioned adds evidence against the assumption that *canny practices* arise purely out of economic needs. If this were the case, we would expect more mentions of these types of *canny practices* because this is a category where parents could potentially make adjustments based on their monetary needs. Also, important to point out is that parents did not reference monetary reasons when discussing these *canny practices.*

Parents also described different goals for engaging in *canny practices*. Parents were likely to mention Extending the Use of a resource (e.g., diluting liquid soap with water) and Giving a Different Use to resources and products (e.g., using old sheets to make pillows). They were relatively less likely to mention Using Everything (e.g., used coffee grinds for composting) and Using What is Needed (e.g., making the right amount of tortillas for the day). The goals of Extending the Use and Giving a Different Use align well with the conceptualization of *canny practices* of maximizing the utility of resources and products.

We identified two unique characteristics of *canny practices*: Careful Use (e.g., picking up all the grains of maiz or frijol from the floor) and Innovative Use of

products and resources (e.g., using old clothes to make mattresses). Parents talked about both types; they described engaging in the Careful Use of resources more often than creating Innovative Uses. Findings also showed different patterns; the more parents described Innovative Use of resources, the more they talked about Giving a Different Use (e.g., cutting the front to the shoes when children have outgrown them) and Using Everything (e.g., using eggshells to make shakes). In contrast, the more parents described Careful Use, the more they talked about Extending the Use of resources and products (e.g., removing clothes from the sun when drying to avoid discoloration or damage).

These findings are important because they provide empirical evidence that *canny practices* are part of daily practices for Guatemalan Indigenous-descent families from rural and urban communities.There is a range of products that were typically used in *canny practices* (e.g., both natural resources and manufactured products). Also, there was a variety of goals parents described in their *canny practices* (e.g., Extending the Use and Giving a Different Use). Considering the limited literature on *canny practices* as a concept, identifying these patterns helps to define and operationalize the concept for further research.

Connections between Canny Practices and Indigenous Worldviews about Nature

Parents who described more *canny practices* also talked more about Indigenous principles, which emphasized the understanding that everything in the natural world is interconnected and recognized the Personhood in *all* entities, humans and more-than-humans (McDaid, et al., 2023). Indigenous principles about nature fit

well with *canny practices* in that using resources and products with Respect and Reciprocity is expected in Indigenous communities (Cajete, 2000; Kimmerer, 2013; Monani & Adamson, 2017; Turner, 2005). These findings provided preliminary evidence that *canny practices* arise from a coherent value system rather than economic need. Further investigation of these connections is imperative. Without proper investigation, there is the risk of the gradual disintegration of cultural practices, which inevitably will privilege mainstream conceptions of environmental practices and open doors for deficit interpretations of environmental understanding when working with Indigenous-descent children.

Overall, parents were more likely to mention Indigenous worldviews than Western worldviews or Availability of Resources. This was true for Indigenous-descent parents living both in rural areas in Guatemala and in urban settings in Guatemala City. More specifically, all parents mentioned principles of Respect and Reciprocity, and almost all mentioned Personhood when discussing their relationship with nature. These findings are unsurprising because, as mentioned before, both are foundational to Indigenous people's relationship with Nature (Robinson, 2014). In that sense, recognizing and understanding the Personhood of Nature –that everything in Nature is alive and has a spirit, identity, and personality - implies living in harmony and using Nature with respect and reciprocity. The following excerpt illustrates the recognition of personhood and the rights of nature as well as Indigenous people's expectation that they ought to treat nature with respect. “I

remember that my grandma said that animals and plants are also alive, that they had the right to live, and that I had to treat them with respect."

Western worldviews about nature tend to emphasize human dominance over nature. In this study, they were discussed less frequently than Indigenous worldviews. Western worldviews are built on the idea that nature needs human intervention to survive and that natural resources should be preserved for the sake of humanity. This Western perspective has dominated research on children's development of environmental concepts, even when working with Indigenous-descent communities. Interestingly, when parents in this study did bring up Western worldviews, many of their statements did not imply human dominance over nature, as is generally assumed in Western worldviews (Cajete, 2000; 2005; Shoreman-Ouimet & Kopnina, 2016). Instead, parents reflected on how humans have depleted natural resources. For example, one parent said, "Well, some people burn their trash in the mountains, but my grandad said that before it was not like that, people cared for Mother Nature." This finding illustrates that even when Indigenous-descent people talked about a seemingly Western perspective (i.e., humans being in charge or caring for nature), their application may differ substantially from Western conceptualizations and therefore may not ultimately be comparable (Boeve-de Pauw & Van Petegem, 2013) and may contribute to inaccurate interpretation of research findings that involve Indigenous communities.

Of note, only half of the parents in this study discussed Western ideas at all, and out of all coded statements, only 8% related to Western ideas. Because of the low

incidence of talk in this category, reserachers using a Western lens to interpret findings might mistakenly conclude that Indigenous-descent people do not care for nature. In other words, measuring the environmental attitudes of Indigenous-descent populations using solely scales built on Western frameworks further contributes to deficit perspectives. Altogether, these findings indicate that using Western perspectives when working with Indigenous-descent communities is likely to lead to misinterpretations of the data. Thus, developing new culturally relevant measures that center Indigenous perspectives is imperative in order to move forward with a strength-based research when working with Indigenous communities.

One prominent deficit-based assumption is that *canny practices* occur out of necessity in response to poverty (Johnson, Bowker, & Cordell, 2004). In the interviews, parents occasionally spoke about economic constraints, scarcity of products, and family subsistence, but these types of statements were notably less frequent than statements about Indigenous principles. Moreover, when talking about the availability of resources, parents tended to consider whether products were seasonally available rather than whether they could afford to buy them. They also discussed future availability as a reason to be mindful of usage.

When parents did discuss money, their statements did not support the idea that *canny practices* are simply a way to save money when one does not have enough. As one mother said, “We have the money today, but we don’t know about tomorrow. We cannot waste just because we have.” In other words, possessing the financial means does not imply that one can be wasteful. As she further described, being wasteful

when one has money is disrespectful of the work their families put into making that money.

Based on this study, there was no clear empirical evidence that *canny practices* arise solely or even primarily from financial limitations. There was also no evidence that Western concepts of conservation and humans' protection of nature are the driving forces underlying *canny practices*. Instead, they appear to be motivated more by Indigenous principles such as respect and reciprocity. As described eloquently by one parent: "Food can not be wasted because it is a gift from Mother Nature. And there are a lot of people who have worked hard to take the Food from the land."

How Lessons and Practices are Learned in Indigenous-descent Communities

During the interviews, parents often described learning about human-nature relationships during conversations and activities with elders. Intergenerational learning findings showed that parents were more likely to describe learning Indigenous ways of interacting with the natural world and cultural practices (i.e. *canny practices*) than Western ideas or the Availability of Resources. These findings are aligned with the intergenerational learning literature (Burns, 2016; Hanks, 2007; Hoff, 2007), and findings showing that Indigenous-descent people learn to live in close relationship with the natural world by participating in daily activities and rituals (Cajete, 2000; Marchand & Wendell, 2014; Rogoff, 2003).

During interviews, when Indigenous-descent children students occasionally had the opportunity to share their thoughts and experiences, they also articulated

learning family lessons from their elders. One student said, “I remember seeing my grandparents and parents wake up really early on the day of the harvest and gather in a circle. Now, I know why they did it.” Another student said, “I sometimes put water in my shampoo, but I did not know that my parents also do that. I have been in school and far from my family for many years now.”

In stark contrast to how Indigenous-descent people learn to care for and live in the natural world, there are now a number of Western intervention programs aimed at training children to influence parents' environmental knowledge, attitudes, and behaviors (Ballantyne et al., 2001). In many cases, these interventions are part of school assignments that require children to involve parents in these assignments (e.g., asking children to talk to their parents about environmental activities that they had participated in or involving parents on weekly homework assignments that consisted of reading books and completing a worksheet). While well-meaning, these intervention programs may cause harm in Indigenous communities by disrupting relationship dynamics and devaluing the ways in which people in Indigenous-descent communities are already caring for the natural world. Instead, intervention programs would benefit from building upon the *canny practices* that have likely been part of Indigenous ways of life for many generations.

Other Findings

During our coding procedure, additional codes emerged that were orthogonal to the coding of worldviews: mentions of Christian God and mentions of Mother Nature or Mother Earth. These codes do not directly relate to the engagement of

canny practices and connections to Indigenous worldviews. Instead, they highlight how colonization has impacted Indigenous narratives as well as the resilience of Indigenous people to preserve their cultural heritage by blending Western ideas into Indigenous practices. Statements referencing the Christian God occurred more often in the context of Indigenous principles. Although mentions of Mother Earth or Mother Nature happened less frequently, we also observed them in the context of Indigenous principles. Not surprisingly, parents mentioned the Christian God or Western religious rituals (e.g.*"we kneel, lit a candle and pray before harvesting. ") when* discussing Indigenous principles. In Guatemala, like many communities worldwide, Indigenous people were forced to abandon their cultural practices and adopt Christian values. As a matter of survival and to hold on to their principles and traditions, Indigenous people kept practicing Indigenous rituals under the guise of Christianity (Pihama & Lee-Morgan, 2019; Watanabe, 1990).

Implications and Future Directions

In coining and defining this new term, *canny practices*, this study offers a promising new angle for exploring the intergenerational transmission of environmental concepts in Indigenous-descent communities. Although this study did not focus on children's development of environmental concepts, the prevalence of *canny practices* and anecdotal observations from children recognizing these practices in their own daily lives suggest that Indigenous-descent children are likely to participate in these practices as well. Preliminary evidence also shows that these practices are linked to Indigenous worldviews of nature. In this way, *canny practices*

can serve as a window to Indigenous-descent children's conceptualization of nature and the environment.

Importantly, this study also provides preliminary evidence that *canny practices* are tied to a coherent value system and do not arise out of poverty or economic need. Parents who described more canny practices also referred more to Indigenous worldviews when talking about their relationship with nature. In some interviews, parents directly referenced respect for nature, giving back and thanks, and maintaining balance, specifically when talking about *canny practices*. This type of explicit connection between *canny practices* and Indigenous worldviews is remarkable, particularly given that interviews were short (only 30 minutes each), and that it is difficult to not only articulate practices embedded in one's daily life but also explain the reasons behind them. Future studies could more explicitly connect *canny practices* with Indigenous worldviews by drawing on methods such as ethnographic observation.

While ethnographic methods would certainly have allowed me to gain a deeper, more nuanced perspective of *canny practices*, there were unexpected benefits to the methodology I chose for this study. At the time, I saw interviewing families via WhatsApp due to pandemic restrictions as an unlucky constraint, but it turned out to be an incredible opportunity to include families who are almost never represented in mainstream developmental research or research at all. These phone interviews allowed me to have conversations with parents in remote areas of rural Guatemala, to

learn about their *canny practices*, and to talk with them about their relationship with the natural world.

This methodological approach, along with culturally sensitive protocols, can benefit the field of developmental psychology by including populations who are typically underrepresented in the literature. In addition, centering *canny practices* in future research with Indigenous populations provides a more ecologically valid way to examine the development of Indigenous-descent children's environmental concepts than the Western measures used in previous studies.

Concluding Thoughts

Canny practices have been embedded in my own family and cultural heritage for generations yet have been absent from the mainstream developmental and environmental dialogue. Bringing to light these practices and uncovering their hidden meaning has been an incredibly meaningful experience for me. Sharing empirical evidence of *canny practices* not only gives voice to my grandpa and my elders, who passed these practices on to me; it also gives hope and meaning to future generations of Indigenous-descent researchers. As a teacher and mentor of underrepresented students, I have witnessed firsthand how validating it is for them when they see themselves represented in research. In the interviews, I saw how validating it was for children to understand the underlying values behind their own daily practices. Defining *canny practices* and revealing links to their underlying values connects past and present knowledge, and underscores their importance in understanding the interconnectedness of humans and more-than-humans.

Decades of research have devalued Indigenous ways of life and framed Indigenous communities as deficient and in need of Western assistance and intervention. From its inception, this study was designed to honor Indigenous cultural traditions. It is my hope that this study and its methodological approach embody the Indigenous values of respect, reciprocity, and community that I had the extraordinary opportunity to learn about from these families.

Tables

Table 1

Participant Families' Distribution and Demographics

Community	Fathers	Mothers	Boys	Girls	Age of the Child Mean Years (SD)
Rural	5	5	2	8	14.00 (1.49)
Urban	3	7	5	5	14.15 (1.78)
Total	8	12	7	13	14.25 (1.62)

Table 2

Semi-structured interview follow-up questions

Topic	Follow-up questions
Relationship with Nature	Were there ways that your elders or parents showed respect and gratitude to nature? Did your family do anything before or after working the land? Do they still do them?
Maiz as an integral part of Guatemalan life	Did your elders or parents tell you anything about the importance of humans' relation with maiz? Did they tell you any stories about the maiz?
Family livelihood	Did your family cultivate the land or have animals? Did your family raise animals?
Canny Practices	Do you have ways to maximize (aprovechar) things from nature? Do you use old containers or bottles for other things?
Conceptualization of Environmentalist Ideas	Did your elders or parents talk about taking care of the environment? What did they say?

Table 3

Materials and Resources Use in Canny Practices, Descriptions and Examples

Categories	This category includes mentions of	Examples
Natural Resources	Water, animals, plants	Watering plants with the water that was used for washing fruits. Using the milpa leaves to tie fences
ManufacturedProducts	Plastic, glass, aluminum, paper	Using bottles as planters Using old newspapers to make piñatas
Food	Prepared and nonprepared food but not raw fruits and vegetables	Using spoiled milk to make flan. Feeding leftover food to animals
Utilities	Paid services	Staking pots to keep different foods warm using one burner

Table 4

Goals of Canny Practices Scheme, Descriptions, and Examples

	This category includes talk about	Examples
Extend the Use	Finding different ways to prolong the use of products or resources without changing their purpose.	Diluting liquid soap with water Cutting containers to take all the product out. Making a new bar of soap from leftover pieces of soap
Give a Different Use	Finding different ways to use products and resources. These practices always involve a new purpose.	Using old clothing as cleaning rags Composting rotten vegetables Using plastic bottles for storage
Use Everything	Looking for effective ways to use products or resources that would otherwise end up in the trash.	Using the canes of the milpa to make a chicken coop fence Picking up all tree shavings to make a fire after cutting a tree Making broth with vegetable peels
Use only what is Needed	Using only what is needed to avoid waste or promote monetary savings.	Measuring how much maiz is needed to make tortillas for the day Putting out the fire after cooking Turning off the lights when not in use

Table 5

Indigenous Worldviews about Nature Scheme, Descriptions, Examples, and Agreement

Categories	This category includes talk about the principle	Examples	G-Index	Simple Agreement
Respect & Reciprocity	that one should always give thanks, take what is needed and only what is given, and give back when something is taken, to maintain balance	"On the day of the sowing and harvest, we share food to show gratitude. We show Mother Earth that the same way she shares with us, we share with others"	.76	88%
Personhood	that all entities, human, more-than-human, have the same abstract qualities and soul	"A grain of corn on the ground should be picked up and kissed and placed with its companions"	.90	95%
One with Nature	that all entities, human, more-than-human are interconnected	"We are one: when we were children, we drank the first rain and the hail. It was a way to connect to the rain"	.95	97%
Everything has a Purpose	that all entities, human, more-than-human, have a purpose and place, as well as a destiny to fulfill	"Nobody could touch that cow; we knew she had a purpose, a destiny"	.98	99%

Note all three coding pairs had a G-Index of at least .90 and a simple agreement of 95% in all categories, except Respect & Reciprocity

Table 6

Western Worldviews about Nature Scheme, Descriptions, Examples, and Agreement

Categories	This category includes talk illustrating the belief that	Examples	G-Index	Simple Agreement
Nature Depends on Humans	Humans are separate from nature, that there is a hierarchical relationship with humans above nature, or that nature needs human intervention to thrive or survive.	“God put us in charge of the animals"	.94	97%
Nature for Human Use	Nature is a commodity usually used for entertainment or profit or that humanity's well-being is more important than nature’s well-being	"Bee extinction is a real problem because they are great pollinators, we need them"	.95	98%

Note all three coding pairs had a G-Index of at least .94 and a simple agreement of 97% in all categories.

Table 7

Availability of Resources Scheme, Descriptions, Examples, and Coders' Agreement

Categories	This category captures instances where parents talked about	Examples	G-Index	Simple Agreement
Family Subsistence	Using nature to survive or for personal and family use	"One part of the harvest, we use it for personal use, the other part we sell it."	.93	96%
Economic Constraints	Financial limitations or restrictions.	"Today, we have the money to buy the things we need, but we do not know about tomorrow."	.97	99%
Scarcity of Products	Having limited access to resources or products	"This product is very difficult to get; sometimes it takes weeks to come to the store."	.96	98%

Note: all three coding pairs had a G-Index of at least .93 and a simple agreement of 96% in all categories.

Table 8

Scheme of Additional Codes Descriptions, Examples, and Coders' Agreement

Categories	This category includes	Examples	G-Index	Simple Agreement
Intergenerational Learning	Family customs, lessons from older family members, and community or school practices	"My father only tells us that only through the maiz are we alive and we always have to give to maiz what belongs to him."	.77	88%
Mentions of the Christian God	The words God, Lord, sin, or church in reference to an organized religion were used	"Well, be careful, you should not hit them [maiz] because it is a sin."	.96	98%
Mentions of Mother Nature	The words Mother Nature or Mother Earth were used.	"Well, my grandmother told us that we have to be grateful to Mother Earth"	.99	100%

Note: all three coding pairs had a G-Index of at least .96 and a simple agreement of 98% in all categories, except in Intergenerational learning.

Table 9

Mean Frequency and Standard Deviations of Goals of Canny Practices

Community	Extending the Use	Giving a Different Use	Using Everything	Using only what is Needed	Full Sample	Total of Canny Practices
Rural	8.00 (5.23)	5.80 (4.39)	3.90 (2.13)	0.70 (.82)	18.40 (6.33)	184
Urban	7.40 (3.98)	5.80 (4.19)	4.11 (3.96)	0.60 (.70)	17.90 (7.68)	179
Total	7.70 (4.52)	5.80 (4.18)	4.00 (3.10)	0.65 (.75)	18.15 (6.85)	363

Table 10

Mean Frequency and Standard Deviations of Statements of Relationship with Nature

Coding Groups and Categories	Rural	Urban	Full Sample	Total Statements
Indigenous Worldviews	18.10 (11.01)	15.30 (7.04)	16.70 (9.11)	334
Respect & Reciprocity [3]	14.40 (9.70)	9.70 (5.93)	12.05 (8.19)	241
Personhood	2.70 (2.00)	3.40 (2.76)	3.05 (2.37)	61
One with Nature	0.40 (0.84)	1.50 (2.12)	0.95 (1.67)	19
Everything has a Purpose	0.60 (0.70)	0.70 (1.16)	0.65 (.93)	13
Western Worldviews	2.10 (1.97)	2.00 (2.05)	2.05 (1.96)	41
Nature Depends on Humans	1.60 (2.12)	1.80 (2.15)	1.70 (2.08)	34
Nature for Human Use	0.50 (0.85)	0.20 (0.42)	0 .35 (0.67)	7
Availability of Resources	7.30 (6.22)	3.70 (3.09)	5.50 (5.12)	110
Family Subsistence	3.20 (3.05)	2.20 (2.30)	2.70 (2.68)	54
Economic Constraints	2.20 (2.97)	0.60 (0.70)	1.40 (2.26)	28
Scarcity of Products	1.90 (2.08)	0.90 (0.88)	1.40 (1.64)	28

[3] Considering that all families discussed respect and reciprocity during the interview and that it is a foundational principle in Indigenous cosmologies, I conducted an independent t-test with community type as the independent variable and the mean percentage of codable statements mentioning Respect and Reciprocity as the dependent variable. Results showed a trend for parents from rural communities (M=.47, SD =.14) to talk more about Respect and Reciprocity in the interview than parents from urban communities (M=.35, SD = .15). This difference was marginal with an alpha of .05, t (18)=1.92, p = .076, d=.86; 95% CI of mean percentage difference [-.7; 1.79].

Table 11

Mean Frequency and Standard Deviations of Other Codes

	Indigenous Worldviews	Western Worldviews	Availability of Resources	Ambiguous	Total Statements
Intergenerational Learning	14.75 (9.51)	1.20 (1.77)	3.90 (4.10)	5.30 (4.40)	503
Mentions of the Christian God	3.20 (3.07)	.05 (.22)	.35 (.59)	.05 (.22)	73
Mentions of Mother Nature	0.75 (1.92)	.05 (.22)	0.25 (.64)	-	27
	374	32	90	107	603

Figures

Figure 1

Frequency of the Types of Canny Consumption Practices, by Community

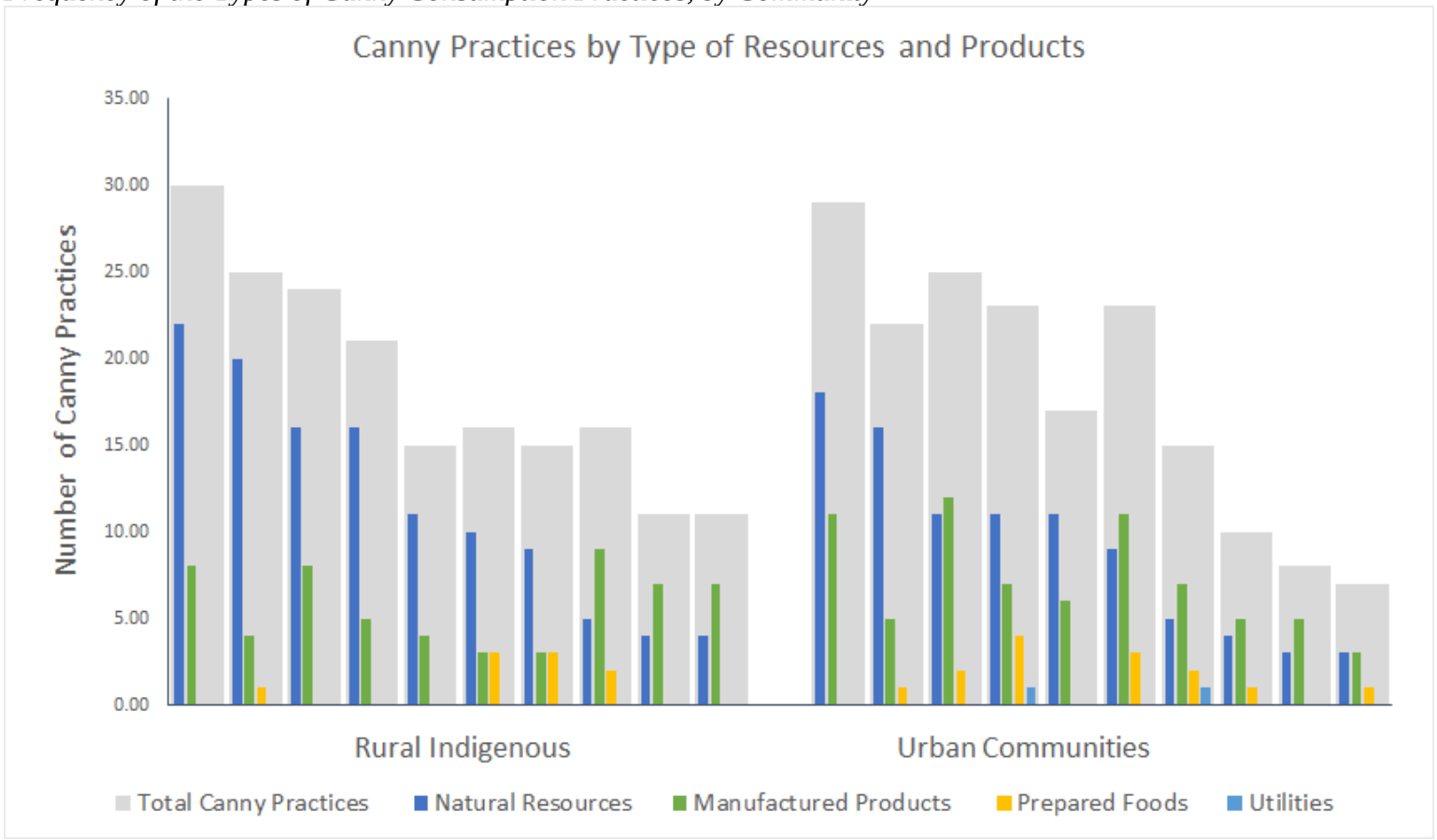


Figure 2

Casegraph for Each Parent's Frequency of Statements per Category

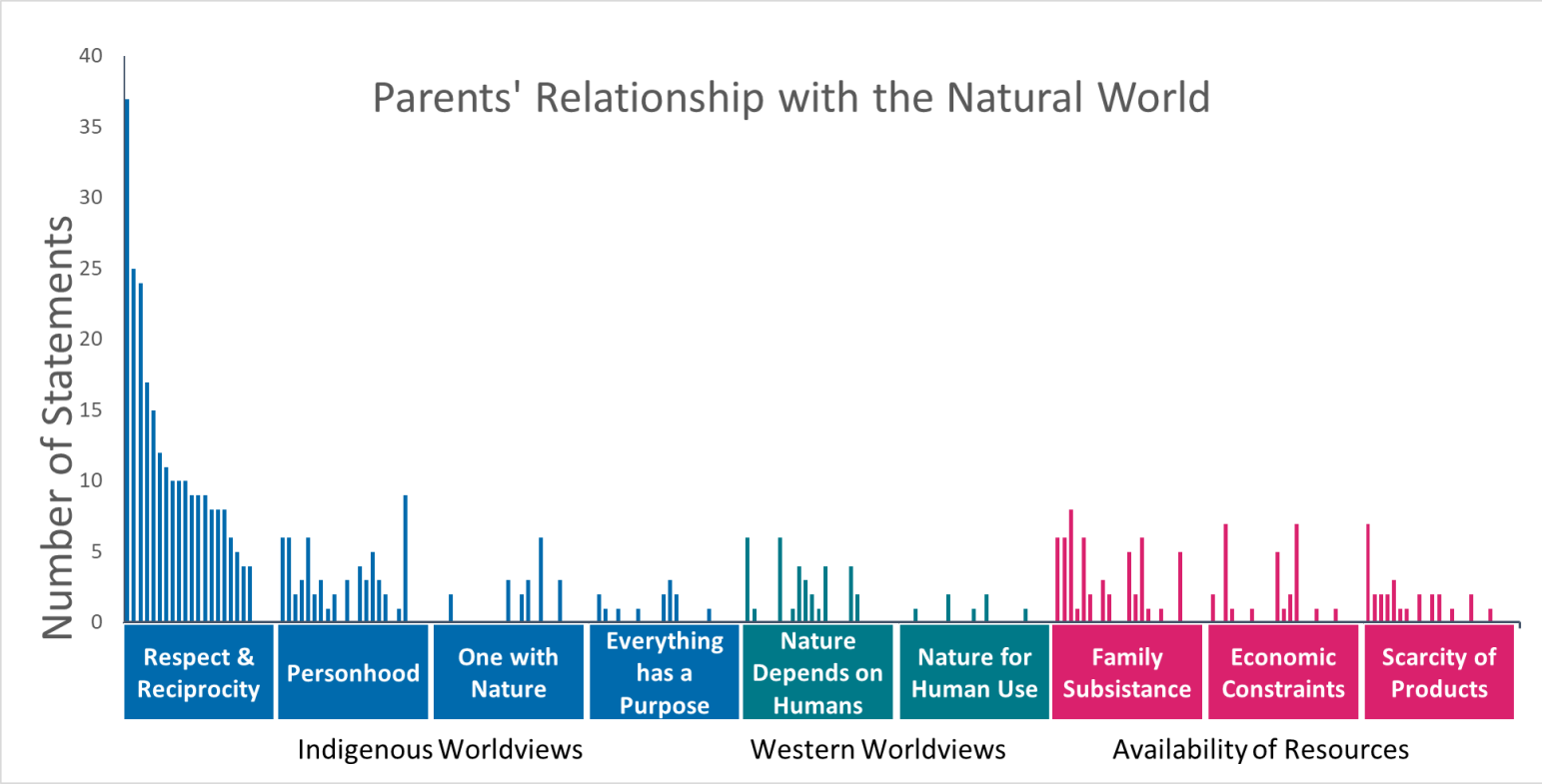
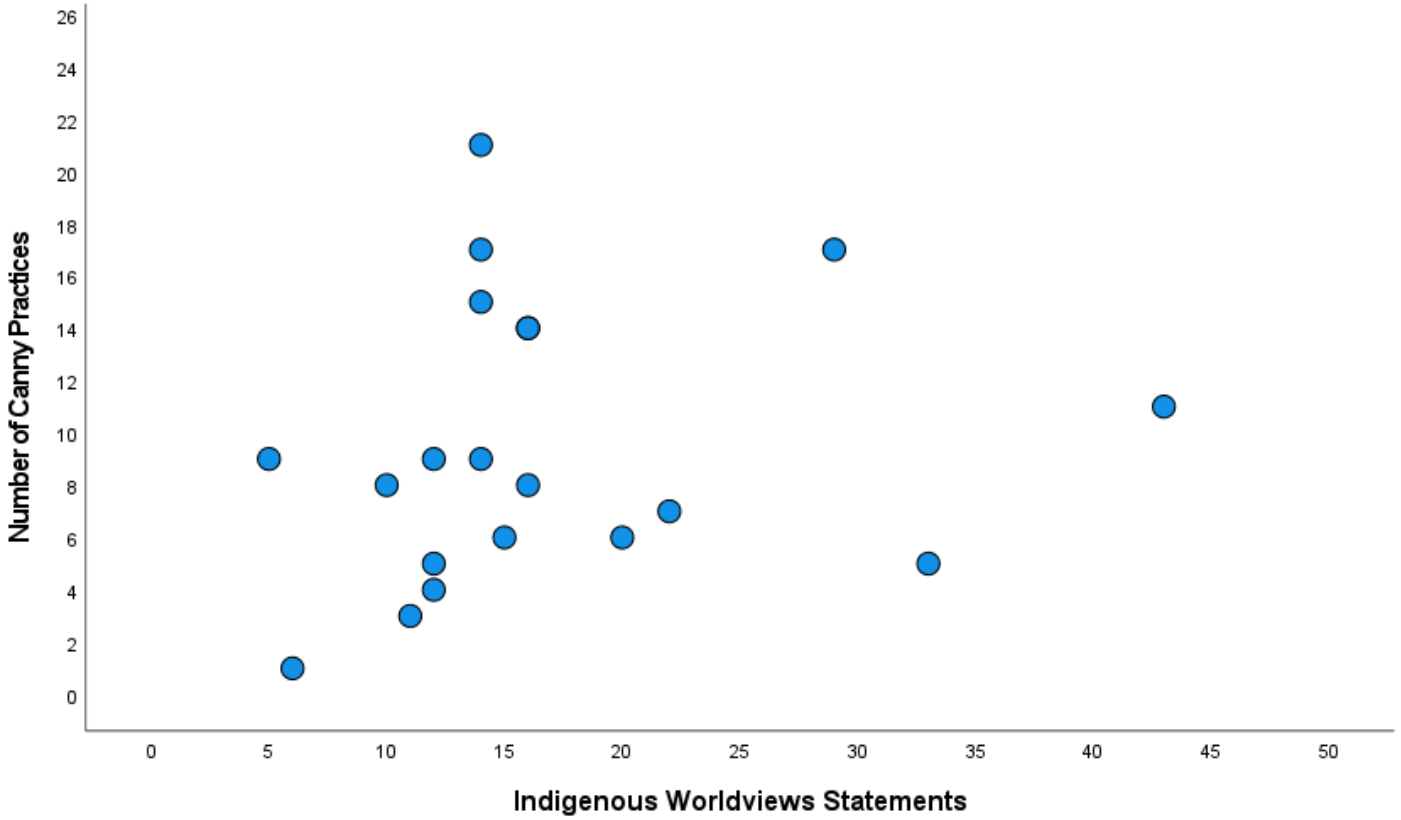


Figure 3

Frequency of Canny Practices related to Parents' Mentions of Indigenous Worldview



Appendix A

INITIAL CONTACT: SCRIPT FOR RECORDED VIDEO INVITATION

[English Version]
School administrators will share this video invitation on a school group chat.

Hello, my name is Claudia Castañeda.

Like you, I am Guatemalan, and I am also a student. My family is from Huehuetenango and I am studying at a university in California. Esperanza Juvenil is helping with my research. I am inviting you and one of your parents to participate in a research study

For my research study, I am inviting students of Esperanza Juvenil, between 12- to 17- years of age, to participate with one of their parents to have a 25-minutes conversation over WhatsApp.

For my study, I am interested in finding out how families think about and live in nature. I would appreciate being able to have a conversation with your family to help me understand their views about people's relationship with nature and the use of natural resources.

I would love to be able to visit you and your family in person, but we will have to talk over WhatsApp. If I were coming in person, I would bring your family a gift basket, so we will send a grocery basket to your home after we have the conversation. I will also reimburse you for the phone costs, and I will provide an extra day of internet access.

We can talk in the language you and your parents prefer. If it is not Spanish I would appreciate your help in translating to Spanish. Please ask your parents if they are willing to talk with me about their views of nature.

If your parents agree, please send me your name and phone number via email, clcastan@ucsc.edu, or if you'd like to send me your number via WhatsApp, this is my WhatsApp contact (+) (1) (818)(522 3740).

If you have any questions, please feel free to call me. I hope to have the opportunity to talk with you.

If you and one of your parents would like to participate or have questions please email or send a WhatsApp message to Claudia.

WhatsApp: (+) (1) (818)(522 3740).
email: clcastan@gmail.com

Title of the study: The Development of Children's Environmental Concepts: Guatemalan Parents' Views of the Utility of Natural Resources and Humanmade Products
Study ID: IRB # 3505

[Versión en español]

Hola, mi nombre es Claudia Castañeda.

Al igual que ustedes, yo también soy guatemalteca y también soy una estudiante. Mi familia es de Huehuetenango. Yo estoy estudiando en una Universidad de California. Esperanza Juvenil me está ayudando con mi investigacion. Yo te estoy invitando a ti y a uno de tus padres a participar en my estudio de investgacion.

Mi tesis es un estudio de investigación. Yo estoy invitando a estudiantes de Esperanza Juvenil, entre las edades de 12- and 17- años a participar en una conversación de aproximadamente de 25-min con uno de sus padres en WhatsApp.

En mi estudio, yo estoy interesada en saber cómo las familias piensan y viven la naturaleza. Yo les voy a estar muy agradecida si pudiera hablar con su familia para yo poder entender como ellos piensan de la relación que las personas tienen con la naturaleza y del uso de los recursos naturales.

A mí me hubiera encantado visítalos y platicar con sus familias en persona, pero lo vamos a tener que platicar por WhatsApp. Si yo hubiera llegado en persona, yo les hubiera llevado una canasta de regalo, pero ahora se las voy a mandar a sus casas después de nuestra conversación. Yo también les voy a dar recargo para un día extra de internet.

Nosotros podemos hablar en el lenguaje que ustedes y sus padres prefieran. Si no es español yo les voy a agradecer que me ayuden a traducir a español. Por favor pregúntenles a sus padres si ellos estarían dispuestos a hablar conmigo de sus ideas sobre de la naturaleza.

Si sus padres están de acuerdo, por favor mándenme su nombre y número de teléfono por correo electrónico a clcastan@ucsc.edu. O si prefieren, me pueden enviar su número por WhatsApp. Este es mi contacto de WhatsApp (+) (1) (818) (522 3740).

Si tienen alguna pregunta, ustedes me pueden llamar o mandarme un mensaje. Espero tener la oportunidad de hablar con ustedes.

Si tu y uno de tus padres les gustaria participar or tienen preguntas porfavor manda un correo o un mensaje por a Claudia.

WhatsApp + 818 522-3740

correo electronico: clcastan@gmail.com

Título del estudio: "Desarrollo de Conceptos de Medio Ambiente en los Niños: Perspectivas de la Utilidad de Recursos Naturales y Materiales en Padres Guatemaltecos

Numero del estudio: IRB ID # 3505

Appendix B

SCRIPT FOR PHONE CALL TO FAMILIES AND VERBAL CONSENT PROCEDURE

[English Version]

After interested students have contacted me letting me know that they are interested in participating in this study, I will call them at the time and phone number of their preference.

Hello, my name is Claudia. May I speak with [student's name].

Just to confirm, did you send a message saying that your family is interested in participating in my research study?

OK, thank you! Have you talked to your mom or dad about this study? Great! Could I please talk to one of them? What is her/his name? Also, if they prefer to talk in your community language, could you help me by translating? I only speak Spanish.

[to the student and parent] Hello, Mr./Mrs., thank you so much for your time. I hope your family is well. My name is Claudia and my family is from Huehuetenango but I am studying at a university in California. Your son's/daughter's school is helping me with my schoolwork.

I am inviting families to participate in my study. I'd like to learn how families think about people's relationship with nature and the use of natural resources. If you would be willing to help me learn about this, it will be a conversation of about 25 minutes. We have talked to families about different topics, including nature, and they have usually enjoyed the conversation because it gives them the opportunity to talk about things they would not normally talk about. We think that you and [child's name] might also enjoy talking about your family's relationship with nature and the use of resources. Also, the families who have participated in similar studies have not experienced anything uncomfortable. Of course, this is an invitation and you do not have to participate. If you participate and want to end earlier or skip any questions, that is fine. I will not share any personal information with anyone. **May I start my tape recorder?**

I would love to be able to visit you, talk in person, and bring you a gift basket. But since I can't, after our conversation, I will send a grocery basket to your home and an extra day of internet. Mrs. XXX from Esperanza Juvenil offered to help me with that. She will send you the grocery basket and add one additional day of internet in your phone account.

Would you [parent's name and child's name] each be willing to participate in my study of your views about how people relate to nature? And are both ok with us recording the conversation?

[wait for yes/no from both student and parent]

Thank you! Do you have any questions?
In case you have questions later, I will send you a picture with phone numbers you can call.

Title of the study: The Development of Children's Environmental Concepts: Guatemalan Parents' Views of the Utility of Natural Resources and Humanmade Products (IRB # 3505)

If you have questions or would like to know the findings of this study you can call:
Maureen Callanan + 831 459-3147 callanan@ucsc.edu
Claudia Castañeda + 818 522-3740 clcastan@gmail.com
Or you can call
Office of Research Compliance at University of California, Santa Cruz
Phone + 831 453-1473 orca@ucsc.edu

[During the verbal consent process, I will send a photo of it through WhatsApp]

I have a few questions to start. You go to Esperanza Juvenil, right? What is your first and last name? How old are you? What grade are you? Who is your teacher? Where do you live, just say the name of your community not your address?

If you like we can talk right now, or we can make an appointment to talk at another time if you prefer.
[Spanish Version]

Hola mi nombre es Claudia. Podría hablar con [nombre del estudiante]

Solo para confirmar, mandaste un mensaje diciendo que tu familia está interesada en participar en mi estudio de investigación? ¡Gracias!

Le hablaste a ellos de este estudio? ¡Perfecto! ¿Podría hablar con uno de ellos? ¿cómo se llama tu mama/papa? Otra cosa, si ellos prefieren hablar en su lenguaje, ¿me puedes ayudar a traducir? Yo solo hablo Español.

[para el padre] Buenas tardes, señora(o), gracias por su tiempo. Espero que su familia este bien. Yo me llamo Claudia y mi familia es de Huehuetenango pero ahora estudio

en una universidad de California. La escuela de su hija(o) me está ayudando en mi estudio de la escuela.

Estoy invitando a las familias a participar en mi estudio de escuela. En mi estudio a mí me gustaría saber cómo las familias piensan acerca de la relación que las personas tienen con la naturaleza y de cómo ellas usan los recursos naturales. Si usted acepta ayudarme a aprender acerca de esto, nosotros tendríamos una conversación de 25 minutos. Nosotros hemos platicado con familias de diferentes temas, incluyendo temas de la naturaleza. Usualmente las familias disfrutan las conversaciones porque tienen la oportunidad de hablar de cosas que normalmente no hablan. Nosotros pensamos que ustedes tal vez también disfruten hablar de la relación que su familia tiene con la naturaleza y de sus prácticas. Hasta ahora, las familias que han participado en estudios similares no han tenido ninguna experiencia desagradable. Por supuesto, esta es una invitación y usted no tiene que participar. Si usted participa y desea terminar antes o no contestar ninguna pregunta usted lo puede hacer. Yo no voy a compartir ninguna información personal con nadie. **¿Podría encender mi grabadora?**
[Encienda la grabadora]

A mí me hubiera encantado visítalos, platicar en persona, y llevarles una canasta de regalo. Pero como no se puede yo le voy a mandar una canasta de víveres a su casa y le voy ha dar una recarga de internet para un día después de nuestra conversación. Mrs. [name] de Esperanza Juvenil se ofreció a ayudarnos. Ella les va ha mandar la canasta y les va a recargar su cuenta de teléfono con un dia extra de internet.

¿A ustedes [mother's name and child's name] les gustaría ayudarme con mi estudio acerca de cómo las personas se identifican con la naturaleza? ¿Me dan permiso de grabar nuestra conversación?

[espere que los participantes padre y estudiante digan que sí/no]

Gracias, ¿Tienen alguna pregunta? En caso tenga preguntas después, le voy a mandar una foto con los números de teléfono a los que se puede comunicar.

Durante el consentimiento verbal, le voy ha enseñar una foto de este papel y voy a enviar una foto a las familias.

Tengo unas preguntas [nombre nino] vas a Esperanza Juvenil? ¿Cuál es tu nombre y apellido? ¿Cuántos años tienes? ¿Qué grado vas? ¿Cómo se llama tu maestra/o? Donde vives, solo el nombre de tu comunidad no tú direction?

Si usted gusta, podemos hablar ahora o podemos quedar para otro día a la hora que usted prefiera.

Título del estudio: "Desarrollo de Conceptos de Medio Ambiente en los Niños: Perspectivas de la Utilidad de Recursos Naturales y Materiales en Padres Guatemaltecos (IRB ID # 3505)

Para preguntas or para saber sobre los resultados del estudio puede llamar a:

Maureen Callanan + 831 459-3147 callanan@ucsc.edu

Claudia Castañeda + 818 522-3740 clcastan@gmail.com

O puede llamar a la oficina de supeervision de invetigacion (ORCA) de la Universidad de California, Santa Cruz

Phone + 831 453-1473 orca@ucsc.edu

Appendix C

PROTOCOL FOR SEMI-GUIDED INTERVIEWS WITH PARENTS AND THEIR CHILDREN

[English Version]

After families have agreed to participate and consent, we will proceed with the conversation either immediately or when families schedule the appointment.

A. SEMI-STRUCTURED INTERVIEW

I got interested in knowing how people think and live in nature because talking to my dad, he told me that our elders and grandparents think that people ought to respect and care for Mother Nature. To me those lessons are important, and I want to know more.

I'm interested in how your elders or parents talked about nature

1. Were there ways that your elders or family showed respect and gratitude to nature? Can you tell me more about that?

2. Do you still do those things or maybe others? [Why or why not?] Do you think your relation to nature is different than your elders or parents? How?

3. What did your [elders or parents] say could happen to people who are not respectful or grateful to nature? Do you know anyone who has suffered any consequences for not showing respect or gratitude to nature?

I'm wondering especially about corn,

4. Did your elders or parents tell you anything about the importance of humans' relation with corn? Did they tell you any stories about corn? [Probe for whether things like picking up the kernels is just in the past]

5. Did your community have any ceremonies or celebrations in honor of corn? Do they still do them?

Canny Practices.
Something else that I would like to talk about is how you and your family use the things that you have, things that are manufactured and natural. The other day I saw my daughter cut the toothpaste tube in half to get the last bit. This is something that I learned from my granddad.

6. Do you or your elders do some of these things or maybe others? Why? For example? (if they start with elders, ask about them; if they start with themselves, ask about elders)

Prompts: (only if need it)

*How about *things from nature like water*? For example, what do you do with the water after you wash vegetables? Do you do other things like that? For Example? Why?

*What about *beans or corn*? [What do you do with the beans or the corn that you pick out as you are cleaning them? Why?

*What about *parts of animals or plants that you cook but you don't eat, like eggshells or feathers or cornstalks or peanut shells*? Why?

7. Would you like your children to do these things? Why?

8. Lately, there has been a lot of talk about how people need to start taking care of the environment, that the climate is changing. But, growing up I do not remember learning or even hearing much about taking care of the environment. What about you, did your elders or parents talk about taking care of the environment? What did they say?

Thank you very much, I have learned a lot. Do you have any questions for me about what we talked about?

Before we finish, I have a few quick questions

B. DEMOGRAPHIC INFORMATION

1. Your son/daughter told me that you live in [name], Are you from there, too?

2. How about the father of [name]? Where is he from?

3. Do you work? What do you do?

4. And the father of your child, does he work? What does he do?

5. Did you go to school? What grade did you finish? How far did school go in your community?

6. And your child's dad, what grade did he finish? Do you know, how far did school go in his community?

7. How about your parents -- do you know how far they went in school? What kind of work did they do?

Thank you very much for your help with my work!

One more thing, I am working on another study on families' experiences with school. Would it be ok for me to call you in the future to ask a few questions about your thoughts about school?

[Spanish Version]

Después que la familia haya aceptado participar y haya aprobado la participación, empezaremos la conversación inmediatamente o cuando las familias hagan la cita.

A. ENTREVISTA SEMIESTRUCTURADA

Yo me interesé en estudiar como las personas piensan y viven la naturaleza porque una vez platicando con mi papá él me dijo que nuestros ancianos y abuelos piensan que las personas deben respetar y cuidar a la Madre Naturaleza. Para mis esas enseñanzas son importantes y busco saber más.

1. ¿Que decían sus abuelos o padres cuando hablaban de la naturaleza?

2. ¿Había formas que su familia demostraba respeto y gratitud a la naturaleza? ¿Me puede contar un poco más acerca de eso?

3. ¿Usted cree que su relación con la naturaleza es diferente a la de sus abuelos o padres? ¿Cómo?

4. ¿Como demuestra usted respeto y gratitud a la naturaleza? Usted dijo que sus [abuelos o padres] hacían [ver pregunta # 2] Usted hace esas cosas o tal vez otras? [Porque o porque no]

5. ¿Qué les decían sus [abuelos o padres] de lo que podría pasar a la gente que no es irrespetuosa o gradecida con la naturaleza? ¿Usted conoce a alguien que haya sufrido consecuencias por no demostrar respeto o agradecimiento a la naturaleza?

6. Y del maíz, ¿qué les decían sus abuelos o padres acerca de la importancia de la relación que los humanos tienen con el maíz? ¿Ellos le contaban historias del maíz? [Casualmente mencione si recoger los granos de maíz es una cosa del pasado].

7. ¿En su comunidad había ceremonias o celebraciones en honor al maíz? ¿Todavía las hacen?

Otra cosa que me gustaría platicar es de como ustedes usan las cosas que tienen, materiales y naturales. Creo que nosotros los guatemaltecos somos “chispudos” e innovadores; siempre andamos viendo la manera de cómo sacar provecho a las cosas que tenemos y que nos da la naturaleza. Y eso yo lo he visto hasta en mi hija. El otro día la vi partir la pasta de dientes a la mitad para sacar toda la pasta de dientes. Eso es algo que yo aprendí de abuelito.

8. ¿Ustedes hacen algunas de estas cosas, o tal vez otras? ¿Por qué? ¿Por ejemplo?

9. ¿Y, sus abuelos o padres hacían estas cosas?

10. ¿Porque ellos pensaban que las cosas se deben de aprovechar?

11. ¿A usted le gustaría que sus niños hicieran con estas cosas? ¿Por qué?

Gracias todo lo que me ha contado. He aprendido mucho. ¿Tiene algunas preguntas de lo que hablamos?

Antes de terminar me gustaría hacerle unas preguntitas

B. INFORMACIÓN DEMOGRÁFICA

1. Su hijo/hija me dijo que viven en [nombre], ¿Es usted de allí, también?

2. ¿Y el papa de [nombre], de donde es?

3. ¿Usted trabaja? ¿Qué trabajo hace?

4. ¿Y el papá de su hijo, trabaja? ¿El que hace?

5. ¿Usted fue a la escuela? ¿Hasta qué grado llego? ¿Hasta qué grado llegaba la escuela en su comunidad?

6. ¿Y el papa de su hija/o, él fue a la escuela? ¿Hasta qué grado llego? ¿Usted sabe hasta qué grado llegaba la escuela de la comunidad de el?

7. ¿Y sus padres? ¿hasta qué grado llegaron en la escuela? ¿En que trabajaban?

¡Muchísimas gracias por ayudarme con mi trabajo!

Una cosita más, yo estoy trabajando en otro estudio acerca de las experiencias que las familias han tenido con la escuela. Usted me da permiso de llamarles en el futuro para hacerle unas preguntas acerca de lo que usted piensa acerca de la escuela?

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