Navigating Family Ties: Young Children's Cognitive Representations of the Family Network

Christina M. Steele[1] (csteele@g.harvard.edu) and Ashley J. Thomas[1] (athomas@g.harvard.edu)
[1]Department of Psychology, Harvard University, Cambridge, MA 02138

Abstract

Family is often central to an individual's early life. However, past work suggests mixed evidence as to whether young children can represent family relationships, showing even the words used to represent these relationships—like grandmother—are hard for young children to learn and define. The current study investigates whether 4-to-5-year-old children (*N*=64) recognize relationships in their families, testing the hypothesis that children can recognize intimate relationships in their environments. Children expected moms to seek out comfort from maternal but not paternal grandparents and expected dads to seek out comfort from paternal but not maternal grandparents. Children did not share those expectations for general information-seeking, and instead expected their parents to seek information for the relative with the relevant skill even when that grandparent was not socially close to the parent. These results suggest that from a young age, humans have the capacity to recognize relationships within their earliest social network—the family.

Keywords: family relationships; children; social cognition

Introduction

From the time that we are born, much of our lives revolve around the relationships that make up large social networks. To become a competent member of one's social group, you must be able to recognize the relationships in these networks. One ubiquitous cultural invention that allows us to communicate about these social networks are kinship terms. While kinship term systems differ across cultures, in all cultures they give information about genealogy, or familial relationship structures. How do humans come to learn the meaning of these terms, and about the structure of their social networks? Do we have early-developing inductive biases that support the learning of these social networks?

Previous research suggests that young children's explicit knowledge of kinship terms is slow and difficult to acquire. In several studies, children seem to fail to comprehend the referential nature of kinship terms. In classic work by Piaget (1928), children had difficulty understanding the logic of kinship terms (e.g., it was not until age 11 years that children understood the reciprocal nature of kinship terms, that is, if child X is child Y's sibling, then child Y is child X's sibling). In another study, when testing children's ideas about grandmothers, younger children were more likely to identify an old woman as a grandmother as opposed to a woman shown with someone who could be her daughter and her daughter's baby (Landau, 1982). Children in this study between 5 and 6 years of age tended to justify their decisions about who is a grandmother based on symptomatic or incidental features that are unrelated to the definition of a grandmother (e.g., having gray hair, wrinkles). However, older children between 7 and 10 years of age and adults were more likely to justify their decisions about who is a grandmother using criterial features core to the definition of a grandmother (i.e., that she is the mother of a mother). Even more broadly it appears that children tend to struggle with explicit meanings of kinship terms. In more recent work research, while 3-year-old children distinguished kinship terms (e.g., "sister") from people described as strangers, and distinguished people described as friends from strangers, they did not distinguish between kin and friends (e.g., when answering, "Which has the same mom as you?"; Spokes & Spelke, 2016). In another study, 5-year-old children classified those who lived together and had contact with each other as a family, even when they were not genetically related, and said that a couple who lived with a child but did not love each other was not family (Gilby & Pederson, 1982). It is possible, however, that children understand family or family-like relationships but have not yet mapped kinship terms onto these relationships. For example, children may learn about their own social networks by learning about individuals and their relationships (e.g., "mom's mom is Grammie").

Some work hints at the possibility that young children understand broader kinship concepts, at least implicitly, before they can produce explicit definitions of them. For example, in one set of studies, children ages 4 and 7 years old, were asked to give definitions of "family", "mom", and "dad" (Williams & Smith, 2010). Much like prior work, it was not until later in childhood around the age of 7 years that children gave criterial descriptions of these terms. However, younger children seemed to express some implicit understanding of these relationships based on relationship closeness in another task. In this task, children were given a photo of a baby and asked to place photos of their family or friends on three concentric circles that represented individuals who were very related (closest circle), quite related (middle circle), or not very related (furthest circle). Four-year-olds in this task put close family friends and biological family members in the same circle of closeness. These studies suggest that while children in early childhood

In D. Barner, N.R. Bramley, A. Ruggeri and C.M. Walker (Eds.), *Proceedings of the 47th Annual Conference of the Cognitive Science Society*

may not yet have a definitional understanding of kinship terms (e.g., that a grandmother is the mom of your parent), they may understand kinship terms as relational: that is, they may understand who is intimately close (e.g., family, friends). This leaves open the possibility that even young children recognize social closeness early in childhood, allowing them to represent at least parts of the social networks in which they are embedded, despite lacking knowledge about kinship terms referring to those network structures. Accordingly, young children may represent their own family networks earlier than their ability to explicitly produce a verbal response that shows that they understand the meaning of kinship terms generally.

Moreover, because kinship terms are by nature relational–that is, defined by their referential structures (e.g., that X is the mother of Y, etc.)—and children seem to have implicit knowledge of a broader category of kinship, the acquisition of kinship terms may be supported by children learning about their own family structure (e.g., observing their family members' patterns of interactions with each other). Existing literature with children in early childhood supports this suggestion. When 3- to 6-year-old children were asked to discuss their understandings of kinship terms, children were more likely to demonstrate an understanding of kinship terms for kin with whom they had more direct experience as reported by their parents (e.g., children discussed mothers using relational terms more than fathers, and immediate family members more than distant or extended family members; Benson & Anglin, 1987). Others have provided evidence that young children may recognize family relationships by observing actions that involve maternal investment (Lieberman et al., 2007). Thus, on the one hand, children with a greater degree of experience with their extended family may be better able to represent the relationships. However, given the importance of the ability to navigate key social relationships for one's survival, children may also rapidly learn about these relationships from relatively few observations. In line with this reasoning, prior work suggests that infants even as young as 8 months recognize physical intimacy, distinguishing it from other prosocial interactions (Thomas et al., 2022). This early ability to recognize intimacy may therefore support the rapid learning of one's family network.

In the present study, we aim to investigate young children's knowledge about their own social networks, specifically relationships within their larger family networks. We did not ask about biological relatedness, consistent with work that suggests individuals may consider people to be family who are not genetic relatives (Sahlins, 2013). Here, we ask, what do children know about their own family networks? We propose that children's understanding of their social networks is supported by early-developing intuitions about social relationships and that previous research has underestimated children's knowledge of family social networks. The present study differs from previous work because we do not ask children about hypothetical individuals, rather we ask them about real-world social behaviors (e.g., hugging, spoon-sharing) and individuals they know and have had the opportunity to learn about. We hypothesized that in doing so we can reveal knowledge that has been overlooked in previous work.

Methods

We complied with all ethical regulations to conduct this research. This study received Institutional Review Board approval. This study was pre-registered on Open Science Framework (OSF) (https://osf.io/b4ua9/?view_only=64c1535e172343a89e617700f2b8e16f).

Participants

We tested 64 4- to 5-year-old children ($Mean_{Age}$ = 4.59 years, SD_{Age} = 0.53; 59% girls, 0% non-binary) from the United States (63% from Northeast US). Children were 61% White, 19% Multiracial, 7% Asian or Pacific Islander, 5% Black or African American, 1% Middle Eastern or North African, 7% Other, and 5% also identified as Latine. Most parents held a 4-year degree (80%). Household income was $80,000 or more for 86% of families. We included data from children between 3 years and 11 months to 6 years and 1 month given this is the age in which children tend to struggle with kinship terms (Landau, 1982). One child recruited was outside of this age range (Age_{years} = 6 years, 0 months, 8 days), and we included them in the analysis.

Design and Materials

This study took place via online surveys and video-chat sessions (refer to OSF for materials: https://osf.io/b4ua9/?view_only=64c1535e172343a89e617700f2b8e16f). The goal of the study was to measure children's early understanding of the closeness between their own parents and their grandparents.

First, parents completed a survey that assessed how many grandparents and additional caregivers (e.g., the parent's spouse, a nanny, godparent, etc.) their child has and what their child usually calls them (e.g., "Grandpa", "Meemaw", etc.). During the experiment, children completed a series of tasks to assess their knowledge of family structure using the labels used by the families for their parents and grandparents (e.g., "Oma", "Grammie").

In the case that children had greater than four grandparents, we only used the four grandparents for whom parents reported their children were most familiar. In the case that children had fewer than four grandparents or fewer than two parents, we used another relevant significant adult involved in the child's life (e.g., a godparent, friend of parent, etc.) and gender-matched where possible to the missing grandparent. As pre-registered, we include all children's answers in our analysis, but to investigate whether findings are specific to grandparents, we also include analysis that does not include trials for which children were not answering about grandparents.

To ask about children's understanding of social closeness within these relationships, we asked children to choose who

they would expect their parent to seek out comfort from when they are feeling sad—the maternal or the paternal grandparent. We asked about hugging behaviors given that close physical contact (Sorokowska et al., 2021; Suvilehto et al., 2015; Suvilehto et al., 2023) and consolation (Swann & Predmore, 1985; Yu et al., 2025) typically occur among kin or intimate relationships and physical touch is a cross-culturally recognizable cue of closeness.

Specifically, we told children: "Imagine [Parent] was sad one day and [Parent] needed a hug, who do you think [Parent] would want to get a hug from?: [Maternal Grandparent 1] or [Paternal Grandparent 1]"?. We reasoned that if children understand the underlying network structure (e.g., that a maternal grandparent is socially closer to their mom), even implicitly, then they should use this to make predictions about comfort seeking—e.g., saying mom would seek comfort from their maternal grandmother over their paternal grandmother. Additionally, we also asked parents to respond to the question their children were given about hugging. Rather than using a binary forced choice, in the parent survey we asked parents to choose a grandparent out of all their child's grandparents from whom they would seek a hug for consolation. We asked parents only about the hugging measure to reduce survey length. The reason we did this was to confirm whether our operationalization of close relationships within a family network structure was accurate (e.g., that on average a child's mother is more likely to feel closer to the child's maternal grandparents than paternal grandparents). Existing work also points to another potentially salient cue of closeness and intimacy involving close physical contact—saliva sharing, a cue that even infants recognize (Thomas et al., 2022). Accordingly, we also asked children to choose with whom they would expect their parent to share the same spoon to eat ice cream. Specifically, we asked: "Imagine that [Parent] is eating some ice cream with a spoon. Who do you think [Parent] would want to share the same spoon with?: [Maternal Grandparent 1] or [Paternal Grandparent 1]". Like the previous dependent measure, we reasoned that if children understand the underlying network structure (e.g., that their dad is socially closer to their paternal grandparents), then they should use this to make predictions about close bodily contact.

In line with research suggesting the role observed experiences may play in the ability to represent kinship relationships (Billingsley et al., 2019), we also aimed to investigate the extent to which children's amount of experience with their grandparents predicted children's performance on the task. Accordingly, we asked parents to report how often their child interacts with their grandparents (e.g., frequency: daily, weekly, monthly, etc., and the modality: in-person, video, phone) of interaction, and the degree of social closeness between the children and grandparents.

While children's ability to identify who would engage in socially close acts with another relative provides some evidence that children have intuitions about kinship relationships, this on its own is not sufficient for understanding whether children view these relationships as intimate or close. For instance, it could be the case that children use a lower-level heuristic of matching mom and mom's relatives, because they have seen them together more often–without recognizing the type of relationship they have (Billingsley et al., 2019; Lieberman et al., 2007). Accordingly, we also asked children to choose who they would expect their parent to go to for information about a particular topic or skill. To do so, we also asked parents in the parent survey to provide skills that their child would know are associated with each grandparent (e.g., "sewing" or "swimming"). To see whether children could flexibly adapt their predictions about who would go to whom, we asked about the skill of the non-socially close grandparent in the family network (e.g., paternal grandparent for mom, maternal grandparent for dad) that, importantly, the socially close grandparent did not have. Specifically, we asked: "Imagine that [Parent] wants to know about [skill of Maternal/Paternal Grandparent 1]. Who do you think [Parent] would go to, to learn more about [skill of Maternal/Paternal Grandparent 1]?". We reasoned that if children were representing social closeness, and not merely associating people who spend more time together, they should flexibly select the grandparent who has the relevant skills or information, rather than the grandparent who is socially closer.

In addition to testing children's predictions about who would go to whom within their family network depending on the particular need (e.g., social, informational), we also tested whether past work on children's failure to define kinship terms (Landau, 1982) would replicate in this sample. We asked whether a subset of children (n = 30) explicitly understood the term "grandmother", and coded whether they used a criterial definition (e.g., "mom of mom") or a feature-based definition (e.g., "old woman with gray hair"). Specifically, we asked children, "Let's say a friend wanted to know what a grandmother was. What would you tell them, to answer the question 'what is a grandmother'?". These questions were added part way through data collection. Based on past research, we expected children to fail to produce an accurate criterial definition of grandmother. If so, then it would suggest that children's possible successes in the rest of the questions were not the result of a cohort-level change in children's ability to understand kin relationships.

Analysis

To analyze children's expectations, we used Bayesian mixed models using the brms package (Bürkner, 2017) in R (R Core Team, 2023) to estimate whether children were more likely to choose the "closer" relative in terms of their family tree (e.g., the maternal relative for mom or the paternal relative for dad, in the closeness condition but not in the skills condition), which fit our data well upon model diagnostic checks). Fixed effects included condition ("close" and "skills" task types) with participant ID as a

random effect. Default priors were used for each model. To test whether children selected the closer relative within each relative pairing (e.g., mom and maternal grandmother, mom and maternal grandfather, etc.), we ran one-sample one-sided Bayesian binomial tests in JASP (JASP Team, 2024).

Results

Consistent with our hypotheses, children selected the closer relative in the family closeness tasks (on hugging and saliva sharing combined) than they did on the family skills tasks, (which by design linked the closer relative with the non-relevant skill; β = 1.69 [1.33, 2.05]; ref: skills). Additionally, in a model that looks at each closeness question type individually in comparison to the skills condition, we find a main effect of hugging (β = 1.92 [1.51, 2.32]; ref: skills) and a main effect of saliva sharing (β = 1.47 [1.07, 1.87]; ref: skills). We also analyzed the data excluding children who did not have four grandparents for whom we used a replacement relevant significant adult individual involved in the child's life (n = 24 excluded), and we did not find a different pattern of results (β = 2.14 [1.62, 2.66]; ref: skills).

We also calculated Bayes Factors (*BF*s) for each grandparent pairing per condition (Figure 1). We found that children were more likely to say their mom would choose maternal grandmothers over paternal grandmothers when asked closeness questions about hugging (Frequency$_{MGM}$: 70.00% (42/60), BF_{10} = 40.83) but not saliva sharing (Frequency$_{MGM}$: 62.10% (36/58), BF_{10} = 1.68). For the comparison information-seeking condition about the skill the paternal grandmother has (that the maternal grandmother does not), children flexibly adapted their responses to the context such that they more likely to say their mom would instead choose paternal grandmothers who have the relevant skill over the socially close maternal grandmothers (Frequency$_{PGM}$: 73.70% (42/57), BF_{10} = 225.26).

We found a similar pattern for grandfathers, such that children were more likely to say that their mom would choose maternal grandfathers over paternal grandfathers when asked about with whom mom would hug although the effect was much weaker for grandfathers (Frequency$_{MGF}$: 64.30% (36/56), BF_{10} = 3.17), but not saliva sharing (Frequency$_{MGF}$: 51.80% (29/56), BF_{10} = 0.21). For the comparison information-seeking condition, children were more likely to say their mom would instead choose paternal grandfathers who have the relevant skill over the socially close maternal grandfathers (Frequency$_{PGF}$: 73.60% (39/53), BF_{10} = 138.73).

We also investigated these patterns for dads. Here, we found that children were more likely to say their dad would choose paternal grandmothers over maternal grandmothers when asked closeness questions about hugging (Frequency$_{PGM}$: 80.00% (48/60), BF_{10} = 27012.85) and saliva sharing (Frequency$_{PGM}$: 72.70% (40/55), BF_{10} = 108.10). For the comparison information-seeking condition, children were more likely to say their dad would choose maternal grandmothers who have the relevant skill over the socially close paternal grandmothers (Frequency$_{MGM}$: 69.60% (39/56), BF_{10} = 25.76).

We found that children were also more likely to say their dad would choose paternal grandfathers over maternal grandfathers when asked about with whom dad would hug

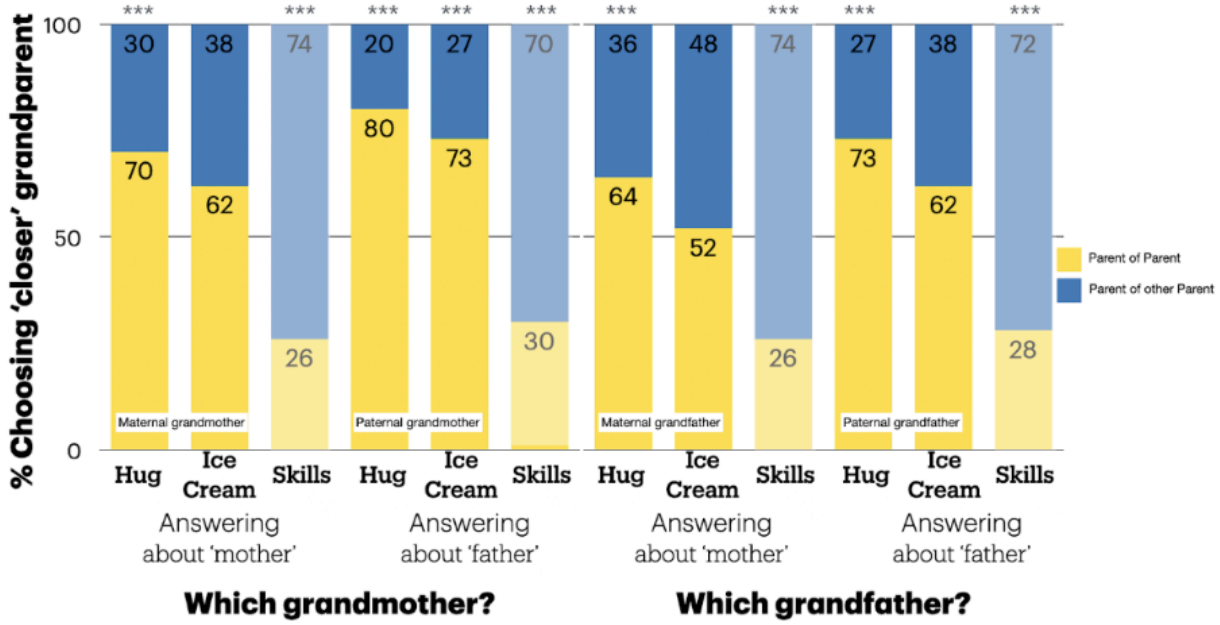

Figure 1: Bar plots depicting children's choices (in percentages) on the family network social closeness tasks (hugging and saliva-sharing) and the skills task. The yellow segment of the bar represents children's selection of the socially close grandparent (e.g., maternal for mom; paternal for dad) on a given condition. The blue segment of the bar represents children's selection of the non-socially close grandparent (e.g., paternal for mom; maternal for dad) on a given condition.

(Frequency$_{PGF}$: 72.70% (40/55) BF_{10} = 108.10), but not about with whom dad would share saliva (Frequency$_{PGF}$: 61.80% (34/55) BF_{10} = 1.47). For the comparison information-seeking condition, children were more likely to say their dad would instead choose maternal grandfathers who have the relevant skill over the socially close paternal grandfathers (Frequency$_{MGF}$: 71.70% (38/53), BF_{10} = 53.33).

Despite variations in children's ratings about which grandparent their parent would seek out on the closeness measures, we do not find evidence for an interaction between condition and grandparent type (i.e., grandmothers, grandfathers) on children's ratings (β = -0.35 [-1.07, 0.36]; ref: grandfather).

In an exploratory analysis, we also investigated whether children's answers corresponded with children's degree of experience with their grandparents. To do so, we asked whether experience predicted children's answers to questions about hugging or saliva sharing. We did not find evidence that this was the case for maternal grandmothers (Mean$_{frequency}$ = 76.18, SD = 20.37, β = -0.003 [-0.02, 0.02]), paternal grandmothers (Mean$_{frequency}$ = 60.21, SD = 21.26, β = 0.002 [-0.02, 0.02]), maternal grandfathers (Mean$_{frequency}$ = 72.44, SD = 18.95, β = 0.003, [-0.02, 0.03]), or paternal grandfathers (Mean$_{frequency}$ = 56.47, SD = 22.48, β = 0.01 [-0.004, 0.03]).

We also did not find evidence that reported closeness between parents and grandparents predicted children's answers (all BFs were under 2). Specifically, parents' own ratings about who they would go to for a hug for consolation when they were sad did not correlate with children's ratings about who their parents would want to go to for a hug (BF_{10} = 0.27). Finally, we analyzed parents' answers to the hug question and indeed found that they were far more likely to choose their own parents than their partner's parents (Frequency$_{Closer_Grandparent}$: 91.20% (52/57), BF_{10} = 1.19 x 10^9). This lack of variance and small sample size may explain why parental reports of closeness did not predict children's answers as there is not much variance to be explained.

In additional exploratory analyses, we also investigated whether children had an explicit understanding of the meaning of the term "grandmother". Of the 30 children we asked, 43% (13/30) said "I don't know". The remaining 57% (17/30) provided responses, none of which were accurate criterial definitions that provided necessary and sufficient features of a grandparent: e.g., "she has not much energy", "she walks with a stick", "it's a person that's old", "someone who babysits you when your parents need to go", "someone who takes care of you", "they dance with kids", "they have a house just like you", "a friend of grandma that is a mom".

Interestingly, for one child who described a grandparent in terms of physical attributes related to aging and lack of physical ability—i.e., "they're old and they use kind of like a stick to like keep their balance"—the parent remarked: "Your grandparents don't have that though. Pretty much all of them are healthy.". Thus, despite the child's direct experience with their own grandparents, they produced a definition of grandparents unrelated to what they experience in their families.

Four children came nearly close to the criterial definition of a grandmother (i.e., the parent of a parent): Three children referred to motherhood, saying "a mom that's really old", "a mother", "an old mom", alluding to one aspect of the criteria that grandmothers are moms, although they need not be old. Interestingly, this definition could lead to correct answers on the current task if children know the relationships between their parents and their grandparents (i.e., that "Oma" is "Mama's" "Mama"). However, they also could have been repeating back a more recognizable component of the word "grandmother" which contains the phrase "mother". One child said "it's more like a parent of someone else's parent", which is nearly close to the criterial definition as the parent of a parent. However, a grandmother need not be the parent of someone else's parent, and can be the parent of one's own parent.

Discussion

The present study sought to investigate children's early representations of family relationships. The findings support the hypothesis that children can recognize and remember specific relationships in their everyday environments. Children expected parents to seek comfort from, and in some cases share saliva with their own parents, but did not expect them to seek information from them when they did not have relevant skills. Thus, children seem to mentally represent at least some parts of their family network. This representation goes beyond merely associating two people who, for example, may spend more time together. Further, we found that even children who were unable to provide an accurate explicit definition of grandmother showed the same overall pattern in the data—distinguishing who each parent would go to based on social closeness or informational relevance.

Collectively, these findings demonstrate that even before having an explicit understanding of kinship terms, children have the ability to navigate their own family networks, understanding who is connected with whom. Accordingly, children may not need to have an explicit understanding of kinship terms before they can navigate relationship structures within their environments.

Interestingly, experience did not seem to play a role in children's answers. We found no correlation between children's closeness or frequency of interactions with their grandparents, and children's ratings on the social closeness tasks. This suggests that children may not need many observations before they can represent individual relationships in their environments and may rapidly learn about these relationships from few observations.

We also found that parents reported that they are socially closer and would rather get a hug from their own parents compared to their in-laws. This suggests that the assumptions going into the study were correct. Interestingly, we do not find a correlation between parent's reports of social closeness and children's predictions. Parents'

responses showed very little variation, approaching ceiling effects in their answers. This limited variance makes it statistically difficult to identify explanatory factors. While one possible interpretation is that children possess general knowledge about parent-child relationships (even when the "child" is an adult and their own parent), the ceiling effect makes this lack of correlation difficult to interpret.

Contrary to our expectations, we found weaker effects for children's predictions about saliva sharing. Children were more likely to select the socially close relative in the hugging condition relative to the saliva sharing condition. It could be that children were focused on the act of sharing resources (e.g., ice cream sharing) which is associated with many positive relationships as opposed to sharing saliva. Past work suggests that other actions (e.g., drinking juice from the same straw) may perhaps cue saliva sharing more strongly (Thomas et al., 2022). Future work could investigate whether emphasizing or making more salient the sharing of bodily fluids through kissing or other actions leads to stronger effects. Alternatively, it could be the case that in the post-pandemic era, there have been more conscious efforts to strongly reinforce norms against acts of saliva sharing even in families, and especially with the elderly, perhaps leading children to think sharing saliva is antisocial or that they simply have less experience with it.

Despite the clarity of these findings, there are limitations. Much like past literature on this topic (e.g., in Landau (1982) children were recruited from private schools in one northeastern state in the United States), our participants were relatively homogenous in terms of education, income, race, and ethnicity in comparison to the rest of the United States and global population. We might find different effects in cultures that have different family structures, or live in cultures where explicit knowledge of family relationships is more salient (Brown et al., 2025; Casillas, 2022).

Furthermore, to understand the criterial definition of grandmother, children must represent two relationships and the correct direction in terms of age differences (e.g., two "mother-daughter" relationships). In our study, we asked children to identify one part of that chain of relationships. This did not require them to think about their own relationship with their mother, nor asymmetries in age. Thus, the successes of children in our study could be because we lowered task demands. Future work could investigate whether there are attributes of the criterial definition of grandmother that make it difficult to represent, and whether children have knowledge about those attributes in their everyday environments (e.g., knowing that their grandmother is older than their mother; or understanding their "Oma" is their Oma because she is the mom of their mom).

Another consideration is how we operationalized the relationships we were investigating. Our study used an inclusive definition of family in order to incorporate a broader range of participants, including those who did not have or had more than two maternal and two paternal grandparent relatives). Our results held up even when we excluded children without four living grandparents, suggesting children are learning about these specific relationships. We also did not restrict the grandparents participants could report on to biological grandparents or to immediate grandparents, instead allowing for step grandparents and great grandparents in some cases as well. We use this broad inclusive approach which we argue is more in line with how young children and individuals across cultures may reason about family (e.g., beyond genetic ties to include those with whom one shares a close intimate bond; Steele & Thomas, 2024). Future research, however, could consider disambiguating these relationships to see whether any differences may emerge.

Interestingly, past work that has theorized about early mechanisms that could allow infants and young children to identify family have focused on two main benefits: incest avoidance and kin directed altruism (Billingsley et al., 2019; Lieberman et al., 2007). While the children we tested had years of experience, they interestingly were able to pick up on relationships that they observed, which would not be useful in incent avoidance or kin-directed altruism. The children in our study presumably have similar relationships with their grandparents, so it is all the more impressive that they have noticed how they relate to their own parents.

Future work could further unpack whether children may be better able to more explicitly discern grandmothers when given additional cues of relationship intimacy. In our current study's exploratory investigation of children's understanding of the definition of grandmother, many children who gave definitions appeared to allude to non-essential yet prototypical physical features (e.g., old age). This appears to be consistent with the responses of young children in previous work (e.g., Landau (1982)). Given children also seem to link acts of social intimacy with relatives closer to each other in the family network in our study, future work could investigate whether presenting children with cues of intimacy may help them overcome atypical perceptual features (e.g., being young) in identifying kinship terms. Finally, children's understanding of the criterial definition of grandmother more broadly may be correlated with developments in nonsocial relational reasoning (e.g., "if I am close to my own mom, then mom would be close to her own mom too"), as has been explored in other domains such as navigation (Newcombe & Huttenlocher, 2000).

Effectively, the present investigation elucidates the extent to which young children have an early-emerging ability to distinguish between relationships within their earliest emerging social networks—the family. These findings further advance knowledge about the developmental trajectory of our early social cognitive abilities in childhood. Taken together, our findings show that even before we can define kinship terms, we are already reasoning about them in our environments. This early reasoning allows young children to interpret social information and to anticipate how others may respond. As such, even young humans appear to have the capacities to navigate these complex social dynamics in their daily lives.

Acknowledgments

We thank the families who participated and the Harvard Laboratory for Developmental Studies. The first author was supported by the Harvard University Barbard R. Ditmars Innovation Fund and the Harvard University Graduate Society Summer Predissertation Fellowship.

References

Benson, N. J., & Anglin, J. M. (1987). The child's knowledge of english kin terms. *First Language, 7*(19), 41-66. https://doi.org/10.1177/014272378700701903

Billingsley, J., Boos, B., & Lieberman, D. (2019). What evidence is required to determine whether infants infer the kinship of third parties? A commentary on Spokes and Spelke (2017). *Cognition, 191*, 103976-103976. https://doi.org/10.1016/j.cognition.2019.05.013

Brown, P., Casillas, M., Goody, M., Fentiman, A., & Bodenhorn, B. (2025). Childrearing through Social Interaction on Rossel Island, Papua New Guinea. In *Building Social Worlds* (1st ed., Vol. 17, p. 199). Berghahn Books. https://doi.org/10.1515/9781805399544-012

Casillas, M. (2023). Learning language in vivo. *Child Development Perspectives, 17*(1), 10–17. https://doi.org/10.1111/cdep.12469

JASP Team (2024). JASP (Version 0.18.3) [Computer software]

Gilby, R. L., & Pederson, D. R. (1982). The development of the child's concept of the family. *Canadian Journal of Behavioural Science / Revue canadienne des sciences du comportement, 14*(2), 110–121. https://doi.org/10.1037/h0081245

Landau, B. (1982). Will the real grandmother please stand up? the psychological reality of dual meaning representations. *Journal of Psycholinguistic Research, 11*(1), 47-62. https://doi.org/10.1007/BF01067501

Lieberman, D., Tooby, J., & Cosmides, L. (2007). The architecture of human kin detection. *Nature*, *445*(7129), 727–731. https://doi.org/10.1038/nature05510

Newcombe, N. S., & Huttenlocher, J. (2000). *Making space: the development of spatial representation and reasoning* (1st ed.). MIT Press. https://doi.org/10.7551/mitpress/4395.001.0001

Piaget, J. (1928). *Judgment and reasoning in the child*. Harcourt, Brace. https://doi.org/10.4324/9780203207260

R Core Team (2023). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. https://www.R-project.org/

Sahlins, M. (2013). *What kinship is– and is not*. The University of Chicago Press.

Spokes, A. C., & Spelke, E. S. (2016). Children's expectations and understanding of kinship as a social category. *Frontiers in Psychology, 7*, 440-440. https://doi.org/10.3389/fpsyg.2016.00440

Sorokowska, A., Saluja, S., Sorokowski, P., Frąckowiak, T., Karwowski, M., Aavik, T., Akello, G., Alm, C., Amjad, N., Anjum, A., Asao, K., Atama, C. S., Atamtürk Duyar, D., Ayebare, R., Batres, C., Bendixen, M., Bensafia, A., Bizumic, B., Boussena, M., . . . Croy, I. (2021). Affective interpersonal touch in close relationships: A cross-cultural perspective. *Personality & Social Psychology Bulletin, 47*(12), 1705-1721. https://doi.org/10.1177/0146167220988373

Suvilehto, J. T., Glerean, E., Dunbar, R. I. M., Hari, R., & Nummenmaa, L. (2015). Topography of social touching depends on emotional bonds between humans. *Proceedings of the National Academy of Sciences - PNAS, 112*(45), 13811-13816. https://doi.org/10.1073/pnas.1519231112

Suvilehto, J.T., Cekaite, A. & Morrison, I. The why, who and how of social touch. *Nat Rev Psychol 2*, 606–621 (2023). https://doi.org/10.1038/s44159-023-00217-5

Steele, C., & Thomas, A. J. (2024, September 9). How do humans think about family? Perspectives from Developmental Psychology. https://doi.org/10.31234/osf.io/bd3a9

Swann, W. B., & Predmore, S. C. (1985). Intimates as Agents of Social Support: Sources of Consolation or Despair? *Journal of Personality and Social Psychology, 49*(6), 1609–1617. https://doi.org/10.1037/0022-3514.49.6.1609

Thomas, A. J., Woo, B., Nettle, D., Spelke, E., & Saxe, R. (2022). Early concepts of intimacy: Young humans use saliva sharing to infer close relationships. *Science (American Association for the Advancement of Science), 375*(6578), 311-315. https://doi.org/10.1126/science.abh1054

Williams, J. M., & Smith, L. A. (2010). Concepts of kinship relations and inheritance in childhood and adolescence. *British Journal of Developmental Psychology, 28*(3), 523-546. https://doi.org/10.1348/026151009X449568

Yu, E., King, A. A., Tsuruta, K., & Thomas, A. J. (*in press*). Children expect emotional consolation to occur in close relationships. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 47.