The Development of Social Reasoning About Shared Sleep Arrangements

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Abstract

Shared sleep arrangements, especially children's, often occur in proximity to family and other caregivers. We investigated whether sleep-sharing serves as a reliable cue to familial and caregiving relationships, even in childhood. Two preregistered studies with U.S. 5–7-year-olds ($N = 168$) and adults ($N = 168$) show people possess systematic intuitions about the social meaning of shared sleep arrangements. In Study 1, both age groups robustly expected that a child character sleep-shared with family over non-family (siblings over friends; parents over teachers), while expecting equal toy-sharing. In Study 2, both age groups predicted that a child's chosen sleep-sharing (vs. toy-sharing) partner would provide physical comfort (care) when the child became upset. Adults privileged sleep-sharing over another intimate interaction—saliva-sharing—as diagnostic of a caregiving relationship. From early childhood, people use shared sleep arrangements as a powerful signal of intimate relationships, supporting their understanding of the social landscape.

Keywords: sleep; family; care; social cognitive development

Introduction

Sleep is a vital yet vulnerable human behavior, especially when one sleeps near another person. Prior research on shared sleep arrangements has explored links between parent-child co-sleeping, attachment relationships, and children's concepts of independence and interdependence (Ball et al., 1999; Bowlby, 1982; Mileva-Seitz et al., 2017; Morelli et al., 1992; Shweder et al., 1995). Yet, it remains unclear whether and when people derive social meaning from others' sleep arrangements—inferring that those who choose to sleep nearby are doing so not out of practicality but because they must share a particularly close or caregiving relationship, and if even young children share intuitions similar to adults'. Here, we present two studies investigating social reasoning about shared sleep arrangements and the origins of these abilities in childhood.

The Social Meaning of Sharing

From early in life, people expect others to selectively share their resources based on the nature of their social relationships. 3–5-year-olds predict that people will preferentially distribute resources like toys and food to family and friends over strangers (Spokes & Spelke, 2016). 3.5-year-olds predict people will share more with people who have previously shared with themselves and others (Olson & Spelke, 2008). By 18 months, infants expect people will favor their ingroup members when allocating limited resources (Bian et al., 2018), and by age 4, children expect that others will give more to a friend than to a disliked peer (Paulus & Moore, 2014). Children also make the reverse inference: They infer close social relationships based on sharing behavior. For example, 4-year-olds infer that people who preferentially share with one another have a closer friendship (Liberman & Shaw, 2017).

Children also recognize that certain kinds of sharing imply closer social relationships than others. By age 6, children judge that sharing personal information like secrets signals a closer friendship than sharing objects (Liberman & Shaw, 2018). By ages 5–7, children systematically judge that food-sharing interactions that would likely involve saliva-sharing––such as licking the same ice cream cone—occur with family members (e.g., brothers and dads) rather than non-family (e.g., friends and teachers; Thomas et al., 2022).

Recent frameworks propose that humans possess early-developing social reasoning systems that allow intimate behaviors like partiality and food-sharing to serve as informative signals of the unobservable social relationships between others; and to predict that those in close relationships will engage in these behaviors (see Liberman & Tompkins, 2026; Liberman et al., 2016; Thomas, in press; Thomas et al., 2025; see also Carey, 2009; Spelke, 2022). In line with this, infants selectively interpret saliva-sharing as indicating close, caregiving relationships: When a protagonist is distressed, infants look longer to a person who previously shared saliva with the protagonist (vs. a person who did not), as though expecting them to respond (e.g., by providing comfort; Ciftci et al., 2025; Thomas et al., 2022). In addition, children expect partners who share physical touch (e.g., snuggling) to respond in intimate, caring ways (Woo et al., 2025). These cues may be part of a suite of intimate behaviors that signal close relationships to young children.

Sleep-Sharing as a Signal of Close Relationships

We focus on a social behavior that involves less overt social interaction, and is widespread in human history: sharing of a close sleep arrangement. How and to what extent people sleep-share—from sleeping in the same bed to sleeping in the same room—varies across cultures. However, when children share sleep arrangements, they often only do so with their caregivers, family members, or particularly close social partners (Ball et al., 1999; Morelli et al., 1992; Shweder et al., 1995).

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By multiple accounts, shared sleep arrangements should be particularly powerful cues to intimate social relationships. Sleep, and sleeping in proximity to conspecifics, are evolutionarily ancient and universal behaviors (see Ball et al., 1999; Morelli et al., 1992; Shweder et al., 1995). Thus, social reasoning about sleep-sharing—like saliva-sharing and other intimate behaviors—could have been shaped by natural selection (Thomas et al., 2022). Alternatively or in addition, learning likely plays a crucial role: Regular observations that people sleep nearby close social partners could strengthen associations between sleep-sharing and intimate, caring relationships (Ciftci et al., 2025; Powell, 2022; Powell & Tompkins, in press; see Gopnik & Wellman, 2012; Xu, 2019). Sleep-sharing also involves multiple features that may sum to strongly signal an intimate relationship: shared resources, physical touch, prolonged proximity, biological exchange, and mutual vulnerability—the last of which is not lost on young children, who recognize by age 5 that sleeping agents have reduced environmental awareness (Barrett & Behne, 2005; Carey, 1985). Together, these accounts motivate the prediction that sleep-sharing interactions serve as powerful and early-emerging cues to familial and caring relationships.

The Present Investigation

Here we examined the development of social reasoning about shared sleep arrangements, testing how 5–7-year-old children and adults reason about children's sleep-sharing partners. In Study 1, we tested if children and adults associate sleep-sharing with family by asking them to judge who a child protagonist shared with: family (parent, sibling), or a familiar non-family member (friend, teacher). We compared sharing of sleep items to toys, which served as control items. We also compared these to items children are known to associate with family: food likely involving saliva-sharing (Thomas et al., 2022). In Study 2, we tested if children and adults infer caregiving relationships from shared sleep arrangements, asking them to predict whether a child's sleep-sharing partner would provide physical comfort to the now-distressed child. We contrasted sleep-sharing to toy-sharing (as a control) and saliva-sharing (as a comparison).

Unless otherwise stated, the methods, stimuli, sample sizes and analyses presented here were preregistered, and are available on Open Science Framework (OSF; https://osf.io/vjtdc/). All study procedures were approved by the University of California, San Diego Institutional Review Board (Protocol No. 161173).

Study 1

To test if people associate sleep-sharing with family from early in life, children and adults were tasked with indicating whether a child protagonist chose to share their personal sleep arrangement (tent, sleeping bag) with family or affiliated non-family (specifically, parent vs. teacher; sibling vs. friend), using an adapted procedure from Thomas and colleagues (2022). Two other kinds of sharing events from Thomas and colleagues (2022) were included for comparison: (1) toy-sharing trials as a control measure (Legos, a scooter), and (2) saliva-sharing trials (licking ice cream, drinking from a juice box with one straw), because children link these interactions to family.

We hypothesized that if people possess an early-emerging understanding of sleep-sharing as a privileged, intimate interaction, then even young children should expect other children to sleep-share more often with family than with familiar non-family members. In this case, children should expect sleep-sharing to occur with family more often than they do toy-sharing. If sleep-sharing is as powerfully linked to family relationships as saliva-sharing (Thomas et al., 2022), both behaviors should yield similarly high family-selection rates.

We tested children ages 5–7 years to allow for direct comparison to previous work (Thomas et al., 2022). A simulation-based power analysis using trials we sought to replicate (Thomas et al., 2022) indicated we would achieve 81.32% power at $N = 28$. We thus collected responses from a sample of 28 5-year-olds, 28 6-year-olds, and 28 7-year-olds (total $N = 84$), and a similarly sized sample of adults ($N = 84$).

Method

Participants. 84 children ($M = 6.46$ years, range: 5.03–7.93; 39 boys, 45 girls) were tested from November through December 2023. Six children were tested but excluded for preregistered reasons. Children were of the following racial and/or ethnic backgrounds: 1.19% African American or Black, 11.90% Asian American or Asian, 17.86% Hispanic or Latinx, 46.43% White, 4.76% another race and/or ethnicity, 8.33% two or more races and/or ethnicities (9.52% not provided).

84 adults ($M = 43.88$ exact years, range: 25–75; 39 men, 45 women) were tested online (www.prolific.com) in January 2024. All adults were compensated $0.80. Sixteen additional adults were tested but excluded for preregistered reasons. Adults were of the following racial and/or ethnic backgrounds: 13.10% African American or Black, 2.38% American Indian or Alaskan Native, 7.14% Asian American or Asian, 73.81% White, 1.19% another race and/or ethnicity, 2.38% two or more races and/or ethnicities.

Design. Participants completed six experimental trials in a 3 (Sharing Type: Sleep vs. Saliva vs. Toys) x 2 (Partner Type: Child vs. Adult) within-subjects design. All trials featured a child protagonist. For each Sharing Type, one trial featured child social partners, while the other trial featured adult social partners. Trials were presented in a blocked order by Sharing Type. The order of blocks, the order of trials within blocks, and the pairing of Sharing Type with Partner Type was evenly randomized (approximately counterbalanced) across participants.

Procedure and Stimuli. Children and adults completed the same task, except that children were read the stimuli by trained experimenters while adults independently completed the study online. Children completed two warm-up trials to

ensure they could remember and track a protagonist's two social partners (adapted from Thomas et al., 2022).

To introduce the task context, children and adults were shown a picture of a group of people gathered at an outdoor setting (adapted from Thomas et al., 2022). They were told that a lot of friends and family were gathered at a summer camp, and that they (the participant) would be helping the experimenter figure out who shared with whom.

Then, participants completed six experimental trials. Each trial featured a novel child protagonist and two social partners (gender-matched to participant). Participants were told that the protagonist shared either a sleep arrangement (tent, sleeping bag); food involving saliva-sharing (ice cream, juice box); or a toy (Legos, scooter). At test, they judged whether the protagonist shared with their family member (parent; sibling) or a familiar non-family member (teacher; friend) (e.g., "Charlie is going to sleep in his sleeping bag. Charlie shared his sleeping bag with one of these people by letting them sleep in his sleeping bag too. Who do you think Charlie shared with, his dad/brother or his teacher/friend?").

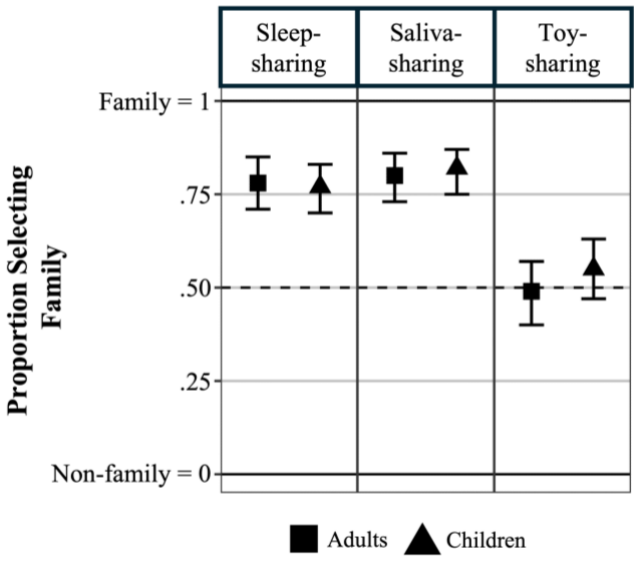

Figure 1: Study 1 adult and child results. Points denote Bayesian proportions; error bars denote credible intervals.

Results

As preregistered, we analyzed participants' responses that the sharing occurred with family (vs. non-family) using mixed logistic regressions and nested model comparisons. The dependent variable was selection of the family member or affiliated non-family member (Family = 1, Non-family = 0); the predictors were "Sharing Type" (3: Toys, Saliva, Sleep), "Partner Type" (2: Child vs. Adult), and 'participant' (as a random effect to control for the repeated measures design). In addition, we tested for effects of "Age" for child participants (continuous in decimal values; e.g., 5.71). We tested for "Gender" effects, but due to largely consistent non-significant effects (and for the sake of space), we do not further discuss these analyses. A random effect of 'trial' was ultimately excluded because doing so resulted in a better model fit and avoided overparameterization (see Muradoglu et al., 2023). To best account for study design and mirror previous work (Thomas et al., 2022), we used Bayesian statistics to calculate predicted probability means/estimates and 95% confidence/credible intervals. Unless otherwise noted, all frequentist statistics presented here align with results of Bayesian analyses (see OSF).

Adult Judgments. Adults' responses showed significant main effects of both Sharing Type, $\chi^2 = 62.07$, BF > 1,000, $p < .001$, and Partner Type, $\chi^2 = 126.86$, BF > 1,000, $p < .001$. An exploratory analysis revealed the interaction between Sharing Type x Partner Type was not significant. The main effect of Partner Type emerged because adults chose parents over teachers more often than they chose siblings over friends ($\beta = 2.99$, $p < .001$).

As predicted, adults more often expected sleep-sharing to occur with family than toy-sharing ($\beta = 2.04$, $p < .001$; see Figure 1). Adults similarly chose family more often on saliva-sharing trials than toy-sharing trials ($\beta = 2.20$, $p < .001$), in line with Thomas and colleagues (2022). Adults reasoned similarly about sleep-sharing and saliva-sharing, choosing family at high and similar rates ($p = .626$).

Child Judgments. Like adults, children's responses showed significant main effects of both Sharing Type, $\chi^2 = 32.92$, BF > 1,000, $p < .001$, and Partner Type, $\chi^2 = 13.92$, BF = 598.22, $p < .001$. Age was not a significant predictor. An exploratory analysis revealed the Sharing Type x Partner Type interaction was not significant. Like adults, the significant effect of Partner Type emerged because children chose parents over teachers more often than they chose siblings over friends ($\beta = 0.78$, $p < .001$).

As predicted, children more often expected sleep-sharing to occur with family (vs. non-family) than toy-sharing ($\beta = 1.05$, $p < .001$; see Figure 1). Children similarly chose family more often on saliva-sharing trials than toy-sharing trials ($\beta = 1.36$, $p < .001$), replicating Thomas and colleagues (2022). Children reasoned similarly about sleep-sharing and saliva-sharing, choosing family at high and similar rates ($p = .273$).

An exploratory analysis tested if children's responses were predicted by parent reports of sleep-sharing history, based on the prompt: "Is [your child's usual sleep arrangement] normally shared?" ($n = 75/84$). Parents could select one of three options: yes, sometimes, and no. However, this analysis revealed that children's personal experience was not a significant predictor of their task responding ($p = .479$).

Discussion

The present findings demonstrate that children and adults expect sleep-sharing to occur selectively with family, reasoning similarly about sleep-sharing and saliva-sharing interactions. This is notable: Sleep-sharing was as robustly tethered to family as saliva-sharing, which has been argued to be a highly weighted, diagnostic cue to intimate and close relationships (Thomas et al., 2022; see Thomas, in press).

Children and adults generally expected child protagonists to preferentially share sleep arrangements, saliva-sharing interactions, and toys with their parents over teachers, and held less systematic expectations for siblings and friends. This suggests that by age 5, people consider these different relationships in a nuanced way, forming expectations of behavior that differ across and within family and non-family.

It remains an open question whether children and adults use sleep-sharing to generate systematic predictions about caregiving behaviors. Infants appear to do so for other intimate behaviors: When a protagonist appeared in distress, infants looked longer to a partner who previously initiated a saliva-sharing (vs. ball-passing or forehead touching) interaction, as if expecting this partner to respond (e.g., to provide comfort or other care; Ciftci et al., 2025; Thomas et al., 2022). Intimate, touch-based interactions have yielded similar findings with children (Woo et al., 2025). If sleep-sharing serves as a signal of a caregiving relationship, then knowing that a child chose to share their sleep arrangement with a particular adult should lead participants to infer that the relationship carries caregiving obligations, such as responding in a comforting way to a partner's distress (Crittenden, 1999; Thomas et al., 2022, 2025). This may be challenging for children: To predict that one adult in particular will provide care, children must form relational expectations of how adults will behave toward the child, despite only knowing how the child has previously behaved toward the adult (see Tatone et al., 2015; Liberman & Shaw, 2017, 2018, 2019). In Study 2, we investigated whether children and adults make these more complex inferences.

Study 2

To test if sleep-sharing signals caregiving relationships, children and adults were presented with scenarios involving child protagonists and two adult partners, and asked to predict which partner would respond to the protagonist's distress. On each trial, a child protagonist shared a unique sleep-sharing, saliva-sharing, or toy-sharing interaction with each adult partner. Then, the protagonist became distressed, and participants predicted which of the two partners responded by giving the child a hug to help them feel better ('Comfort' trials). To test whether child and adult participants made specific predictions about caregiving behavior rather than broad behavioral predictions, we compared 'Comfort' trials to control trials. On these trials, participants predicted which adult responded to the child protagonist's excitement by playing a game of tag ('Tag' trials).

If sleep-sharing is considered a reliable signal of a caregiving relationship from early in life, then children and adults should systematically predict that a sleep-sharing adult will provide physical comfort, over a toy-sharing adult (as in Thomas et al., 2022, for saliva- vs. toy-sharing partners). Toy-sharing, in contrast, may not be diagnostic of an intimate relationship or of an obligation to provide care. Instead, it may show a tendency to engage in joint play. If so, then people should more reliably select the toy-sharing partner when predicting who will play tag with the child protagonist and, in contrast, more often select the sleep- and saliva-sharers when predicting comfort.

Method

Participants. 84 children (M = 6.46 years, range: 5.01–7.99 [2 birthdays not reported]; 45 boys, 39 girls) participated from May through October 2024. Three children were tested but excluded for preregistered reasons. Children were of the following racial and/or ethnic backgrounds: 10.71% Asian American or Asian, 9.52% Hispanic or Latinx, 1.19% Native Hawaiian or Pacific Islander, 38.10% White, 13.10% two or more races and/or ethnicities (27.38% not provided).

84 adults (M = 38.08 exact years, range: 25–62; 34 men, 50 women) participated online (www.prolific.com) in May 2024. All participants were compensated $1.20. Four participants were tested but excluded for preregistered reasons. Adults identified with the following races and/or ethnicities: 4.76% African American or Black, 10.71% Asian American or Asian, 5.95% Hispanic or Latinx, 71.43% White, 1.19% another race and/or ethnicity, 5.95% two or more races and/or ethnicities.

Design. Participants completed six experimental trials in a 3 (Sharing Contrast: Sleep vs. Saliva; Sleep vs. Toys; Saliva vs. Toys) x 2 (Predicted Behavior: Comfort vs. Tag) within-subjects design. All trials featured one child protagonist and two adult social partners. Trials were presented in a blocked order by Behavior. The order of blocks, trials within blocks, Stimuli Set (2: A vs. B), and side of sharing (2: left vs. right) were programmed to evenly randomize (resulting in an approximate counterbalance) across participants.

Procedure and Stimuli. Children and adults completed the same task, using similar methods to Study 1. To introduce the task context, participants were told they would learn which characters shared what the day before ("yesterday") and predict what the characters did today ("this morning"). Then, participants were presented with the six experimental trials.

Each trial featured three characters: a child protagonist, and their two adult social partners (gender-matched to the participant). The child protagonist was described as knowing both adults, and having shared something distinct with each adult the day before: a sleep arrangement (tent, sleeping bag), saliva-sharing interaction (ice cream cone, juice box with one straw), or a toy (bubbles, chalk). We changed the toys from Study 1 to be more easily consumable items, to lessen the possibility that children would think one character had the toy during test trials (which could influence reasoning; e.g., expecting the toy itself to soothe the distressed child). Each sharing interaction was described verbally, and the item shown between the two involved characters. Sharing interactions were not directly pictured.

The protagonist was next depicted with an emotional expression, either distress or excitement, in the center equidistant from each adult. Participants were asked to predict which adult provided physical comfort to the child in distress (giving them a hug to help them feel better;

'Comfort' trials), or which adult played tag with the excited child ('Tag' trials). Participants completed three Sharing Contrast trials for each of the two predicted behaviors: (1) sleep-sharing vs. saliva-sharing; (2) sleep-sharing vs. toy-sharing; and (3) saliva-sharing vs. toy-sharing.

Results

We analyzed participants' predictions using two-tailed binomial tests. We then analyzed participants' responses for each "Sharing Contrast" (3: Sleep vs. Saliva; Sleep vs. Toys; Saliva vs. Toys) using mixed logistic regressions and nested model comparisons. The dependent variable was selection of the predicted social partner [Coding on each Sharing Contrast: Sleep (= 1) vs. Saliva (= 0); Sleep (= 1) vs. Toy (= 0); Saliva (= 1) vs. Toy (= 0)]; the predictor variables were "Predicted Behavior" (2: Comfort vs. Tag), and included a random effect of participant. As in Study 1, we tested for effects of stimulus/participant "Gender", "Stimuli Set" (2: A vs. B), and "Age" for child participants (continuous in decimal values). Gender was non-significant in all analyses; Stimuli Set was a significant predictor of saliva-sharing vs. toy-sharing contrasts, and adults' sleep vs. saliva-sharing contrasts (for further details, see OSF). All frequentist statistics here align with Bayesian analyses (see OSF).

Sleep-sharing vs. Saliva-sharing Contrasts. On comfort trials, adults judged that the sleep-sharer would provide comfort, choosing them over the saliva-sharer (72 of 84 selected the sleep-sharer; prop. = 0.86, $p < .001$). In contrast, on tag trials, adults selected the sleep-sharer and the saliva-sharer at similar rates (37 of 84 selected the sleep-sharer: prop. = 0.44, $p = .326$). The models yielded a significant main effect of Predicted Behavior, $\chi^2 = 38.46$, BF > 1,000, $p < .001$, because adults selected the sleep-sharer more often on comfort versus tag trials ($\beta = 2.64$, $p < .001$; see Figure 2).

In contrast to adults, but in line with predictions, children were no different from chance in selecting the sleep-sharer or saliva-sharer on either comfort or tag trials (ps > .445). Age was non-significant. Because Predicted Behavior was the sole predictor variable left in the model, we conducted a Chi-squared test instead of the preregistered model. This analysis revealed the main effect of Predicted Behavior was non-significant ($p = .355$), indicating children did not reason differently about sleep-sharers and saliva-sharers.

Sleep-sharing vs. Toy-sharing Contrasts. As predicted, on comfort trials, adults judged that the sleep-sharer would provide comfort, choosing them over the toy-sharer (72 of 84; prop. = 0.86, $p < .001$). Also as predicted, adults instead chose the toy-sharer on tag trials (70 of 84; prop. = 0.83, $p < .001$). The main effect of Predicted Behavior was significant, $\chi^2 = 74.46$, BF > 1,000, $p < .001$, driven by adults tending to select the sleep-sharer on comfort trials and the toy-sharer on tag trials ($\beta = 17.05$, $p < .001$). On comfort trials, children responded as predicted, though with a smaller effect size than adults: Children also judged that the sleep-sharer would provide comfort over the toy-sharer (52 of 84; prop. = 0.62, $p = .038$). In contrast, children's judgments were no different from chance on tag trials (39 of 84 selected sleep-sharer; prop. = 0.46, $p = .586$). The main effect of Age was non-significant. Because Predicted Behavior was the sole predictor variable, we deviated from our preregistration and instead conducted a Chi-squared test. The main effect was significant, $\chi^2 = 4.33$, $p = .037$, indicating that children predict that sleep-sharers will provide comfort rather than play tag. The Bayesian intervals for the comfort and tag trials overlapped, although the comfort trials' intervals were above and not overlapping with chance-level responding (see OSF). We take these analyses as indicating that the comfort and tag blocks were not robustly different, while also substantiating the notion that children consider sleep-sharers as likely caregiving partners.

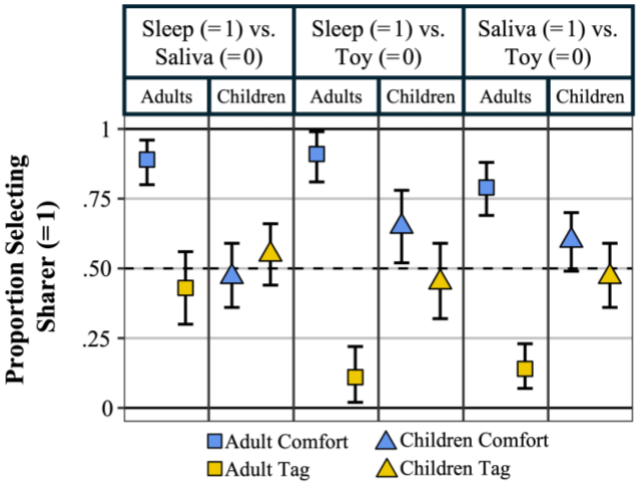

Figure 2: Study 2 adult and child results. Points denote Bayesian proportions; error bars denote credible intervals.

Saliva-sharing vs. Toy-sharing Contrasts. Adults again responded as predicted: On comfort trials, they tended to select the saliva-sharer over the toy-sharer (65 of 84; prop. = 0.77, $p < .001$); on tag trials, they tended to select the toy-sharer over the saliva-sharer (71 of 84; prop. = 0.85, $p < .001$). The model revealed a significant main effect of Predicted Behavior, $\chi^2 = 70.35$, BF > 1,000, due to adults selecting the saliva-sharer on comfort trials and the toy-sharer on tag trials ($\beta = 3.01$, $p < .001$).

In contrast, children selected the partners at equal rates and were no different from chance, both on tag trials (40 of 84 selected saliva-sharer; prop. = 0.48, $p = .744$) and comfort trials (50 of 84 selected saliva-sharer; prop. = 0.60, $p = .101$). The model revealed significant main effects of Age, $\chi^2 = 6.66$, BF = 14.31, $p = .010$, because children selected saliva-sharers less with age ($\beta = -0.53$, $p = .012$). The model revealed a non-significant main effect of Predicted Behavior, $\chi^2 = 2.23$, BF = 2.81, $p = .136$, indicating participants did not expect saliva-sharers (vs. toy-sharers) to either comfort or play tag.

Discussion

We provide evidence that both children and adults predict caregiving behaviors based on children's chosen sleep-sharing interactions. As hypothesized, adults (robustly) and children (with a smaller effect size) predicted a sleep-sharer to provide physical comfort, as compared to a toy-sharer. Participants' expectations of sleep-sharers were also specifically about caregiving interactions, rather than play. For tag trials, adults predicted joint play behavior from prior toy-sharing (as compared to sleep- and saliva-sharing), whereas children did not systematically predict future play behavior from the sharing interactions. Adults also robustly selected a sleep-sharing partner over a saliva-sharing partner as likely to provide comfort. This finding suggests that adults' mature concepts treat sleep-sharing as more systematically diagnostic of caregiving relationships than saliva-sharing (at least, in the forms depicted in our stimuli). This notion is supported, in part, by children's failure to use saliva-sharing to predict comforting behavior in the current study (see Ciftci et al., 2025; Thomas et al., 2022).

We propose two factors that may explain why children's judgments showed smaller effect sizes than adults'. First, young children tend to expect people to help others, regardless of their social relationship; only around age 6 do children robustly expect only closer social partners to help and provide comfort, judge these behaviors as obligatory, and deem partners who fail to act in these ways as 'meaner' (Marshall et al., 2020, 2022; see Marshall, Wilks, et al., 2025). Second, younger children especially associate closer relationships with intentional proximity and private interactions (Liberman & Shaw, 2019; Yang & Liberman, 2025). Together, these factors suggest that children's ability to selectively weight particular cues over others (e.g., sleep-sharing vs. any positive interaction) becomes more robust with development.

The task did possess several methodological factors that may have dampened children's comprehension. Our task required children to imagine and remember the supposed interactions between characters without seeing them directly (because the stimuli had an abstract, iconographic depiction rather than a direct illustration of sharing events like sharing a sleeping bag or licking the same ice cream). In addition, the task required use of time-based concepts ("yesterday"; "this morning") which are still developing at this age (see Tillman & Barner, 2015; Tillman et al., 2017); and behavior-to-behavior predictions, which emerge throughout the lifespan (see Heyman, 2009; Powell, 2022; Sommerville, 2024). These factors motivated Study 3.

Preview of Study 3

A recently-finished, preregistered follow-up with 5–11-year-old children (n = 196) and adults (n = 196) replicates and extends the Study 2 findings, employing a simplified, more clearly illustrated, and slightly modified conceptual replication. When predicting who would more quickly respond to a child protagonist's distress, child participants (like adults) selected the child's chosen sleep-sharing adult partner over their chosen toy-sharing adult partner by age 7, and over their chosen saliva-sharing adult partner by age 8 (see OSF for details). These patterns strengthened with age.

General Discussion

The present studies show that from childhood, shared sleep arrangements are seen as meaningful social cues. 5–7-year-old children and adults systematically linked children's shared sleep arrangements to family members, and also used sleep-sharing behavior to predict who would provide care. In our tasks, the link between sleep-sharing and family/ caregiving was as strong as or stronger than the link to saliva-sharing, a behavior previously shown to signal close and intimate relationships (Thomas et al., 2022).

The present findings are consistent with the idea that children have an early emerging intuitive theory of social relationships integrating concepts of intimacy (Thomas, in press; Thomas et al., 2025) and care (Powell, 2022). The developmental pattern across studies is noteworthy: While children robustly mapped sleep-sharing to family relationships by ages 5–7 years, their understanding of how sleep-sharing relates to caregiving behavior showed a smaller effect size than adults', suggesting that this reasoning may have a longer developmental trajectory (see also Study 3).

Our stimuli depicted sleep sharing in a limited set of contexts. Future work using a broader set of stimuli may further characterize factors influencing children's and adults' reasoning about the extent to which sleep has social meaning (e.g. duration of sleep-sharing; amount of physical contact; whether sleep-sharing was freely chosen). Future work to characterize intuitive theories of relationships may also examine the range of concepts that are involved in this reasoning (e.g., trust; care; intimacy), and test for the interconnectedness of these social inferences (e.g., Yu et al., 2025) across the lifespan.

Future work also is needed to test for cultural universals and differences, both in younger populations and across cultures. Enculturation and experience likely play important roles in shaping teaching and learning about which behaviors are most diagnostic of others' close social relationships (see Gweon, 2021; Shutts & Kalish, 2021; Thomas et al., 2022). A related direction concerns the role of first-person experience: Although reports of sleep-sharing experience at home did not predict children's reasoning in Study 1, there may be other experience-based factors influencing their performance. For example, U.S. children who attend preschool (ages 3–5 years) regularly sleep near schoolmates and trusted teachers, who likely serve as intimate and caring social partners to some degree. Future work may explore whether this early experience predicts children's variable judgments (e.g., in Study 2).

To conclude, sleep-sharing—though not an overtly interactive social behavior—hooks into social reasoning systems from early in life. From childhood, people use their knowledge of sleep-sharing to reason about unobservable social relationships, in turn supporting their effective navigation of the social world.

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