

Supporting Information:

Children seek help based on how others learn

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Methods

Participants

Here we include more details on the distribution of ages for Experiments 1 - 3. Figures 1, 2, 3 display the histogram of ages for each experiment. In Experiment 1, the mean age was 60.66 months and range was 36.69 months to 83.74 months ($SD = 13.61$ months); the median age was 60.36 months. In Experiment 2, the mean age was 67.63 months and range was 36.66 months to 96.03 months ($SD = 17.46$ months); the median age was 67.79 months. In Experiment 3, the mean age was 75.71 months and range was 48.23 months to 107.97 months ($SD = 16.06$ months); the median age was 75.42 months.

Results

Here we provide additional details on the outcome of the formal model comparisons described in the main text, and on the reliability analyses.

Experiment 1

Main Analyses. To examine children’s learner choice both within and across toy trial, we fit a mixed effects Bayesian multinomial (categorical) regression predicting children’s learner choice (categorical, 3-levels: Active, Instructed, Passive with Active dummy coded as the reference category) with a fixed effect of toy trial (categorical, 3-levels: Original, Similar, Different with Original dummy coded as the reference category) and a random intercept by subject. In addition to this model, we also fit a model with simple effects of toy and age (continuous), as well as a model with simple effects of toy and age, and their interaction. We conducted a formal model comparison using an approximate Bayesian model comparison method described in the main text.

The model comparison model weights were: 0.573 for the model with the single predictor of toy, 0.417 for the model with simple effects of toy and age, and 0.010 for the interactive model. The highest model weight was on the model with the single predictor of toy (i.e., $learner\ choice \sim toy + (1|subject)$), indicating that this model was preferred. The results for this model are presented in the main text.

Exploratory Analyses with Memory. To examine potential relations between children’s performance on the memory questions and their learner choice, we fit two exploratory Bayesian multinomial (categorical) regressions predicting children’s learner choice (categorical, 3-levels: Active, Instructed, Passive with Active as the reference category) with (1) simple effects of toy trial (categorical, 3-levels: Original, Similar, Different with Original as the reference category) and memory score (coded as an integer from 0-3) and (2) simple effects of toy trial and memory score, and their interaction. Formal model comparison of a model with the single predictor of toy and these models with memory score as a predictor preferred the model with the single predictor of toy (model comparison weights: 0.760 for model with single predictor of toy, 0.226 for model with simple effects of toy and memory score, and 0.013 for the interactive model). These analyses and the formal model comparison indicate that children’s memory score did not predict their learner choice in Experiment 1.

Reliability Analysis. In order to assess the reliability of our data, an individual blind to the research questions and hypotheses of the experiment was asked to randomly select 25% of the video recordings ($n = 30$) of the testing sessions and code participants’ learner choice on the help-seeking (toy) trials and memory task. We analyzed the agreement between the data collected by the experimenter and those collected by the independent coder by computing the intraclass correlation coefficient (ICC) with a two-way random effects model and single unit. The model showed excellent reliability on participants’ learner choice (ICC = .99, 95% CI [.98, .99]; $F(30, 31) = 209, p < .001$.) and memory (ICC = .94, 95% CI [.88, .97]; $F(29, 29.5) = 32.8, p < .001$.)

Experiment 2

Main Analyses. To examine children’s learner choice both within and across toy trial, we fit a mixed effects Bayesian logistic regression predicting children’s learner choice (Active vs. Instructed) with fixed effects of toy trial (categorical, 3-levels: Original, Similar, Different with Original dummy coded as the reference category), age in months (continuous and centered), and their interaction, including a random intercept by subject. In addition to this model, we also fit a model with simple effects of toy and age (continuous), as well as a model with toy as a single predictor. Formal model comparison preferred the model with simple effects of toy and age, and their interaction (model comparison weights: 0.425 for interactive model, 0.322 for model with single predictor of toy, and 0.253 for model with simple effects of toy and age). The results for the interactive model (i.e., $learner\ choice \sim toy * age + (1|subject)$) are presented in the main text.

Exploratory Analyses with Memory. We again conducted exploratory analyses to see if memory score predicted learner choice. We fit two mixed effects Bayesian logistic regressions predicting children’s learner choice (Active vs. Instructed) with (1) simple effects of toy trial (categorical, 3-levels: Original, Similar, Different with Original dummy coded as the reference category) and memory score (coded as an integer from 0-2) and (2) simple effects of toy trial and memory score, and their interaction. Formal model comparison of a model with the single predictor of toy and these models with memory score as a predictor preferred the model with effects of toy trial and memory score, and their interaction. We provide additional details on this interactive model in the main text. The model weights for the model comparison were: 0.644 for the interactive model, 0.263 for the model with the single predictor of toy, 0.092 for the model with simple effects of toy and memory.

Reliability Analysis. An independent person blind to the research questions was asked to randomly select 25% of the video recordings ($n = 47$) of the testing sessions and code participants’ learner choice on the help-seeking (toy) trials and

memory task to assess the reliability of our data. To do so, we analyzed the agreement between the data collected by the experimenter and those collected by the independent coder by computing the intraclass correlation coefficient (ICC) with a two-way random effects model and single unit. The model showed excellent reliability on participants' learner choice (ICC = .92, 95% CI [.87, .95]; $F(46, 46) = 25.4, p < .001.$) and memory (ICC = .94, 95% CI [.89, .96]; $F(47, 47) = 32.8, p < .001.$).

Experiment 3

Main Analyses. To examine children's learner choice both within and across toy trial, we fit a mixed effects Bayesian logistic regression predicting children's learner choice (Deliberate vs. Accidental) with fixed effects of toy trial (categorical, 3-levels: Original, Similar, Different with Original dummy coded as the reference category) and age in months (continuous and centered), including a random intercept by subject. In addition to this model, we also fit a model with simple effects of toy and age, and their interaction, as well as a model with toy as a single predictor. Formal model comparison preferred the model with simple effects of toy and age, so we report the results of this analysis in the main text (i.e., $learner\ choice \sim toy + age + (1|subject)$). The model weights for the model comparison were: 0.744 for the model with simple effects of toy and age, 0.135 for the model with a single predictor of toy, and 0.121 for the interactive model.

Exploratory Analyses with Memory. As in Experiments 1 and 2, we conducted exploratory analyses to see if memory score predicted learner choice. We fit two mixed effects Bayesian logistic regressions predicting children's learner choice (Deliberate vs. Accidental) with (1) simple effects of toy trial (categorical, 3-levels: Original, Similar, Different with Original dummy coded as the reference category) and memory score (coded as an integer from 0-2) and (2) simple effects of toy trial and memory score, and their interaction. Formal model comparison revealed that a mixed effects Bayesian logistic regression predicting learner choice with the single predictor of

toy trial was preferred over models (1) and (2), which included memory score as a predictor. The model weights for the model comparison were: 0.525 for the model with a single predictor of toy, 0.415 for the model with simple effects of toy and memory, and 0.060 for the interactive model. These analyses and the formal model comparison suggest that children's memory score did not predict their learner choice in Experiment 3.

Reliability Analysis. An independent person blind to the research questions was asked to randomly select 25% of the video recordings ($n = 58$) of the testing sessions and code participants' learner choice on the help-seeking (toy) trials and memory task to assess the reliability of our data. To do so, we analyzed the agreement between the data collected by the experimenter and those collected by the independent coder by computing the intraclass correlation coefficient (ICC) with a two-way random effects model and single unit. The model showed excellent reliability on participants' learner choice (ICC = .95, 95% CI [.93, .97]; $F(57, 57.5) = 47.5, p < .001.$) and memory (ICC = .96, 95% CI [.93, .96]; $F(57, 57.5) = 51.3, p < .001.$).

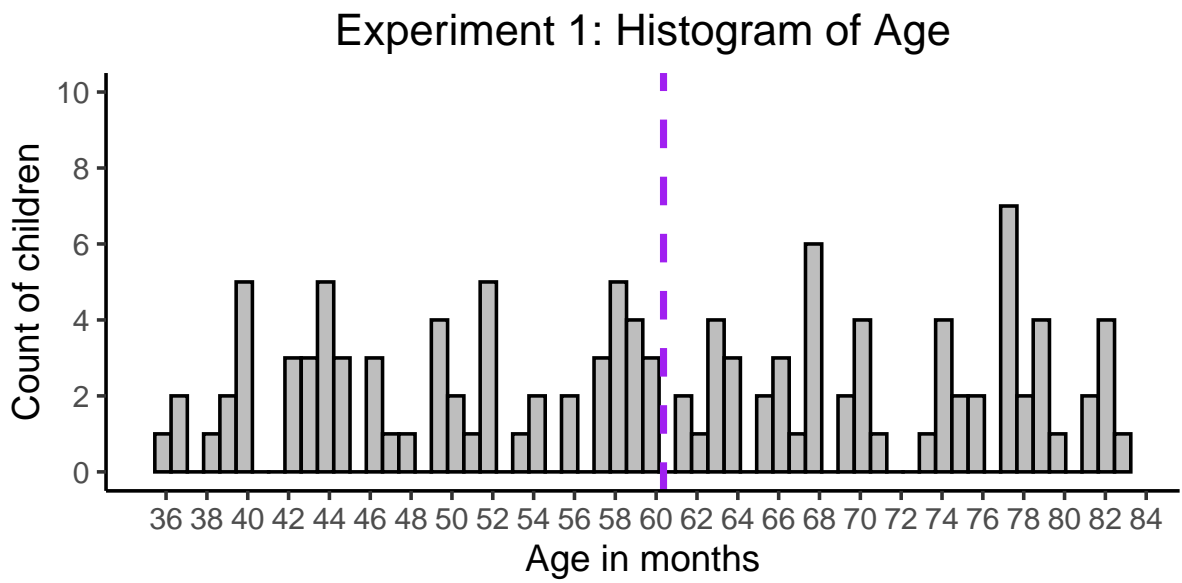


Figure 1. Experiment 1: Histogram of Age. Age bins are in months (x-axis) and count of children per bin is displayed on the y-axis. Purple dashed vertical line is the median age (60.36 months).

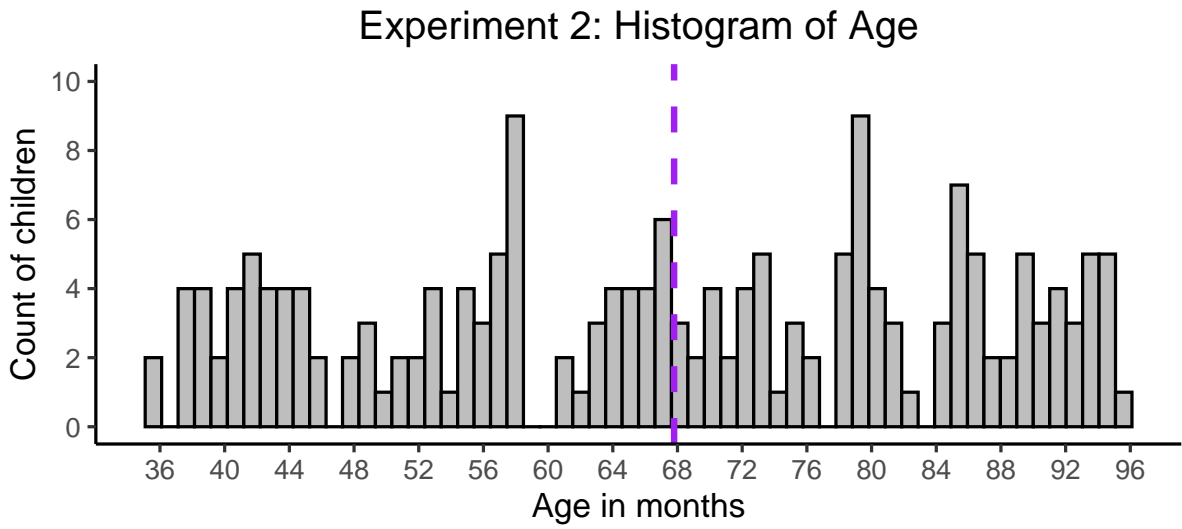


Figure 2. Experiment 2: Histogram of Age. Age bins are in months (x-axis) and count of children per bin is displayed on the y-axis. Purple dashed vertical line is the median age (67.79 months).

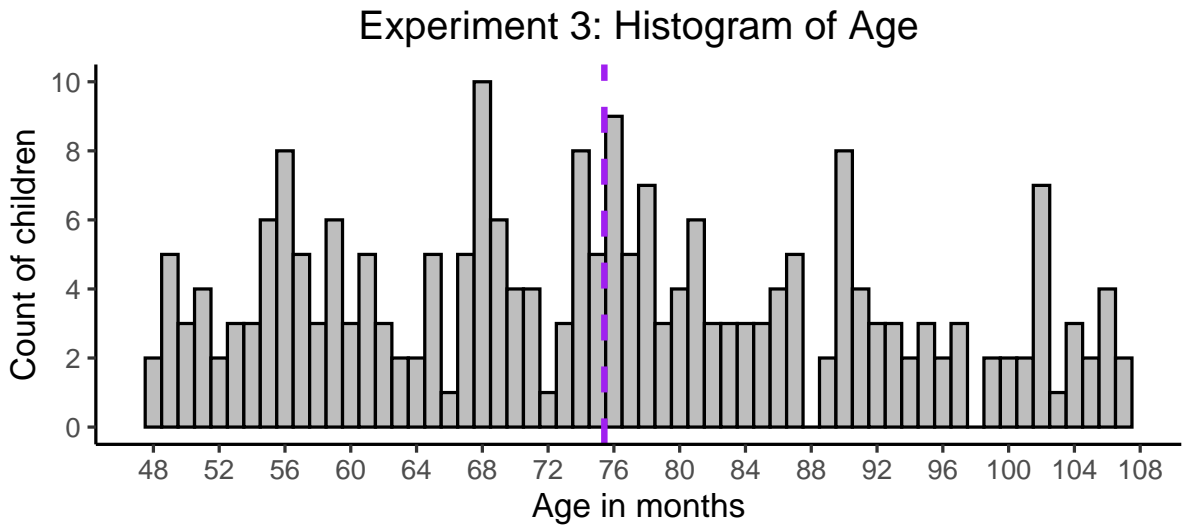


Figure 3. Experiment 3: Histogram of Age. Age bins are in months (x-axis) and count of children per bin is displayed on the y-axis. Purple dashed vertical line is the median age (75.42 months).