Constant curiosity? Children and adults prefer to ask “why” questions about variability over constancy

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Abstract

Children and adults frequently ask, “Why?” Here, we examined *which* “why” questions learners ask, hypothesizing that they are more curious to know why things *vary* versus are *constant*. Informed by the Explanation-Seeking Curiosity Model (Liquin & Lombrozo, 2020), we predicted that explanatory curiosity about variability aligns with participants’ judgments that (1) they will *learn* more when asking about variability (i.e., the explanations are complex, rather than simple), and (2) explanations for variability are more *useful*. Two pre-registered experiments with children and adults (total $N = 164$) supported these hypotheses. Children and adults *generated* and *selected* “why” questions about variability more than constancy, reasoned that constancy has *simpler* explanations, and evaluated variability as more *useful* to explain in everyday life. Perceived utility, but not simplicity, predicted participants’ question preferences. We discuss how explanatory curiosity about variability may be leveraged by educators, but also caution that children and adults may underexamine important constants.

Keywords: curiosity; questions; development; variability

Introduction

From early in development, children want to know “why” (Callanan & Oakes, 1992). In a single day, a child can ask over one hundred questions, many of which seek causal explanations (Chouinard et al., 2007; Engel, 2011; Tizard et al., 1983). Moreover, children persist in asking questions when they receive non-explanations (Frazier et al., 2009). This insistence on explanatory information is justified: Causal explanations are critical for building mental models that allow us to predict, intervene upon, and explore the world effectively (Keil, 2024).

Given limited time and cognitive resources, however, children cannot ask about everything–their curiosity must be selective. The Explanation-Seeking Curiosity Model (Liquin & Lombrozo, 2020b; Lombrozo & Liquin, 2023) proposes two factors that influence this selectivity. First, learners are more curious when they anticipate *learning opportunities*. Anticipated learning is tied to the perceived *novelty* of the information to be gained (i.e., something previously unknown; Liquin & Lombrozo, 2020a) and its *complexity* (e.g., anticipating an explanation with many parts to it; Zemla et al., 2017). Second, learners want to know “why” when the information has *future utility*, such as being useful for everyday life. Indeed, adults report being more interested in “why” questions (e.g., in questions from the *Reddit Explain Like I’m Five* webpage) when they judge that the answer “would teach you something new” (anticipated learning) and “would be useful to you in the future” (future utility) (Liquin & Lombrozo, 2020a).

While the Explanation-Seeking Curiosity Model describes triggers that make any given “why” question appealing, we propose that certain aspects of the world may *systematically* elicit more “why” questions than others. That is, we apply the model to make predictions about the focus of “why” questions, specifically children’s curiosity about *variability* (i.e., why things are different) versus *constancy* (i.e., why things are the same). While causal explanations for both constancy and variability are important for understanding the world–e.g., it is useful to know why objects fall downward when dropped (constancy) *and* why some objects reach the ground faster than others (variability)–we propose that children will be more curious to know why things *vary*. Our research includes a comparison sample of adults to examine our hypothesis that this variability curiosity bias is stable across development.

Explanation-Seeking Curiosity about Variability over Constancy

Before motivating our proposal that children prefer to ask “why” questions about variability, we clarify that children *do* value information about constancy in certain contexts. For example, when seeking *descriptive* knowledge about social categories and artifacts (e.g., answers to “What” questions), children are sensitive to generic statements about constancy (e.g., “Vawns have freckles on their feet”; Noyes & Keil, 2019; Rhodes et al., 2012), and even remember and expect generic claims to be shared more than claims about individuals (Cimpian & Erickson, 2012; Cimpian & Scott, 2012). However, asking *what* is distinct from asking *why*. Consider the differences between students who ask, “*What* is on the exam?” versus “*Why* is this on the exam?” The present research addresses the latter type of question, questions that seek explanation.

Providing initial support for our proposal, learners from infancy onward show curiosity about a specific kind of variability–*violated expectations*, i.e., when the world *varies* from what is expected. Infants look longer at and explore objects that behave in unexpected ways (Stahl & Feigenson, 2015), and children and adults seek explanations for unexpected outcomes (Frazier et al., 2009; Wong & Weiner, 1981). Here, we propose that learners may have broad explanatory curiosity about *statistical* variability. Drawing on the Explanation-Seeking Curiosity Model (Liquin &

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Lombrozo, 2020b; Lombrozo & Liquin, 2023), we posit that the model's triggers of explanation-seeking curiosity–judgments of anticipated learning and future utility–may align more with variability than constancy.

Anticipated learning. Prior research on the inherence heuristic finds that children assume that constancy in their everyday lives–such as firetrucks being red and doctors wearing white coats–can be explained by simple, inherent causes (e.g., "Fire trucks are red just because they are fire trucks and fire trucks have to be red"; Cimpian & Steinberg, 2014). In contrast, children may assume that the causal mechanisms underlying variability are more complex. Indeed, children judge systems with more variable functions (e.g., a smartphone versus a flashlight) as having more complex insides (e.g., a greater number of internal parts; Ahl et al., 2020). Once judging a system as complex, children are more likely to ask for help to understand it (Kominsky et al., 2018). Although complexity judgments are not necessarily accurate–e.g., there may be a very complex history and set of current regulations that explain the ubiquity of red firetrucks and doctors' white coats (see, e.g., Horne et al., 2019)–children may nonetheless *assume* they will gain more information when asking "why" about variability, as it appears to be a signal of complexity.

Future utility. Causal explanations have *future utility* to the extent that they support intervention and prediction (Gopnik et al., 2004). Variability in outcomes may indicate to children that *intervention* is possible and, in turn, they judge seeking causal explanations as useful. In line with this idea, children and adults ask "what would have happened" (counterfactual curiosity) about outcomes they can change more than those outside of their control (FitzGibbon et al., 2019; Roese & Epstude, 2017). Even if an outcome is not amenable to intervention, explanations are still useful for *prediction*. For example, understanding why it rains more on certain days than others allows learners to anticipate rainfall and prepare accordingly. In contrast, prediction may seem less informative when outcomes are constant, and learners may reason that there is little possibility of intervention. Thus, children may judge explanations for constancy as having lower utility.

The Present Research

Which aspects of the world prompt children to ask "why"? In particular, are learners more inclined to seek explanations for variable or constant features of the world? In Experiment 1 (pre-registered), we sampled children aged 5 to 10 years old. Children show a robust interest in causal explanations by age 5 (Chouinard et al., 2007). Across early to middle childhood, children shift from focusing on a single object or hypothesis to asking more sophisticated questions (see Ruggeri et al., 2019), which may include a focus on variability information. We included an adult comparison sample in Experiment 2 (pre-registered) to test for expected developmental *continuity* in learners' explanatory bias toward asking "why" about variability, given that children and adults share curiosity about violated expectations (a specific type of variability).

Together, these studies have both theoretical and practical implications. Theoretically, we aim to specify which phenomena elicit "why" questions across the lifespan, extending prior research on explanation-seeking to the *content* of children's and adults' curiosity (Liquin & Lombrozo, 2020b; Lombrozo & Liquin, 2023). Practically, learners seek and remember information that they are more curious about (Fandakova & Gruber, 2021; Kang et al., 2009; Stahl & Feigenson, 2015). This research therefore informs parents and educators about the phenomena that spontaneously elicit curiosity, and, importantly, which phenomena may require educational interventions to draw learners' attention to and scaffold inquiry.

To assess whether learners privilege variability over constancy when asking "why," as well as its underlying triggers (anticipated learning and future utility), we presented participants with arrays of four entities (e.g., four bugs) that had at least one visible feature that *varied* across the individuals (e.g., some had spots, others had stripes) and one feature that was *constant* (e.g., all had yellow and black shells). Participants were asked to *generate* a question about the array, which we coded as variable or constant, and then asked to *choose* between a variable or constant question. We hypothesized that children and adults would generate and choose to ask "why" questions about variability more than constancy. Participants were then asked if they (a) already knew the answer to each type of question and (b) which question had an easier, simpler explanation (the inverse of complexity; see Liquin & Lombrozo, 2020a)–both of which were meant to assess (lower) *anticipated learning*. We expected participants to anticipate greater learning opportunities when asking the variability question. Finally, to assess *future utility*, participants were asked which question would be more useful to know the answer to for everyday life. We expected learners to judge the variability question as more useful. Importantly, participants completed measures across four topics (biological, social, perceptual, and fantastical) to assess whether explanatory curiosity about variability over constancy reflects a domain-general tendency rather than one restricted to specific content areas.

Experiment 1: Child Sample

Method

Participants. Eighty-four U.S. children ages 5 to 10 years old (M = 7.52 years, SD = 1.65 years; 49 girls, 35 boys) were recruited from public parks in the Los Angeles area.

Procedure and dependent measures. A research assistant interviewed children one-on-one with an iPad that presented the stimuli. Children completed the set of measures below for each of the four arrays (see Table 1 for the corresponding images). The stimuli spanned four domains: biological (bugs), perceptual (shapes), fantastical (creatures), and social (people). We counterbalanced the order from *bugs to people* or from *people to bugs*.

(1) Question preference: Generation As our first measure of question preferences, children were asked to *generate* a question spontaneously with the prompt, "Look at these four [bugs/shapes/creatures/people]! Think of one question about these four [bugs/shapes/creatures/people] that you want to know the answer to. What is your question?"

The prompt was designed to allow children to ask about variability *or* constancy, as well as explanatory *or* descriptive information. For example, we described the entities in very general terms (e.g., four "bugs" instead of four "cucumber beetles") so that children could ask about category identity–i.e., a *constant*, *descriptive* question. Two independent coders categorized children's questions in three steps. First, we coded the *syntax* of children's questions to examine whether children spontaneously asked "why" questions (coders showed perfect agreement; Cohen's κ = 1.00). The majority of the questions that children asked were "why" questions (75%). A few children asked "how come" or "what caused" (2% of all questions). Following Callanan and Oakes (1992), we added these questions to the category of "why" questions because they were asking for causal information (77% in total were "why" questions). The remaining responses were either coded as "non-causal" questions, which most often asked for descriptive information (e.g., "What kind of bugs are they?"; 13% of all questions), or as "non-questions," which were statements or no response (10% of all questions).

Third, as pre-registered, we coded *all* questions as either (a) "variable," which were questions about a property that varied across the entities (68% of responses), or (b) "constant," which were questions about a property that was shared across the entities (24% of responses). We also included codes for being (c) off-topic, in which children asked about a topic unrelated to the current trial (1% of responses), and (d) non-questions (6% of responses). Interrater agreement when coding these categories was high (Cohen's κ = 0.98). Sample variable and constant questions generated by children are presented in Table 1.

(2) Question preference: Selection For additional evidence of a bias toward variability, we examined whether children would still choose to learn about variability when *presented* with questions about variability *and* constancy. Indeed, an alternative possibility is that children *generate* questions about variability more easily, but are interested in constancy once it is brought to their attention. We thus presented pairs of "why" questions about variability and constancy in each domain (see Table 2). The prompt before presenting each pair of questions was, "I have two fun facts, but only enough time to tell you about one of them at the very end. Which one do you want to learn more about?" Importantly, we counterbalanced whether the variability or constancy question was presented first across participants.

We note that the "why" question pairs were matched in several ways: (1) Both questions asked about an observable

Table 1: Sample "why" questions spontaneously generated by children for each trial.

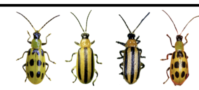
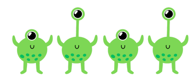
Trial	Image	Constant Question	Variable Question
Bugs		"Why are they all yellow?"	"Why are some striped and some dotted?"
Shapes		"Why are they shapes?"	"Why do two have different colors?"
Creatures		"Why are they so round?"	"Why are some short and some long?"
People		"Why is it only girls?"	"Why do they have different hair and color?"

Table 2: Experimental "why" questions.

Trial	Constant Question	Variable Question
Bugs	"Why do *all* these bugs have yellow and black shells?"	"Why do *some* bugs have spots on their shells and others have stripes?"
Shapes	"Why are *all* these shapes orange?"	"Why are *some* shapes filled with black and others all orange?"
Creatures	"Why are *all* these creatures green?"	"Why are *some* creatures short and others tall?"
People	"Why do *all* these people have two eyes?"	"Why do *some* people have to wear glasses and others don't?"

property, (2) Both questions covered all four cases in the array (either why *all* four entities had a shared property, or why *some* entities had one property while the *others* had a different property), and (3) Experimenters emphasized the quantifier information in both questions. We examined children's choice of the variability (vs. constancy) question.

(3) Anticipated learning: Novelty of information Next, as the first measure of children's anticipated learning, we asked if participants already knew the answer to each of the questions, "Do you already know the answer to [question]? Yes or no?" Answering "no" indicated greater anticipated learning. We hypothesized that children may be more likely to say "yes" to the constant question, insofar as children anticipated an inherent explanation for constancy.

(4) Anticipated learning: Complexity of information As a second measure of children's anticipated learning, we asked which question had the simpler answer: "I asked *both* questions to someone who knows a lot about [bugs/shapes/creatures/people]. One answer they gave was really *long* and had lots of parts to it. Another answer they gave was really *short* and very easy to understand. Which question had the short, easy answer?" We expected children to choose the constancy question as having the simpler answer, given that inherent explanations tend to have fewer parts and are easily generated (Horne et al., 2019). This question also aligns with children's intuitions that machines with more variable functions have more parts (Ahl et al., 2020). We designed the question to ask about *simplicity* instead of complexity to rule out an account that children *always* choose the variability question indiscriminately.

(5) Information utility Finally, we asked about how useful the information was in daily life: "Think about the things that are *useful* to know about [bugs/shapes/creatures/people] in your day-to-day life. Which question is *more helpful* to know the answer to?" We examined participants' tendency to choose the variability (vs. constancy) question.

Analytic Plan

As pre-registered, for each dependent measure, we ran an intercept-only mixed-effects logistic regression model using the *glmer* function from the *lme4* package in *R* (Bates et al., 2015). The model also included a random intercept for participants to account for the nesting of four trials within each participant. Model coefficients (B), 95% confidence intervals (calculated using the Wald method), p-values, and odds ratios (OR) were extracted from each model. We were interested in whether participants would choose variability at rates different from chance (50%). An intercept significantly greater than 0 ($p < .05$) would indicate that participants chose variability more than 50% of the time ($OR > 1$), suggesting a preference for variability.

Results

Figure 1 presents children's results.

Question preferences.

Generation. We first analyzed children's tendency to *generate* questions about variability. Overall, children generated more questions about variability than constancy, $B = 1.21$, 95% CI [0.84, 1.59], $p < .001$, $OR = 3.37$.

However, as shown in Figure 1, children's curiosity about variability was *specific* to "why" questions. In a follow-up model that included question type ("why" vs. "non-causal" questions) as a predictor of asking about variability, we found that when children posed non-causal questions, they were *less* likely than chance to ask about variability (i.e., they preferred to ask about constancy), $B = -1.11$, 95% CI [-1.88, -0.35], $p = .004$, $OR = 0.33$. When asking "why" questions (vs. non-causal questions), children were significantly more curious about variability, $B = 2.74$, 95% CI [1.86, 3.63], $p < .001$, $OR = 15.56$.

Selection. We now turn to children's preferences for the experimental "why" questions. In further support of our hypotheses, children *selected* "why" questions that asked about variability more than constancy, $B = 1.08$, 95% CI [0.72, 1.45], $p < .001$, $OR = 2.96$.

Anticipated learning: Novelty and complexity of information.

Novelty. We first note that the novelty data is not graphed in the main figure because it had a different response structure: Rather than choosing between the variability and constancy questions, children evaluated *each* question and indicated "yes" or "no" as to whether they already knew the answer. Initially, we thought children would say they knew the answer to the constant question, given the assumption there is an easy, inherent answer. In contrast to this hypothesis, children were no more likely to state that they already knew the answer to the variability question than the constancy question, $B = 0.21$, 95% CI [-0.13, 0.55], $p = .22$, $OR = 1.24$. Children said they already knew the answer 49% of the time for variability questions (bugs: 33%, shapes: 33%, creatures: 46%, people: 83%), and 44% of the time for constancy questions (bugs: 27%, shapes: 33%, creatures: 46%, people: 72%).

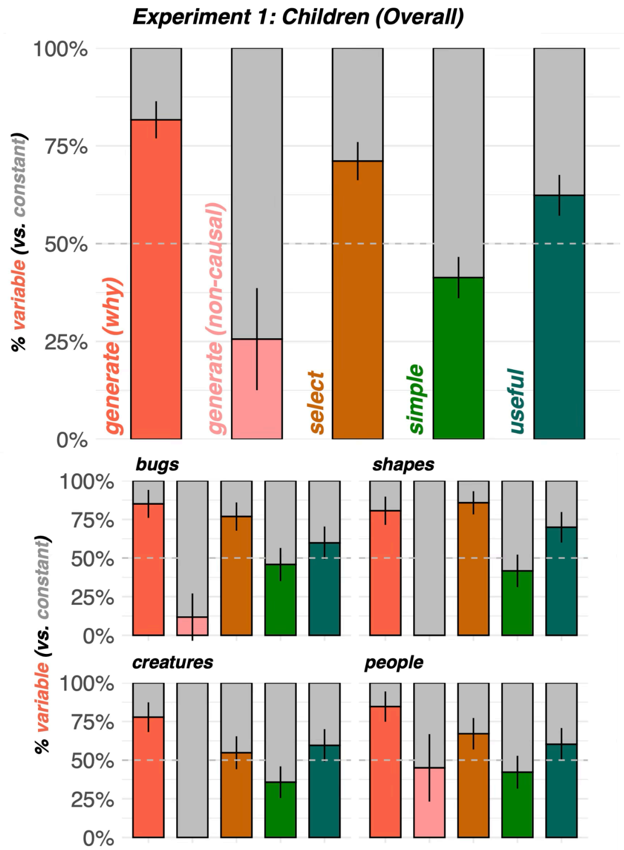


Figure 1. Experiment 1: Child results overall and by trial.

Upon reflection, we reasoned that even if children assume that the explanation for the constant question is a simple inherent answer, they recognize they do not know its details (e.g., how to describe it, how it functions) and therefore answer "no" (for related arguments, see Gelman, 2004; Keil, 2024). In line with this account that children are reporting on their knowledge, children were the *most* likely to say "yes" for the *people* trial about eyes, presumably because they have exposure to this domain.

Moreover, this null result indicates that the variability and constancy questions were matched in *actual* novelty of the content being explained, which would have otherwise been a problematic confound in our design–i.e., if children preferred the variability question simply because it focused on a more novel property. As such, we prioritize the information complexity measure as the key indicator of anticipated learning moving forward.

Complexity (coded as simplicity). We next examined judgments of complexity, which better aligned with prior research on constancy and inherent explanations (i.e., that children assume constancy has *simpler*, inherent explanations; Cimpian & Steinberg, 2014). In line with our hypotheses, children were *less* likely to infer that the variability questions had simpler answers, B = -0.45, 95% CI [-0.80, -0.10], p = .01, OR = 0.64. In other words, children inferred that "why" questions about constancy had simpler explanations.

Information utility. Finally, in line with our hypotheses about judgments of information utility, children judged the variability question as more useful to know in daily life, B = 0.57, 95% CI [0.28, 0.86], $p < .001$, OR = 1.76.

Supplementary analyses.

Age differences. Older children *generated* fewer variable (vs. constant) "why" questions, B = -0.36, 95% CI [-0.62, -0.10], p = .007, OR = 0.70. However, older children were *less* likely than younger children to select the variability question as having a simple answer, B = -0.22, 95% CI [-0.42, -0.01], p = .04, OR = 0.81. There were no age differences in *selecting* the variability question to learn about or judging it as *useful* (all $ps > .05$).

Domain differences. We examined whether the results differed by domain (bugs, shapes, creatures, and people) by comparing the intercept-only model to a model that included domain as a predictor. We found that adding the domain predictor improved model fit for only one measure, *question selection*, $\chi^2(3) = 26.93$, $p < .001$. Children were at chance for the creatures trial and were most likely to ask about variability in the shapes trial. The results were robust across domains for all other measures–question generation, information complexity, and information utility–adding the domain predictor did not improve model fit ($ps > .05$).

Linking judgments to question selections. We ran a mixed-effects model that predicted children's choice of variability (vs. constant) questions, with perceived utility and simplicity as predictors. Children's utility judgments significantly predicted question selections, B = 0.96, 95 CI% [0.38, 1.54], p = .001, OR = 2.60. Simplicity judgments, on the other hand, did not predict question selections, B = 0.51, 95 CI% [-0.08, 1.11], p = .09, OR = 1.67.

Experiment 2: Adult Sample

Experiment 2 replicated Experiment 1 with an adult sample.

Method

Participants. Eighty U.S. adults (M = 46.85 years, SD = 12.58 years; 39 women, 41 men) were recruited from the online platform, Prolific.

Procedure and dependent measures. Adults completed the identical measures from Experiment 1 in an asynchronous Qualtrics survey.

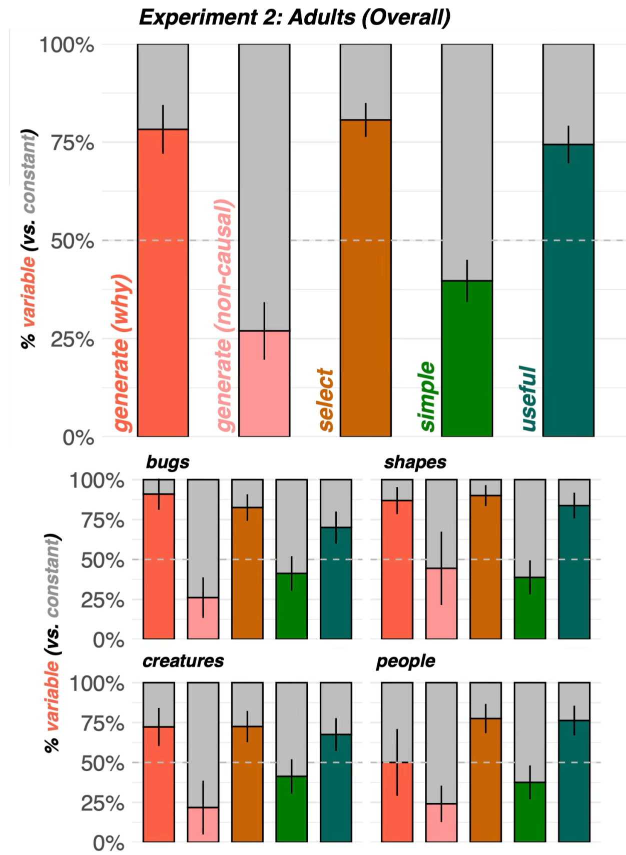


Figure 2. Experiment 2: Adult results overall and by trial.

Results

Figure 2 presents the adult sample's results.

Question preferences. Of all questions adults generated, 53% were "why" questions, 45% non-causal questions, and 2% no responses (Cohen's κ = 1.00). In terms of content, 53% focused on variability, 45% on constancy, 1% off topic, and <1% non-question (Cohen's κ = 0.96).

Generation. When analyzing adults' questions overall, adults were no different from chance in terms of asking about variability versus constancy, B = 0.19, 95% CI [-0.07, 0.44], p = .15, OR = 1.21. However, when separating the questions by "why" versus "non-causal", we found the same pattern as we did with children. When asking a non-causal question, adults asked about variability *below* chance, B = -1.09, 95% CI [-1.10, -1.08], $p < .001$, OR = 0.34. However, when asking "why?" they were significantly more likely to ask about variability, B = 2.47, 95% CI [2.46, 2.48], $p < .001$, OR = 11.81.

Selection. When *presented* with "why" questions, adults, similar to children, were significantly above chance in selecting the questions that asked about variability, B = 1.84, 95% CI [1.32, 2.35], $p < .001$, OR = 6.27.

Anticipated learning: Novelty and complexity of information.

Novelty. Recall that we reinterpreted this measure as assessing the *actual* novelty of the properties being asked about, which we wanted to be similar across question types. Indeed, adults were no more likely to state that they already knew the answer to the variability question than the constancy question, $B = 0.20$, 95% CI [-0.14, 0.55], $p = .25$, $OR = 1.23$. Adults said they already knew the answer 29% of the time for variability questions (bugs: 9%, shapes: 10%, creatures; 13%, people: 86%), and 25% of the time for constancy questions (bugs: 8%, shapes: 9%, creatures; 11%, people: 74%). Thus, across both child and adult samples, the questions were matched in novelty.

Complexity. Importantly, for our prioritized measure of anticipated learning, adults like children were *less* likely to infer that the variability questions had simpler answers, $B = -0.56$, 95% CI [-0.94, -0.17], $p < .01$, $OR = 0.57$. That is, adults also judged that questions about constancy had easier, simpler answers.

Information utility. Finally, as in Experiment 1, adults chose the variability question as more useful to know the answer to in daily life, $B = 1.40$, 95% CI [0.94, 1.86], $p < .001$, $OR = 4.07$.

Supplemental analyses.

Domain differences. Adults demonstrated a robust pattern of reasoning across the four domains: They generated and selected "why" questions about variability (with the one exception of generating a variable question about people), judged constancy questions as having simpler answers, and judged explanations for variability as more useful. However, the model fits improved (ps < .05) when including domain as a predictor for the generate question, select, and utility measures. We note two salient patterns. First, like children, adults asked about variability most often in the *shapes* trial. Second, adults were more likely to avoid generating "why" questions about variability in the *people* trial. We propose that this result is due to pragmatic issues rather than a true domain difference. Specifically, race/ethnicity (rather than eyeglasses) was likely the most salient variable, and adults avoid discussing race more than children (Apfelbaum et al., 2008). When presented with questions about eyes, adults then preferred to ask about variability, as in other domains.

Linking judgments to question preferences. Like children, adults' utility judgments significantly predicted their question selections, $B = 2.37$, 95 CI% [1.50, 3.24], $p < .001$, $OR = 10.74$. Simplicity judgments were again not significant predictors of question selections, $B = -0.27$, 95 CI% [-1.05, 0.50], $p = .49$, $OR = 0.76$.

General Discussion

Across two pre-registered experiments, learners preferred to ask "why" questions about variability over constancy. This preference was robust across question format (generation and selection), developmental stage (children and adults), and domain (bugs, shapes, creatures, and people). Notably, in line with the Explanation-Seeking Curiosity Model (Liquin & Lombrozo, 2020b; Lombrozo & Liquin, 2023), children's and adults' question preferences were predicted by the perceived *utility* of the information to be gained. However, participants' preferences were not predicted by the perceived *simplicity* of the question's answer.

While prior research has applied the Explanation-Seeking Curiosity Model to predict *individual differences* in learners' curiosity (Liquin & Lombrozo, 2020a), here, we identified a systematic *bias* in favor of variability over constancy. Our findings bridge the Explanation-Seeking Curiosity Model with theories that also propose biases in explanatory reasoning. The inherence heuristic, and related theories of psychological essentialism, document an early-emerging bias to attribute constant patterns to simple, inherent causes (Cimpian & Steinberg, 2014; Gelman, 2004). Research also documents that children believe that how the world *is* (i.e., constant patterns) is how the world *ought* to be (Roberts, 2022). Considering these findings with the Explanation Seeking Model, learners may have little interest in interrogating *why* constant patterns exist if there is little possibility–and no good reason–to intervene.

Prior research has found that utility judgments are strong predictors of explanatory curiosity in adults (Liquin & Lombrozo, 2020a), and here we replicate this result and find that it extends to children. This finding raises new questions regarding *when* it may be useful to ask about variability. In particular, does *any* variability trigger curiosity? Our study presented distributions in which two features were equally possible (e.g., stripes versus spots), and thus, learners may find it useful to know the underlying mechanism. With age, children become more sensitive to *degrees* of variability (Lapidow et al., 2025), and this sensitivity may shape their curiosity. For example, learners may be *less* curious about variations that are infrequent, such as when a disease impacts only one in one million people.

Although we hypothesized that perceptions of *simplicity* (i.e., inverse of complexity) may trigger explanation-seeking curiosity, we did not find support for this association in children or adults. One reason may be that our simplicity judgment asked which question had the *easier* answer (which may *reduce* curiosity; Kominsky et al., 2018), but also which explanation had *fewer parts* (which aligns with explanatory virtues that may *increase* curiosity; Lombrozo, 2016). Future work should manipulate different aspects of complexity and examine their effects on curiosity.

While a bias toward variability can facilitate efficient information search, it may lead learners to underinvestigate important constants. Consider a child who never asks why plants reliably thrive in their home; they are ill-equipped to intervene if conditions or outcomes change. Future work should test whether making alternatives salient can enhance curiosity about constants. One counterfactual intervention prompted 5-year-olds to imagine what would have happened had a factor been changed, and this improved causal learning (Engle & Walker, 2021). Such an approach may also help learners interrogate stable *societal* systems whose unjust effects may be overlooked otherwise (Amemiya et al., 2024). We hope this research inspires strategies to foster curiosity that deepens understanding of the world as it is and encourages new ideas for how it could be different.

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