Transmission of Natural and Supernatural Explanations by Hindu and Muslim Schoolchildren in Gujarat, India

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Abstract

What determines which stories (or parts of stories) about the social world are captured and conveyed by children? How do they transform with retelling? We use an iterated learning paradigm to explore how peer-to-peer transmission of explanatory stories (here, explanations for the social customs of novel social groups) is influenced by explanatory framework (*natural*, *supernatural*, or *hybrid*) and children's existing belief systems. Our participants were 79 Hindu and Muslim 3rd–7th-graders in Gujarat, India.Consistent with the 'minimally counterintuitive' nature of many highly culturally preserved concepts, hybrid explanations (containing both natural and supernatural elements) were transmitted with the greatest fidelity across chains. Individual religiosity also affected transmission: children who reported themselves as more religious transmitted scientific explanations less faithfully (and hybrid explanations more faithfully) than less religious children.

Keywords: cultural transmission; explanation; religion

The child's playground is a teeming marketplace of social-cultural knowledge. The stories traded there have diverse origins, and they make sense of diverse phenomena, from where babies come from to what teachers do after school, via diverse explanatory frameworks. These stories about the social world often transform as they spread from child to child, leaving the imprint of new children's imaginations, vocabularies, and belief systems. What makes a given explanatory story 'competitive' in this marketplace? What determines how faithfully children retell a new one?

One noteworthy feature of children's explanations is the frequency of contradictory accounts for the same phenomenon (Busch et al., 2017; Legare & Shtulman, 2018; Legare et al., 2012; Shtulman & Legare, 2020). Cooties come from "touching someone you don't like" or "when someone digs up their nose," while prevention methods include crossing your fingers, touching a pole, receiving an injection, or locking all the doors (Hirschfeld, 2002) — collectively implying a chaotic set of causal mechanisms spanning the supernatural, social, and biological. Seemingly inconsistent explanations coexist not only across groups of children, but within individual minds, persisting well into adulthood. An adult might simultaneously blame an illness on not having worn a mask on the subway and having gone to bed with wet hair. Such explanatory flexibility also often characterizes superstitious practices: adults will knock on wood to prevent bad luck, and also deny that doing so has any causal relation to fortune (Cryer, 2016; Nixon, 1925; Risen, 2016).

Some evidence suggests that dueling explanations may actually reinforce each other, making the pair together more memorable than either alone. This might explain why certain religious, supernatural, or superstitious ideas have such staying power: many longstanding religious ideas consist of concepts or entities that adhere almost entirely to a familiar reality—but for a single element that violates it (e.g., ghosts, gods, and spirits are recognizably anthropomorphic but with specific modifications; Boyer & Barrett, 2005). Consistent with these concepts' preservation across generations, children exhibit greater curiosity about and recall of "minimally counterintuitive" stimuli—those that violate just one or two intuitive expectations (Banerjee et al., 2013; Lewry et al., 2023). Importantly, what counts as 'minimally counterintuitive' depends on what is already intuitive to a given learner, highlighting the role of children's existing knowledge and beliefs in determining which stories—or which elements of stories—'stick' (Park et al., 2024).

One place we can see experimental evidence for these sorts of cognitive biases is in paradigms that model cultural transmission on a smaller scale. Variants of 'serial reproduction' (Bartlett, 1932) or 'iterated learning' (Kirby et al., 2014) tasks resemble a game of "Telephone," where one participant's response becomes the input for the next. Participants' prior expectations or beliefs, often subtle at the individual level, reveal themselves at the group level following repeated generations of information transmission (Bangerter, 2000; Griffiths et al., 2008; Kalish et al., 2007).

The present study uses this method to investigate potential biases in how children transmit explanations that rely on different explanatory frameworks. We test three types of explanations: NATURAL, appealing to mundane phenomena of the material world (Busch et al., 2017; Legare et al., 2012), SUPERNATURAL, appealing to spiritual or faith-based phenomena operating outside of the natural world, and HYBRID (mixed). Notably, while most existing work examines how children integrate explanations from adults, we focus on how children transmit explations to one another (Braswell et al., 2012; Legare, 2019).

Our participants were Hindu and Muslim children, who previous work has shown to be practiced at tracking the practices of other cultural groups. For example, they are aware of the religious norms (Dahl et al., 2022; Srinivasan & Dahl, 2024; Srinivasan et al., 2018) and supernatural beings (Shtulman et al., 2019) belonging to both Hinduism and Islam. What's more, they differentiate between norms (not eating meet during *Shivaratri*, reading *namaz* in the morning and evening) and supernatural beings (Ganesha, Allah), which are

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restricted to adherents of a particular religion, versus those that are relevant to all people (Shtulman et al., 2019; Srinivasan & Dahl, 2024; Srinivasan et al., 2018). These observations suggest that schoolchildren in this context are familiar with reasoning about other groups' religiously motivated practices and supernatural beliefs, and are sensitive to their bounds.

Inspired by children's real-world awareness of other groups' practices, our study asked children to receive and transmit explanations for the social customs of *novel* peoples. By introducing information about fictional social groups, we aimed to control for variation in specific prior knowledge across children, while still mimicking a naturalistic means by which children construct knowledge about the social world — we often learn about other people through other people.

To investigate how a child's existing beliefs and expectations might "prepare" them for particular types of explanations, we measured children's religiosity, and sampled from distinct religious groups. Our participants were 8–13 years of age, when previous work has shown that Hindu and Muslim children in this context diverge in both self-reported religiosity (Muslim children tend to report and maintain on-average greater religiosity; Dahl et al., 2022), and their beliefs about religious norms (Srinivasan et al., 2018).

We address two specific hypotheses: First, given evidence for the memorability of minimally counterintuitive or manageably conflicting stimuli, we hypothesize that HYBRID explanations (which blend natural and supernatural rationales) will be transmitted with the greatest fidelity across generations of children. Second, we hypothesize that (a) transmission chains composed of more religious children (here, chains of Muslim children) and (b) individual children with higher self-reported religiosity (which may include highly religious Hindu children) will be more likely to preserve SUPERNATURAL explanations and elements compared to less religious transmission chains or less religious individual children.

Method

Participants

Participants were 79 girls who self-identified as either Hindu or Muslim in grades 3–7, recruited from a mixed Hindu–Muslim school ($n = 47$) and a Hindu-dominant school ($n = 32$) in Gujarat, India. Ten participants were excluded due to experimenter or technical error, leaving a final sample of 69 girls in two age groups: "younger" (recruited from 3rd–4th grades; $n = 33$, $M = 8.67$; $SD = 0.69$ years) and "older" (recruited from 6th–7th grades; $n = 36$, $M = 11.17$; $SD = 0.65$ years). Roughly half of children in each age group self-identified as Hindu ($n = 16$ younger children; $n = 18$ older children), and half self-identified as Muslim ($n = 17$ younger children; $n = 18$ older children). As this type of iterated learning paradigm is best suited for more homogeneous populations (Navarro et al., 2017), children were recruited to participate in transmission chains of children from the same age group (younger/older), religion (Hindu/Muslim), and gender (girls). Children were pulled out of class one at a time and tested in an empty classroom with 1–2 experimenters present.

Stimuli

Social Customs. We used Amazon's Mechanical Turk ($n = 21$ adults located in India) to identify three unfamiliar social customs that were recalled by participants at equivalent rates. Based on these results, we selected social customs representing three familiar domains: FOOD, DWELLING, and BURIAL (Table 1), and adapted from real-world cultural practices. For example, the DWELLING custom was inspired by the hogans of the Diné, which traditionally face eastward to welcome the sun and bring good fortune (Rapoport, 1969). The FOOD custom had elements reminiscent of Islam (eating tied to sunrise/sunset, as in the month of Ramadan), and elements reminiscent of Hinduism (the prohibition on meat—or 'nonveg'—as in some practices of Hinduism). The BURIAL ritual corresponded to neither the Muslim nor Hindu norm, and was inspired by Viking funerary practices and Greek mythology. As these last two domains (FOOD and BURIAL) were areas with distinct Hindu and Islamic traditions (e.g. the dead are typically cremated in Hindu tradition vs. buried in Islamic tradition), we expected children to already be aware of them as loci of cultural diversity.

Explanations. There were a total of nine explanations: each of the three customs had a SUPERNATURAL, NATURAL, or HYBRID explanation (see Table 1). SUPERNATURAL explanations accounted for the social customs of the novel people via its religious beliefs. NATURAL explanations accounted for the same phenomena, but referring to commonsense premises (e.g., not being able to see in the dark). HYBRID explanations blended the two, at once accounting for each practice via natural and supernatural rationale (Busch et al., 2017; Legare & Shtulman, 2018; Legare et al., 2012; Shtulman & Legare, 2020).

Explanations were translated into Hindi by a native speaker. To ensure the quality of the translations, a different speaker translated them back into English. A local research assistant recorded the explanations in Hindi for use in the study. All Hindi texts were as similar in length as possible, ranging from 56 to 77 words ($M = 68$, $SD = 7$); recordings lasted between 21 and 35 seconds ($M = 26$, $SD = 5$). To maintain comparable lengths, HYBRID explanations contained subsets of the propositions encountered in the exclusively NATURAL or SUPERNATURAL explanations. For the DWELLING custom, for example (see Table 2), we generated two NATURAL and two SUPERNATURAL propositions and incorporated one of each into the HYBRID stimulus.

Visual Stimuli. The audio recordings were embedded in a series of slideshow presentations used for data collection (Figure 1). There were three orders, each beginning with a different explanation type, and containing a different pairing between explanation type and domain (e.g., children in

Table 1: Novel Social Group Customs and Supernatural vs. Natural Explanations.

Domain	Custom	SUPERNATURAL	NATURAL
FOOD	The Noma don't eat meat after dark	Animals and humans made an agreement at the beginning of the world	They can't see if the meat is rotted in the dark
DWELLING	The Anin's doors always face east	Evil spirits travel from west to east	They like to be woken as early as possible by the sun
BURIAL	The Frejo place their dead in a boat, weighed down by stones and possessions	The entrance to the underworld is at the bottom of the sea	The island is too small to bury people

one order first heard the NATURAL explanation for the FOOD custom, followed by the SUPERNATURAL explanation for the BURIAL custom, then the HYBRID explanation for the DWELLING custom, while another order heard DWELLING (SUPERNATURAL) –FOOD (HYBRID)–BURIAL (NATURAL). Data for each transmission chain was recorded via its own slideshow (2 age groups × 2 religions × 3 orders × 2 chains = 24 slideshows).

Procedure

Transmission. Children were tested individually in a quiet room of their school, where they sat next to the researcher and in front of a laptop displaying the slideshow (Figure 1). The researcher used the first slide, showing an overview of the task, to explain the structure of the task. Next, children practiced listening and repeating two practice stories to familiarize them with the format of the task. The experimenter spoke as little as possible from this point forward. Three critical trials followed, one for each explanation type (SUPERNATURAL/NATURAL/HYBRID), and domain (FOOD/DWELLING/BURIAL). For Generation 1, the first slide of each trial played the original Hindi audio introducing and explaining the novel social custom (see schematic in Figure 2). For Generations 2 and 3, the first slide showed the video from the previous child.

After listening to the previous child's explanation, children were cued to repeat what they had learned via a slide with a drawing of a child whispering in another child's ear. The final slide showed a photo of a same-gender peer and asked the child to explain the social custom (which was restated in text above the photo) to the peer (see Figure 1).

Figure 1: Slides for a Single Transmission Trial.

The researcher pressed a key to begin recording from the laptop. When the child finished retelling the explanation, the researcher stopped recording, and an animated gold star signaled the successful end of the trial. This procedure was repeated for the remaining two customs and explanations.

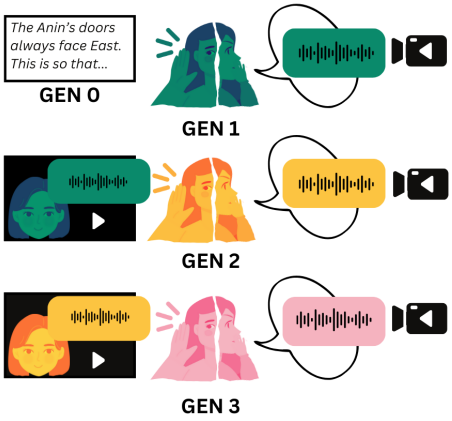

Figure 2: Schematic of Three-Generation Chain.

Survey. After the transmission procedure, children filled out a survey where they confirmed their religious identity (Hindu or Muslim), rated their religiosity on a 4-point scale ("I am:" *Very religious/Somewhat religious/Not very religious/Not at all religious*), and responded to a series of Likert-style question prompts, adapted from the World Values Survey (Haerpfer et al., 2020). These latter questions were hypothesized to relate to children's likelihood of faithfully transmitting information about another culture's religion. Responses were recoded to numeric values: 1 to 4 (religiosity) or −2 to 2 (values questions with response options *Strongly disagree* to *Strongly agree*).

We report descriptive statistics and planned comparisons for responses to these items by Hindu vs. Muslim children, but reserve relating survey responses to transmission behavior for later analysis.

Coding and Analysis

A native Hindi-English bilingual speaker used Datavyu (Datavyu Team, 2014) to first transcribe children's video-recorded explanations in Hindi, and then translate them to English. The transcriptions and translations were spot-checked by an additional native Hindi-English bilingual speaker. Proposition coding was done by English-speaking research assistants, using the English translation, while basic text analyses were performed on the original Hindi transcriptions.

Proposition Coding. Seeded explanations were disassembled into component propositions. For each child explanation, trained coders assessed whether or not the child communicated the propositions for that custom (*0=absent, 1=present*). Coders coded the same set of propositions for all explanations within each domain, regardless of whether they were retellings of the originally SUPERNATURAL, NATURAL, or HYBRID explanations for that custom.

Table 2 shows an example from a single chain transmitting the HYBRID explanation for the Anin's dwelling custom (see first column for explanation content, and Generation 0 column for presence/absence of each proposition in the set). Hearing this explanation, the first child in the chain (see codes in column for Generation 1) preserved all but one proposition in their repetition for the next child. That child (Generation 2) dropped an additional one of the propositions in their repetition for the final child (Generation 3), who faithfully communicated all propositions that had been transmitted to them.

In addition to coding the presence/absence of the original propositions, coders noted any new material inserted by the child — as when, retelling the dwelling explanation, one child invented that the Anin people "used to make walls," (e.g., "Anin people used to make walls. One time they were making their wall in the east when they thought that if they make the wall then ghosts will not be able to enter their house"). A sixth-grader riffed: "... sunlight was coming and there was a boy standing. A shadow fell and the door started creaking."

Motivated by first analyzing the transmission chains' final outputs, coders completed coding of all of the Generation 3 explanations, before coding all of the Generation 2, and finally the Generation 1 explanations. One-third of all explanations were double-coded, showing high reliability for proposition presence/absence (87%).

Primary analyses were pre-registered (https://aspredicted.org/zwgc-dm9h.pdf). Analysis scripts were written and tested using simulated data in advance of the coded data.

Results

Survey

Children from the two religious groups responded similarly to most survey items: (a) "Whenever science and religion conflict, religion is always right:" $M_{Muslim} = 0.641$ [0.33, 0.92], $M_{Hindu} = 0.474$ [0.132, 0.816] [1]; (b) "People who belong to different religions are probably just as moral as those who belong to mine:" $M_{Muslim} = 0.68$ [0.29, 1.05], $M_{Hindu} = 0.95$ [0.55, 1.29]; (c) "We depend too much on science and not enough on faith:" $M_{Muslim} = 0.18$ [−0.21, 0.59], $M_{Hindu} = -0.11$ [−0.50, 0.29]; (d) "There is an explanation for everything:" $M_{Muslim} = 1.00$ [0.59, 1.41], $M_{Hindu} = 1.32$ [0.92, 1.63]. However, Hindu and Muslim children differed significantly in their responses to the statement, "The only right religion is my religion:" $M_{Muslim} = 0.54$ [0.179, 0.87], $M_{Hindu} = -0.45$ [−0.95, 0.03]. For illustration, 40% of Hindu children selected "Strongly disagree" (recoded as -2) as their response, compared to 10% of Muslim children. Comparing the observed difference in means between the two groups to differences between pairs of randomly permuted subsets of the data suggests that the observed difference (0.99) is significant ($p = 0.002$).

As anticipated based on prior work (Srinivasan et al., 2018), the two groups also differed in self-reported religiosity. Muslim children tended to rate themselves as more religious ($M_{Muslim} = 2.77$ [2.64, 2.90]) than Hindu children ($M_{Hindu} = 2.40$ [2.21, 2.58]), and 77% of Muslim children described themselves as "Very religious" (recoded as 4), compared to 45% of Hindu children. A permutation test suggests the difference in group means (0.37) is significant ($p = 0.004$).

Explanation Length

Average explanation length (in terms of words in Hindi) decreased with each generation ($M_{Gen_1} = 45$ [40, 50]; $M_{Gen_2} = 41$ [35, 46]; $M_{Gen_3} = 33$ [29, 37]). There were no substantive differences by age group ($M_{younger,\ older} = 40$ [36, 44]), though Muslim children tended to give longer explanations across generations ($M_{Muslim} = 45$ [39, 50]) compared to Hindu children ($M_{Hindu} = 36$ [33, 40]).

Transmission Fidelity

We define 'fidelity' as the ratio of preserved vs. abandoned propositions present in the child's response, excluding the proposition describing the social custom. While there was variability in children's inclusion of the custom description (children included the custom in 84% [74%, 93%] of explanations overall: 83% [67%, 100%] of SUPERNATURAL explanations, 71% [52%, 91%] of NATURAL explanations, and 100% of HYBRID explanations), we nonetheless exclude children's repetition of the social custom from our evaluation of fidelity because it is unclear what this variability indexes. Given that the custom was restated on the slide where children recorded their explanations, children who repeated the custom could have been just reading from the screen, and children who left it out could have been interpreting it as information in the common ground that need not be repeated.

When analyzing data from the terminal generation of our transmission chains, we compute fidelity with respect to the propositions present at Generation 0. When analyzing data

[1] According to the World Values Survey, 53.8% of people agree with this statement and about 10% more Muslims agree compared to Hindu respondents.

Table 2: Example Proposition Coding for a Single Explanation and Transmission Chain.

Seeded HYBRID Explanation	Propositions: Dwelling Custom	Generation 0	1	2	3
The Anin people's doors always face east. This is because the evil spirits are afraid of the light of the sun. The sun always rises in the east, so homes will be filled with light as soon as possible each day, awakening all the residents and preventing evil spirits from entering their homes.	doors always face east (C)	1	1	1	1
	the sun rises in the east and sets in the west (N)	1	0	0	0
	residents want to receive light as early as possible (N)	1	1	0	0
	evil spirits travel from east to west (S)	0	0	0	0
	evil spirits do not enter because of the sun (S)	1	1	1	1

(C): Custom description; (N): NATURAL proposition; (S): SUPERNATURAL proposition

from all generations, we compute fidelity with respect to the particular propositions present in the previous generation.

To test our hypotheses, we use the `lme4` package (Bates et al., 2015) in R (R Core Team, 2021) to fit generalized linear mixed effects models to the (log of the) ratio of preserved vs. abandoned propositions, including different predictors and a random intercept for generation.[2] We report and interpret odds ratios (*OR*s; exponentiated model coefficients) for our predictors of interest, using each parameter estimate's 95% bootstrapped confidence interval as a cue to its reliability: intervals which do not cross 1 suggest a reliable directional effect. To report traditional significance tests for a given parameter, we use the `anova` function to compare nested models with and without that predictor. When comparing the means of two groups, we report the results of permutation tests estimating the probability of obtaining the observed difference in means by chance.

There was no significant difference in transmission fidelity by younger vs. older children ($OR = 1.37$ [0.57, 3.48], $\chi(1) = 0.49$, $p = 0.48$), so data in subsequent analyses are collapsed across age groups. We test our two primary hypotheses — first in the final generation of our transmission chains, and then in the data from all generations.

H1: HYBRID explanations will be transmitted with greater fidelity.

Final Generation. More propositions made it to the final generation from the HYBRID explanations ($M = 0.27$ [0.16, 0.40] preserved) than from the NATURAL ($M = 0.09$ [0.02, 0.17]) or SUPERNATURAL ($M = 0.13$ [0.03, 0.24]) explanations (see Figure 3). Given that there were equal numbers of propositions for all seeded explanations ($n = 17$), this finding suggests that there was something about the HYBRID explanations that made them 'stickier.'

A model predicting final-generation fidelity from explanation type further confirmed that HYBRID explanations reliably showed greater fidelity than NATURAL explanations (the reference level; $OR = 3.30$ [1.16, 10.90]). The fidelity of SUPERNATURAL explanations, however, was not reliably different from the fidelity of NATURAL explanations ($OR = 1.33$ [0.34, 5.16]). Comparing two models with and without explanation type indicates trend-level significance for it as a factor ($\chi(2) = -5.82$, $p = 0.054$).

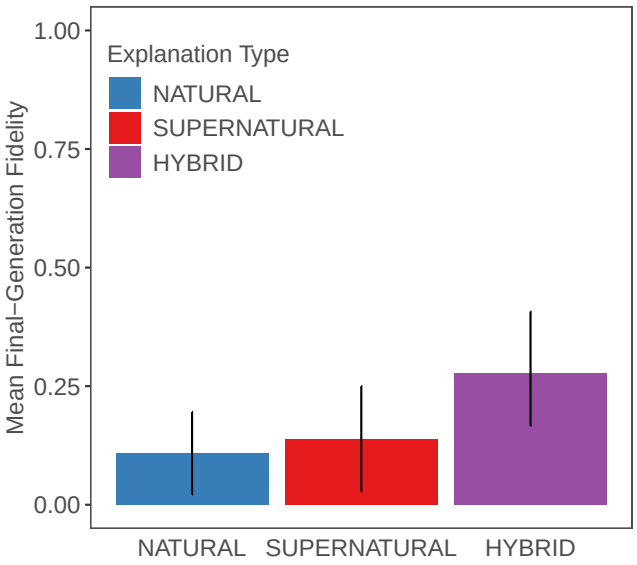

Figure 3: Mean Fidelity (Proportion of Generation-0 Propositions Preserved) by Explanation Type.

All Generations. HYBRID explanations ($M = 0.55$ [0.42, 0.67]) were transmitted with numerically greater fidelity, averaging across generations, relative to NATURAL ($M = 0.31$ [0.19, 0.43]) or SUPERNATURAL ($M = 0.37$ [0.25, 0.50]) explanations. However, a model predicting fidelity from explanation type, with random intercepts for generation, suggested that the real difference was between the NATURAL and SUPERNATURAL explanations, with exclusively SUPERNATURAL explanations being transmitted with lesser fidelity ($OR = 0.84$ [0.32, 0.96]) than NATURAL ones. A comparison

[2] Generic model syntax: `glmer(cbind(n_kept, n_lost) ~ predictor(s) + (1|generation), family="binomial")`

between a model with and without explanation type revealed a trending but nonsignificant effect ($\chi(2) = 4.62$, $p = 0.099$).

H2: More religious chains will preserve the SUPERNATURAL explanations more

Final Generation. We predicted that transmission chains composed of Muslim children—who are on-average more religious than Hindu children—would be more likely to preserve the SUPERNATURAL explanations. Contrary to our predictions, children in the final generation of Muslim vs. Hindu chains did not differ in their transmission of SUPERNATURAL ($M_{Muslim} = 0.11$ [0.00, 0.28]; $M_{Hindu} = 0.15$ [0.05, 0.30]), NATURAL ($M_{Muslim} = 0.04$ [0.00, 0.13]; $M_{Hindu} = 0.15$ [0.04 0.31]), or HYBRID ($M_{Muslim} = 0.25$ [0.11, 0.44]; $M_{Hindu} =$ 0.29 [0.11, 0.46]) explanations. A model predicting fidelity from explanation type, religion, and their interaction showed no significant interaction effect ($\chi(2) = 1.03$, $p = 0.6$ compared to a model without the interaction).

We also looked at the relative preservation of the religious vs. scientific propositions *within* the HYBRID explanation in the final generations of Muslim vs. Hindu transmission chains. The final generations did not differ by religion in their preservation of the religious ($M_{Muslim,Hindu} = 0.22$ [0, 0.56]) or scientific ($M_{Muslim} = 0.28$ [0.06, 0.50], $M_{Hindu} = 0.32$ [0.11, 0.53]) propositions within the HYBRID explanations. This was confirmed by a model fit to the proposition data from the HYBRID explanations, with proposition type, religion, and their interaction as predictors ($\chi(1) = -0.018$, $p = 0.89$ comparing a model with all three predictors to a model without the interaction).

All Generations. Rather than rely on group-level differences in average religiosity, we asked whether individual children's self-reported religiosity interacted with the content of the explanation or proposition in predicting transmission fidelity. In a model predicting fidelity from explanation type, religiosity, and their interaction, the interaction term was significant ($\chi(2) = 15, p < 0.001$). Specifically, more religious children tended to transmit the NATURAL explanation less faithfully than less religious children ($OR =$ 0.23 [0.10, 0.52]), and the HYBRID explanation ($OR = 7.94$, [2.74, 24.03] more faithfully. There was no difference in SUPERNATURAL transmission rates based on religiosity.

There was no significant difference in the transmission of scientific vs. religious propositions *within* the HYBRID explanations, based on religiosity (that is, the interaction of religiosity and proposition type was not significant: $\chi(1) = 3.5$, $p = 0.062$ compared to a model without the interaction).

General Discussion

We used an iterated learning paradigm to explore how explanatory framework (reliance on natural, supernatural, or mixed rationale), and children's prior beliefs inform the transmission of explanatory stories from child to child. The stories we tested were explanations for the cultural practices of novel social groups, including in domains (e.g., diet and funerary practices) that are locally salient to the children in our sample, as they distinguish Hinduism and Islam. The Hindu and Muslim children we tested tend to differ in their religiosity, affording us the opportunity to manipulate religiosity at the level of entire homogeneous transmission chains (Navarro et al., 2017), as well as to measure it at as a factor in the behavior of individual children. Consistent with cognitive scientific observations that (a) apparently conflicting explanations often coexist, even in adulthood (Busch et al., 2017; Legare & Shtulman, 2018; Legare et al., 2012; Shtulman & Legare, 2020), and (b) many culturally persistent ideas (e.g., religious concepts) are 'minimally counterintuitive' (Banerjee et al., 2013; Boyer & Barrett, 2005; Lewry et al., 2023), children transmitted HYBRID explanations with the greatest fidelity, compared to entirely NATURAL or SUPERNATURAL ones.

This context was ideal for investigating the role of children's prior beliefs in predicting their transmission of explanatory stories, given the significant role played by religious beliefs in structuring children's material and social lives. We hypothesized that more religious transmission chains (those composed of Muslim children), and individual children with higher self-reported religiosity would be more faithful to the SUPERNATURAL explanations than children of lower religiosity. We did not see the anticipated effect in our analyses of the terminal generation's explanations (as products of their transmission chains). However, we observed it when we analyzed children's explanations across generations, controlling for generation. Specifically, more religious individual children showed lesser fidelity in their transmission of NATURAL, but not SUPERNATURAL or HYBRID, explanations. This finding represents a concrete demonstration that (a) individuals are cognitively prepared to different degrees for different ideas, and (b) those preparations are sufficiently impactful so as to reveal differences in the fidelity of transmission of even small amounts of information, over a short timescale.

Future Directions

Future analyses will track fidelity at the level of individual propositions: for example, are highly religious children more or less likely to preserve the specific proposition describing a religious practice that conflicts with their own? How about a similar practice? We also aim to quantify the trajectory of the similarity between the original, seeded Hindi story and children's own retellings, using text-based natural language processing methods. Finally, we lacked the space here to describe children's elaborations or embellishments of the explanations they transmitted. However, these represent a rich source of qualitative data and potential insight into the interaction between the explanations and children's existing causal beliefs, social expectations, personalities, and styles.

More broadly, future work will explore similar phenomena over longer delays, more generations, and in more naturalistic settings, as well as the transmission of more immediately child-relevant or taboo information.

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