

Children in Kenya and the US are averse to epistemic injustice

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Abstract

This preregistered study investigated children's response to testimonial injustice in peer-to-peer dyadic interactions across two cultural contexts—Nanyuki, Kenya, and Berkeley, USA ($N = 192$, ages 4–10, 50% female; 2023–2024). In an inequity condition, an adult listener repeatedly believed one child over another when they offered conflicting testimony. In a control condition, the listener disbelieved both children. Children in both societies evaluated the listener as fair in the control condition and unfair in the inequity condition regardless of whether they were believed or disbelieved. There was cross-cultural variation in the age of onset for these moral judgments, and different patterns of emotional responses. These findings point to an early-emerging sensitivity to whether someone's voice is given fair consideration across two cultural contexts.

Keywords inequity aversion, epistemic injustice, fairness

Lay summary

Epistemic injustice expresses how people are undermined in their ability to gain and express knowledge. One form that this can take is when someone is unfairly disbelieved: when a listener does not give someone's claim the credibility it deserves. This is referred to as "testimonial injustice." In this study, we investigated how 4- to 10-year-olds respond to testimonial injustice in two different cultural contexts: Nanyuki, Kenya, and Berkeley, USA. We found that children in both cultures object when an adult repeatedly believes one child over the other one, even when they are the one being believed by the adult. We found cross-cultural differences in the children's emotional reactions, and at what age they begin to label this as unfair. This work shows that from early in childhood, children are sensitive to whether someone's voice is given fair consideration.

The harm of testimonial injustice

Two children squabble in the backseat of a car, until one of them decides to break the unspoken truce: "DAD, he hit me," a tiny voice whines. Affronted, the other protests "Wait, but she did it first!" An exasperated voice from the front of the car drifts back, "Be nice to your sister." Finding his sister's smug smirk too much to take, the boy puffs up, self-righteously crying, "That's not fair! You always believe her; you never believe me!"

Whether it is as trivial as being unfairly disbelieved in a fight with your siblings, or as harmful as your voice being disregarded in court because of who you are, there is something uniquely wrong about someone not taking your testimony seriously. As informants, we

expect others to give us some degree of credibility: we assume that when we speak, listeners will treat what we say as truthful and informed unless given good reason to believe otherwise (Degen, 2023; Grice, 1975). Beyond the individual, this kind of baseline trust in others is fundamental to cooperation at large (Boyd & Richardson, 2009). Our ability to cohesively build and pass on cultural knowledge relies upon mutual recognition of one another as rational and credible epistemic agents: as people who are capable of knowing things and communicating this knowledge reliably.

When a person is deprived of due credibility—when others unjustly disregard their voice—they are therefore being denied a basic human quality (Fricker, 2007). In the theoretical framework of epistemic injustice, such cases constitute a unique form of

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moral harm, wherein “the victim is wronged in her capacity as a knower... a capacity essential to human value,” (Fricker, 2007, pg. 44). In Fricker’s original definition, testimonial injustice is a form of epistemic injustice that occurs when a speaker is deprived of the credibility that they are owed by a listener due to either arbitrary prejudice (incidental testimonial injustice) or prejudice against marginalized identities (systemic testimonial injustice). In many cases of testimonial injustice, reduced credibility of one person’s testimony goes hand in hand with increased credibility of another person’s testimony: one person is unjustly disbelieved in favor of another. Thus, when two parties provide conflicting testimony, testimonial injustice produces two opposite psychological experiences. The believed party experiences a *credibility excess*, as the listener believes them without having adequate epistemic justification. Meanwhile, the disbelieved party suffers a *credibility deficit*.

While there has been a considerable amount of discussion around epistemic injustice in philosophy and policy (Kidd et al., 2017), almost no research has examined the psychological response to individual instances of epistemic injustice, nor the ontogeny of our moral aversion towards it. This is an important gap to address within developmental psychology, as children are an especially vulnerable group to testimonial injustice. They are frequently not taken seriously as informants by adults around them (Archard & Skivenes, 2009; Carel & Györfy, 2014). In the present study, we investigate children’s response to incidental testimonial injustice that creates both a *credibility excess* and *credibility deficit* across two cultural contexts—Kenya and the USA. Specifically, we evaluate how children react to an adult listener who consistently believes one child over the other, without any epistemic reasons to do so. We hypothesized that, from a young age, children would display an aversion to this form of testimonial injustice, based on prior evidence of their understanding of what claims deserve credibility (Harris & Corriveau, 2011), their developing understanding of the obligations within testimonial exchange (Li et al., 2024), and their evaluations of situations in which individuals are not afforded equal respect (Engelmann & Tomasello, 2019).

Children’s selective trust and the mutual obligations of testimony

To notice when someone is deprived of due credibility, one must first have some expectation for the credibility a claim should receive. A large body of work on selective trust demonstrates that children consider a range of epistemic and social factors when assigning credibility to others (Harris & Corriveau, 2011; Sobel & Kushnir, 2013). Within the first two years of life, infants show a sensitivity to a range of cues when deciding which sources to learn from (see Poulin-Dubois & Brosseau-Liard, 2016 for review). By 18–24 months of age, infants show a sensitivity to an informant’s competence and reliability in their subsequent exploration and word learning (Luchkina et al., 2018; Poulin-Dubois et al., 2011). In contexts where two informants provide conflicting information—for example, about the name or function of a novel object—it is not until the age of 4 that children consider each informant’s relative credibility to decide whom to believe, and begin to value disagreement as an epistemic process (Harris et al., 2018; Langenhoff et al., 2025; Ransom et al., 2025; Schmid et al., 2024). At 4 years old, children also begin to selectively trust informants on the basis

of the quality of the reasons they provide, rather than focusing on trait-level attributes or prior accuracy (Schleihauf et al., 2022). In addition to epistemic reasons to believe one party over another, preschool age children assign credibility to informants on the basis of social reasons (Confer et al., 2025; Harris & Corriveau, 2011; Rottman et al., 2025). Children selectively trust speakers who share their native accent (Kinzler et al., 2011), speakers who are in line with group consensus (Corriveau et al., 2009; Fusaro & Harris, 2008), and speakers who adhere to moral norms (Doebel & Koenig, 2013; Mascaro & Sperber, 2009).

In addition to exploring how children decide whom to believe, recent theoretical accounts have explored how children understand the interpersonal obligations created through testimonial exchange (Koenig et al., 2022; Li et al., 2024). Under these accounts, testimony is not just a form of evidence, akin to seeing a piece of physical evidence. Rather, by offering testimony, a speaker invites a listener to trust them. This creates particular, mutual obligations between speaker and listener. In support of this view, infants and children hold speakers to certain obligations such as accuracy. For example, 16-month-old infants looked longer at, and attempt to correct, speakers who make false claims (Koenig & Echols, 2003). Importantly, infants did not show the same pattern when the source of information was nonsocial (an audio speaker in a chair) nor when it was an unaware speaker (someone facing away from relevant information). This suggests that infants’ responses were motivated by an objection to the violation of epistemic obligations assumed by knowledgeable, social agents when giving testimony. Moreover, 3- and 4-year-old children also hold inaccurate speakers more directly accountable through spontaneous and normative protest (Li & Koenig, 2020; Rakoczy & Tomasello, 2009).

Together, this research demonstrates that from early in life, children form strong expectations for the credibility of a claim, and hold speakers accountable for inaccurate or implausible testimony. Yet this work leaves open whether children understand the social and moral obligations of a listener: do children expect listeners to treat their testimony with respect, and do they object when listeners fail to do so?

Children’s sensitivity to testimonial injustice through equal respect

How might young children detect when a listener is unjustly denying them the credibility they are owed? One possibility is that children use normative expectations for how much credibility one ought to give particular types of claims, reasons, and evidence (Tomasello, 2020). Then, when a listener’s actions violate these expectations, children may infer bias or prejudice on the part of the listener (see Asaba et al., 2025 for a similar framework for detecting bias in adults).

Alternatively, children may detect a failure to attribute appropriate credibility through relative contrast. If a listener treats two equally plausible claims differently without epistemic justification to do so, children can infer bias on the part of the listener through this differential treatment. We hypothesized that children may be particularly adept at detecting testimonial injustice involving relative contrast, and particularly averse to listeners who create testimonial injustice through inequitable consideration for one party over another.

This hypothesis is supported by prior studies on children's sensitivity to being treated differently than an equal partner, and their desire for equal respect (reviewed in Engelmann & Tomasello, 2019; McAuliffe et al., 2017; Shaw, 2013). In material distribution contexts, children object to being treated as inferior to another equal partner as early as 4 years old (McAuliffe et al., 2013). Specifically, when preschool age children are offered a predetermined split of rewards, they prefer to throw away offers where they get less, rather than allowing their peer to receive more (referred to as disadvantageous inequity aversion or *DIA*; Blake et al., 2015; Blake & McAuliffe, 2011). Later in childhood, and only in particular societies, children are willing to do the opposite: to throw away a proposed allocation to avoid getting more than a peer (called advantageous inequity aversion or *AIA*). Importantly, children's desire to be respected as an equal is broader than objections to inequitable material outcomes. Children respond differently to material inequity on the basis of the distributor's intent, procedure, justification, and whether they are given a say in the division (Dunham et al., 2018; Gordon-Hecker et al., 2022; Grocke et al., 2015, 2018; Jacobs et al., 2022; Shaw & Olson, 2014). Children also engage in costly protest against being given less when the distributed objects are explicitly worthless (Jacobs et al., 2025). These studies suggest that children's fairness objections are often motivated by the interpersonal significance of an action: at being as treated as "less-than" another.

Together, this literature suggests that children may be able to detect testimonial injustice through relative differences in how a listener treats two, equal informants from around 4 years old. Moreover, children's strong objections to unfairness in material contexts suggest that they may be particularly motivated to object to testimonial injustice when it involves a lack of equal respect for two informants. That said, there is very little research that examines the development of fairness outside of resource allocations (see Huff et al., 2025; Surian & Margoni, 2020). It remains an open question whether the psychological mechanism underlying preschool aged children's fairness intuitions would apply to cases of testimonial injustice, or whether the application of fairness intuitions to epistemic contexts occurs later in development.

Cross-cultural variation and our sampling approach

We sample from Nanyuki, Kenya, and Berkeley, USA, in the present study for three broad reasons. The first reason is to respond to a prevalent call to action in psychological research: to create more representative research through cross-cultural sampling (Henrich et al., 2010; Nielsen et al., 2017). We believe this goal is inherently valuable so long as researchers uphold respectful practices within each community (Amir & McAuliffe, 2020; Urassa et al., 2021).

The second reason is that both children's epistemic practices and their sense of fairness vary by cultural context (Benozio et al., 2024; Corriveau et al., 2014; House et al., 2020; Schafer et al., 2015). Regarding their sense of fairness, children from different societies vary in the development of inequity aversion (Amir et al., 2023; Blake et al., 2015); in their appreciation of deviating away from equal distributions to account for merit or relationships (Engelmann et al., 2021; Huppert et al., 2019); and in their willingness to sacrifice a resource to when they receive more than a peer (Amir et al., 2023; Blake et al., 2015; Rochat et al., 2009).

Regarding epistemic practices, children and infants differ across societies in how they respond to child-directed pedagogical cues (Shneidman et al., 2016); consider peer consensus (Corriveau et al., 2013; Sebastián-Enesco et al., 2020); and their sensitivity to speaker ignorance (Lucas et al., 2013). Given that children's moral and epistemic intuitions differ across cultural contexts, it's likely that children's sensitivity to testimonial injustice may manifest differently between cultural contexts.

Third, we specifically chose to contrast Nanyuki and Berkeley owing to differences in adult attitudes towards children as epistemic agents (Nganga, 2012). In a preliminary survey of $n=64$ adults, we found that adults in Nanyuki endorsed a stronger sense of epistemic hierarchy compared to adults in Berkeley. For example, adults in Nanyuki neither endorse nor condemn the statement "Children should mainly listen instead of speak," on average (see Supplemental Information). In contrast, adults in Berkeley tend to very strongly disagree with this statement. If differences in adult attitudes cause children to be treated differently as informants, this may contribute to differences in sensitivity to testimonial injustice between samples.

Due to an absence of prior cross-cultural research on this topic and in these locations, however, we had no specific predictions for how these cultural differences (and others) would influence sensitivity to testimonial injustice. For more information on cultural and demographic differences between our samples, please see "Sample contexts," in the Supplemental Information and "Demographics" in the Methods section below.

The current study

In the present preregistered study, we evaluate if 4- to 10-year-olds are sensitive to testimonial injustice in a peer-to-peer dyadic interaction. In our paradigm, a pair of participants peek into a tube across from one another, then testify to an ignorant adult listener what they see inside (see Figure 1). After a brief warm-up, the game is arranged such that the children see different images inside the tube and produce contradictory claims, despite both having equal perceptual access to inform their claim. In the *inequity condition*, the adult listener consistently believes one child's claim over the other. This produces a *credibility deficit* for the disadvantaged child, who is disbelieved despite the merit of their claims. At the same time, this produces a *credibility excess* for the advantaged child, who is repeatedly believed even though the competing claim is equally plausible. In the *control condition*, the listener disbelieves both children by endorsing a third option that neither child testified to (See Figure 2). Crucially, the adult listener is "ignorant," in that they are described to the children as having no prior knowledge of the game (and they also never look inside of the tube themselves). Thus, the listener appears to decide who they think is right exclusively based on the children's testimony (see Methods).

The comparison between the inequity and control conditions allows us to tease apart whether children's responses stem specifically from experiencing testimonial injustice, compared to being disbelieved in general. If children are simply averse to being disbelieved, they should find our *control condition* equally, if not more, aversive compared to the *inequity condition* (as in our *control condition*, the listener disbelieves both children simultaneously on every test trial). On the other hand, if children are specifically sensitive to testimonial injustice—to being unjustly

discredited compared to another peer—our *inequity condition* listener may be judged more harshly. For our primary measure, we asked children to evaluate the fairness of the listener after the last test trial of each condition. To capture children's unprompted responses to both of these conditions, we also code for children's emotional valence and spontaneous protest (see Methods and Behavioral Coding).

In summary, the present design allows us to evaluate the following set of questions regarding children's sensitivity to testimonial injustice: (1) Are children averse to testimonial injustice, beyond a baseline aversion to being disbelieved? (2) Does their aversion depend on whether they are being advantaged or disadvantaged by the injustice? (3) Do children in the US and Kenya respond differently to testimonial injustice?

Methods

Open science commitment

All materials, procedures, methods, and analyses were preregistered unless noted as exploratory. Anonymized versions of explicit evaluation data, behavioral coding data, and data analysis scripts are openly available. All of these resources can be found at: https://osf.io/wjb2m/?view_only=cbf6b157a1a44fcab06f98f657d88f8b.

Participants

$N=192$ children were recruited from local schools near Nanyuki, Kenya, and Berkeley, California ($N=48$ dyads in each sample population). Sample size was determined on the basis of a power analysis of pilot data. In our pilot data, we found that the majority of children evaluated the listener's behavior in the inequity condition as unfair and in the control condition as fair. This would theoretically yield a large effect of condition on fairness evaluation (Cohen's $d \approx 1$). To be conservative, we instead assumed a more moderate effect size ($d=0.6$), which corresponds to a mean difference of 0.6, with a standard deviation of 1. With $\alpha=.05$ and desired power $(1-\beta)=.80$, this yielded a required sample size of $n=24$ per condition per site. Both samples reflected roughly equal numbers of girl and boy participants, and no participants identified alternatively to girl or boy ($n=48$ girls, $n=48$ boys in Nanyuki; $n=49$ girls, $n=47$ boys in the Bay Area).

On the basis of related research on children's understanding of fairness and their ability to reason about conflicting claims, we set our lower age bound to four. To compare the developmental pattern to one observed with resources, we set a high upper bound of age 10 (Blake et al., 2015). This left us with an age range between 4 and 10, with participants roughly divided equally across the age range (mean = 7.31, range = 4.00–10.93). We treat age as a continuous variable throughout the present study, and thus report

developmental trends but not specific age-group analysis (e.g., 4-year-olds compared to 5-year-olds). For a more detailed age group breakdown please see [Supplemental Information](#). All children were paired randomly with another peer from the same school, and children within each pair were no more than year from one another in age. Data collection took place between June 18, 2023, and February 21, 2024.

Demographics

Nanyuki is a town within Laikipia County East, around 3–4-hour drive outside of Nairobi. On the basis of gross county product and population data reported by Laikipia county, we estimate per capita yearly income to be roughly ~15,000 KSh per month, or 147 USD (County Government of Laikipia & Kenya National Bureau of Statistics, 2020). This is a very broad estimate, as granular income data is unavailable for this area and economic productivity does not necessarily reflect income. General living conditions vary vastly, ranging from simple wooden huts without electricity and water to huge estates. Our participants came from semiurban and rural areas near Nanyuki and were almost entirely part of the Kikuyu ethnic group. Kikuyu are Kenya's largest ethnic group, living in the central part of the country. Their language (Kikuyu) is part of the Bantu family. Families usually speak a mix of Kikuyu and Swahili (the national language) at home, with Swahili being more prevalent in more urbanized areas.

Berkeley is a city within Alameda County, about an hour drive from San Francisco in the East Bay Area. The average income is quite high relative to global and local conditions, with an average per capita income of ~5,500 USD per month, or 710,160 KSh (U.S. Census Bureau, 2024). While living conditions also vary by income, the vast majority of individuals in Berkeley live in urban apartment buildings or suburban homes. In terms of race and ethnicity, Berkeley is 53% White, 7.8% Black or African American, 0.5% American Indian or Alaska Native, 20% Asian, 0.2% Native Hawaiian or Pacific Islander, 11% two or more races, and 6.3% describe themselves as a racial category outside of responses provided by the US Census (U.S. Census Bureau, 2024). Families in Berkeley often speak English alone (65%), though the remaining 35% speak Spanish (7.5%), other Indo-European languages (10.9%), Asian and Pacific Islander languages (15%), or other languages not included in the US census options (1.8%).

Materials

Materials consisted of a table, four chairs, a large tube (91 cm tall, 15 cm wide) with a slot in the middle, and a set of 12 slides: four warm-up slides with identical images on each side, and eight test trial slides with different images on either side (e.g., a flower and a tree; see OSF for all images).



Figure 1 Example of a test trial in (A) Kenya and (B) the US. Children view different images inside of the tube, creating conflicting claims. The “listener” is sat across from our main experimenter, who manipulates the slides and tube.

Procedure

After co-developing the study concept, authors from both sample contexts translated and back-translated scripts for the procedure. US children were tested in English; Kenyan children were tested in Swahili.

Overview of the procedure

Overall, the procedure had six stages: introduction to the setup; warm-up I; condition I; warm-up II; condition II; debrief. Condition (inequity or control) was manipulated within-subjects with presentation order counterbalanced across subjects. Warm-ups I and II were the exact same process, just repeated at the beginning of each condition. Debrief was conducted after all manipulations and measurements.

Introduction to the setup

To begin, two experimenters welcomed two child participants into a study area with a table, four chairs, and a large tube placed on top of the table. The children sat across from one another on each open end of the tube, while the two experimenters sat across from each other on either side of the tube (see Figure 1). The main experimenter (referred to as E1) introduced both children to the second experimenter (referred to as the listener below).

E1 then explained that the children are going to play a special game with the tube. E1 told the participants that the listener “has never seen what’s inside the tube! They have no idea what is in there, but they really, really want to know.” E1 then explained that the children’s goal is “to help them by telling them what is inside.” Finally, E1 explained that after they both tell the listener what they think it is, the listener “can decide who they believe.”

Warm-up I

E1 then asked everyone to close their eyes so that they could start the game. Once everyone’s eyes were closed, E1 inserted the first warm-up slide into a slot in the middle of the tube. After that, E1 asked everyone to open their eyes and look inside the tube. The listener exaggerated covering their eyes with both hands, keeping

them covered until after both children had already opened their eyes (to prevent children from suspecting that the listener was peeking). Then, both children looked inside of the tube and told the listener what they saw.

In two warm-up trials, both children saw the same image (e.g., a triangle). The listener acknowledged both children then agreed with them (i.e., “[Name 1] said it was a triangle, and [Name 2] said it was a triangle, so it must be a triangle”).

Condition I

Following the two warm-up trials, children then experienced the first condition (either inequity or control, order counterbalanced between subjects). The first condition consisted of four test trials in which the two children saw different images and produced conflicting testimony. Test trial slides were randomly selected by E1 in both conditions (see OSF for all images used).

In the *inequity condition*, the listener responded to the children’s conflicting testimony by endorsing one child over the other for all four trials (i.e., “Hm ... [Name 1] said it was a spoon, and [Name 2] said it was a fork ... so it must be a fork”). The listener alternated which child they acknowledged first, but always believed the same child. Note that the listener did not endorse a particular child as an individual (e.g., “you were right, good job!”); they only indicated that they believed their testimony. They also did not offer any justification for their belief in one child over the other, nor did they respond to any comments made by participants. After the first two trials, children swapped sides of the tube. This manipulation was intended to rule out low level explanations for the listener’s decisions, such as one side of the tube always being correct.

For the *control condition*, there was only one difference from the inequity condition. Instead of endorsing either of the two children’s testimony, the listener instead endorsed a third option which neither child had proposed, but that was also conceptually relevant (i.e., “Hm ... [Name] said it was a spoon, and [Name 2] said it was a fork ... so it must be a knife). This caused both children to be disbelieved, but revealed no relative bias for either of the two children. As in the *inequity condition*, the listener in the

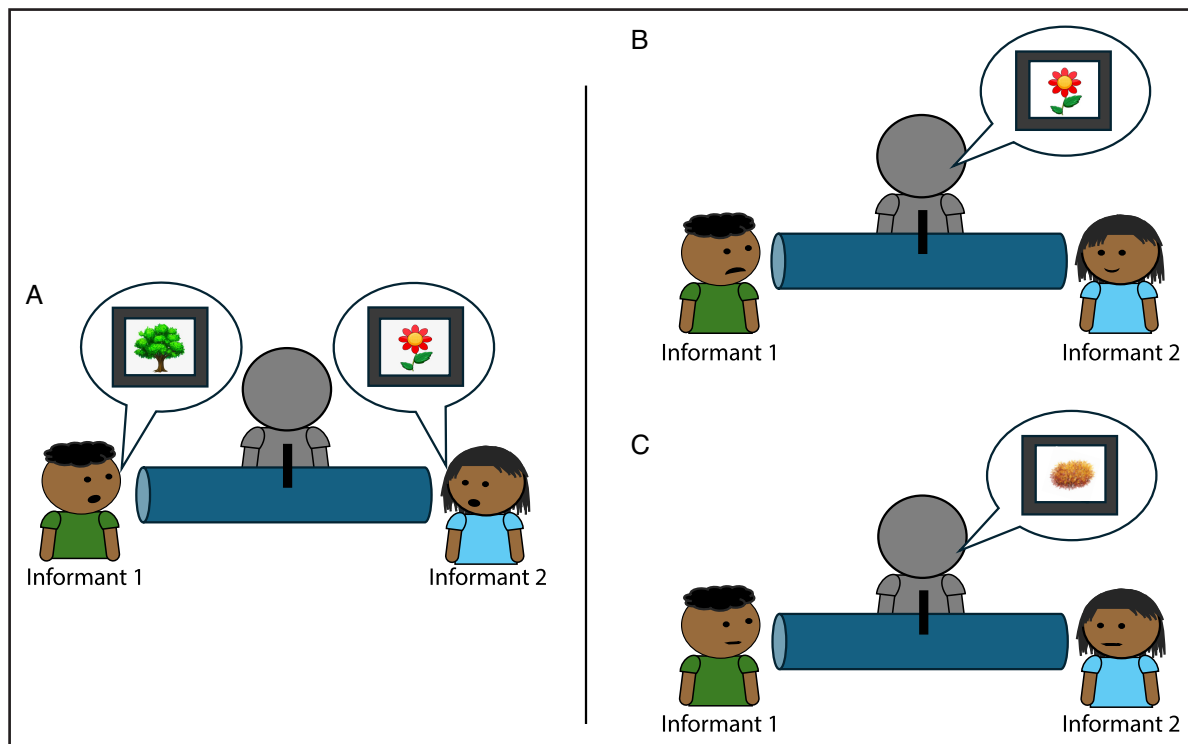


Figure 2 General schematic of the test trial procedure. (A) Both children view different images inside of a large tube, leading to conflicting testimony over what is inside (shown here as a tree and a flower). (B) Inequity condition: the experimenter believes the same child for all four test trials. (C) Control condition: the experimenter endorses a third option rather than endorsing either child's testimony (shown here as a bush).

control condition also did not offer any justification for their belief in one child over the other, nor did they respond to any comments made by the children.

After the first condition concluded, the first listener left the room and children were separated. They were then asked by E1 whether or not they liked the listener, and whether or not they thought the listener was fair (*explicit evaluations*; for details, see coding section below).

Warm-up II

After collecting explicit judgments from both children, E1 invited a third experimenter in to join them, and everyone returned to the table with the tube. E1 introduced the new experimenter, then explained that this new listener “also has no idea what is inside of the tube, and they really, really want to know.” The rest of the warm-up trials proceeded identically to warm-up I.

Condition II

Following the second set of warm-up trials, children experienced four test trials in the second condition (either inequity or control, whichever was not run as condition I). The test trials for both conditions were conducted the exact same way as described before, regardless of condition order. Finally, the second listener left the room and children were again separated. They were then asked by E1 whether or not they liked the listener, and whether or not they thought the listener was fair (*explicit evaluations*; for details, see coding section below).

Debrief

Finally, to mitigate any negative feelings by both children from being disbelieved, we had a debrief session with both participants. Our *inequity condition* listener first apologized to the children. The *inequity condition* listener then explained that they were mistaken, and both children must have been right every time. They then offered to answer any questions the children might have, and offered participant rewards (stickers in the US, biscuits in Kenya).

Measures and behavioral coding

For in-depth detail on coding instructions and interrater reliability calculations for each coded variable, please see the [Supplemental Information](#). To account for differences in language and cultural differences in expression of emotion, coding for each sample was completed by members of each respective community unaware of condition and hypotheses.

Explicit evaluations—likability and fairness

Following each condition, children were separated and asked, “Did you like [listener], or not like them?” Upon answering, E1 prompted the child to follow up with “and how much did you

[like/not like] them, a little or a lot?” This likability evaluation was designed to test broad social preferences or dis-preferences for each listener. Afterwards, E1 asked “Did you think [listener] was being fair or unfair?” Upon answering, E1 prompted the child to follow up with “and how [fair/unfair] do you think they were, a little [fair/unfair] or really [fair/unfair]?” This fairness evaluation tested for specific judgments about the listener’s actions during the game.

Explicit judgments of likeability were coded as 1–4, with 1 representing really dislike and 4 representing really like. Fairness judgments were treated similarly with 1 representing really fair and 4 representing really unfair.

Emotional valence

Emotional valence of each participant was independently coded at the trial level by two coders for each sample. Coders used video clips showing each trial from the listener announcing which claim they believe, to the children closing their eyes again. Coders attended to facial expression to assign a valence score to each child: a score of 1 indicates very unhappy, 3 indicates neutral, and 5 indicates very happy. When the two coders disagreed, the lead experimenter for each research site resolved the disagreement by reviewing the trial and selecting one of the two assigned values. This process was conducted separately for our Kenyan and US samples.

For our Kenyan sample, coders agreed upon 88.6% of trial ratings (Cohen’s kappa = 0.812). For our US sample, coders agreed upon 81% of trial ratings (Cohen’s kappa = 0.728).

Spontaneous protest

Similarly, protest was coded for by two coders for each sample using videos of each trial. Protest was coded as 0 (absent) or 1 (present) for each trial. For protest to be coded as present for a particular trial, the child must have protested after the listener’s statement of belief (“so it must be a [X]”), and before the experimenter inserted the slide for the next trial. Protest was then summed according to condition for each child to evaluate overall spontaneous objections to each listener. Our initial definition of protest was deliberately broad, including any form of objection to the listener’s statement. This included verbal exclamations (“What! No!”), as well as nonverbal protest (e.g., shaking their head and frowning).

For all trials where protest was marked as present, coders then categorized the child’s protest into mutually exclusive content categories for subsequent exploratory analysis: *negative comparison* indicated a complaint about being treated worse than the other child; *advantaged comparison* indicated a complaint about being treated better than the other child; *evidence* indicated the child referring to the basis of their testimony; *nonverbal protest* indicates gestures with negative communicative intent towards the listener; *other* includes any verbal protest which does not fit any of the above categories.

Results and analysis

All analyses were preregistered unless noted explicitly as exploratory.

Explicit evaluations—likability

Overall, children showed little variation in “liking” judgments of each listener. Kenyan children did not show significant differences in how much they said they liked the listener on the basis of condition ($t(94) = 1.03$, $p = .30$), nor did their likability ratings of the inequitable listener depend on whether they experienced a credibility deficit or excess ($t(89.95) = -0.38$, $p = .70$). US children indicated liking the control listener significantly more than the unfair listener ($t(95) = -2.13$, $p = .03$), but still assigned a positive rating to the unfair listener (mean = 3.26, roughly corresponding to “like them a little”). US children’s likability judgments for the listeners did not change by whether they had experienced a credibility deficit or excess ($t(92.28) = -1.55$, $p = .12$). Exploratory Bayesian causal mediation analysis indicated that US children’s fairness evaluations fully mediated the effect of condition on likability (indirect effect $b = -0.77$, 95% ETI: -1.49 to -0.24 ; direct effect $b = -0.020$, 95% ETI: -0.697 – 0.671). In summary, children in both populations maintained high likability ratings for all listeners, and US children’s fairness evaluations explain the slight variance in each listener’s likability between conditions.

Explicit evaluations—fairness

Descriptively, as can be seen from Figure 3, children in both countries evaluated the inequitable listener as unfair, with children in Kenya labelling the inequitable listener as more unfair than US children (Kenya sample mean = 3.22, 95% CI: 2.98–3.45; US sample mean = 2.77, 95% CI: 2.54–2.99; with 1 = really fair and 4 = really unfair). Both samples evaluated the control listener as similarly fair (Kenya sample mean = 1.92, 95% CI: 1.68–2.16; US sample mean = 1.86, 95% CI: 1.65–2.07).

To evaluate whether fairness evaluations varied by condition (inequity or control listener) and the participant’s role (whether the participant experienced a *credibility excess* or *credibility deficit* within the inequity trials), we conducted paired samples *t*-tests in each population. As predicted, children in both countries evaluated the listener in the inequitable condition as less fair than the listener in the control condition (Kenya: $t(94) = 8.18$, $p < .001$; US: $t(95) = 2.96$, $p < .01$). In both countries, children’s fairness evaluations of the inequitable listener did not significantly vary on the basis of whether children were advantaged (*credibility excess*) or disadvantaged (*credibility deficit*) by the inequity (Kenya: $t(89.9) = 1.91$, $p = .06$; US: $t(92.8) = 0.55$, $p = .58$). However, while not statistically significant, Kenyan children who experienced a *credibility deficit* labelled the inequitable listener as slightly more unfair (mean = 3.44) than did Kenyan children who experienced a *credibility excess* (mean = 3.00; $p = .059$).

To examine age-related change in fairness judgments in an exploratory analysis, we fit a linear mixed model with fairness judgment as an outcome variable, age and condition as predictors, and participant ID as a random intercept. We performed a likelihood ratio test between models with and without an interaction term between age and condition. In Kenya, this analysis indicated that children’s fairness evaluations of listeners in each condition did not change with age ($\chi^2(1) = 0.48$, $p = .49$). In the US, however, older children exhibited a stronger effect of condition than did younger children ($\chi^2(1) = 6.57$, $p = .01$).

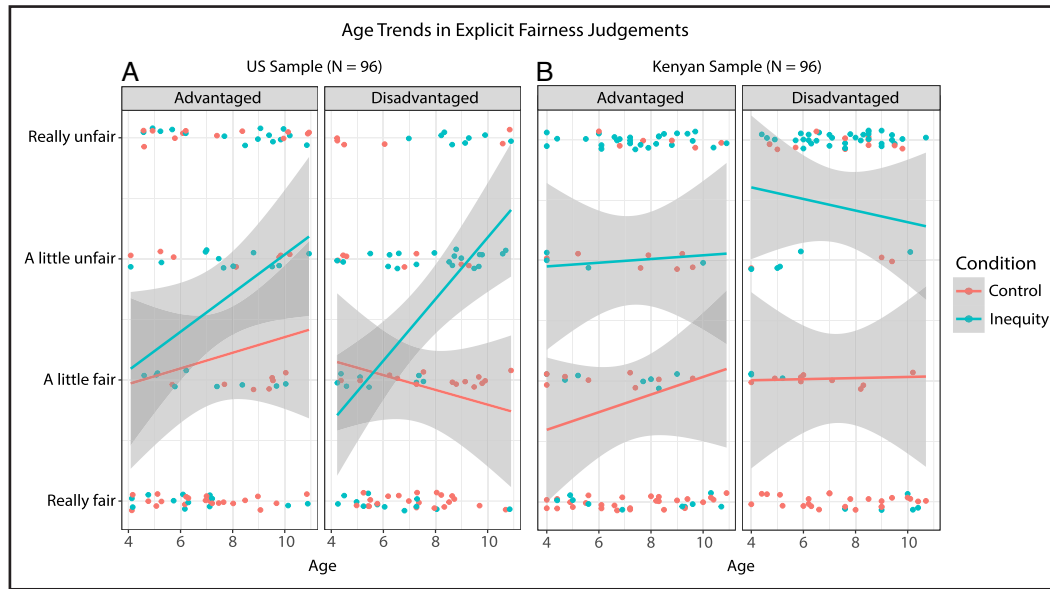


Figure 3 Age trends in fairness evaluations displayed by condition and country for (A) children in the credibility deficit role and (B) children in the credibility excess role. The y-axis displays explicit fairness evaluations, data jittered slightly for visibility purposes. The x-axis indicates participant age in years. Color shows which listener is being evaluated: red indicates evaluations of the listener from the control condition; blue indicates the inequity condition. Individual points display each participant judgment. Colored lines show linear regressions over each subset, with the shaded area indicating standard error.

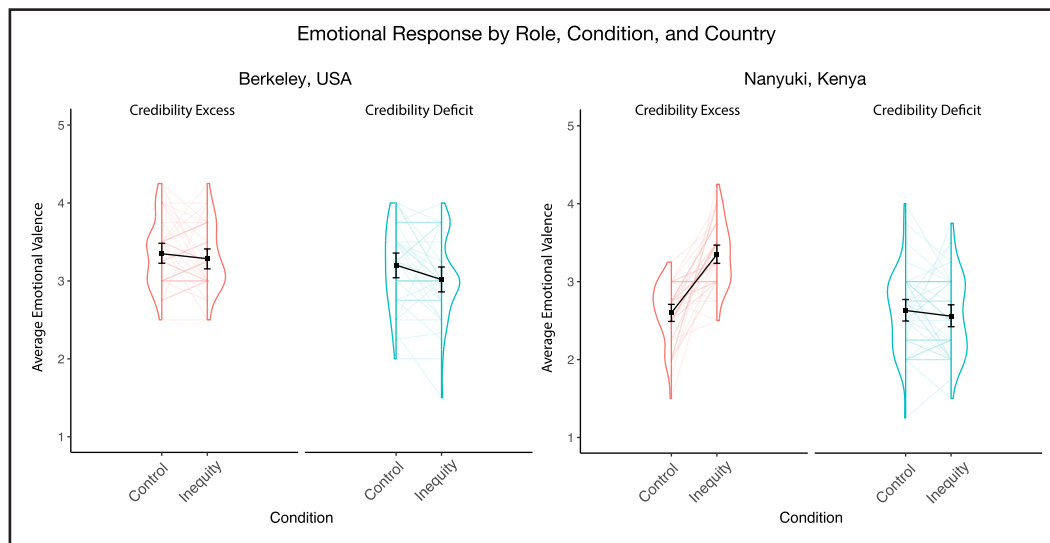


Figure 4 Emotional valence corset plots by participant role, condition, and country. The y-axes show average emotional valence for each participant, where 1 indicates strong negative emotion, 3 indicates a neutral affect, and 5 indicates strong positive emotion. The x-axes separate out responses by participant role and condition. Black squares represent mean emotion rating for each subgroup, with black bars showing bootstrapped 95% CIs around the mean. Colored density plots show the distribution of average emotional valence, with faint colored lines indicating change across conditions for each participant.

To further explore the developmental trend within our US sample, we ran a segmented regression analysis that indicated a breakpoint around the age of 7.12 (95% CI: 5.93–8.31). This indicates that US children began judging inequity of credibility more harshly than disbelieving both parties around the age of 7 years old. However, we should point out that our study was not powered to test for differences between each year of age, so this breakpoint should be treated with caution (see Discussion). Most importantly, the increasing severity of unfairness judgments with

age in US children suggests that their overall weaker negative evaluations of the inequitable listener (relative to Kenyan children) were a result of age-related changes, as opposed to a general insensitivity to testimonial injustice.

Emotional valence

To evaluate the effect of condition and age on trial-level emotional valence, we fit mixed effects models to data separated by

role and country, with a random intercept for dyad ID. We then performed likelihood ratio tests between models with and without a predictor term of interest to evaluate its effect on our outcome variable (e.g., a contrast between models with and without condition as a predictor indicated the effect of condition on emotion).

Children showed distinct emotional responses to testimonial injustice across our sample populations (Figure 4). In Kenya, children showed a significant increase in positive emotion when advantaged by the inequity condition relative to the control condition ($\chi^2(1) = 134.32, p < .001$), but showed no significantly different emotional response between conditions when they were disadvantaged by the inequity ($\chi^2(1) = 1.82, p = .18$). This increase in positive emotion for advantaged children in the inequity condition did not differ by age ($\chi^2(1) = 0.01, p = .90$). In the US, advantaged children's emotional valence was generally unaffected by condition ($\chi^2(1) = 0.93, p = .34$). Meanwhile, disadvantaged children showed a significant decrease in emotional valence in the inequity condition relative to the control ($\chi^2(1) = 10.67, p = .001$). We found no evidence that the effect of condition on emotion in disadvantaged US children differed by age ($\chi^2(1) = 0.49, p = .48$).

Protest

Contrary to our preregistered hypothesis, children's propensity to protest was largely unaffected by our condition or role manipulations. Kenyan children exhibited no protest on any trials. US children exhibited notable rates of protest, but their quantity of protest was not significantly predicted by condition nor an interaction of condition and age in a linear model (condition, $t = -0.54, p = .39$; age:condition, $t = 0.89, p = .37$). So, while US children spontaneously protested being disbelieved, their protest was not more common in response to the inequitable listener compared to the control listener who disbelieved both parties equally.

Exploratory analyses

Upon reviewer request, we conducted additional exploratory analyses evaluating mediation between dependent variables, effects of participant gender, age differential between participants as a predictor variable, and a reproduction of our findings using cumulative link mixed models. These analyses did not yield additional insight beyond a confirmation of our findings above, so we do not describe the results of all exploratory analyses here. Please see [Supplemental Information](#) for a full report.

General discussion

The present study investigated how children in two different cultural contexts respond to unequal credibility given to their testimony, despite equal basis for their claims. From as early as 4 years old, Kenyan children judged that a listener was unfair when they repeatedly believed one person over another without good reason to do so. From around the age of 7, US children did the same. Critically, children's evaluations of the listener as unfair were specific to experiencing the listener's testimonial injustice, and did not reflect their reactions toward being disbelieved in general: children in both cultural contexts did not evaluate the listener as unfair when they disbelieved both parties equally in the control

condition. Children in both countries also gave similarly negative evaluations of the unfair listener independent of whether they were personally disadvantaged (i.e., they had experienced a *credibility deficit*) or advantaged (i.e., they had experienced a *credibility excess*). These results suggest that, from a young age, children in two diverse societies are averse to instances of testimonial injustice.

Our findings shed light on children's understanding of the moral obligations within testimonial exchange (Li et al., 2024). Even though children in the *credibility excess* role were believed about their own testimony, they negatively evaluated a listener who did not consider their peer's testimony equally. This pattern suggests that children believe that listeners owe speakers equal respect, regardless of whether they have been personally advantaged by a listener's actions or not (Engelmann & Tomasello, 2019). The independence of children's fairness evaluations from their own interests suggests the beginning of a normative understanding of testimonial exchange: an agent-neutral expectation of what speakers and listeners owe to one another. While prior work has suggested that children understand the epistemic obligations that speakers have toward listeners in making accurate claims (Koenig, 2002; Li & Koenig, 2020; Rakoczy & Tomasello, 2009), our findings are novel in showing that children also understand the interpersonal obligations that listeners have toward speakers, in treating each speaker as worthy of consideration.

Our findings also present the first evidence that children apply concerns for fairness to epistemic contexts. Children's explicit evaluations in the present study echo two well-studied forms of inequity aversion within an entirely new domain, highlighting the flexibility of children's early fairness intuitions. In Kenya, children evaluated inequitable listeners as unfair from the age of 4, regardless of whether they were disadvantaged or advantaged by the listener. This indicates that from preschool, the mechanism for children's sense of fairness must be able to account for more than intuitions about material rewards or procedures for distributing them. Our findings are therefore consistent with theories of fairness that center higher level social inferences, such as a desire for equal respect or agent impartiality (Engelmann & Tomasello, 2019; Shaw, 2013; Shaw & Olson, 2014). From this perspective, relative endorsement for each informant's testimony and relative reward quantities may be interchangeable signals operating over a common psychological mechanism for fairness.

At the same time, the way in which we measured children's response to testimonial injustice makes it difficult to directly compare our findings with prior research on inequity aversion. Prior studies have operationalized inequity aversion in material contexts by observing whether children sacrifice a valuable resource to protest against unfair treatment (Blake et al., 2015; Blake & McAuliffe, 2011). Meanwhile, children in our paradigm simply had to ascribe a negative verbal label to the adult listener. This difference could impact the comparison of our findings to prior work in several ways. First, owing to differences in measurement, we cannot say whether children's negative responses to *credibility deficit* and *credibility excess* reflect the same strength of aversion as DIA and AIA. Second, prior work on inequity aversion shows that AIA emerges later in development and is far more culturally variable compared to DIA. In contrast, we found no developmental differences based on whether the child was epistemically advantaged or disadvantaged. We believe that the lack of conflict between self-interest and objection to injustice in our paradigm

contributed to this pattern. Future work should investigate how children navigate testimonial injustice when normative and self-centered interests conflict, for example, whether young children would rectify being advantaged by testimonial injustice at a cost to their own epistemic reputations.

Our study uncovered variability in children's fairness evaluations of testimonial injustice between cultural contexts. While children in both our Kenyan and in our US sample evaluated inequitable listeners as unfair, the age of onset varied between the two samples. In Kenya, children judged listeners who create testimonial injustice as unfair as early as 4 years of age, and maintained the same degree of sensitivity to epistemic inequity across ages 4 to 10. Meanwhile, children in the US evaluated listeners in the inequity and control conditions as equally fair until around the age of 7, after which they showed stronger aversion to the inequitable listener, which increased until age 10 (see [Figure 3](#)).

What features of each cultural context might produce these different trajectories? One possibility is that cultural attitudes emphasizing epistemic hierarchy contribute to an earlier understanding of testimonial injustice in Kenyan children. In contrast to US adults, Kenyan adults in our survey were more likely to agree that a child's role is to listen and learn, and that children do not need to be asked for their opinion on decisions that adults make for them (see [Supplemental Information](#)). If Kenyan children experience their testimony's being given less credibility compared to American children—or are less encouraged to share their beliefs in the first place—this may contribute to a sensitivity to being unfairly disbelieved earlier in life.

Alternatively, it is also possible that US children in our sample have their intuitions of fairness narrowed by a specific cultural emphasis on fairness in material contexts. In contrast to in Kenya, children from wealthy Western societies apply strict norms of turn-taking with high-value rewards or toys ([Melis et al., 2016](#); [Zeidler et al., 2016](#)). Similarly, prior research suggests that US children begin showing aversion to material reward inequity at an earlier age than children in many other societies ([Blake et al., 2015](#)). Rather than acquiring an earlier, general sensitivity to fairness compared to children from other cultures, these data may reflect US children's applying early fairness intuitions predominantly to material objects. This relatively narrow focus could then take time to broaden out, producing a delay in connecting explicit concepts of fairness to testimonial injustice.

Widespread differences in orientation towards interdependence may also play a role in the variance of fairness judgments we observed between our sample contexts. In material distribution, collectivistic values influence what children perceive to be fair ([Huppert et al., 2019](#)). Brockner & colleagues (2005) also found that when Dutch adults perceived themselves as a connected to others and defined through their relationships, they were more sensitive to being denied a voice by the group leader. If Kenyan children perceive themselves as more interdependent with others compared to US children, they may be similarly more sensitive to their voice being unjustly disregarded, though we want to caution against assuming high levels of interdependence in our Kenyan sample without direct measurement. Future research could investigate the role of perceived interdependence on evaluations of testimonial injustice by directly measuring if variance in children's perceptions of self–other interdependence influences their response to violations of listener–informant respect.

Our results also showed distinct patterns of behavioral and emotional responses to testimonial injustice between children in Kenya and the US. Kenyan children showed an increase in positive emotion when they were unfairly believed over a peer (i.e., in the *credibility excess* role), and never protested against the adult listeners. Broadly, this pattern can be explained in two, non-mutually exclusive ways. In the *credibility excess* role, children might simply be glad that their answer was chosen out of the two conflicting ones ([Hermann et al., 2019](#)). Meanwhile, Kenyan children in the *credibility deficit* role may acknowledge that testimonial injustice is unfair, but are not emotionally impacted by a few instances of being unfairly disbelieved. Especially given the game-like context of our study, a few instances of disbelief from an adult may not have been sufficient to produce negative emotions. Alternatively, another plausible explanation is that this pattern of emotional response is a manifestation of authority differences and cultural display rules around emotion ([Ip et al., 2021](#); [Ritov et al., in press](#)). Unlike prior studies examining children's protest in Nanyuki, the target of protest in our study was an adult ([Kanggiesser et al., 2022](#)). In relationships with strong power differences, clear display of negative emotion from the *credibility deficit* child could be construed as a form of protest or defiance toward the adult's decision ([Petkanopoulou et al., 2019](#)). Thus, in tandem with the lack of protest from the Kenyan children, this lack of negative emotional response may reflect a hesitance to contradict adult's authority. Similarly, children's positive emotion in the *credibility excess* condition may reflect a deference to authority and a relief at being “correct,” rather than genuine approval of their epistemic advantage. Future research should explore the role of authority or hierarchy between speaker and listener in children's response to testimonial injustice.

In contrast, US children showed an increase in negative emotion when they were disbelieved unfairly, and exhibited substantial protest that was equally present in both conditions. US children's negative emotional response to experiencing a *credibility deficit* aligns with recent work demonstrating that children display negative social emotions following material inequity ([Gerdemann et al., 2022](#)), though we did not observe this effect in *credibility excess* children. Importantly, in contrast to US children's explicit fairness evaluations, children's negative emotional reactions to experiencing a *credibility deficit* did not change with age. Younger US children in our sample were therefore emotionally impacted by the experience of being unfairly disbelieved, though they did not explicitly evaluate the listener as unfair. One way of interpreting this disconnect is that affective responses precede explicit understanding, laying an emotional foundation for children's later understanding of why testimonial injustice is unfair ([LoBue et al., 2011](#)). Another way of viewing this pattern aligns with our earlier hypothesis that US children's intuitive sense of fairness is narrowed towards a focus on material objects. From this perspective, the developmental gap between emotional response and fairness judgments can be seen as a distinction between what is being emphasized to the US children as things relevant to fairness (sharing and turn-taking with toys, equal reward splits) and what is implicitly understood as unfair (being unjustly disbelieved).

We found that when the agent in the *control condition* disbelieved both informants, children across all ages and sample populations evaluated their actions as fair. Why? One explanation for this pattern is that children interpreted the *control condition*

listener as “opting-out,”—refusing to align with either informant since both claims were equally plausible yet directly contradictory. Future work could investigate whether children see suspension of belief as a justified way to navigate conflicting testimony. Another explanation is that young children detect testimonial injustice specifically through relative differences in treatment between two parties. Instead of seeing denial of both informants as a deliberately neutral action from the listener, young children may simply fail to detect testimonial injustice without salient differences in how a listener responds to two informants. We hope to investigate this possibility in the future by testing whether children’s response to testimonial injustice differs without direct social contrast. For example, do children condemn someone who is being unreasonably skeptical towards them without another peer present?

Our study leaves open how children evaluate the harm of testimonial injustice beyond fairness evaluations. While children consistently rated our inequitable listener as unfair, they did not demonstrate large differences in likability judgments corresponding to this evaluation (e.g., saying that they do not like the inequitable listener). There are several possibilities that might account for this pattern. First, children may see the instance of testimonial injustice in our study as unfair, but not so harmful that they are willing to say they dislike someone. This may be particularly true for children in our Kenyan sample, who did not show negative emotion in response to unfair listeners. Relatedly, saying that you dislike someone is a more severe judgment of the individual, whereas saying that they were unfair is a lighter criticism of their actions. It is also possible that children are hesitant to say they dislike the inequitable listener owing to our study design. The experimenters clearly know one another, which may make children wary of proclaiming they do not like a listener when the main experimenter asks. The listener is also an adult authority, which may dissuade children from expressing dislike. Future work should explore whether children disprefer unjust listeners through using less explicit and more relative measures of social preference, such as forced-choice preferences between listeners (e.g., Shaw et al., 2012).

Relatedly, our study also leaves open whether children understand what is distinctively wrong about epistemic injustice. In Fricker’s theoretical framework (Fricker, 2007), the harm of epistemic injustice is distinguished from discrimination or injustice in general: both in how epistemic injustice manifests, as well as its corresponding consequences. Our data suggest that children are indeed sensitive to cases of testimonial injustice, but do not speak to how children conceptualize or internalize this harm beyond participant affect and fairness evaluations. This is a particularly important point for future research to clarify, as being deprived of epistemic credibility may have unique consequences compared to other forms of injustice. For example, children may frequently experience *credibility deficits* on the basis of their age (Archard & Skivenes, 2009; Carel & Györfy, 2014). Such experiences may cause children to internalize the deficit and doubt their own intellectual abilities (Jones, 2012). After all, especially in development, intellectual self-trust is built on intellectual trust by others: we incorporate how others treat our testimony in how we represent our own credibility (Jones, 2012). Testimonial injustice may present an imminent threat to this developmental process in early childhood.

Another limitation of our work is its focus on a relatively arbitrary form of incidental testimonial injustice. In our paradigm, we

operationalize testimonial injustice as a listener being biased towards believing one informant over another, disconnected from identity or prejudice. Meanwhile, the theoretical framework of epistemic injustice (Fricker, 2007) primarily focuses on how systemic prejudice epistemically harms marginalized individuals. We opted for this operationalization of testimonial injustice for two reasons. First, we wanted to know if testimonial injustice is objectionable to children irrespective of intuitions about identity-based discrimination. Second, we wanted to examine children’s first-person reactions to this form of injustice without engaging in identity-based discrimination against our participants. However, this also means that our study isolates and tests just one piece of a very broad theoretical discussion around epistemic injustice (Baumtrog & Peach, 2019; Dotson, 2014; Gallagher et al., 2021; Kidd et al., 2017; Pohlhaus, 2014; Stivers et al., 2011). Thus, our results cannot speak to how children’s experience of testimonial injustice varies by their identity in a social system (for ongoing work in this area, see DeAngelis, 2024 and Langenhoff et al., under review). Children who belong to identities that are systematically discredited may experience uniquely harmful downstream consequences as instances of testimonial injustice are compounded by cultural forces.

The present study is limited in its ability to draw conclusions about developmental trajectories and the generalizability of our results. Our analyses treat age as a continuous variable to evaluate general developmental trajectories across a broad age range (i.e., increasing or decreasing sensitivity across our sample). However, this also leads to our sample being underpowered to reliably evaluate specific age differences (e.g., 5-year-olds vs. 6-year-olds). This also means that our study may miss finer gradations in children’s developing sensitivity to testimonial injustice. Additionally, in the one instance where we did discover developmental change (US children’s fairness evaluations), we used a post hoc analysis to estimate a rough transition point. We want to highlight that this estimate should be treated with caution, and more research is needed within particular age groups to examine developmental trajectories in more detail. Importantly, we also do not know how our results may generalize to cultural contexts outside of our sample populations, nor what specifically causes differences between our sample contexts. We hope to investigate this in future studies by including within-culture contrasts to test how specific features of a context contribute to the developmental differences observed here.

To summarize, the present study shows that children from a Kenyan context and a US context are sensitive to testimonial injustice; both recognize it is unfair to believe one person over another without good reason to do so, though they show different emotional and behavioral reactions to being treated this way. These findings demonstrate that, from early in development, children expect their voice to be given fair consideration.

Supplementary material

Supplementary material is available at *Child Development* online.

Data availability

All materials, procedures, methods, and analyses were preregistered unless noted as exploratory. Anonymized versions of explicit evaluation data, behavioral coding data, and data analysis scripts

are openly available. All of these resources can be found at: https://osf.io/wjb2m/?view_only=cbf6b157a1a44fcab06f98f657d88f8b.

Author contributions

Colin Jacobs (Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Validation, Visualization, Writing—original draft, Writing—review & editing [lead]), Oded Ritov (Conceptualization, Methodology, Writing—review & editing [supporting], Formal analysis [equal]), Emily Chau (Conceptualization, Formal analysis, Writing—review & editing [supporting]), Nancy Njogu (Conceptualization, Investigation, Methodology, Project administration [supporting]), Mahesh Srinivasan (Conceptualization [supporting], Supervision, Writing—original draft, Writing—review & editing [equal]), Henriette Zeidler (Conceptualization, Data curation, Investigation, Methodology, Project administration, Supervision, Writing—review & editing [equal]), and Jan M. Engelmann (Conceptualization, Investigation, Methodology, Project administration, Writing—original draft, Writing—review & editing [equal], Supervision [lead])

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Conflicts of interest

The authors have no conflicts of interest for this work.

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