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Forever young: The end of history illusion in children

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ABSTRACT

The "end of history" illusion in adults (Quoidbach et al., 2013) is an asymmetrical pattern in which people accept that they've changed in the past but don't believe they will change in the future. We explore here whether the same psychological forces that cause the illusion in adults exist in the minds of children. Two studies with 4- to 11-year-olds (N = 256) suggest that they do, even in a within-subject design where the same child is asked questions about the past and the future. A third study (N = 83) finds that this illusion does not persist when children are asked about other people. These studies suggest that even young children believe that although they used to be different in the past, from this point on, they will remain forever young.

Many people—including celebrities such as Johnny Depp and Angelina Jolie—express their love for their current partners by getting tattoos of their names, only to get this body art painfully removed years later when the relationship has collapsed. It's apparently hard for some of us to imagine that our present passions will ever fade, even though we are fully aware that in the past, we have loved and then fallen out of love. In a series of studies of more than 19,000 adults, Quoidbach et al. (2013) found that when it comes to personality, values, and preferences, people remember that they have changed in the past, but tend to believe that from here on in, they will remain pretty well the same—an asymmetry they called the "end of history" illusion.

Adults' recollections of the extent to which they have changed in the past seems to be surprisingly accurate. For example, when adults were asked to fill out a personality survey for themselves today and again for themselves as they were a decade in the past, the magnitude of the difference was nearly identical to the actual changes observed in personality tests taken a decade apart (Lachman & Weaver, 1997; Quoidbach et al., 2013). Thus, the asymmetry between prediction and recollection seems to result because adults are relatively underestimating the degree to which they will change in the future (see also Renault et al., 2016).

Quoidbach et al. (2013) offer two potential theories of the cause of this illusion. First, since imagining the future is more effortful than remembering the past (presumably because constructing new events is harder than recollecting old ones), people may infer from the difficulty of imagining personal changes that they are unlikely to actually occur (e.g., Schwartz, 1992; Tversky & Kahneman, 1973). Second, since people are motivated to think well of themselves in the present and believe that their current preferences and values are good ones (Sedikides & Alicke, 2012), this might motivate them to avoid predicting changes in these domains.

Here, we are interested in the developmental origins of this illusion. If the theories proposed above are correct, this would predict that young children will also show the end of history illusion because they possess the same biases than are said to cause it in adults. Like adults, children as young as 4 years old are subject to the availability heuristic (Davies & White, 1994; Geurten et al., 2015). And, like adults, children show a self-enhancement bias—for example, they tend to remember more of their own nice actions than cruel actions (Carlson et al., 2020; Rowell & Jaswal, 2021; Tasimi & Johnson, 2015; Tasimi & Young, 2016). Hence they too might be motivated to believe that their current preferences will not change in the future.

The proposal that preschoolers could believe that most of their changing and growing is behind them might seem absurd. Shouldn't the inevitability of change be obvious just by observing older children and adults? There are a couple of reasons, however, to take this hypothesis seriously. First, among adults there is an intriguing age effect. While adults of all ages showed the end of history illusion, the effect was substantially greater for younger adults than for older adults (Quoidbach et al., 2013). Younger adults (accurately) reported a greater degree of change within the past decade than older adults, yet adults at all ages predicted a similarly low amount of future change, resulting in a wider gap between reported and predicted change for young adults. Thus, since young children are likely changing even more than adults in their twenties, if children also accurately report their past change, we might expect an even larger end of history illusion in children than in adults.

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Further support for this hypothesis comes from a body of research suggesting that young children and adults seem to share some of the same difficulties in imagining personal change in the future. For example, adults are resistant to predicting that their preferences will change in the future, although they are more accurate when predicting how a same-aged peer will change (Renault et al., 2016). Likewise, children are resistant to believing they will want to engage in adult-like preferences (e.g., coffee over juice boxes; Bélanger et al., 2014), activities (e.g., crossword puzzles; Atance et al., 2021), or desires (e.g., wanting to kiss someone; Starmans, 2021), but know that other children will change in these ways (Bélanger et al., 2014; Starmans, 2021).

Young children's difficulties are not because they are incapable of reasoning about the future. Four-year-olds can correctly distinguish between "yesterday" and "tomorrow" (Busby & Suddendorf, 2005), and understand that present actions can affect future events but not past events (Tillman & Walker, 2022). Children at this age can also engage in episodic future thinking to reason about events that will occur in the future (Atance, 2008; Atance & Meltzoff, 2005; Russell et al., 2010). When thinking about how they themselves will change in the future, 4-year-olds can also accurately predict their future physical and physiological states (Atance & Meltzoff, 2005, 2006; Starmans, 2021)—they understand that they will grow taller, and eventually get grey hair, for instance. Yet, despite these abilities, children seem to specifically resist predicting that their future psychological states will differ.

To explore the development of the end of history illusion, we conducted two experiments to assess whether children believe their preferences have changed in the past year, and whether they believe they will change in the next year. We predicted that children would report greater change when reflecting on their past than when anticipating their future—demonstrating the same asymmetric end of history illusion found in adults. In a third experiment, we test a further prediction of the theories described above: the end of history illusion should be specific to thinking about change in the self and should not extend to thinking about change in other people.

1. Open practices statement

The data and materials for all Experiments are publicly accessible at https://osf.io/hbszw/?view_only=3f03f667d1884cc2b8b3f412dcc31882. The studies were not pre-registered.

2. Experiment 1

2.1. Method

2.1.1. Participants

One hundred seventy-eight North American children aged 4 to 11 years were recruited from a lab database (mean age = 8.02 years; SD = 2.27 years; age range = 3.90–12.01 years; 51% girls, 49% boys). Thirty-eight additional participants were tested but excluded from the data analysis (see below for details). We set the desired sample size at 20 participants per year of age. However, due to multiple overlapping modalities of data collection, we collected data from 18 additional participants. We opted to include all participants that met our study criteria, but note that excluding these additional participants does not substantively change the results reported below. A power analysis indicated that this sample size provided 99% power to detect a small effect (linear multiple regression in a random model, two tails, up to 3 predictors, $\alpha = 0.05$, $\rho^2 = 0.2$; using G*Power).

A majority of the participants were tested in-person in the lab ($N = 66$) or at a local museum ($N = 60$). Due to the COVID-19 pandemic, the remaining participants were tested online via Zoom ($N = 52$). Comparisons of developmental studies run in-person and online results revealed that both methods are comparable, providing empirical support for the validity of moderated online data collection (Chuey et al., 2021). Parents optionally reported demographic information; only 30% opted to do so. Of these, 45% identified as White, 20% as two or more races, 12% as South-East Asian, 11% as East Asian, 6% as Latin American, 3% as South Asian, 1.5% as Black, and 1.5% as Middle Eastern.

2.1.2. Materials and procedure

Children interacted with an experimenter either in-person or on Zoom. The study was hosted through Qualtrics survey software, and displayed on a computer, iPad, or via share-screen to the participant. In all cases, the experimenter read each test question aloud and manually entered the participants' answers.

Children were randomly assigned to either the past condition or the future condition, between subjects. All participants engaged in a short warm-up activity to get them thinking about the past or future. Children were initially told the activity would involve questions about their preferences and were then asked 3 warm-up questions about their current age, the current season, and what their age was last year in this season (for children in the past condition), or next year (for children in the future condition). If the children provided an incorrect answer to any of these questions, they were corrected and prompted again until they arrived at the correct answer.

Children were then shown two pairs of socks, one pair of matching red socks to represent "same" and one pair of mismatching blue and green socks to represent "different", that would be used to answer the following test questions. Children were asked to identify which socks were the same and which were different. If they answered incorrectly, they were corrected and prompted again until they arrived at the correct answer.

Children were asked two additional comprehension check questions about whether their age and name would be the same or different next year or last year. Children who failed to provide a correct answer were excluded from the study ($N = 27$).

In the test phase, all children were asked to indicate 10 current favorite preferences– animal, book, color, food, friend, game, season, song, sport, and TV show, presented in random order. After each preference was indicated, children in the past condition were asked whether their favorite preference had been the same or different one year ago, and children in the future condition were asked whether they thought their favorite preference would be the same or different one year in the future. If children could not name a favorite preference, the question was skipped. If children gave a duplicate answer for two or more questions (e.g., child said "baseball" was their favorite sport and game), then their response was only counted once. On average participants answered 9.6 test questions out of 10.

Children who did not indicate a preference on more than 5 out of 10 trials were excluded from data analysis ($N = 1$). An additional 10 participants were excluded from data analysis for experimenter error ($N = 1$), parental and/or sibling interference ($N = 4$), withdrawing their participation ($N = 3$), being outside the target age range ($N = 1$), or being non-English-speaking ($N = 1$).

2.2. Results

Because each participant contributed a dichotomous response (same or different) on 10 consecutive trials, we conducted a binary logistic Generalized Estimating Equation (GEE) to examine children's preference judgments. Although we did not predict differences based on modality, to confirm that there were no such effects, we ran an initial GEE with location of testing (museum, in-lab, or online) and condition (reporting past change or predicting future change) as between-subject variables. There was no main effect of testing location, $\chi^2(2) = 5.77$, $p = .056$, and no interaction between location and condition, $\chi^2(2) = 0.78$, $p = .676$, thus we collapsed across this variable for our main analyses.

A GEE with condition (reporting past change or predicting future change) and age in months as between-subjects variables revealed a main effect of condition, χ^2 (1) = 5.20, $p = .023$, such that children reported more change in the past than they predicted change in the future (see Fig. 1). There was also a main effect of age, $\chi^2(1) = 5.63$, $p = .018$, such that older children predicted more change overall than younger children. However, there was no significant interaction between age and condition, χ^2 (1) = 0.47, $p = .492$, suggesting that the asymmetry between reported change and predicted change was similar across all ages tested.

Thus, children aged 4 to 11 reported more change in the past than they predicted in the future. One possibility is that this simply reflects an actual asymmetry in change across age—that is, it is plausible that children change a great deal when they are younger, and this rate of change decreases as they get older. If so, the asymmetry in children's judgments may reflect accurate knowledge of this declining rate of change. Alternatively, children might be subject to the same end of history illusion as adults. If so, we should observe that within any age period, reported past change should be greater than predicted future change. For instance, 5-year-olds should report that more change has occurred since they were 4 years old than 4-year-olds should predict they will change by the time they become 5 years old.

To assess this (following Quoidbach et al., 2013), we first assigned a value to each of the 1-month periods represented by our age range of 46 months to 142 months. We called this variable "time period." For each time period, we compared the predictions of predictors aged x to the reports of reporters aged $x + 1$ year. So, for example, when time period = 1, we compared 46-month-old predictors and 58-month-old reporters (i.e., a 12-month difference); when time period = 2, we compared 47-month-old predictors and 59-month-old reporters; and so on. We removed participants aged 46 to 57 months who were reporting past change, and participants aged 131 to 142 months who were predicting future change, as there were no participants to compare these with. This left 159 participants in this analysis.

This revealed a main effect of condition, χ^2 (1) = 6.50, $p = .011$, such that older children reported more change during the past year than younger children predicted in the same future year (see Fig. 2). For example, 5-year-olds looking back at when they had been four reported that more of their preferences had changed than 4-year-olds predicted would change. There was also a main effect of time period, χ^2 (1) = 5.05, $p = .025$, such that children agreed to a greater proportion of changes as they got older. However, this was qualified by an interaction between time period and condition, χ^2 (1) = 5.00, $p = .025$, such that children of all ages predicted a similarly low degree of future change, while younger children reported significantly fewer past changes than older children.

3. Experiment 2

Experiment 1 suggests that 4-to-11-year-old children believe they have changed more in the past than they will change in the future. However, it is possible that our participants who were asked about past change interpreted questions about change in a different way than participants who were asked about future change. Faced with a similar concern, Quoidbach et al. (2013) replicated the effect using a within-subject design, and we do the same here. In addition, previous studies have found that children as young as 3 years of age are better able to predict their future preferences when their past preferences are highlighted (Goulding et al., 2022), thus including both blocks for each participant may improve performance and eliminate the illusion. More generally, a within-subject design provides a stronger test of our hypothesis, since in order to show the end of history illusion, the very same children will have to acknowledge that they have changed in the past, and also say that despite this, they do not expect to change as much in the future.

3.1. Method

3.1.1. Participants

Because the design of Experiment 2 was within-subjects, we collected a smaller sample size of eighty-two 4- to 11-year-old North American children (mean age = 8.06 years; SD = 2.32 years; age range = 4.21–11.97 years; 53% male, 47% female); all children were recruited from a lab database and tested online via Zoom. The sample size was set to a total of 80, half of our targeted sample size for Experiment 1. Again, we included two additional participants that were inadvertently tested after this threshold was met; excluding these participants does not substantively change the results reported below. A power analysis indicated that this sample size provided 93% power to detect a small effect (linear multiple regression in a random model, two tails, up to 3 predictors, $\alpha = 0.05$, $\rho^2 = 0.2$; using G*Power).

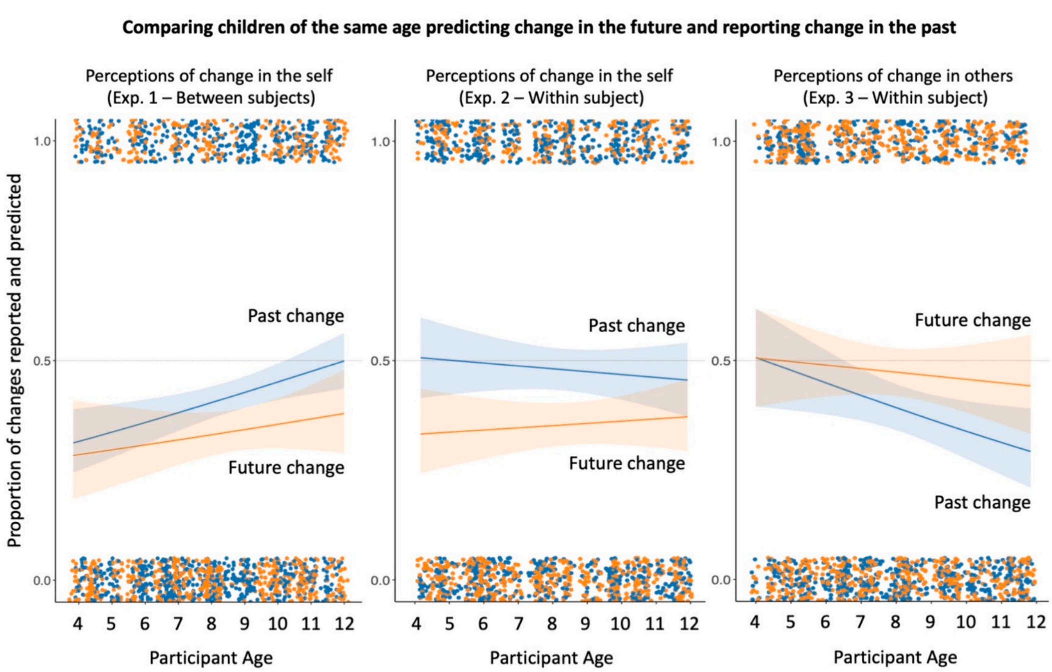

Fig. 1. Children's reports of how much they have changed in the past and predictions of how much they will change in the future, across all three experiments. Colored bands show 95% confidence intervals; individual data points are jittered to avoid overplotting.

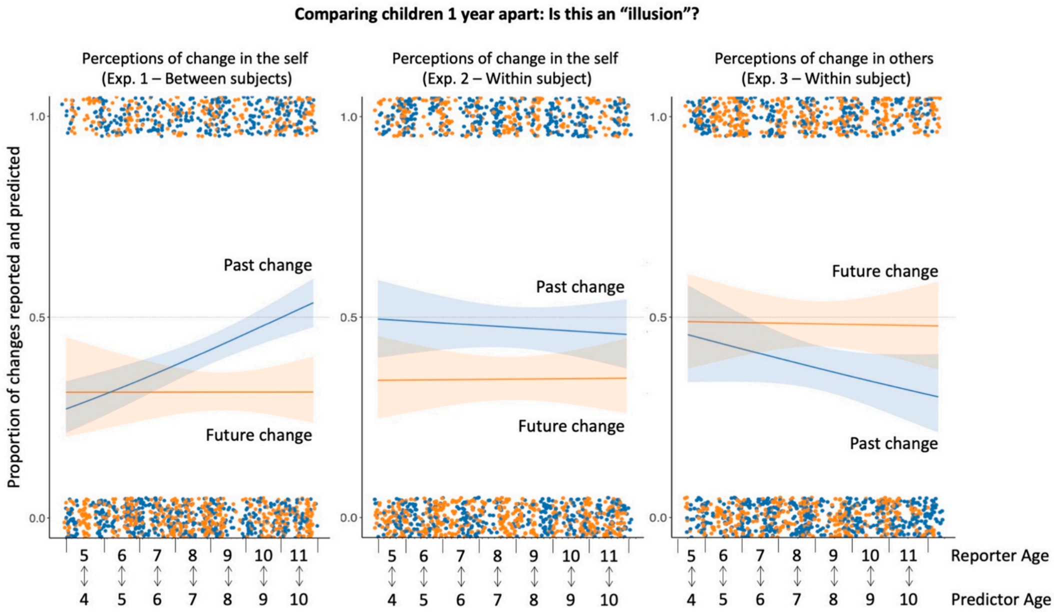

Fig. 2. Predictors' expectations of future change compared to reporters' reports of past change during the same year, across all three experiments. Colored bands show 95% confidence intervals; individual data points are jittered to avoid overplotting.

Twelve additional participants were tested but excluded from data analysis (see below for details). Parents optionally reported demographic data; 83% opted to do so. Of these, 36% of participants were identified as White, 15% South Asian, 14% South-East Asian,12% two or more races, 9% other (not specified), 6% East Asian, 4% Latin American, and 4% Black.

3.1.2. Materials and procedure

The study proceeded as in Experiment 1, except that each child completed both the past and future conditions, presented blocked and in random order. Children answered the warm-up and comprehension questions in both blocks. In Experiment 1, children who did not answer the comprehension questions correctly on the first try were excluded, however, this resulted in a fairly high number of exclusions, in part because children were confused by the wording of the age question. Since the goal of these questions was just to ensure that children understood how to use the "same" and "different" buttons in the study, in Experiment 2 those who initially answered incorrectly about whether their name or age would be different in the past or future were corrected and prompted to answer again; those who again answered incorrectly a second time were excluded from analyses ($N = 3$).

Children's answers about their current preferences in the first block were carried over to the second block. For example, an 8-year-old answering questions about the past in the first block was asked: *"What is your favorite animal?* [Child answers.] *Last year, when you were 7, was your favorite animal the same or different?"* Then, in the second block, the experimenter would refer back to this preference by saying, *"You said your favorite animal was [a cat]. Next year, when you are 9, will your favorite animal be the same or different?"* If children did not indicate a preference, that test trial was skipped in both the first half and second half of the study. As in Experiment 1, if children gave a duplicate preference for two or more questions, their response was only counted once. Participants who did not indicate a preference for more than half of the items were to be excluded, however in this experiment all participants answered at least 12 out 20 test trials, thus none were excluded for this reason. On average participants answered 9.5 test questions out of 10. Nine additional participants were excluded from the data analysis for experimental error ($N = 3$), parental and/or sibling interference ($N = 3$), or withdrawing their participation ($N = 3$).

3.2. Results

As in Experiment 1, we conducted a binary logistic GEE to examine children's preference judgments, this time with age in months and condition (past or future) as within-subjects factors. An initial model including order of presentation (past first or future first) and condition as between-subjects variables showed no significant effects involving the order of presentation (all $ps > 0.653$), thus we did not include this variable in the final model. The analysis again revealed a main effect of condition, χ^2 (1) = 22.78, $p < .001$, such that children reported more change in the past than they predicted in the future (see Fig. 1). This replicated the results of Experiment 1, despite the fact that the within-subjects design highlighted the asymmetry for children. Unlike in Experiment 1, we did not observe a main effect of age, χ^2 (1) = 0.004, $p = .950$, and again there was no significant interaction between age and condition, χ^2 (1) = 0.92, $p = .338$.

As in Experiment 1, to examine whether this difference represented an illusion, we again assigned a value to each of the 1-month periods represented by our age range of 50 months to 143 months. All participants were retained in this analysis, but we removed data from the past condition from participants aged 50 to 61 months, and data from the future condition from participants aged 132 to 143 months, as there were no participants to compare these with.

This analysis revealed a significant main effect of condition, χ^2 (1) = 19.65, $p < .001$, suggesting that children reported more change in the past than predicted change in the future (see Fig. 2). However, unlike in Experiment 1, there was no significant effect of time period, χ^2 (1) = 0.060, $p = .806$, suggesting that children across all ages overall reported (or predicted) a similar degree of change. As well, there was no significant interaction between condition and time period, $\chi^2(1) = 0.161$, $p = .688$, such that children across all ages reported similar amounts of change in the past and predicted change in the future for the same year.

4. Experiment 3

Experiment 1 and 2 suggest that 4-to-11-year-old children exhibit the same end of history illusion as adults (Quoidbach et al., 2013)—they remember that their preferences have changed in the past, but believe that from here on out, they will change very little. Does this asymmetry extend to their intuitions about other people? That is, do children think that other children have changed more in the past than they will in the future?

The theories discussed above about the mechanism behind this illusion—the asymmetry between memory and imagination, and the motivation to think well of oneself—should apply only to one's own past and future, and these same motivations and difficulties should not be present when thinking about the past and future of others. To explore this prediction, we use a modified version of the design of Experiments 1 and 2 to explore whether children show the same asymmetry between past change and future change when considering another same-aged peer.

4.1. Method

4.1.1. Participants

As in Experiment 2, we set our sample size at 80 participants. Due to overlapping data collection locations, we ultimately collected data from 3 extra participants. We opted to include all participants that met our study criteria, but note that excluding these additional participants does not substantively change the results reported below. Our final sample was eighty-three 4- to 11-year-old North American children (mean age = 7.49 years; SD = 2.27 years; age range = 4.0–11.8 years; 57% female, 43% male). Approximately half of the participants were tested online via Zoom ($N = 41$) with a live experimenter while the other half of participants were tested in person at a local museum (the adult = 42). Twelve additional participants were tested but excluded from data analysis (see below for details). Parents optionally reported demographic data; 88% opted to do so. Of these, 44% of participants identified as White, 15% as South Asian, 11% as two or more races, 11% as South-East Asian, 10% East Asian, 5% as Middle Eastern, 1% Latin American, 1% Black, and 1% as Other (not specified).

4.1.2. Materials and procedure

The study procedure was identical to Experiment 2, except that children were asked about another child's preferences rather than their own. Participants were offered the choice to hear about either boys or girls in the study, and then were shown an image of a same-aged child corresponding to their chosen gender; all participants chose to hear about same-gender characters. They were then told about that child's current preferences in the same 10 categories as in Experiments 1 and 2, and asked whether they thought that child's preferences would have been the same one year in the past, and whether they would be the same one year in the future.

Two lists of current preferences were created by extracting the most common answers given by younger (4–7 years) and older (8–11 years) participants in Experiments 1 and 2, and generating two lists of common preferences per age group (see online materials). Three face sets were generated using the AI software MidJourney to represent a mix of ethnicities, and depicted the same child at 4 different developmental stages (4–5 years, 6–7 years, 8–9 years, and 10–11 years) such that there were three faces that plausibly represented a same-age match to each participant (see online materials for the full set). For each participant, we randomly selected one of the three faces, one of two child names per gender (Anna or Avery for females; Aiden or Andrew for males), and one of the two preference lists.

As in Experiments 1 and 2, children answered the age and season warm-up and comprehension questions in both blocks about the same-aged and gendered-peer. Children then answer questions about both past and future change, blocked in random order. Children who incorrectly answered questions about whether the same-gendered peer's name or age would be different in the past or future were corrected and prompted to answer again; those who again answered incorrectly were excluded from analyses ($N = 7$). All participants answered all 20 test questions. Five additional participants were excluded from the data analysis for parental and/or sibling interference ($N = 3$) or withdrawing their participation ($N = 2$).

4.2. Results

We again conducted a binary logistic GEE to examine children's preference judgments, with age in months and condition (past or future) as within-subjects factors. An initial model including order of presentation (past first or future first), location (online or museum) and condition (past or future) as between-subjects variables showed no significant effects of order of presentation or location or interactions with condition (all $ps > 0.080$), thus we did not include these variables in the final model.

The analysis again revealed a main effect of condition, χ^2 (1) = 13.33, $p < .001$. However, this effect was in the opposite direction as in Experiments 1 and 2: children were more likely to predict that others would change in the future than that to believe that they had changed in the past (see Fig. 1). There was no significant effect of age, χ^2 (1) = 0.2.37, $p = .124$, however there was a significant interaction between age and condition, χ^2 (1) = 5.28, $p = .022$. This resulted because children across all ages predicted a similar amount of future change, but older children were less likely to report past change than younger children.

To examine whether this difference represented an illusion, we again assigned a value to each of the 1-month periods represented by our age range of 48 months to 144 months. All participants were retained in this analysis, but we removed data from the past condition from participants younger than 60 months, and data from the future condition from participants older than 130 months, as there were no participants to compare these with.

Here again there was a significant main effect of condition (past or future), χ^2 (1) = 14.92, $p < .001$, suggesting that participants believed that other children would change more in the future than they had in the past (see Fig. 2). There was no significant effect of time period, χ^2 (1) = 1.01, $p = .315$, suggesting that children across all ages had similar intuitions about change in others. There was also no significant interaction between condition and time period, $\chi^2(1) = 1.83$, $p = .176$, suggesting that the size of this illusion was similar for children at all ages.

Thus, when children are thinking about change in their own lives, they expect to change less in the future than they have in the past. However, when children are thinking about change in the lives of others, they have the opposite illusion: they expect that others will change more in the future than they have in the past.

5. General discussion

In our first two experiments, we find that 4- to 11-year-old children remember that their preferences have changed in the past, but believe that from here on out, they will change very little. This cannot simply be an accurate reflection of the development of preferences, since there is a mismatch between children's reports of change and their predictions of change for the same time period. Thus, children, like adults, exhibit an "end of history" illusion when thinking about change in themselves. However, our third experiment found that when children are thinking about change in other 4- to 11-year-olds, they don't show this illusion. These findings are consistent with the theory that the end of history illusion emerges from psychological processes that are shared between adults and children, and that are restricted to thinking about change in the self.

How does this illusion emerge across development? Experiment 1, which used a between-subjects design, suggested that the magnitude of the end of history illusion (that is, the discrepancy between children's expectations of change in the future, and the reports of change during that same year from children one year older) becomes larger with age (see Fig. 2). This trend arose because older children reported more past change than younger children did, while children of all ages predicted a similarly low level of future change (consistently predicting that only about 30% of their preferences would change within the next year).

This developmental trend is the opposite of the age trend found with adults (Quoidbach et al., 2013), in which the end of history illusion is largest in younger adults and becomes smaller in older adults. The adult age trend was also driven by differences in reflecting on past change, but in the inverse direction to what we observed in Experiment 1: Older adults believed that they had changed less in the past ten years than younger adults did. However, the relatively small magnitude of the end of history illusion at the older end of the lifespan may arise for reasons distinct from the small magnitude of the illusion in our youngest children. For example, older adults may be accurately reporting that they have failed to change much in recent years, while younger children may be inaccurately misremembering the extent to which they have changed in recent years.

The results of Experiment 1, combined with the adult findings, are thus consistent with the possibility of an inverted U-shaped developmental curve, in which the illusion grows in childhood, peaks in early adulthood, and then declines. However, we see this as a very tentative proposal, since our studies were not designed to be directly comparable to the existing adult work, in part because the timescale of change for children is necessarily smaller, and led us to ask about change across one year, rather than a decade. And there is no research that we know of that explores these questions with adolescents (i.e., 11–18-year-olds, the gap which currently exists between our oldest participants and the youngest subjects tested by Quoidbach and colleagues).

Further complicating this picture is that in Experiment 2, when we asked the same children to both report past change and predict future change, we found no effect of age. This difference between Experiment 1 and Experiment 2 appears to have been driven by an increased tendency of younger children to report that they had changed in the past, as compared to Experiment 1. We considered the possibility that when children were asked about past and future within the same session, the younger children might have been prompted to report more past change after having just predicted at least a small amount of future change. However, we found no effect of the order in which children answered these questions: Children who were asked about the past first reported just as must past change as children who were asked about the future first.

Although one might have expected the magnitude of the end of history illusion to decrease with a within-subjects design, since children may have felt some pressure to be consistent across both time periods, we instead found that the effect size was actually larger within-subject, suggesting that the asymmetry between past and future is not just unconscious or implicit, but can be observed even by explicitly asking the same child about both sorts of change.

The experiments here, taken by themselves, do not tell us whether the discrepancy between memory and expectation is because children underestimate how much they will change in the future, overestimate how much they changed in the past, or both. Most likely, children's failure to appreciate the extent to which they will change in the future explains at least some of this effect, because, as discussed above, other research finds that young children typically deny (often vehemently) that they will come to have adult preferences such as enjoying coffee or kissing (Atance et al., 2021; Bélanger et al., 2014; Starmans, 2021). It also stands to reason that younger children experience more change than older children—not less change, as they reported in Experiment 1. Thus, the relative lack of discrepancy in reported and predicted change in younger children is likely due to both a failure to predict the change they will experience in the future, and a failure to remember the change they have experienced in the past.

What is the scope of this illusion? Motivated by the hypotheses of Quoidbach et al. (2013), which propose that the illusion is grounded in psychological processes that apply to oneself, such as differences in the difficult of memory and imagination, and a bias to think well of oneself in the present, we explored whether the end of history illusion would be present when children thought about change in third parties. As predicted by these hypotheses, it was not.

One reason for this is that children were more likely to predict that others would change in the future (Experiment 3) than they were to predict that they themselves would change in the future (Experiments 1 and 2). This is consistent with past work finding that while children seem to believe that they will not undergo much change in the future (Bélanger et al., 2014; Davies & White, 1994; Geurten et al., 2015; Starmans, 2021), they are more willing to accept that *other* children of the same age will change (Atance et al., 2021; Bélanger et al., 2014; Starmans, 2021). Adults show a similar discrepancy between reasoning about future change in the self and reasoning about future change in others (Renault et al., 2016)—though even with third parties, they still tend to underestimate the extent of change that will occur.

Indeed, Experiment 3 not only found that the end of history illusion does not extend to others, but also found an *opposite* illusion: what one might call the *beginning of history illusion*. Children, especially older children, thought that other children would change in the future, but that they were not very likely to have changed in the past (see Fig. 1). Again, these judgments can be shown to be an illusion by comparing children one year apart (see Fig. 2). For example, 8-year-olds reported that another 8-year-old would not have changed much between the ages of 7 and 8, but 7-year-olds predicted that another 7-year-old would change substantially more between the ages of 7 and 8. Since both groups of participants are judging change over the same one-year period between age 7 and 8, they cannot both be correct.

Again, we cannot be sure whether children's judgments of past change or future change are more correct, but considering the large amount of change that occurs throughout childhood, it is more likely that children are underestimating the extent to which others have changed in the past. The fact that older children underestimated past change more than younger children raises additional interesting questions about whether this "beginning of history" illusion for others is also present in adult cognition; this has not yet been studied to our knowledge.

Several questions remain. We suggest here that the end of history illusion can be explained through the same mechanisms that have been proposed for adults, but further research is needed to directly explore this proposal. It is also worth exploring whether children also demonstrate the end of history illusion in other domains, given that this pattern has been demonstrated in adults in areas including life satisfaction (Harris & Busseri, 2019), motivation (Van Ryzin, 2016), authenticity (Seto & Schlegel, 2018), and values and personality (Quoidbach et al., 2013). Finally, it is a pressing question whether the end of history illusion applies to children who are not raised in highly WEIRD cultures such as the United States (for cross-cultural research with adults, see e.g., Guo & Spina, 2019; Haas & Omura, 2021). Do children everywhere believe that, at least to some extent and in some domains, they will remain forever young?

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CRediT authorship contribution statement

Alexa Sacchi: Data curation, Formal analysis, Methodology, Writing – original draft. **Jessica Sah:** Data curation, Formal analysis, Methodology, Writing – original draft. **Melissa Finlay:** Conceptualization, Data curation, Methodology. **Christina Starmans:** Conceptualization, Formal analysis, Funding acquisition, Methodology, Supervision, Visualization, Writing – original draft, Writing – review & editing.

Data availability

Data available at OSF: https://osf.io/hbszw/?view_only=3f03f667d1884cc2b8b3f412dcc31882.

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