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Intergenerational Spillovers of Pro-Environmental Attitudes and Behaviors*

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Abstract

This study evaluates how environmental education shapes household behavior through the intergenerational transmission of knowledge, beliefs, and attitudes. We implement a novel activity-based environmental education program tailored to the local context in Patna, India, designed to engage children, parents, or both. In a randomized field experiment with 1,446 child–parent pairs assigned to child-only, parent-only, joint, or control arms, we separately estimate direct treatment effects and within-household spillovers to non-participating family members. We find substantial within-household spillovers on incentivized behavior: parents whose children were treated are 25 percentage points more likely to choose a delayed recycled certificate over an immediate standard one—comparable to the 25-point effect of treating parents directly—and this certificate-choice spillover runs symmetrically in both directions. Spillovers on beliefs and attitudes, however, are asymmetric: only children shift their parents' views on climate change, with limited spillover running from parents to children on other measures. Joint participation does not outperform targeting children alone once child-to-parent spillovers are accounted for, suggesting that targeting children may be a more scalable and cost-effective approach to promoting sustainable household behavior.

JEL Codes: C93, D10, I20, O10, Q01, Q53, Q54
Keywords: Environmental education; Intra-household spillovers; Intergenerational transmission; Pro-environmental behavior; Climate risk perceptions; Factorial randomized design; India

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1 Introduction

Encouraging households to adopt sustainable behaviors is a fundamental step toward addressing climate change and other environmental challenges (IPCC, 2023; Dietz et al., 2009). Household choices over energy use, waste, and consumption generate substantial externalities, with downstream consequences for public health (Hathaway and Maibach, 2018; Cianconi et al., 2020; Berry et al., 2010), human capital (Hanna and Oliva, 2016; Venegas Marin et al., 2024; Marchetta et al., 2019; Garg et al., 2020), and distributive equity (Mattoo and Subramanian, 2012). While a growing body of research evaluates interventions that promote pro-environmental behaviors, most focus on individual decision-makers, typically adults, implicitly treating the household as a unitary agent.

This assumption is particularly restrictive for climate mitigation: those who bear long-run consequences may not control decisions today, while those with decision authority may have weaker preferences for mitigation. Children tend to express greater concern about climate change and will bear its long-term consequences disproportionately (Currie and Deschênes, 2016; O'Donoghue and Rabin, 2015; Weber, 2010; Fuerst and Singh, 2018). At the same time, decision-making power over household resources and many environmental behaviors typically resides with parents (Jodl et al., 2001; Lawson et al., 2019a; Lazarides et al., 2015; Bandura and Cherry, 2020). *This mismatch raises a first-order policy design question: who within the household should be targeted to maximize the effectiveness of climate interventions—adults, children, or both jointly?*

To answer this question, we conducted a cluster randomized controlled trial in Patna, India—a low-income urban area facing severe environmental challenges, including air pollution, inadequate waste management, recurrent flooding, and rising temperatures (Guttikunda and Jawahar, 2019; Alakshendra, 2019). We enrolled 1,446 child–parent pairs (2,892 individuals) and randomly assigned them to one of four groups: (1) a control group with no exposure to the program; (2) a child-only treatment arm (T1); (3) a parent-only arm (T2); and (4) a joint parent–child arm (T3). Because the curriculum is delivered at home rather than at school, in the setting where many environmental decisions are made, this 2×2 design cleanly separates (i) direct effects on treated children and parents, (ii) within-household spillovers from treated to untreated members in both directions, and (iii) whether joint exposure generates

complementarities beyond the sum of the individual treatments. We study outcomes spanning costly and low-cost action: two incentive-compatible behaviors, a "green certificate" choice that imposes a time cost for recycled materials, and an experimentally elicited green donation, alongside self-reported pro-environmental behaviors, climate risk perceptions, self-efficacy, and knowledge. To understand the mechanisms underlying intergenerational spillovers, we explore whether the frequency of climate-related discussions with family and peers and perceptions of relationship hierarchy mediate behavioral and attitudinal change.

We report three findings. First, direct participation raises pro-environmental action for both generations. Treated children were 23 percentage points more likely to choose the green certificate, increased green donations by 39 percent (about INR 7 on a control mean of INR 17.78), and reported gains of 0.20 SD in pro-environmental behavior and 0.33 SD in risk perceptions. Treated parents were 25 percentage points more likely to choose the certificate and gained 0.26 SD in risk perceptions and 0.16 SD in knowledge. Second, spillovers are asymmetric and run predominantly from children to parents. Parents of treated children were 25 percentage points more likely to choose the certificate and gained 0.19 SD in risk perceptions and 0.15 SD in self-efficacy, with no detectable spillovers to other behaviors or knowledge. In contrast, spillovers from parents to children are limited: parental treatment shifts only children's certificate choice (23 percentage points), leaving their attitudes, knowledge, and other behaviors unchanged. Third, joint participation does not outperform targeting children alone. Children in the joint arm were 28 percentage points more likely to choose the certificate and raised donations by INR 7.97, and their parents gained 0.23 SD in risk perceptions and 0.18 SD in self-efficacy; but once child-to-parent spillovers are accounted for, these gains are not significantly larger than in the child-only arm. Complementarities from joint exposure are therefore limited, and targeting children alone emerges as the more scalable and cost-effective way to move household environmental outcomes.

We find suggestive evidence that intra-household spillovers were mediated, in part, by increased discussion of climate change. The intervention increased the frequency of climate-related discussions within households, with communication increasing regardless of whether children or parents were targeted by the treatment. However, this communication was asymmetric in its behavioral implications. While increases in parent-to-child discussions

mediated spillover effects on children's pro-environmental behavior, we do not find corresponding evidence that child-to-parent discussions mediated parents' selection of the green certificate. The spillovers did not vary with children's perceptions of household hierarchy or with the gender of the participating parent or child, suggesting that communication, rather than household power or demographics, is the central driver.

We contribute to three strands of literature, environmental behavior change, intra-household spillovers, and educational interventions, through an experimental design that, to our knowledge, provides a clean identification of bi-directional environmental influence within households. Our four-arm randomized controlled trial separately assigns environmental education to children, parents, to both jointly, or to neither, allowing us to recover distinct estimates for (i) direct treatment effects, (ii) cross-member spillover effects, and (iii) joint exposure effects within the same household. This design enables a head-to-head comparison of child-to-parent and parent-to-child influence across a range of outcomes, an identification problem that existing studies, which typically treat only one household member, are unable to address. The same identification gap exists outside environmental education: financial-education programs targeted at children have been shown to shift parental financial behavior—robustly so within poorer households in Frisancho (2023), and alongside broader spillovers in Bruhn et al. (2016)—but these studies likewise measure spillovers in a single direction and cannot speak to whether targeting parents directly, or jointly with children, would generate comparable or complementary effects. This question is especially salient in the context of climate change, where children often hold stronger environmental preferences but lack formal decision-making power.

While joint parent–child participation has been studied in health and education contexts (Golan et al., 2006; Özler et al., 2018; Berlinski et al., 2009), ours is the first study to embed joint exposure within a household-level 2×2 factorial design in the context of environmental education. The inclusion of a joint treatment arm alongside child-only and parent-only arms allows us to test whether treating multiple household members generates complementarities or whether spillovers render additional targeting redundant—a distinction that is central for policy design but rarely addressed empirically. We find that the joint intervention produces only modest gains relative to the child-only intervention and does not significantly outperform it. Accounting for direct effects and spillovers, our results suggest that targeting children alone may be the most

cost-effective and scalable strategy for shifting household-level environmental outcomes. More broadly, this design allows us to decompose total treatment effects into direct and spillover components, providing methodological guidance for optimal intervention targeting of household-based policies. Our study also builds on the intra-household decision-making literature by shifting the focus away from spousal interactions and toward parent–child relationships (Jack et al., 2024; Conlon et al., 2021).

A second feature of our design, alongside the joint treatment arm, is the household-based delivery of the intervention. Most environmental education programs are implemented through schools (Roy Ballantyne and Packer, 2001; Lawson et al., 2019b; Jaime et al., 2023), and consequently, evidence on intergenerational spillovers is in the direction of children to parents (Alix-García and Knittel, 2025; Jaime et al., 2023): school-based delivery reaches only children, so parent-to-child spillovers cannot be observed even if they exist. Our home-based experimental design instead engages children and/or parents directly in the setting where most environmental decisions are actually made, allowing us to estimate spillovers in both directions and test whether the one-directional pattern in prior work reflects a genuine asymmetry in intergenerational influence or simply an artifact of where treatment happens to be delivered.

2 Context

The intervention took place in Patna, the capital city of the Indian state of Bihar, which exemplifies the environmental challenges facing rapidly urbanizing cities in the developing world. Its population grew fourfold between 1971 and 2011, from 473,000 to 1.68 million (Census of India, 2011), straining infrastructure through largely unplanned expansion (Ghose, 2014). This rapid growth has created severe environmental pressures that directly affect residents' daily lives and health outcomes.

The city faces acute air and water pollution challenges that have worsened significantly in recent years. Air quality has reached crisis levels, with the AQI exceeding 300 (classified as "very poor") in November 2023 — one month before our baseline survey began. These conditions have driven a dramatic increase in health impacts: acute respiratory infections surged from approximately 300,000 cases in 2018-19 to over 1.2 million in 2019-20 (India Today Insight, 2023).

Water contamination presents equally pressing concerns, particularly in the Ganga River, where untreated sewage and industrial discharge render the water unfit for human use (Down to Earth, 2024). Climate change compounds these challenges through increasing frequency of extreme weather events, including floods and heatwaves, which threaten public health, infrastructure, and economic stability (Masson-Delmotte et al., 2021; WHO, 2021). This combination of rapid urbanization, severe pollution, thinly stretched infrastructure, and climate vulnerability characterizes many South Asian cities, so the setting speaks beyond Patna to household-based environmental interventions in similar contexts.

3 The Intervention and Experimental Methodology

3.1 The "Green Warriors" Curriculum

We test the direct and indirect effects of "Green Warriors," an activity-based environmental education curriculum designed to promote sustainable household behavior. The curriculum was developed by *VentureVillage*, a Finland-based organization operating in India, to raise awareness of climate change and local environmental problems while equipping participants with practical mitigation strategies. The curriculum contains interactive lessons taught by trained educators over a few weeks (Ballantyne et al., 2001; Moser and Dilling, 2011; Sutherland and Ham, 1992). We collaborated closely with *VentureVillage* to adapt the curriculum to Patna's environmental challenges, which was informed by extensive discussions with the Patna Municipal Corporation. Following the principle that information in the climate domain spurs action only when recipients understand it, see it as actionable, care about it, and believe their actions matter (Sabarwal et al., 2024), the curriculum aims to go beyond awareness to encourage participants to adopt sustainable behaviors through targeted exercises and share what they learn with peers and family. All trainers who administered the curriculum to participants underwent comprehensive training by *VentureVillage* in activity-based teaching techniques, ensuring quality of the curriculum implementation. The curriculum consisted of four thematic sessions, each lasting around 30 minutes. The full curriculum is provided in Appendix J.

The themes of the four sessions were as follows:

Session 1: Awareness and Identification of Environmental Problems

Using puzzles, pictures, and videos, this session built awareness of the urgency of climate change and helped participants identify environmental problems in their immediate surroundings and connect them to human action. Participants were also encouraged to speak with family members about environmental changes over the past 30 years.

Session 2: Understanding Waste and Its Management

Through waste-tracking exercises, participants examined how everyday activities generate waste and how individual actions connect to waste-management systems at the community, district, national, and global levels, visualizing their personal impact.

Session 3: Behavioral Change Towards Environmental Sustainability

This session emphasized how small individual steps aggregate into collective impact, prompting participants to reflect on their own consumption and the practical trade-offs of eco-friendly choices, anchored in the local history of environmental catastrophes in Bihar and Patna.

Session 4: Climate Activism and Pro-Environmental Campaigns

The final session introduced global climate activism and prominent environmental champions, then asked participants to design and commit to their own pro-environmental campaign for their school or neighborhood. It closed by recapping the program's key takeaways and the concrete actions participants could take.

3.2 Treatment Arms

We implemented the curriculum across four arms: child-only (T1), parent-only (T2), joint child–parent (T3), and a pure control (C) receiving no intervention.

3.3 Validity of the Randomization

Baseline characteristics for children, parents, and households are well balanced along stratification dimensions and other observables. Descriptives are in tables A1 to A4 and detailed balance checks are in Tables A5, A6, A7, and A8. Although the intervention was delivered at home, we recruited through schools, and randomization was conducted at the section level, with each section assigned to one of the three treatment arms or control.[1] Each grade is divided into multiple sections to

[1]We recruited through schools, in partnership with the Patna Municipal Corporation, because schools provided a practical sampling frame for eligible child–parent pairs and because the school structure lets us contain contamination.

maintain class sizes recommended by the Education Department of Bihar. Assigning treatment at the section level, rather than to individuals, minimized the risk of treatment contamination that could arise from interactions among students in the class assigned to different treatment arms.

To ensure a balanced allocation of sections across treatment groups, we stratified the randomization along three dimensions: (i) grade, (ii) section size, and (iii) a contamination propensity score. The contamination propensity score was constructed at the classroom level using peer network data collected in the baseline survey. During baseline data collection, each student listed up to five peers with whom they interacted most frequently, distinguishing between peers in the same section, peers in other sections of the same grade, and peers in other grades. For each section, we aggregated interactions outside the classroom to identify sections with higher potential for cross-contamination. This index was used as a stratification variable to ensure an even distribution of high-contamination sections across treatment arms. Appendix F provides details on the construction of the contamination propensity score. In absolute terms, cross-section ties are limited: at baseline children name on average 2.2 peers within their own section, but only 1.3 in other sections of the same grade and 1.2 in other grades, so the most frequent interactions—which we place in the same arm—occur within section. This index is also balanced across treatment arms (Table A5).

In addition, we identified 156 sibling pairs during the baseline survey. To avoid within-household confounds arising from multiple treated children, we randomly selected one sibling per household to participate in the study. This procedure resulted in an enrolled sample of 1,537 child–parent pairs; after endline attrition (Section 4.4), our analysis sample comprises 1,446 child–parent pairs (2,892 individuals). Overall, the randomization was successful in generating a balanced sample across treatment arms.

The intervention itself was administered in the home. Had we sampled and randomized individual households drawn from the same neighborhoods, treated and control children attending the same school would interact daily, and curriculum content could diffuse from treated to control students through ordinary conversation. We therefore assign treatment at the section level and place classmates, who interact most frequently, in the same arm. The baseline peer-network data underlying our contamination index confirm that students interact little across sections of the same grade or across grades (Appendix F). The main remaining within-frame channel is siblings, whom we address by randomly retaining one child per household. See Appendix I for field operations.

3.4 Implementation of the curriculum

Households assigned to the three treatment groups received a total of six visits by the enumerators. These included the four sessions conducted by the enumerators at their homes and two data collection rounds (baseline and endline surveys) for the participating parent or child. Each of the four environmental education sessions was delivered during a separate visit to the household. During these sessions, only the household member(s) assigned to that treatment arm were asked to be present; in the child-only and parent-only arms, the non-participating family member was asked not to be in the room during curriculum delivery, limiting direct exposure to session content outside the assigned treatment condition. We did not separately record whether the excluded member specifically complied with this request; the closest available evidence is enumerators' broader assessment of family interference during sessions, which was infrequent but not zero (2.2–6.1% across arms; Table 2). This measure captures disruption from any family member, not exclusively the excluded parent or child, so it is suggestive rather than a direct compliance check. Control group households were visited only twice, once for the baseline survey and once for the endline survey. The average duration between the completion of the baseline survey and the endline survey was approximately two months for all participating households. Figure A1 in the appendix shows the timeline.

3.5 Participant Engagement and Session Quality

Enumerators recorded engagement metrics after each of the four sessions across all treatment arms (T1, T2, and T3). Table 1 presents summary statistics for nine binary engagement indicators. Overall, participants demonstrated high levels of engagement with the curriculum. Nearly all participants (96.4%) remained attentive throughout the sessions, and a similarly high proportion (96.2%) reported enjoying the session activities. The majority of participants (91.0%) were able to effectively summarize the session content when prompted. Additionally, three-quarters of participants (75.4%) actively asked questions during the sessions.

Implementation conditions were generally conducive to learning, with minimal disruptions across sessions. Only a small fraction of sessions experienced significant background noise (4.8%), family interference (4.7%), or general interruptions (3.2%). The positive reception is

further evidenced by the fact that 94.4% of participants stated they would recommend the course to others. Splitting these metrics by arm and respondent (Table 2) shows that parents engaged nearly as much as children: attentiveness (96% vs. 97%) and enjoyment of activities (95% vs. 98%) were uniformly high for both, with only minor differences, and engagement was no lower in the joint arm. Adults were therefore not a passive audience for an environmental education curriculum that is usually delivered to children.

4 Data Collection, Outcomes, and Pre-Analysis Plan

4.1 Baseline Data Collection Protocols

We identified eligible schools based on approval from the Head of School and student availability for the baseline according to the academic calendar. We proceeded with sample selection in a staggered manner, school by school. Once a school was selected, we obtained consent from students and their parents, indicating their willingness to take part in the study. We then conducted baseline surveys in two stages. First, we administered the baseline to all students from whom we had obtained both child and parent consent. Our enumerators conducted household visits to collect baseline data from all consenting parents. Further details regarding the field operations can be found in Appendix I.

4.2 Outcome Measures

To evaluate the curriculum's effectiveness, we focused on outcomes that align with its content and thematic progression of the curriculum.[2]

4.2.1 Incentive Compatible Outcomes

We measured participants' willingness to donate to an environmental cause and to wait to obtain a recycled certificate in place of an immediately available non-recycled one. These two outcomes differed in the type of commitment required—time or money—yet neither demanded significant physical effort from participants. Opting for the recycled certificate required participants to

[2]Table A24 maps the outcomes discussed in this section to the contents in the curriculum.

passively wait for the delayed option, while the donation involved contributing funds that were experimentally earned and could otherwise be kept by the participants.[3]

Green Certificate: At the endline, all participants were given a study completion certificate (including those in the control condition, whose participation consisted of the baseline and endline surveys rather than the curriculum sessions). Participants chose between a certificate printed on standard paper, available immediately, and one printed on recycled paper, available after a one-week wait. This choice was designed around the curriculum's own core themes—the waste-management content in Session 2 and the trade-off framing in Session 3—and corresponds to exactly the kind of behavior our conceptual framework predicts should be most responsive to treatment: low-cost, one-time, and visible. The two certificate options are identical in every respect relevant to the recipient—delivered through the same channel, equally usable as a credential—except that one is available immediately and the other requires a one-week wait, so this choice offers a direct, revealed-preference test of whether that wait is costly, independent of any treatment effect. Among control-group households, who received no curriculum content whatsoever, the split is close to even: 49.5% of parents and 47.5% of children choose the immediate, standard certificate over the delayed recycled option despite the recycled option being otherwise preferable (Table 3). Were the one-week wait costless, we would expect selection of the recycled certificate to be close to universal; instead, roughly half of untreated households reveal a binding preference for immediacy. Choosing the recycled certificate is therefore not a costless expression of environmental sentiment, but a costly, incentive-compatible action, which is what makes it a meaningful test of pro-environmental behavior in this setting. In addition, this outcome is particularly well suited to the Bihar context, where solid waste management and paper waste are persistent policy challenges. State- and national-level reports document low rates of waste segregation and limited recycling infrastructure, with paper constituting a substantial share of household solid waste. In response, public campaigns under initiatives such as the Swachh Bharat Mission have emphasized recycling and responsible paper use, especially through schools.

Green Donations: We measured participants' willingness to make contributions to address environmental issues with an incentive-compatible, experimentally elicited donation task, in

[3]These outcomes were pre-registered with the AEA Trial Registry at RCT ID: AEARCTR-0013240

which respondents could allocate their earnings to an environmental organization. Participants had a 1 in 6 chance to win 100 INR by rolling a fair die. Before the lottery outcome was revealed, they had to decide whether to contribute some of their potential earnings to one of two organizations: one focused on an environmental cause (waste recycling and management) and the other on a non-environmental yet salient cause (helping children). This decision thus incurs a monetary cost. We examined which organization participants chose, and how much they decided to donate. Our primary outcome measure is the amount donated to the environmental organization, with the choice of the alternative organization or no donation coded as 0.[4] Data on green donations were collected in both the baseline and endline.

4.2.2 Self-Reported Outcomes, Attitudes, and Knowledge

We complement the incentivized behaviors with four survey-based indices, each measured at baseline and endline and constructed by aggregating and standardizing their component items following Anderson (2008). Pro-environmental behavior index records how often respondents and their families undertake effortful, habitual actions such as waste segregation and using energy-efficient bulbs. Green discussions index captures how frequently participants talked about climate change with friends, family, or community members over the preceding two to three weeks. Self-efficacy index measures perceptions of how much one's own actions, and individual actions more broadly, can address local environmental problems and climate change. Risk perceptions measures concern about the risks and impacts of climate change (adapted from Leiserowitz, 2006; Chryst et al., 2018; Van der Linden, 2015), and the climate knowledge captures understanding of climate change and local environmental issues (adapted from Leiserowitz et al., 2013; Howe et al., 2015). Detailed information on specific questions and index construction appear in Table A21 and Appendix E.

4.3 Descriptive Statistics

Our study sample was drawn from 131 classrooms across 11 private schools in Patna, and included both children and their parents. The majority of our households (96%) were Hindu, with 39% belonging to upper castes and 56% classified as Other Backward Classes (OBC).

[4] Refer to Table A19 for detailed descriptions of all the outcomes.

Socioeconomically, 21% of the households stated that they have a 'Below Poverty Line' card. Additionally, 24% of households had at least one member in a government job, 26% owned a car, and 72% owned a house. The average age of the children in the sample was 12 years, and they were enrolled in grades 6 to 8.[5] Notably, 53% of the children spoke English[6], and 66% were male. On the parent side, the average age was 37 years, and 65% of the participating parents were mothers. We present the descriptive statistics in Tables A1, A2, A3, and A4.

4.4 Attrition

Endline outcomes were collected for 1,446 of the 1,537 child–parent households that remained after sibling selection, an overall attrition rate of 5.9%. Attrition is concentrated rather than individually selective: 87 of the 91 attriting households belong to six classrooms in which the endline could not be fielded, and attrition does not differ significantly across treatment arms (joint $F(3, 136) = 1.65$, $p = 0.18$; Appendix Table A13). Attriting and completing households are also statistically indistinguishable on baseline characteristics (joint $F(10) = 0.37$, $p = 0.96$; Appendix Table A14). As a conservative non-parametric robustness check, Lee (2009) bounds that trim the less-attrited control group confirm that our headline effects survive worst-case selection: every green-certificate effect remains bounded away from zero, as do the child's green-donation and green-discussion effects and the bulk of the risk-perception effects (Appendix Tables A15 and A16).

5 Conceptual Framework

Environmental policy targeted at households faces a problem that is easy to state and hard to solve: the household member most receptive to new information is often not the member with the authority to act on it. Children bear the long-run consequences of environmental degradation and are plausibly the more responsive learners, since their attitudes are still forming and their longer horizon over climate impacts gives them more reason to engage, yet they hold little direct capacity to act on what they learn. Parents hold the decision-making authority over most household resource and behavior choices, but arrive at a curriculum with more settled views and

[5] We intentionally excluded grade 10 students from this intervention due to the externally administered "high-stakes" board examination, which coincided with our endline data collection.

[6] The curriculum was available in both Hindi and English

may respond less to new information. When responsiveness and capacity to act are split across two people, the question of who to educate is no longer a question about which person learns most, but about whether learning by one person changes what the household does at all.

This split is what a design that treats only one household member cannot resolve. Such a design can identify how much the treated member learns, but it cannot say whether that knowledge changes household behavior when the treated member lacks the authority to act, or whether the untreated member absorbs it secondhand and acts on it themselves. Existing evidence on intergenerational environmental spillovers is, for this reason, almost entirely one directional: because programs are delivered through schools, they can only ever detect whether children move parents, never whether parents move children. Our four-arm design, assigning the curriculum to children alone, parents alone, both jointly, or neither, is built to close this gap. By randomizing exposure separately to each household member, we decompose any observed change in household behavior into a direct effect on the person taught, a spillover effect on the person not taught, and, where both are taught, any additional gain from joint exposure. This decomposition is what lets us ask, and answer, the targeting question directly: not simply whether environmental education works, but which household member, or combination of members, converts education into changed behavior most efficiently.

We organize our predictions around three dimensions that this design is built to test: the channels through which spillovers travel from one household member to another, how strongly treatment effects and spillovers depend on the cost of the behavior in question, and whether jointly treating both household members yields more than the sum of treating each alone.

Spillover Mechanisms. Whether knowledge and attitudes transmit within the household, and not merely correlate because both members share the same environment, depends on channels we can measure directly: the frequency of climate-related discussion, the household's decision-making hierarchy, and the gender composition of the child–parent dyad. In more hierarchical households, children may find it harder to influence parental beliefs and behavior even as parents shape children's more easily; communication patterns and authority dynamics may likewise differ systematically between mothers and fathers. Because we assign treatment to children and parents separately rather than to the household as a unit, any change we observe in the untreated member's outcomes can be attributed to spillover from the treated member specifically, rather than to an

unobserved shock common to the household. This lets us test not just whether spillovers occur, but which of these candidate channels, discussion, hierarchy, or dyad composition, carries them.

Behavioral Heterogeneity by Cost Structure. Not all pro-environmental behaviors are equally easy to adopt, and we expect both direct effects and spillovers to shrink as the cost of acting rises. Low-cost behaviors that are one-time and visible, such as choosing a recycled certificate, should show the largest direct effects and the largest spillovers, since neither the treated nor the untreated member faces much of a barrier to acting on newly formed beliefs. Behaviors carrying a monetary cost, like green donations, or requiring sustained and coordinated effort, like everyday pro-environmental habits, face higher adoption barriers on both margins; we expect smaller direct effects here, and weaker spillovers still, since spillover requires the treated member's belief change to survive being communicated and to be strong enough to overcome the untreated member's own adoption cost. Measuring outcomes that span this full cost range within the same households lets us test whether spillover strength tracks the cost of the behavior itself, rather than being a fixed property of the household or the curriculum.

Joint Participation and Complementarity. If parent and child inputs are complements in producing environmental outcomes, if, for instance, a child's new enthusiasm is more persuasive when a parent has independently encountered the same material, joint participation (T3) should outperform the sum of the two single-member arms. But complementarity is not guaranteed: if children and parents influence household behavior through independent channels, joint participation may do no better than the larger of the two single-member effects, and if child-to-parent spillovers in T1 are already substantial, adding direct parental participation in T3 may buy only marginal additional gains. Distinguishing genuine complementarity from this kind of redundancy is only possible because we randomize a joint arm alongside, rather than instead of, the two single-member arms; without that comparison, a positive effect of joint treatment is equally consistent with amplification and with duplication.

Together, these three dimensions, mechanism, cost, and complementarity, turn the targeting question into testable predictions, which the estimating equation below translates into treatment effects we can recover directly from the data.

6 Estimating Equation

We estimate the following intent to treat (ITT) empirical specification to identify the direct and indirect effects of the treatment.

$$Y_{i,t=1} = \beta_0 + \beta_1 P + \beta_2 T_1 + \beta_3 T_2 + \beta_4 T_3 + \beta_5 (P * T_1) + \beta_6 (P * T_2) + \beta_7 (P * T_3) + \beta_8 Y_{i,t=0} + \beta_9 X_i + e_i$$

where $Y_{i,t=1}$ is an outcome measure for individual i (which can be a parent or a child) measured at endline and $Y_{i,t=0}$ is the same outcome measured at baseline (if available). P is the indicator variable that takes value 1 if i is a parent and 0 if i is a child. T_1 is an indicator for the 'Child Only Treatment', T_2 is an indicator for the 'Parent Only Treatment', and T_3 is an indicator for the 'Child + Parent Treatment'. X_i is a vector of control variables that are selected using a double LASSO procedure (Belloni et al., 2014) and school-fixed effects. Standard errors are clustered at the section level at which the intervention is randomized.

Because T_1, T_2, and T_3 enter uninteracted, β_2 is the direct effect of the child attending the curriculum, β_3 is the spillover effect on the child when their parent attends the curriculum, and β_4 is the effect of participating jointly with their parent. The effect of T_1 on parents is $\beta_2 + \beta_5$, the spillover effect on parents; the effect of T_2 on parents is $\beta_3 + \beta_6$, the direct effect on parents; and the effect of T_3 on parents is $\beta_4 + \beta_7$, the joint effect. These sums are what we report directly in Tables 3 and 4 as the direct, spillover, and joint effects on parents.

The behavioral and self-reported outcomes were pre-registered prior to data collection with the AEA Trial Registry (RCT ID: AEARCTR-0013240) and the Open Science Framework Registry.

7 Main Results

7.1 Behavioral Outcomes

We first examine the effect of the curriculum on the two incentivized behavioral outcomes: green certificates and green donations. Table 3 presents the regression estimates based on the specification outlined in the previous section.

Green certificate: We observe a significant increase in the choice of the green certificate across all conditions—direct, spillover, and joint participation—among both parents and children. Direct participation increased the recycled-certificate choice by 23 percentage points for children (T1)

and 25 percentage points for parents (T2). The spillovers are nearly as large and run in both directions: 25 percentage points for parents whose children were treated (T1) and 23 percentage points for children whose parents were treated (T2). The spillovers are similar to the direct effect of participating in the curriculum and are symmetric. Lastly, we observed an increase in the selection of green certificates among both parents and children in the joint condition—children showed a 28 percentage point increase and parents showed a 26 percentage point increase. As this spillover is symmetric and low-cost, one concern is that household members coordinate a single choice rather than independently shift preferences. The data do not support this: within-pair concordance is highest in the control group and no larger in the joint arm than in control (Table A10), so the effect does not seem to reflect mechanical coordination or one member deferring to the other.

The certificate outcome is further supported by two features of our design discussed elsewhere. Section 7.4 shows the certificate effects are not driven by experimenter demand, and the coordination analysis above rules out mechanical within-pair copying. Together with the revealed-preference evidence in Section 4.2, these checks address the main threats to interpreting certificate choice as a meaningful behavioral outcome.

A related but distinct concern is that parents might defer to a child's presumed preference on this specific, low-stakes, visible choice without any accompanying change in belief or behavior—internalizing the child's preference rather than learning from the child. Our results are only partly reassuring on this point. Consistent with a deference account, the child-to-parent spillover is concentrated entirely on the certificate: we detect no spillover from treated children to parents' donations, self-reported pro-environmental behavior, or climate knowledge (Table 3), and the child-to-parent spillover in risk perceptions, while significant, is roughly a quarter smaller than the direct effect on parents themselves (0.19 vs. 0.26 SD; Table 4). We cannot fully distinguish genuine belief updating that is strongest on low-cost, visible margins from deference that is strongest on the same margins; we note this as a limitation of the certificate outcome rather than a pattern the data can adjudicate.

Green Donations: In contrast to the certificates, donations moved only for children and only through direct participation. Treated children (T1) increased their donations to the environmental cause by 6.96 INR ($p < 0.05$) and children who participated jointly with their

parents (T3) by 7.97 INR ($p < 0.01$). We do not find direct effects on parents whether they attended the curriculum alone (T2) or jointly with their child (T3). We also observe no spillovers. The donation is a censored, zero-inflated amount, but the child direct (T_1) and joint (T_3) effects retain their significance under two-limit Tobit, Poisson, inverse-hyperbolic-sine, and extensive-margin specifications (Appendix Table A9), so a single bounded outcome is not driving the result.

Self-Reported Behavioral Outcomes: Children who directly participated in the curriculum (T1) reported engaging in more pro-environmental behaviors. For children in the joint participation treatment (T3), the corresponding effect is positive but not statistically significant. Similar to donations, for parents, we do not see any effect.

7.2 Perceptions, Attitudes and Knowledge

We next examined the effects of the curriculum on climate knowledge, self-efficacy, and risk perceptions and report the estimates in Table 4.

Climate Change Knowledge: We do not find significant changes in climate change knowledge among children in any treatment condition, and the standardized point estimates are small and not consistently ordered across arms (Table 4). This likely reflects a ceiling effect: baseline knowledge is already high (88% of control children agree that climate change is happening, and a majority correctly identify its causes), leaving little room for measured gains. In contrast, the curriculum had a significant impact on climate change knowledge among parents, but only when they participated in the curriculum directly. In the parent-only treatment (T2), parents exhibited an increase in knowledge (0.16 SD, $p < 0.05$), whereas no significant effects were observed in the joint (T3) or child-only (T1) treatments.

Self-Efficacy: Children's perceived efficacy did not change under any treatment conditions. For parents, direct participation (T2) had no effect, but interestingly, perceived efficacy increased substantially when they participated jointly with their children (T3), with an increase of 0.18 standard deviations ($p < 0.05$). Spillovers were also observed from children to parents (T1), resulting in a 0.15 standard deviation increase in parental self-efficacy ($p < 0.10$). Parents' sense of efficacy seems to respond to their children's involvement rather than to their own direct participation.

Risk Perceptions: Children's risk perceptions rose through direct participation (0.33 SD, $p < 0.01$, T1) and joint participation (0.32 SD, $p < 0.01$, T3), but not through spillover from a treated parent. For parents, all three conditions raised risk perceptions: direct participation (0.26 SD, $p < 0.01$, T2), spillover from a treated child (0.19 SD, $p < 0.01$, T1), and joint participation (0.23 SD, $p < 0.05$, T3).

Perceived Social Norms: Children's perceived social norms increased with direct participation (0.16 SD, $p < 0.10$, T1) and, more strongly, with joint participation (0.25 SD, $p < 0.01$, T3), but showed no significant spillover from a treated parent (T2). For parents, none of the three conditions significantly shifted perceived social norms, though point estimates were positive across all arms (0.10–0.14 SD).

7.3 Multiple Hypothesis Testing

Because we estimate six treatment effects (direct, spillover, and joint effects on children and parents) across four outcomes in each of our two outcome domains, we guard against false positives by computing Romano–Wolf step-down p-values, which control the family-wise error rate while exploiting the bootstrap correlation across outcomes (Romano and Wolf, 2005, 2016; Clarke et al., 2020). Our headline correction treats the four outcomes within a domain as a family of four for each treatment effect, while a more demanding robustness check jointly corrects all 24 treatment-effect tests within a domain. The main results survive both. Every effect on green-certificates remains significant at the 1% level under both corrections (family-of-four $p \leq 0.003$; 24-way $p \leq 0.004$), confirming that the symmetric direct and spillover effects on incentivized behavior are not artifacts of multiple testing. The children's green-donation and green-discussion effects under the child-only (T1) and joint (T3) treatments likewise remain significant (family-of-four $p \leq 0.009$; 24-way $p \leq 0.042$). Among survey outcomes, the climate-risk-perception effects are especially robust: the direct effects on children (T1) and parents (T2), the child-to-parent spillover (T1), and both joint effects (T3) all retain significance after correction (family-of-four $p \leq 0.013$; 24-way $p \leq 0.037$), as does the joint treatment's effect on children's perceived social norms. The weaker single-outcome results, the child-only effect on pro-environmental behavior and the scattered knowledge and self-efficacy effects, survive the family-of-four correction but not the conservative 24-way one, consistent with treating them as

exploratory. Full adjusted p-values appear in Appendix Tables A17 and A18.

7.4 Experimenter Demand Effects

A natural concern is that our estimates partly reflect experimenter demand rather than genuine changes in behavior and attitudes (Zizzo, 2010; de Quidt et al., 2018). This concern is muted for our headline behavioral outcomes—the green certificate and green donation—since both are incentivized decisions with real monetary or time stakes rather than statements of intent. Winichakul et al. (2025) provide a useful external benchmark for how large a demand-driven distortion can plausibly be: using a design that induces strong, differentially applied experimenter demand across three subject pools and four classic behavioral comparative statics, they find that even this extreme inducement moves incentivized decisions by no more than a small effect (Cohen's $d \leq 0.2$), and is never large enough to reverse a directional result. The direct and spillover effects we estimate for the green certificate (23–28 percentage points on a control mean of roughly 0.5, Table 3) correspond to a substantially larger standardized effect than this upper bound, making demand an implausible explanation for our incentivized results on its own.

For our self-reported outcomes, where demand concerns are more salient, we test directly for the presence of demand effects. We exploit individual variation in the propensity to give socially desirable answers: at baseline, every child and parent completed the 13-item short form of the Marlowe–Crowne social desirability scale (Crowne and Marlowe, 1960; Reynolds, 1982), and we re-estimate our specifications interacting each treatment term with the respondent's own baseline score, standardized using the control-group mean and standard deviation separately for children and parents. If experimenter demand were inflating our results, the interaction should be positive: effects should be larger for respondents who are more prone to giving socially desirable answers.

We find no such pattern. The certificate-choice interactions never exceed three percentage points, and the donation interactions are small and statistically insignificant. The same holds for pro-environmental behavior, climate knowledge, self-efficacy, and perceived social norms. The only consistent interactions are for parents' climate-risk perceptions, and these run *negative* (-0.15 to -0.20 SD)—the opposite sign from what a demand account would predict.[7] Full

[7]The one exception is children's reported willingness to discuss climate change, where effects are 0.30–0.35 points larger per standard deviation of social desirability across all three treatment arms. We interpret this self-reported outcome with caution, while noting that the role of household discussions is corroborated by the mediation analysis

interaction estimates for both outcome domains appear in Appendix Tables A11 and A12.

8 Mechanisms

8.1 Parent–child discussions

Given the symmetric spillover effects observed for green certificate choices, we first examine whether these spillovers operate through increased environmental discussions within households in both directions. Table 5 presents the analysis focusing on the two spillover pathways: from child participation to parent behavior (T1), and from parent participation to child behavior (T2). We examine whether the treatment increases household discussions and whether controlling for this intermediate outcome alters the estimated treatment effect on the choice of green certificates. This approach is descriptive in nature and is intended to assess whether household discussions are a plausible channel underlying the spillover effects

For spillovers from children to parents (Panel A), we find that child participation in the curriculum leads to a substantial increase in child-reported green discussions. However, controlling for these discussions does not attenuate the spillover effect on parents' green certificate choices, and the discussion index itself is not significantly associated with parental behavior; a bootstrap test cannot reject that the total and mediator-controlled effects are equal ($p = 0.91$). This suggests that child-to-parent spillovers do not primarily operate through explicit environmental discussions, but may instead reflect alternative channels such as observational learning, inferred norms, or broader changes in the salience of environmental issues in the household.

In contrast, for spillovers from parents to children (Panel B), we find evidence consistent with partial mediation through discussions. Parent participation significantly increases parent-reported green discussions, and these discussions are positively associated with children's green certificate choices. Including the discussion index modestly reduces the estimated spillover effect; this reduction is statistically significant though small (bootstrap $p = 0.04$ for equality of the total and controlled effects), with the indirect path accounting for about 5% of the spillover. This indicates that conversations within the household are one channel—though not the dominant

in Table 5 and that the corresponding incentivized outcomes show no demand-consistent pattern.

one—through which parental participation influences children's behavior. Taken together, these results point to different mechanisms underlying spillovers from parents to children or children to parents: while parental engagement appears to affect children partly through discussion, child-driven spillovers to parents are less likely to be mediated by explicit communication.

8.2 Hierarchy

A natural concern is that intergenerational influence may be constrained by household decision authority. In more hierarchical parent–child relationships, children may have fewer opportunities to persuade parents, potentially attenuating child-to-parent spillovers even when children themselves respond to the curriculum.

We measure perceived relational hierarchy using a vignette in which a fictional child in class 7 is offered a place in a weekend science competition and the family must decide whether she participates. Both the child and the parent in each dyad answer five questions about the scenario: who is likely to make the final decision (the child, one parent, both parents, or the whole family), how influential parental opinions are in such decisions, who would decide if their own child were in the same situation, how likely the child would be to insist on his or her own preference against the family's wishes, and how many of the respondent's peers would go against their family in the same scenario. We code responses so that higher values correspond to stronger parental authority and average across items to form a continuous hierarchy index, constructed separately from child and parent reports. The detailed measure construction is in Table A22 in Appendix H.

We estimate specifications that interact the treatment indicators with the hierarchy index, and Tables 6 and 7 report the interaction terms. Overall, we find limited evidence that hierarchy systematically moderates the intervention's effects. For the incentive-compatible outcomes, treatment $\times$ hierarchy interactions are generally small and statistically indistinguishable from zero for green certificates and donations for both children and parents (Table 6). For self-reported behaviors, we likewise find little evidence that hierarchy changes the average treatment effects on pro-environmental behavior. The clearest hierarchy-related heterogeneity appears for climate-related communication: several treatment $\times$ hierarchy interactions for *green discussions* are positive and statistically significant, especially on the parent side (Table 6), suggesting that hierarchy is more strongly related to whether the curriculum changes household

conversations than to whether it changes the core behavioral outcomes.

For survey-reported outcomes, we again find that most treatment $\times$ hierarchy interactions are close to zero, but there is some evidence of moderation for a subset of attitudinal measures. Interactions for knowledge and perceived social norms are generally small, while interactions for self-efficacy and risk perceptions are positive and statistically significant in a few specifications (Table 7). Taken together, these results do not support the view that stronger authority gradients shut down spillovers or eliminate treatment impacts. Instead, hierarchy appears, at most, to shift *how* households process the curriculum—most visibly through climate-related discussions and, in some cases, through perceived efficacy and risk—rather than producing broad attenuation of the main behavioral effects.

8.3 Gender composition

We also examine whether intergenerational influence varies with the gender composition of the dyad, focusing on whether the participating parent is the father (Tables 8 and 9). For behavioral outcomes, the interaction terms with father participation are small and statistically insignificant across outcomes for both children and parents (Table 8). For survey-reported outcomes, the primary exception is climate knowledge: the estimated impacts on parents' knowledge are significantly smaller when the participating parent is the father, with negative and statistically significant father-interaction terms across treatment arms (Table 9). This suggests that mothers are more likely to have spillovers from the intervention when it comes to acquiring climate knowledge. For the remaining survey outcomes—self-efficacy, risk perceptions, and social norms—we similarly find little evidence of gender moderation. However, since mothers make up 65 percent of participating parents, the father interaction is estimated from a smaller subsample. Aside from this pattern, the data suggest that the curriculum's behavioral impacts and most belief changes are broadly similar across dyads, and that heterogeneity by parent gender is limited.

9 Benchmarking Effect Sizes

To situate our estimates, we benchmark them against the existing literature on pro-environmental behavior and environmental education (Table 10).[8] A central takeaway from this literature is that behavioral interventions tend to move actual behavior only modestly, with larger effects on self-reported attitudes than on behavior. Meta-analysis by Nisa et al. (2019) synthesizes randomized controlled trials across energy use, transportation, recycling, food consumption, and water use, and finds an average standardized effect on climate-relevant behavior that is close to zero ($|d| \approx 0.09$). In contrast, we detect significant effects on incentive-compatible behaviors, the green certificate and green donation effects reported in Section 7.

School-based programs often generate improvements in children's knowledge, attitudes, and self-reported behaviors, but spillovers to parents are generally weak or absent. For example, Jaime et al. (2023) document improvements in children's environmental practices following a school-based intervention in Chile, but find no evidence of spillover effects on parents' outcomes. Relative to this evidence, the magnitude of the behavioral spillovers we observe is unusually large.

Existing studies document child-to-parent spillovers primarily in beliefs or knowledge rather than behavior. Lawson et al. (2019b) report a child-to-parent effect of approximately 0.12 standard deviations on climate concern, while Damerell et al. (2013) find knowledge transmission from children to parents but do not examine behavioral outcomes. In contrast, we document sizable spillovers on a revealed, incentive-compatible choice. We emphasize that this comparison is only suggestive: the certificate is a one-time, low-cost margin, and the benchmark studies above largely measure attitudes or sustained household practices, so the comparison speaks to the relative strength of intergenerational transmission for visible, low-cost actions rather than establishing that our overall behavioral effects are larger in an unqualified sense.

Outside the environmental domain, comparable child-to-parent spillovers on revealed behavior have been documented in financial education. Bruhn et al. (2016) find that a school-based financial education curriculum for Brazilian high schoolers generated positive spillovers to parents alongside improvements in students' own savings and budgeting behavior, and Frisancho (2023), using Peruvian credit bureau records rather than self-reports, finds that

[8] Because our behavioral outcomes are measured in percentage points or rupees while most benchmarks are standardized, we draw these comparisons directionally.

while average spillovers to parents are modest, effects on parental financial behavior are sizable within poorer households — reducing default probability by roughly a quarter and raising credit scores — and persist up to three years after the intervention. These findings suggest that our results are not idiosyncratic to environmental attitudes, but reflect a more general pattern in which children's exposure to new information can alter household-level decisions even in domains, like personal finance, where parental authority is typically assumed to dominate.

10 Conclusion

This paper studies how environmental education shapes household behavior depending on whether children or parents are exposed to the educational intervention. Using a four-arm randomized experiment that separately targets children, parents, or both, we provide causal evidence on the direction, magnitude, and limits of intergenerational spillovers in environmental behavior. The results point to a systematic asymmetry: children's participation in an environmental education program generates substantial direct effects and meaningful spillovers to parents, while parental participation is largely limited to direct effects on parents themselves but generates only limited spillovers to children.

These findings contribute to the broader literature on intra-household decision-making by highlighting a domain in which influence is not aligned with formal authority or control over resources. In contrast to settings such as health or education, where parental investments typically dominate, environmental education appears to operate through channels that allow children to shape household beliefs and low-cost behaviors — evidently not primarily through explicit discussion, since child-to-parent spillovers persist without being mediated by conversation, suggesting observation or shifted household norms rather than direct persuasion. This is not entirely without precedent: evidence from financial education shows that children can shift parental financial behavior as well (Bruhn et al., 2016; Frisancho, 2023), suggesting that child-driven spillovers may be a broader feature of household learning rather than one specific to environmental attitudes.

Our experimental design also allows us to assess whether treating multiple household members generates complementarities. We find little evidence that joint parent–child

participation amplifies outcomes relative to child-only exposure. Instead, the estimates are consistent with a substitution pattern in which activating a single household member—particularly a child—is sufficient to shift household norms around environmental responsibility. This result suggests that intergenerational spillovers may reflect changes in the allocation of attention and salience within the household, rather than additive information effects. From a methodological perspective, these findings underscore the importance of distinguishing direct, spillover, and joint effects when evaluating household-based interventions.

We also find that spillovers are not uniform across outcomes. Intergenerational transmission is concentrated in low-cost, visible behaviors and in attitudinal measures, while behaviors requiring sustained effort or monetary commitment exhibit little indirect response. This heterogeneity aligns with models in which social influence is more effective for actions that serve as signals of identity or values, but less effective when adoption is constrained by economic or institutional barriers. The results therefore delineate a boundary or limit to household spillovers: attitudes and perceptions transmit readily, while higher-cost behaviors remain tightly linked to individual incentives and constraints. Another possibility is that attitudes and beliefs, such as risk perceptions and personal efficacy, are important precursors to pro-environmental behaviors, which may take more time to emerge. Together, these results suggest that when household members disagree on environmental priorities, policy may do better to work with that asymmetry than against it—targeting the family member most willing to act, rather than the one traditionally assumed to hold authority.

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Tables and Figures

Table 1: Engagement and Participation Metrics

Variable	Mean	SD	Min	Max	Sessions ×Observations
Panel A: Participant Engagement					
Asked questions during session	0.754	0.431	0	1	5,314
Attentive throughout session	0.964	0.187	0	1	5,314
Enjoyed session activities	0.962	0.191	0	1	5,314
Wanted to end session quickly	0.146	0.353	0	1	5,314
Able to summarize session well	0.910	0.286	0	1	5,314
Panel B: Implementation Quality					
Background noise	0.048	0.213	0	1	5,314
Family interference	0.047	0.211	0	1	5,314
Interruptions during session	0.032	0.175	0	1	5,314
Panel C: Overall Satisfaction					
Would recommend course to others	0.944	0.230	0	1	1,318

NOTES: All variables are binary indicators (0/1); means therefore represent the proportion of respondents with a positive response. Variables are coded as 1 if the respondent strongly agrees or agrees (categories 1–2 on the original five-point scale), and 0 otherwise (categories 3–5). Data were collected by trained enumerators after each of the four curriculum sessions for treatment groups T1 (Child Only), T2 (Parent Only), and T3 (Child and Parent); comparable data are not available for the control group. The "Sessions Œ Observations" column reflects session-level measurements (4 sessions Œ up to 1,329 treated participants = 5,316 maximum possible observations; the actual count is 5,314 due to minor attrition). Panel A variables reflect enumerator assessments of participant behavior and engagement. Panel B variables capture environmental factors that may affect learning quality; note that these are coded such that lower values indicate better implementation conditions (e.g., noise = 0 means the session had minimal background noise). Panel C reflects participants' self-reported willingness to recommend the course, collected at program completion (N = 1,318 reflects one response per participant rather than per session).

Table 2: Engagement and Participation Metrics, by Treatment Arm

	Children		Parents		
Variable	Child-only (T_1)	Joint (T_3)	Parent-only (T_2)	Joint (T_3)	p (C=P)
Panel A: Participant Engagement					
Asked questions during session	0.737	0.767	0.803	0.690	0.513
Attentive throughout session	0.970	0.975	0.956	0.956	0.003***
Enjoyed session activities	0.973	0.980	0.950	0.947	0.000***
Wanted to end session quickly	0.137	0.096	0.180	0.154	0.000***
Able to summarize session well	0.905	0.931	0.906	0.902	0.220
Panel B: Implementation Quality					
Background noise	0.067	0.026	0.056	0.028	0.435
Family interference	0.061	0.022	0.061	0.028	0.678
Interruptions during session	0.037	0.017	0.038	0.028	0.357
Session $\times$ participant obs.	1566	1041	1666	1041	

NOTES: Each entry is the share of post-session enumerator assessments with a positive response (binary indicators coded 1 if the enumerator strongly agreed or agreed, categories 1–2 on the five-point scale). Columns split the pooled engagement table by treatment arm and respondent: children in the child-only (T_1) and joint (T_3) arms, parents in the parent-only (T_2) and joint (T_3) arms. Data were collected after each of the four sessions for the treated arms; comparable data are not available for the control group. The final column reports the p-value for the difference between child and parent respondents (pooled across arms) from a regression with standard errors clustered at the household. In Panel B, higher values indicate worse implementation conditions (e.g., a higher share of sessions with background noise). $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 3: Behavioral Outcomes

	Incentivized behavior		Self-reported behavior	
	Green Certificates	**Green Donations (INR)**	**Pro-Environment Behavior**	**Green Discussions**
	(1)	(2)	(3)	(4)
Panel A: T1 – Child-Only Treatment				
Direct effect on Child	0.23***	6.96**	0.20**	0.40***
	(0.06)	(2.72)	(0.09)	(0.11)
Spillover on Parent	0.25***	-0.26	0.07	0.08
	(0.06)	(2.51)	(0.09)	(0.09)
Panel B: T2 – Parent-Only Treatment				
Spillover on Child	0.23***	2.70	0.12	0.10
	(0.06)	(2.35)	(0.09)	(0.08)
Direct effect on Parent	0.25***	0.07	0.03	0.22**
	(0.05)	(2.60)	(0.09)	(0.10)
Panel C: T3 – Joint Treatment (Child + Parent)				
Joint effect on Child	0.28***	7.97***	0.12	0.37***
	(0.06)	(2.94)	(0.08)	(0.12)
Joint effect on Parent	0.26***	-3.05	-0.03	0.23*
	(0.05)	(2.75)	(0.08)	(0.13)
Control Mean (Child)	0.53	17.78	0.00	3.30
Control Mean (Parent)	0.51	18.98	0.00	3.14
Observations	2752	2892	2892	2892
School Fixed Effects	Yes	Yes	Yes	Yes
Baseline Control		Yes	Yes	
LASSO Controls	Yes	Yes	Yes	Yes

NOTES: Standard errors clustered at the section level (in parentheses). $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. Each column reports estimates from a single pooled regression that includes both child and parent observations, with treatment indicators interacted with the household-member indicator P ($P = 1$ for parent, $P = 0$ for child). Panels A, B, and C report effects of the child-only (T_1), parent-only (T_2), and joint (T_3) treatments, respectively. Within each panel, the first row reports the effect on the child and the second row reports the effect on the parent. All specifications include school fixed effects and the baseline value of the outcome as a control where available. Additional controls are selected via post-double-selection LASSO Belloni et al. (2014) from a candidate pool of household and individual demographics, parent characteristics, and education and occupation indicators. The selection procedure is applied to every column; it selects one additional control each in columns (1) and (2) and none in columns (3) and (4). The green-certificate outcome is observed for all 2,892 individuals; column (1) reports 2,752 observations because the LASSO-selected control (parent employment status) is missing for 70 pairs. For calculating the donation amounts to green charity, all donation amounts to non-green charities were coded as 0. The pro-environment behavior indices are constructed using Anderson (2008). Column (4) reports coefficients for the willingness to discuss climate change with friends, family, or neighbors. All columns use survey data.

Table 4: Survey Reported Outcomes

	Climate Knowledge	Climate Self-Efficacy	Climate Risk Perception	Perceived Social Norms
	(1)	(2)	(3)	(4)
Panel A: T1 – Child-Only Treatment				
Direct effect on Child	0.06	0.09	0.33***	0.16*
	(0.07)	(0.07)	(0.07)	(0.08)
Spillover on Parent	0.02	0.15*	0.19***	0.10
	(0.07)	(0.07)	(0.07)	(0.08)
Panel B: T2 – Parent-Only Treatment				
Spillover on Child	0.02	-0.00	0.11	0.08
	(0.08)	(0.08)	(0.07)	(0.08)
Direct effect on Parent	0.16**	0.12	0.26***	0.10
	(0.07)	(0.07)	(0.06)	(0.08)
Panel C: T3 – Joint Treatment (Child + Parent)				
Joint effect on Child	0.02	0.05	0.32***	0.25***
	(0.08)	(0.09)	(0.08)	(0.09)
Joint effect on Parent	0.02	0.18**	0.23**	0.14
	(0.09)	(0.08)	(0.09)	(0.09)
Control Mean (Child)	-0.00	0.00	0.00	0.00
Control Mean (Parent)	-0.00	-0.00	0.00	-0.00
Observations	2892	2892	2892	2892
School Fixed Effects	Yes	Yes	Yes	Yes
Baseline Control	Yes		Yes	
LASSO Controls	Yes	Yes	Yes	Yes

NOTES: Standard errors clustered at the section level (in parentheses). $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. Each column reports estimates from a single pooled regression that includes both child and parent observations, with treatment indicators interacted with the household-member indicator P ($P = 1$ for parent, $P = 0$ for child). Panels A, B, and C report effects of the child-only (T_1), parent-only (T_2), and joint (T_3) treatments, respectively. Within each panel, the first row reports the effect on the child and the second row reports the effect on the parent. All specifications include school fixed effects and the baseline value of the outcome as a control where available (Climate Knowledge and Climate Risk Perception). Additional controls are selected via post-double-selection LASSO Belloni et al. (2014) from a candidate pool of household and individual demographics, parent characteristics, and education and occupation indicators. All four indices are constructed using Anderson (2008). All columns use survey data.

Table 5: Mediation Analysis: Green Certificate Spillovers

	Panel A: Child → Parent			Panel B: Parent → Child		
	Total Effect	**Mediator Only**	**With Mediator**	**Total Effect**	**Mediator Only**	**With Mediator**
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Child-to-Parent Spillovers						
T1: Child-Only Treatment	0.23***	0.30***	0.23***			
	(0.06)	(0.07)	(0.06)			
Child Discussion Index			0.00			
			(0.01)			
Panel B: Parent-to-Child Spillovers						
T2: Parent-Only Treatment				0.21***	0.21***	0.20***
				(0.06)	(0.06)	(0.06)
Parent Discussion Index						0.05***
						(0.02)
Indirect effect (total − controlled)		0.001 (0.005)			0.010 (0.005)	
p-value (H_0: total = controlled)		0.908			0.041	
Proportion mediated		0.00			0.05	
Observations	779	779	779	802	802	802
R^2	0.31	0.06	0.31	0.22	0.04	0.23
School Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Grade Controls	Yes	Yes	Yes	Yes	Yes	Yes

NOTES: This table examines whether spillover effects of the curriculum on green certificate choices operate through increased parent-child discussions about environmental issues. Panel A considers spillovers from child participation to parent outcomes under the child-only treatment (T_1), using child-reported discussion indices as mediators. Panel B considers spillovers from parent participation to child outcomes under the parent-only treatment (T_2), using parent-reported discussion indices as mediators. Columns labeled "Total Effect" report the treatment effect on green certificate choices. Columns labeled "Mediator Only" report the treatment effect on the discussion mediator. Columns labeled "With Mediator" report the treatment effect after controlling for the corresponding discussion mediator. The indirect effect is the difference between the total and mediator-controlled effects; its p-value is from a section-clustered bootstrap of the null that the two are equal. All specifications include school fixed effects and grade controls. Standard errors clustered at the classroom level are reported in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 6: Heterogeneity in Behavioral Treatment Effects by Household Hierarchy

	Incentivized behavior		Self-reported behavior	
	Green Certificates	**Green Donations (INR)**	**Pro-Environment Behavior**	**Green Discussions**
	(1)	(2)	(3)	(4)
Panel A: T1 – Child-Only Treatment				
Direct effect on Child × Hierarchy Index	0.01	-1.17	0.04	-0.05
	(0.03)	(2.21)	(0.07)	(0.08)
Spillover on Parent × Hierarchy Index	-0.01	2.62	-0.09	0.19***
	(0.03)	(2.32)	(0.08)	(0.07)
Panel B: T2 – Parent-Only Treatment				
Spillover on Child × Hierarchy Index	0.05	2.07	-0.06	0.15**
	(0.03)	(2.18)	(0.07)	(0.07)
Direct effect on Parent × Hierarchy Index	0.05	4.17**	-0.06	0.16**
	(0.03)	(2.00)	(0.06)	(0.07)
Panel C: T3 – Joint Treatment (Child + Parent)				
Joint effect on Child × Hierarchy Index	-0.00	4.37*	-0.19**	-0.01
	(0.03)	(2.53)	(0.09)	(0.07)
Joint effect on Parent × Hierarchy Index	0.02	2.79	-0.13	0.12*
	(0.04)	(2.18)	(0.08)	(0.07)
Control Mean (Child)	0.53	17.78	0.00	3.30
Control Mean (Parent)	0.51	18.98	0.00	3.14
Observations	2752	2892	2892	2892
School Fixed Effects	Yes	Yes	Yes	Yes
Baseline Control		Yes	Yes	
LASSO Controls	Yes	Yes	Yes	Yes

NOTES: This table reports heterogeneous treatment effects on behavioral outcomes by child-reported household decision-making hierarchy. Higher values of the hierarchy index indicate more adult-dominated household decision-making. Each entry reports the coefficient on the interaction between the relevant treatment-effect term and the hierarchy index. Thus, each coefficient should be interpreted as the change in the corresponding treatment effect associated with a one-unit increase in the household hierarchy index. Panels A, B, and C report heterogeneity for the child-only (T_1), parent-only (T_2), and joint (T_3) treatments, respectively. Within each panel, the first row reports the child outcome and the second row reports the parent outcome. Standard errors clustered at the section level are reported in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. All specifications include school fixed effects, the baseline value of the outcome as a control where available, and additional controls selected via post-double-selection LASSO Belloni et al. (2014) from a candidate pool of household and individual demographics, parent characteristics, and education and occupation indicators. The pro-environment behavior index is constructed using Anderson (2008).

Table 7: Heterogeneity in Survey Treatment Effects by Household Hierarchy

	Climate Knowledge	Climate Self-Efficacy	Climate Risk Perception	Perceived Social Norms
	(1)	(2)	(3)	(4)
Panel A: T1 – Child-Only Treatment				
Direct effect on Child × Hierarchy Index	-0.05	0.09	0.03	-0.10
	(0.06)	(0.07)	(0.07)	(0.06)
Spillover on Parent × Hierarchy Index	0.03	0.05	0.06	0.03
	(0.07)	(0.06)	(0.06)	(0.08)
Panel B: T2 – Parent-Only Treatment				
Spillover on Child × Hierarchy Index	0.01	0.21***	0.14**	0.02
	(0.05)	(0.07)	(0.07)	(0.06)
Direct effect on Parent × Hierarchy Index	0.08	0.11*	0.13*	-0.02
	(0.07)	(0.06)	(0.07)	(0.07)
Panel C: T3 – Joint Treatment (Child + Parent)				
Joint effect on Child × Hierarchy Index	-0.05	0.17*	0.05	0.00
	(0.05)	(0.09)	(0.07)	(0.06)
Joint effect on Parent × Hierarchy Index	-0.01	0.13*	0.05	-0.01
	(0.08)	(0.07)	(0.06)	(0.08)
Control Mean (Child)	-0.00	0.00	0.00	0.00
Control Mean (Parent)	-0.00	-0.00	0.00	-0.00
Observations	2892	2892	2892	2892
School Fixed Effects	Yes	Yes	Yes	Yes
Baseline Control	Yes		Yes	
LASSO Controls	Yes	Yes	Yes	Yes

NOTES: This table reports heterogeneous treatment effects on survey-reported outcomes by child-reported household decision-making hierarchy. Higher values of the hierarchy index indicate more adult-dominated household decision-making. Each entry reports the coefficient on the interaction between the relevant treatment-effect term and the hierarchy index. Thus, each coefficient should be interpreted as the change in the corresponding treatment effect associated with a one-unit increase in the household hierarchy index. Panels A, B, and C report heterogeneity for the child-only (T_1), parent-only (T_2), and joint (T_3) treatments, respectively. Within each panel, the first row reports the child outcome and the second row reports the parent outcome. Standard errors clustered at the section level are reported in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. All specifications include school fixed effects, the baseline value of the outcome as a control where available (Climate Knowledge and Climate Risk Perception), and additional controls selected via post-double-selection LASSO Belloni et al. (2014) from a candidate pool of household and individual demographics, parent characteristics, and education and occupation indicators. All four indices are constructed using Anderson (2008).

Table 8: Heterogeneity in Behavioral Treatment Effects by Parent Gender

	Incentivized behavior		Self-reported behavior	
	Green Certificates	**Green Donations (INR)**	**Pro-Environment Behavior**	**Green Discussions**
	(1)	(2)	(3)	(4)
Panel A: T1 – Child-Only Treatment				
Direct effect on Child × Father Participant	-0.03	1.60	0.08	-0.14
	(0.07)	(5.39)	(0.16)	(0.19)
Spillover on Parent × Father Participant	-0.05	-7.32	0.04	-0.03
	(0.07)	(5.11)	(0.15)	(0.16)
Panel B: T2 – Parent-Only Treatment				
Spillover on Child × Father Participant	-0.11	-4.68	-0.11	-0.15
	(0.07)	(5.75)	(0.13)	(0.18)
Direct effect on Parent × Father Participant	-0.11	-7.31	-0.18	0.06
	(0.07)	(5.48)	(0.13)	(0.16)
Panel C: T3 – Joint Treatment (Child + Parent)				
Joint effect on Child × Father Participant	-0.02	0.18	0.11	0.00
	(0.07)	(6.24)	(0.16)	(0.19)
Joint effect on Parent × Father Participant	-0.06	-7.80	-0.12	0.17
	(0.07)	(5.18)	(0.16)	(0.18)
Control Mean (Child)	0.53	17.78	0.00	3.30
Control Mean (Parent)	0.51	18.98	0.00	3.14
Observations	2740	2878	2878	2878
School Fixed Effects	Yes	Yes	Yes	Yes
Baseline Control		Yes	Yes	
LASSO Controls	Yes	Yes	Yes	Yes

NOTES: This table reports heterogeneous treatment effects on behavioral outcomes by parent gender. Each entry reports the coefficient on the interaction between the relevant treatment-effect term and an indicator for a father participant, relative to a mother participant. Thus, each coefficient should be interpreted as the difference in the corresponding treatment effect for households in which the participating parent is the father rather than the mother. Panels A, B, and C report heterogeneity for the child-only (T_1), parent-only (T_2), and joint (T_3) treatments, respectively. Within each panel, the first row reports the child outcome and the second row reports the parent outcome. Standard errors clustered at the section level are reported in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. All specifications include school fixed effects, the baseline value of the outcome as a control where available, and additional controls selected via post-double-selection LASSO Belloni et al. (2014); the participating-parent gender variable is excluded from the candidate pool because it is collinear with the moderator. The pro-environment behavior index is constructed using Anderson (2008).

Table 9: Heterogeneity in Survey Treatment Effects by Parent Gender

	Climate Knowledge	Climate Self-Efficacy	Climate Risk Perception	Perceived Social Norms
	(1)	(2)	(3)	(4)
Panel A: T1 – Child-Only Treatment				
Direct effect on Child × Father Participant	0.04	0.19	0.22	0.03
	(0.13)	(0.12)	(0.14)	(0.12)
Spillover on Parent × Father Participant	-0.21*	-0.01	-0.12	0.01
	(0.12)	(0.15)	(0.14)	(0.14)
Panel B: T2 – Parent-Only Treatment				
Spillover on Child × Father Participant	-0.14	0.07	-0.17	0.01
	(0.14)	(0.12)	(0.17)	(0.13)
Direct effect on Parent × Father Participant	-0.26*	-0.00	-0.02	0.07
	(0.15)	(0.15)	(0.13)	(0.15)
Panel C: T3 – Joint Treatment (Child + Parent)				
Joint effect on Child × Father Participant	-0.05	0.22*	-0.21	0.16
	(0.14)	(0.13)	(0.17)	(0.16)
Joint effect on Parent × Father Participant	-0.60***	-0.03	-0.09	0.01
	(0.17)	(0.16)	(0.15)	(0.14)
Control Mean (Child)	-0.00	0.00	0.00	0.00
Control Mean (Parent)	-0.00	-0.00	0.00	-0.00
Observations	2878	2878	2878	2878
School Fixed Effects	Yes	Yes	Yes	Yes
Baseline Control	Yes		Yes	
LASSO Controls	Yes	Yes	Yes	Yes

NOTES: This table reports heterogeneous treatment effects on survey-reported outcomes by parent gender. Each entry reports the coefficient on the interaction between the relevant treatment-effect term and an indicator for a father participant, relative to a mother participant. Thus, each coefficient should be interpreted as the difference in the corresponding treatment effect for households in which the participating parent is the father rather than the mother. Panels A, B, and C report heterogeneity for the child-only (T_1), parent-only (T_2), and joint (T_3) treatments, respectively. Within each panel, the first row reports the child outcome and the second row reports the parent outcome. Standard errors clustered at the section level are reported in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. All specifications include school fixed effects, the baseline value of the outcome as a control where available (Climate Knowledge and Climate Risk Perception), and additional controls selected via post-double-selection LASSO Belloni et al. (2014); the participating-parent gender variable is excluded from the candidate pool because it is collinear with the moderator. All four indices are constructed using Anderson (2008).

Table 10: Benchmarking Effect Sizes in Environmental Education and Behavioral Interventions

Study	Intervention Context	Outcome Type	Effect Size	Design Notes
Nisa et al. (2019)	Meta-analysis of randomized interventions across energy use, transport, recycling, food, and water	Climate-relevant behaviors	$d = -0.093$	Average standardized effect across revealed behaviors
Jaime et al. (2023)	School-based environmental education (Chile)	Child self-reported behaviors	+5–11 pp	Child-only exposure; no spillovers to parents
Lawson et al. (2019b)	School-based climate education (United States)	Parent climate concern (spillover)	0.12 SD	Child-to-parent attitudinal spillover
Damerell et al. (2013)	Wetlands-focused environmental education (United Kingdom)	Parent knowledge (spillover)	+19%	Knowledge transmission only
Monroe et al. (2019)	Systematic review of climate change education studies	Environmental attitudes	0.15–0.20 SD	Typical attitudinal effects
Cordero et al. (2020)	University-level climate and weather course (United States)	Climate concern	$d = 0.45$	Intensive, experiential; non-randomized
Boudet et al. (2016)	Girl Scouts energy-saving program with family engagement (United States)	Household energy-saving behaviors	$d = 1.12$ (children); $d = 0.62$ (parents)	Large short-run effects; attenuation over time
This study	Household-based randomized controlled trial (India)	Incentive-compatible green choice (children)	+22 pp	Direct behavioral effect; light-touch curriculum
This study	Household-based randomized controlled trial (India)	Incentive-compatible green choice (parents, spillover)	+26 pp	Child-to-parent behavioral spillover
This study	Household-based randomized controlled trial (India)	Climate risk perceptions	0.33 SD (children); 0.26 SD (parents)	Attitudinal effects with intra-household spillovers

NOTES: Effect sizes are reported as percentage point (pp) changes or standardized differences (SD), as defined in the original studies. Outcomes are not directly comparable across studies due to differences in intervention intensity, outcome measurement, and identification strategies. The table provides contextual benchmarks rather than a ranking of intervention effectiveness.

A Demographic Tables

Appendix Table A1: Descriptive Statistics: Child Baseline Characteristics

	N	Mean	Std. Dev.	Min.	Max.
Child's gender (0=Female/1=Male)	1,545	0.66	0.48	0.00	1.00
Participating parent (0=Father/1=Mother)	1,545	0.65	0.48	0.00	1.00
Child's age	1,539	12.24	1.54	8.00	18.00
Child's grade	1,545	6.43	1.54	4.00	9.00
Can speak english fluently (1=Yes/0=No)	1,545	0.53	0.50	0.00	1.00
Contamination index (Child network mapping)	1,545	0.01	1.01	-0.62	7.63
Part of a sibling household (1=Yes/0=No)	1,545	0.10	0.30	0.00	1.00

NOTES: Descriptive statistics of the child characteristics as measured in the baseline.

Appendix Table A2: Descriptive Statistics: Parent and Household Characteristics (Part-1)

	N	Mean	Std. Dev.	Min.	Max.
Household demographics and socio-economic status:					
Parent's age Age	1,537	37.66	5.76	23.00	65.00
Owns below poverty line card	1,521	0.21	0.40	0.00	1.00
Household caste category:					
General category	1,527	0.39	0.49	0.00	1.00
Other backward class	1,527	0.56	0.50	0.00	1.00
Scheduled caste	1,527	0.05	0.21	0.00	1.00
Scheduled tribe	1,527	0.01	0.08	0.00	1.00
Household religion:					
Household religion: Hindu	1,542	0.96	0.20	0.00	1.00
Household religion: Muslim	1,542	0.04	0.19	0.00	1.00
Household religion: Other	1,542	0.00	0.06	0.00	1.00

NOTES: Descriptive statistics of the parent and household characteristics as measured in the baseline.

Appendix Table A3: Descriptive Statistics: Parent and Household Characteristics (Part-2)

	N	Mean	Std. Dev.	Min.	Max.
Household income (Monthly):					
Monthly income: Less than INR ten thousand	1,393	0.09	0.29	0.00	1.00
Monthly income: INR Ten to thirty thousand	1,393	0.46	0.50	0.00	1.00
Monthly income: INR Thirty to sixty thousand	1,393	0.32	0.47	0.00	1.00
Monthly income: INR Sixty thousand to hundred thousand	1,393	0.10	0.29	0.00	1.00
Monthly income: INR Greater than Rs. hundred thousand	1,393	0.03	0.17	0.00	1.00
Household assets:					
Household asset: Owns car	1,545	0.26	0.44	0.00	1.00
Household asset: Owns bike/motorcycle	1,545	0.80	0.40	0.00	1.00
Household asset: Owns air conditioner	1,502	0.30	0.46	0.00	1.00
Household asset: Owns refrigerator	1,535	0.82	0.38	0.00	1.00
Household asset: Owns computer/laptop	1,507	0.46	0.50	0.00	1.00
Household asset: Owns washing machine	1,515	0.50	0.50	0.00	1.00
Household asset: Owns room heater	1,499	0.35	0.48	0.00	1.00

NOTES: Descriptive statistics of the parent and household characteristics as measured in the baseline.

Appendix Table A4: Descriptive Statistics: Parent and Household Characteristics (Part-3)

	N	Mean	Std. Dev.	Min.	Max.
Parent occupation:					
Occupation: Not working outside home	1,467	0.02	0.15	0.00	1.00
Occupation: Government job	1,467	0.24	0.43	0.00	1.00
Occupation: Private firm employee	1,467	0.30	0.46	0.00	1.00
Occupation: Owns business (both small and large)	1,467	0.42	0.49	0.00	1.00
House ownership:					
Stays in Own House	1,538	0.72	0.45	0.00	1.00
Stays in rented house	1,538	0.28	0.45	0.00	1.00
How many rooms are there in your house?	1,539	3.96	2.75	1.00	40.00
Parent education:					
Never went to school	1,521	0.03	0.17	0.00	1.00
Upto primary school	1,475	0.11	0.31	0.00	1.00
Upto grade 10	1,334	0.26	0.44	0.00	1.00
Upto grade 12	990	0.29	0.45	0.00	1.00
Master's degree & beyond	1,494	0.12	0.32	0.00	1.00
Vocational training	1,521	0.02	0.14	0.00	1.00

NOTES: Descriptive statistics of the parent and household characteristics as measured in the baseline.

Appendix Table A5: Balance Table: Child Baseline Characteristics

Variable	Mean Control	Mean T1 (Child Only)	Mean T2 (Parent Only)	Mean T3 (Child and Parent)	diff (2)-(1)	diff (3)-(1)	diff (4)-(1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child's gender (Male or Female)	0.707	0.679	0.590	0.654	-0.058*	-0.111***	-0.013
	(0.456)	(0.467)	(0.492)	(0.477)	(0.034)	(0.035)	(0.038)
Participating parent (Father or Mother)	0.682	0.604	0.637	0.675	-0.022	-0.054	-0.007
	(0.466)	(0.490)	(0.481)	(0.469)	(0.035)	(0.034)	(0.038)
Child's age	12.331	12.463	12.169	11.885	0.039	-0.045	-0.699***
	(1.704)	(1.351)	(1.460)	(1.628)	(0.111)	(0.106)	(0.128)
Child's grade	6.618	6.659	6.391	5.904	-0.099	-0.040	-0.985***
	(1.807)	(1.314)	(1.347)	(1.614)	(0.111)	(0.102)	(0.126)
# Household members	6.307	6.421	6.293	6.267	-0.140	-0.051	-0.142
	(3.212)	(3.340)	(4.392)	(3.406)	(0.245)	(0.286)	(0.275)
Can speak english fluently	0.573	0.516	0.503	0.525	-0.020	-0.027	-0.045
	(0.495)	(0.500)	(0.501)	(0.500)	(0.037)	(0.036)	(0.041)
Contamination index (Child network mapping)	-0.008	0.082	-0.030	-0.019	0.029	-0.039	-0.078
	(0.992)	(1.034)	(0.983)	(1.064)	(0.076)	(0.073)	(0.086)
Part of a sibling Household	0.099	0.108	0.121	0.075	-0.007	0.011	-0.035
	(0.299)	(0.310)	(0.326)	(0.264)	(0.023)	(0.023)	(0.024)
Observations	403	399	463	280	1,545	1,545	1,545

NOTES: Standard errors are clustered at the school level (in parentheses). Columns (1) depicts the mean of the student characteristics for those who were in the control group. Columns (2)-(4) depict the mean of the child characteristics for those who are in the child-only (T1), parent only (T2) or in child and parent (T3) treatment groups respectively. Columns (5)-(7) depict the p-values for difference in means of the child characteristics of the respective treatment groups in comparison to the control group. All the indices were created using Anderson (2008). Refer to Table A19 for details about the index construction. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Appendix Table A6: Balance Table: Parent and Household Characteristics (Part-1)

Variable	Mean Control	Mean T1 (Child Only)	Mean T2 (Parent Only)	Mean T3 (Child and Parent)	diff (2)-(1)	diff (3)-(1)	diff (4)-(1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Parent's age	37.729	38.020	37.475	36.663	0.281	0.113	-0.923*
	(6.000)	(6.124)	(5.946)	(6.289)	(0.453)	(0.435)	(0.503)
Owns below poverty line card	0.207	0.211	0.171	0.255	-0.006	-0.055*	0.012
	(0.405)	(0.408)	(0.377)	(0.436)	(0.030)	(0.028)	(0.034)
Household caste category:							
General category	0.401	0.389	0.374	0.389	0.066*	-0.045	-0.013
	(0.491)	(0.488)	(0.484)	(0.488)	(0.036)	(0.034)	(0.040)
Other backward class	0.549	0.550	0.571	0.560	-0.071*	0.033	0.009
	(0.498)	(0.498)	(0.495)	(0.497)	(0.036)	(0.035)	(0.041)
Scheduled caste	0.043	0.055	0.048	0.044	0.006	0.013	0.004
	(0.203)	(0.229)	(0.214)	(0.205)	(0.016)	(0.016)	(0.017)
Scheduled tribe	0.008	0.005	0.007	0.007	-0.001	-0.002	-0.000
	(0.087)	(0.071)	(0.081)	(0.085)	(0.006)	(0.006)	(0.007)
Household religion:							
Household religion: Hindu	0.955	0.965	0.970	0.935	-0.017	0.014	-0.034*
	(0.207)	(0.184)	(0.171)	(0.246)	(0.014)	(0.014)	(0.018)
Household religion: Muslim	0.042	0.033	0.026	0.061	0.015	-0.017	0.032*
	(0.202)	(0.178)	(0.159)	(0.240)	(0.014)	(0.013)	(0.018)
Household religion: Other	0.002	0.003	0.004	0.004	0.002	0.003	0.002
	(0.050)	(0.050)	(0.066)	(0.060)	(0.004)	(0.004)	(0.005)
Observations	403	399	463	280	1,545	1,545	1,545

NOTES: Standard errors are clustered at the school level (in parentheses). Columns (1) depicts the mean of the parent/household characteristics for those who were in the control group. Columns (2)-(4) depict the mean of the child characteristics for those who are in the child-only (T1), parent only (T2) or in child and parent (T3) treatment groups respectively. Columns (5)-(7) depict the p-values for the difference in means of the parent/household characteristics of the respective treatment groups in comparison to the control group. All the indices were created using Anderson (2008). Refer to Table A19 for details about the index construction. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Appendix Table A7: Balance Table: Parent and Household Characteristics (Part-2)

Variable	Mean Control	Mean T1 (Child Only)	Mean T2 (Parent Only)	Mean T3 (Child and Parent)	diff (2)-(1)	diff (3)-(1)	diff (4)-(1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Household income (Monthly):							
Monthly income: Less than INR ten thousand	0.086	0.102	0.093	0.097	0.007	-0.011	-0.007
	(0.280)	(0.303)	(0.291)	(0.297)	(0.023)	(0.022)	(0.024)
Monthly income: INR Ten to thirty thousand	0.429	0.444	0.501	0.467	-0.047	0.026	0.027
	(0.496)	(0.498)	(0.501)	(0.500)	(0.039)	(0.038)	(0.042)
Monthly income: INR Thirty to sixty thousand	0.338	0.331	0.296	0.315	0.028	0.008	0.004
	(0.474)	(0.471)	(0.457)	(0.465)	(0.037)	(0.036)	(0.040)
Monthly income: INR Sixty thousand to hundred thousand	0.102	0.102	0.083	0.097	0.021	-0.008	-0.006
	(0.303)	(0.303)	(0.276)	(0.297)	(0.024)	(0.022)	(0.026)
Monthly income: Greater than INR hundred thousand	0.046	0.023	0.027	0.023	-0.009	-0.016	-0.019
	(0.209)	(0.149)	(0.162)	(0.151)	(0.014)	(0.014)	(0.016)
Household assets:							
Household Asset: Owns car	0.310	0.243	0.240	0.257	-0.003	-0.057*	-0.025
	(0.463)	(0.429)	(0.427)	(0.438)	(0.032)	(0.032)	(0.037)
Household Asset: Owns bike/motorcycle	0.811	0.787	0.812	0.800	-0.019	0.009	-0.001
	(0.392)	(0.410)	(0.391)	(0.401)	(0.030)	(0.029)	(0.033)
Household asset: Owns air conditioner	0.360	0.230	0.308	0.293	-0.030	-0.049	-0.021
	(0.481)	(0.422)	(0.462)	(0.456)	(0.030)	(0.032)	(0.036)
Household asset: Owns refrigerator	0.829	0.804	0.851	0.796	0.004	0.012	0.009
	(0.377)	(0.398)	(0.357)	(0.404)	(0.028)	(0.026)	(0.031)
Household asset: Owns computer/laptop	0.487	0.424	0.482	0.421	0.015	0.012	-0.014
	(0.500)	(0.495)	(0.500)	(0.495)	(0.036)	(0.036)	(0.040)
Household asset: Owns washing machine	0.524	0.442	0.525	0.505	0.036	0.017	0.019
	(0.500)	(0.497)	(0.500)	(0.501)	(0.035)	(0.035)	(0.039)
Household asset: Owns room heater	0.408	0.304	0.338	0.370	-0.040	-0.038	0.020
	(0.492)	(0.460)	(0.474)	(0.484)	(0.035)	(0.035)	(0.040)
Observations	403	399	463	280	1,545	1,545	1,545

NOTES: Standard errors are clustered at the school level (in parentheses). Columns (1) depicts the mean of the parent/household characteristics for those who were in the control group. Columns (2)-(4) depict the mean of the child characteristics for those who are in the child-only (T1), parent only (T2) or in child and parent (T3) treatment groups respectively. Columns (5)-(7) depict the p-values for the difference in means of the parent/household characteristics of the respective treatment groups in comparison to the control group. All the indices were created using Anderson (2008). Refer to Table A19 for details about the index construction. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Appendix Table A8: Balance Table: Parent and Household Characteristics (Part-3)

Variable	Mean Control	Mean T1 (Child Only)	Mean T2 (Parent Only)	Mean T3 (Child and Parent)	diff (2)-(1)	diff (3)-(1)	diff (4)-(1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Parent occupation:							
Occupation: Not working outside home	0.018	0.035	0.025	0.007	0.022*	0.006	-0.010
	(0.134)	(0.184)	(0.155)	(0.086)	(0.013)	(0.011)	(0.010)
Occupation: Government Job	0.244	0.229	0.230	0.276	0.015	0.015	0.080**
	(0.430)	(0.421)	(0.422)	(0.448)	(0.033)	(0.032)	(0.037)
Occupation: Private firm employee	0.315	0.332	0.275	0.299	0.013	-0.087**	-0.045
	(0.465)	(0.471)	(0.447)	(0.458)	(0.037)	(0.034)	(0.040)
Occupation: Owns Business (Both Small and Large)	0.415	0.394	0.452	0.407	-0.050	0.059	-0.027
	(0.493)	(0.489)	(0.498)	(0.492)	(0.038)	(0.037)	(0.042)
House ownership:							
Stays in own house	0.731	0.773	0.661	0.707	-0.067**	-0.028	-0.037
	(0.444)	(0.419)	(0.474)	(0.456)	(0.030)	(0.032)	(0.035)
Stays in rented house	0.269	0.227	0.339	0.293	0.067**	0.028	0.037
	(0.444)	(0.419)	(0.474)	(0.456)	(0.030)	(0.032)	(0.035)
How many rooms are there in your house?	3.958	4.412	3.621	3.903	-0.029	-0.181	-0.049
	(2.615)	(3.420)	(2.450)	(2.204)	(0.221)	(0.176)	(0.196)
Parent education:							
Never went to school	0.025	0.049	0.020	0.029	0.009	-0.012	-0.005
	(0.157)	(0.215)	(0.139)	(0.169)	(0.014)	(0.011)	(0.014)
Upto primary School	0.090	0.105	0.105	0.139	-0.016	0.000	0.029
	(0.287)	(0.307)	(0.307)	(0.347)	(0.022)	(0.022)	(0.026)
Upto grade 10	0.207	0.309	0.280	0.224	0.067*	0.034	-0.014
	(0.406)	(0.463)	(0.449)	(0.418)	(0.034)	(0.033)	(0.037)
Upto grade 12	0.289	0.272	0.296	0.306	-0.063	-0.027	0.008
	(0.454)	(0.446)	(0.457)	(0.462)	(0.041)	(0.041)	(0.046)
Master's degree & beyond	0.126	0.127	0.114	0.107	0.049**	0.017	0.013
	(0.332)	(0.334)	(0.318)	(0.309)	(0.024)	(0.023)	(0.027)
Vocational training	0.023	0.018	0.024	0.011	0.007	0.008	-0.008
	(0.149)	(0.133)	(0.153)	(0.104)	(0.010)	(0.011)	(0.011)
Observations	403	399	463	280	1,545	1,545	1,545

NOTES: Standard errors are clustered at the school level (in parentheses). Columns (1) depicts the mean of the parent/household characteristics for those who were in the control group.Columns (2)-(4) depict the mean of the child characteristics for those who are in the child-only (T1), parent only (T2) or in child and parent (T3) treatment groups respectively. Columns (5)-(7) depict the p-values for the difference in means of the parent/household characteristics of the respective treatment groups in comparison to the control group. All the indices were created using Anderson (2008). Refer to Table A19 for details about the index construction. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Appendix Table A9: Robustness of Green Donation Effects to Alternative Specifications

	OLS (main)	**Winsor.** (5%)	**Tobit** [0,100]	**Poisson**	**IHS**	**Ext. margin** $\Pr(>0)$
	(1)	(2)	(3)	(4)	(5)	(6)
Direct on Child (T_1)	6.96**	6.96**	23.26***	0.32***	0.44**	0.10**
	(2.72)	(2.72)	(8.92)	(0.12)	(0.18)	(0.04)
Spillover on Parent (T_1)	-0.26	-0.26	-0.69	-0.01	0.00	-0.01
	(2.51)	(2.51)	(8.29)	(0.13)	(0.17)	(0.04)
Spillover on Child (T_2)	2.70	2.70	13.78*	0.14	0.31**	0.08**
	(2.35)	(2.35)	(8.06)	(0.12)	(0.15)	(0.03)
Direct on Parent (T_2)	0.07	0.07	1.09	0.00	0.04	0.01
	(2.60)	(2.60)	(9.14)	(0.14)	(0.19)	(0.04)
Joint on Child (T_3)	7.97***	7.97***	28.54***	0.37***	0.62***	0.14***
	(2.94)	(2.94)	(9.66)	(0.13)	(0.20)	(0.04)
Joint on Parent (T_3)	-3.05	-3.05	-11.23	-0.18	-0.18	-0.03
	(2.75)	(2.75)	(8.90)	(0.15)	(0.18)	(0.04)
Observations	2892	2892	2892	2892	2892	2892
School Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Baseline & LASSO Controls	Yes	Yes	Yes	Yes	Yes	Yes

NOTES: Each column re-estimates the pooled donation regression (Table 3, column 2) with a different treatment of the censored, zero-inflated donation amount (0–100 INR, 62% zeros). Column (1) is the headline OLS estimate; (2) winsorizes at the 2.5/97.5 percentiles; (3) is a two-limit Tobit censored at 0 and 100; (4) a Poisson model; (5) OLS on the inverse-hyperbolic-sine transform; (6) a linear-probability extensive-margin model for any positive donation. All specifications include school fixed effects, the baseline donation, and the LASSO-selected control(s); columns (3)–(4) enter school effects as indicators. Standard errors clustered at the section level in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Appendix Table A10: Within-Household Coordination in Green Certificate Choice

Treatment Arms	Child chose	Parent chose	Observed concordance	Expected if independent	Pairs
Control	0.53	0.51	0.862	0.500	392
T1: Child-only	0.83	0.85	0.819	0.734	387
T2: Parent-only	0.76	0.76	0.827	0.635	410
T3: Joint	0.81	0.77	0.848	0.669	257

NOTES: For each arm the table reports the share of children and parents choosing the recycled (green) certificate among pairs with both choices observed, the observed within-pair concordance (share of pairs making the same choice), and the concordance expected if the two members chose independently given the arm-specific marginals. A coordination artifact would show the joint arm's observed concordance exceeding both its independence benchmark and the other arms. A pooled linear-probability regression of the parent's choice on the child's choice interacted with arm yields a child–parent association in the joint arm that is not significantly larger than in the control group ($p = 0.299$ for the joint-arm interaction), indicating the symmetric certificate spillover does not reflect mechanical within-pair coordination. Standard errors clustered at the section level.

Appendix Table A11: Heterogeneity in Behavioral Treatment Effects by Social Desirability

	Incentivized behavior		Self-reported behavior	
	Green Certificates	**Green Donations (INR)**	**Pro-Environment Behavior**	**Green Discussions**
	(1)	(2)	(3)	(4)
Panel A: T1 – Child-Only Treatment				
Direct effect on Child × SDB Index	0.03	-0.62	0.03	0.31***
	(0.03)	(2.14)	(0.06)	(0.08)
Spillover on Parent × SDB Index	-0.00	0.31	-0.14**	0.02
	(0.03)	(1.86)	(0.06)	(0.08)
Panel B: T2 – Parent-Only Treatment				
Spillover on Child × SDB Index	0.02	1.52	-0.07	-0.06
	(0.03)	(2.08)	(0.06)	(0.08)
Direct effect on Parent × SDB Index	0.02	-0.35	0.03	0.30***
	(0.03)	(2.01)	(0.06)	(0.09)
Panel C: T3 – Joint Treatment (Child + Parent)				
Joint effect on Child × SDB Index	0.02	1.02	-0.08	0.35***
	(0.04)	(2.39)	(0.07)	(0.08)
Joint effect on Parent × SDB Index	-0.02	-0.39	-0.04	0.14
	(0.03)	(2.52)	(0.08)	(0.09)
Control Mean (Child)	0.53	17.78	0.00	3.30
Control Mean (Parent)	0.51	18.98	0.00	3.14
Observations	2752	2892	2892	2892
School Fixed Effects	Yes	Yes	Yes	Yes
Baseline Control		Yes	Yes	
LASSO Controls	Yes	Yes	Yes	Yes

NOTES: This table reports heterogeneous treatment effects on behavioral outcomes by the respondent's baseline social desirability. Higher values of the SDB index indicate a greater tendency to give socially desirable responses. Each entry reports the coefficient on the interaction between the relevant treatment-effect term and the standardized social desirability index. Thus, each coefficient should be interpreted as the change in the corresponding treatment effect associated with a one-unit increase in the respondent's social desirability index. Panels A, B, and C report heterogeneity for the child-only (T_1), parent-only (T_2), and joint (T_3) treatments, respectively. Within each panel, the first row reports the child outcome and the second row reports the parent outcome. Standard errors clustered at the section level are reported in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. All specifications include school fixed effects, the baseline value of the outcome as a control where available, and additional controls selected via post-double-selection LASSO Belloni et al. (2014) from a candidate pool of household and individual demographics, parent characteristics, and education and occupation indicators. The pro-environment behavior index is constructed using Anderson (2008).

Appendix Table A12: Heterogeneity in Survey Treatment Effects by Social Desirability

	Climate Knowledge	Climate Self-Efficacy	Climate Risk Perception	Perceived Social Norms
	(1)	(2)	(3)	(4)
Panel A: T1 – Child-Only Treatment				
Direct effect on Child × SDB Index	-0.03	0.04	0.00	0.09
	(0.07)	(0.06)	(0.06)	(0.07)
Spillover on Parent × SDB Index	0.03	0.00	-0.17***	0.14*
	(0.06)	(0.08)	(0.06)	(0.08)
Panel B: T2 – Parent-Only Treatment				
Spillover on Child × SDB Index	-0.00	-0.05	-0.15**	-0.02
	(0.07)	(0.08)	(0.06)	(0.07)
Direct effect on Parent × SDB Index	-0.03	0.11*	0.09	0.13
	(0.06)	(0.06)	(0.06)	(0.08)
Panel C: T3 – Joint Treatment (Child + Parent)				
Joint effect on Child × SDB Index	-0.01	0.09	-0.03	0.02
	(0.06)	(0.07)	(0.10)	(0.07)
Joint effect on Parent × SDB Index	0.00	-0.07	-0.20**	0.14*
	(0.09)	(0.08)	(0.08)	(0.07)
Control Mean (Child)	-0.00	0.00	0.00	0.00
Control Mean (Parent)	-0.00	-0.00	0.00	-0.00
Observations	2892	2892	2892	2892
School Fixed Effects	Yes	Yes	Yes	Yes
Baseline Control	Yes		Yes	
LASSO Controls	Yes	Yes	Yes	Yes

NOTES: This table reports heterogeneous treatment effects on survey-reported outcomes by the respondent's baseline social desirability. Higher values of the SDB index indicate a greater tendency to give socially desirable responses. Each entry reports the coefficient on the interaction between the relevant treatment-effect term and the standardized social desirability index. Thus, each coefficient should be interpreted as the change in the corresponding treatment effect associated with a one-unit increase in the respondent's social desirability index. Panels A, B, and C report heterogeneity for the child-only (T_1), parent-only (T_2), and joint (T_3) treatments, respectively. Within each panel, the first row reports the child outcome and the second row reports the parent outcome. Standard errors clustered at the section level are reported in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. All specifications include school fixed effects, the baseline value of the outcome as a control where available (Climate Knowledge and Climate Risk Perception), and additional controls selected via post-double-selection LASSO Belloni et al. (2014) from a candidate pool of household and individual demographics, parent characteristics, and education and occupation indicators. All four indices are constructed using Anderson (2008).

B Attrition

Appendix Table A13: Differential Attrition by Treatment Arm

	Attrition rate	Difference vs. Control
	(1)	(2)
Control (pure control)	0.030	
T1: Child-Only	0.040	0.010
		(0.029)
T2: Parent-Only	0.079	0.049*
		(0.029)
T3: Joint (Child + Parent)	0.098	0.069*
		(0.037)
Overall attrition rate	0.059	
Joint test (H_0: no differential attrition)	$F(3, 136) = 1.65$, $p = 0.180$	
Observations (households)	1537	
S.E. clustered by section	Yes	

NOTES: A household is coded as attrited if the child and/or the participating parent did not complete the endline. Column (1) reports the raw attrition rate within each arm. Column (2) reports the coefficient (section-clustered standard error in parentheses) from a single regression of the household attrition indicator on the three treatment-arm dummies; the omitted category is the pure control group, so each coefficient is the arm-minus-control difference in attrition. Standard errors are clustered at the section level (the unit of randomization). The joint test is the F-test that all three arm coefficients are zero. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Appendix Table A14: Baseline Characteristics: Attritors vs. Completers

	Completers	Attritors	Difference	p-value
	(1)	(2)	(3)	(4)
Child's age (years)	12.221	12.121	-0.100	0.842
Child is male	0.660	0.593	-0.066	0.198
Child's grade	6.450	5.500	-0.950	0.034
Parent's age (years)	37.955	37.407	-0.548	0.626
Parent completed Grade 10+	0.861	0.920	0.059	0.109
Below-Poverty-Line card	0.211	0.157	-0.053	0.412
General caste category	0.376	0.506	0.130	0.004
Hindu household	0.960	0.912	-0.048	0.169
Monthly income $>$ Rs. 30k	0.439	0.519	0.080	0.239
Household size	3.958	3.462	-0.497	0.075
Joint test (H_0: attritors $=$ completers)		$F(10) = 0.37$, $p = 0.958$		
Observations (households, complete cases)		1252		

NOTES: Columns (1) and (2) report mean baseline characteristics among completer and attritor households, respectively. Column (3) is the difference (attritor mean minus completer mean) and column (4) the p-value from a regression of each characteristic on the attrition indicator with section-clustered standard errors. The joint test regresses the attrition indicator on all listed characteristics simultaneously and reports the F-test that all coefficients are zero (complete cases). Characteristics are taken from the baseline survey and recoded as in the main analysis.

Appendix Table A15: Lee (2009) Bounds: Behavioral Outcomes

	Green Certificates	Green Donations (INR)	Pro-Environment Behavior	Green Discussions
	(1)	(2)	(3)	(4)
Panel A: T1 – Child-Only Treatment				
Effect on Child	**[0.30, 0.31]**	**[7.49, 8.53]**	[0.00, 0.15]	**[0.37, 0.41]**
Effect on Parent	**[0.34, 0.35]**	[-0.08, 0.96]	[-0.18, 0.01]	**[0.06, 0.10]**
Panel B: T2 – Parent-Only Treatment				
Effect on Child	**[0.21, 0.26]**	**[1.35, 6.66]**	**[0.01, 0.26]**	[-0.06, 0.15]
Effect on Parent	**[0.22, 0.28]**	[-1.55, 3.76]	[-0.12, 0.16]	**[0.07, 0.28]**
Panel C: T3 – Joint Treatment (Child + Parent)				
Effect on Child	**[0.25, 0.32]**	**[6.12, 13.72]**	**[0.01, 0.31]**	**[0.17, 0.47]**
Effect on Parent	**[0.23, 0.30]**	[-5.13, 2.47]	[-0.17, 0.16]	**[0.04, 0.35]**

NOTES: Each cell reports the Lee (2009) lower and upper bound on the treatment effect of the indicated arm (relative to the pure control), estimated with the official `leebounds` command. Selection into the analysis sample is the household-attrition margin (a household is observed iff both members completed the endline). Because the control group retains more households than every treatment arm, the control group is trimmed; the trimming proportion equals the differential attrition between the arm and control. Bounds are nonparametric and unconditional (no covariates or fixed effects). Intervals shown in **bold** exclude zero. T_1 is child-only, T_2 parent-only, and T_3 the joint treatment; within each panel the first row is the effect measured on the child and the second on the parent.

Appendix Table A16: Lee (2009) Bounds: Survey Reported Outcomes

	Climate Knowledge	Climate Self-Efficacy	Climate Risk Perception	Perceived Social Norms
	(1)	(2)	(3)	(4)
Panel A: T1 – Child-Only Treatment				
Effect on Child	**[0.01, 0.06]**	**[0.07, 0.11]**	[-0.01, 0.30]	**[0.20, 0.21]**
Effect on Parent	[-0.04, 0.02]	**[0.12, 0.18]**	**[0.11, 0.12]**	**[0.13, 0.14]**
Panel B: T2 – Parent-Only Treatment				
Effect on Child	[-0.16, 0.00]	[-0.17, 0.00]	[-0.22, 0.10]	**[0.03, 0.08]**
Effect on Parent	[-0.04, 0.12]	[-0.05, 0.17]	**[0.22, 0.27]**	[-0.04, 0.04]
Panel C: T3 – Joint Treatment (Child + Parent)				
Effect on Child	**[-0.22, -0.01]**	[-0.16, 0.05]	**[0.01, 0.32]**	**[0.21, 0.29]**
Effect on Parent	[-0.19, 0.00]	[-0.01, 0.25]	**[0.19, 0.26]**	[-0.02, 0.10]

NOTES: Each cell reports the Lee (2009) lower and upper bound on the treatment effect of the indicated arm (relative to the pure control), estimated with the official `leebounds` command. Selection into the analysis sample is the household-attrition margin (a household is observed iff both members completed the endline). Because the control group retains more households than every treatment arm, the control group is trimmed; the trimming proportion equals the differential attrition between the arm and control. Bounds are nonparametric and unconditional (no covariates or fixed effects). Intervals shown in **bold** exclude zero. T_1 is child-only, T_2 parent-only, and T_3 the joint treatment; within each panel the first row is the effect measured on the child and the second on the parent.

C Multiple Hypothesis Testing

Appendix Table A17: Romano–Wolf Multiple-Hypothesis-Adjusted p-values: Behavioral Outcomes

	Incentivized behavior		Self-reported behavior	
	Green Certificates	**Green Donations (INR)**	**Pro-Environment Behavior**	**Green Discussions**
	(1)	(2)	(3)	(4)
Panel A: T1 – Child-Only Treatment				
Direct effect on Child	0.23***	6.96**	0.20**	0.40***
	(0.06)	(2.72)	(0.09)	(0.11)
	[0.002] {0.004}	[0.009] {0.042}	[0.015] {0.093}	[0.002] {0.004}
Spillover on Parent	0.25***	-0.26	0.07	0.08
	(0.06)	(2.51)	(0.09)	(0.09)
	[0.001] {0.003}	[0.890] {0.987}	[0.571] {0.804}	[0.554] {0.722}
Panel B: T2 – Parent-Only Treatment				
Spillover on Child	0.23***	2.70	0.12	0.10
	(0.06)	(2.35)	(0.09)	(0.08)
	[0.003] {0.003}	[0.251] {0.681}	[0.251] {0.598}	[0.251] {0.671}
Direct effect on Parent	0.25***	0.07	0.03	0.22**
	(0.05)	(2.60)	(0.09)	(0.10)
	[0.001] {0.002}	[0.975] {0.987}	[0.887] {0.977}	[0.034] {0.111}
Panel C: T3 – Joint Treatment (Child + Parent)				
Joint effect on Child	0.28***	7.97***	0.12	0.37***
	(0.06)	(2.94)	(0.08)	(0.12)
	[0.001] {0.002}	[0.003] {0.028}	[0.080] {0.536}	[0.003] {0.015}
Joint effect on Parent	0.26***	-3.05	-0.03	0.23*
	(0.05)	(2.75)	(0.08)	(0.13)
	[0.001] {0.002}	[0.337] {0.681}	[0.646] {0.977}	[0.114] {0.305}
Observations	2752	2892	2892	2892
School FE / Baseline / LASSO	Yes	Yes	Yes	Yes

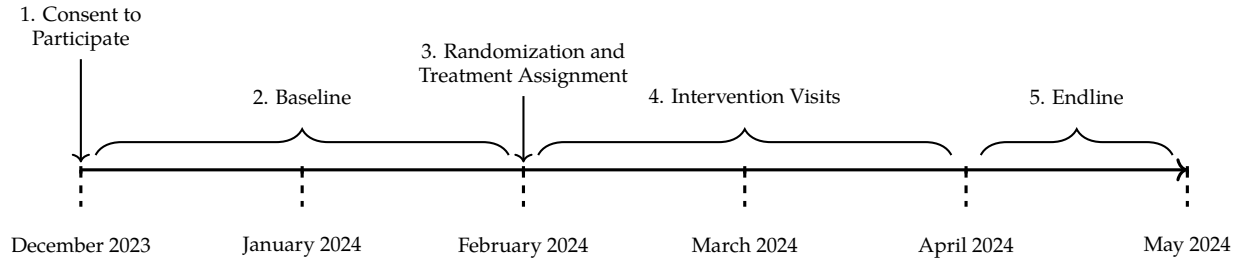
NOTES: Coefficients reproduce the main-effects LASSO specification (Tables 3–4): section-clustered standard errors in parentheses, with school fixed effects, the baseline outcome where available, and post-double-selection LASSO controls. Stars on the coefficient denote unadjusted significance ($^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$). Beneath each estimate, square brackets $[\,\cdot\,]$ report the Romano–Wolf step-down p-value (Romano and Wolf 2005, 2016; Clarke, Romano and Wolf 2020) correcting the indicated treatment effect across the four outcomes in this domain (family of four); braces $\{\,\cdot\,\}$ report the more conservative Romano–Wolf p-value correcting jointly across all 24 treatment-effect tests in the domain (six effects $\times$ four outcomes). Both control the family-wise error rate and account for cross-outcome correlation via the bootstrap.

Appendix Table A18: Romano–Wolf Multiple-Hypothesis-Adjusted p-values: Survey Outcomes

	Climate Knowledge	Climate Self-Efficacy	Climate Risk Perception	Perceived Social Norms
	(1)	(2)	(3)	(4)
Panel A: T1 – Child-Only Treatment				
Direct effect on Child	0.06	0.09	0.33***	0.16*
	(0.07)	(0.07)	(0.07)	(0.08)
	[0.303] {0.882}	[0.215] {0.660}	[0.001] {0.002}	[0.072] {0.248}
Spillover on Parent	0.02	0.15*	0.19***	0.10
	(0.07)	(0.07)	(0.07)	(0.08)
	[0.718] {0.995}	[0.058] {0.235}	[0.005] {0.037}	[0.232] {0.660}
Panel B: T2 – Parent-Only Treatment				
Spillover on Child	0.02	-0.00	0.11	0.08
	(0.08)	(0.08)	(0.07)	(0.08)
	[0.934] {0.996}	[0.946] {0.996}	[0.191] {0.476}	[0.483] {0.778}
Direct effect on Parent	0.16**	0.12	0.26***	0.10
	(0.07)	(0.07)	(0.06)	(0.08)
	[0.028] {0.132}	[0.116] {0.476}	[0.001] {0.002}	[0.116] {0.660}
Panel C: T3 – Joint Treatment (Child + Parent)				
Joint effect on Child	0.02	0.05	0.32***	0.25***
	(0.08)	(0.09)	(0.08)	(0.09)
	[0.749] {0.996}	[0.739] {0.985}	[0.001] {0.002}	[0.006] {0.017}
Joint effect on Parent	0.02	0.18**	0.23**	0.14
	(0.09)	(0.08)	(0.09)	(0.09)
	[0.730] {0.996}	[0.030] {0.132}	[0.013] {0.037}	[0.109] {0.476}
Observations	2892	2892	2892	2892
School FE / Baseline / LASSO	Yes	Yes	Yes	Yes

NOTES: Coefficients reproduce the main-effects LASSO specification (Tables 3–4): section-clustered standard errors in parentheses, with school fixed effects, the baseline outcome where available, and post-double-selection LASSO controls. Stars on the coefficient denote unadjusted significance ($^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$). Beneath each estimate, square brackets $[\,\cdot\,]$ report the Romano–Wolf step-down p-value (Romano and Wolf 2005, 2016; Clarke, Romano and Wolf 2020) correcting the indicated treatment effect across the four outcomes in this domain (family of four); braces $\{\,\cdot\,\}$ report the more conservative Romano–Wolf p-value correcting jointly across all 24 treatment-effect tests in the domain (six effects $\times$ four outcomes). Both control the family-wise error rate and account for cross-outcome correlation via the bootstrap.

D Timeline



Appendix Figure A1: Timeline of the Field Activities

E Steps for Index Construction

We follow the methodology proposed by Anderson (2008) to create variance-weighted indices.[9] The outcome variables are comprised of several individual questions (usually 5-point likert scale or Agree/Disagree scale). We aggregate these individual questions and create an index by taking the weighted-average value of these individual variables. The weights are constructed by normalizing the variables such that they have the same standard deviation and following Anderson (2008), the weights from the inverse covariance matrix are recovered.

The following process is followed by Anderson (2008) for index construction:

(i) For all variables, the positive direction always indicates a more "environment friendly" outcome. We recode all the variables for which the scale was reversed in the original question, such that a higher value continues to indicate a more environment friendly outcome.

(ii) For questions that used a 5-point Likert scale, a corresponding binary variable is created. This binary variable is coded as 1 if the respondent answered "Strongly Agree" ("Strongly Disagree") or "Agree" ("Disagree") for a question containing an environmentally progressive (regressive) statement, and 0 otherwise.

(iii) Standardization of each individual variable takes place by demeaning the variables and subsequently dividing them by the control group standard deviation. We create standardized variables $\tilde{y}$ using this process.

(iv) Compute covariance matrix $\widehat{\sum}$, which consists of elements:

$$\sum_{mn}^{\wedge} = \sum_{i=1}^{N_{mn}} \frac{(y_{im} - \bar{y}_m)}{\sigma_m^y} * \frac{(y_{in} - \bar{y}_n)}{\sigma_n^y}$$

where, N_{mn} is the number of observations (total persons with non-missing data for variables m and n).

(v) Next, we invert the covariance matrix, and define weight w_k for each variable k by summing the entries in the row of the inverted covariance matrix:

[9] Refer to Haushofer and Shapiro (2016); Fiala et al. (2025) for a recent application.

$$(\overset{\wedge}{\sum})^{-1} = \begin{bmatrix} c_{11} & \cdots & c_{1K} \\ \vdots & \ddots & \vdots \\ c_{K1} & \cdots & c_{KK} \end{bmatrix}$$

$$w_k = \sum_{l=1}^{K} c_{kl}$$

(vi) Finally, we create a new variable, $\hat{y}_i$, that is a weighted average of $\tilde{y}_{ik}$ for person i. When constructing $\hat{y}_i$, weight its inputs, standardized variables $\tilde{y}_{ik}$ by the inverse of the covariance matrix of the transformed variables. A simple way to do this is to set the weight on each outcome equal to the sum of its row entries in the inverted covariance matrix for area. The index variable $\hat{y}_i$ is called because this transformation yields a generalized least squares estimator Anderson (2008).

$$\hat{y}_i = \Big(\sum_{k \in K} w_k \Big)^{-1} \sum_{k \in K_i} w_k * \frac{y_{ik} - \bar{y}_k}{\sigma_k^y}$$

F Contamination Propensity Index Score

This index was calculated by mapping the peer network data gathered at baseline for every child. The following steps were followed for the index construction:

(i) The contamination index used for the randomization is constructed from a "sender's only" perspective. We map the peer network data at the section level, grade level and finally, at the school level.[10]

(ii) Since our unit of randomization is at the section level, the within section networks are not considered for the calculation of our "contamination score." Only the grade and school level networks are considered for our calculations, since they contribute towards the potential "contamination" in our study.

(iii) Each child is assigned a raw contamination score against each of the network categories. For example, if the child speaks to 5 students within the section level, a raw score of 5 is assigned to this child. The same scoring pattern is followed for the remaining two categories.

(iv) We convert these raw scores into index scores by using Anderson (2008). Refer to Section E for details on the index construction. Following this, each child is associated with a contamination propensity index score, which is calculated by aggregating grade level and school level contamination scores.

(v) Since our unit of randomization is at the section level, we represent the level of contamination for a particular section by the contamination propensity score of the median student.

(vi) Similarly at the school level, we calculate the median contamination among all the sections.

(vii) Following the above steps ensures that each section and each school is represented by its respective median contamination score.

(viii) Lastly, we classify whether a section is above or below the median level of contamination by using a binary variable. This variable takes a value 1 if the median contamination level of the

[10] The minimum raw score which the child can receive is 1, since we made it compulsory to name at least one friend that they speak to within their grade and within their school (but outside the section). The maximum score for both categories is 6 as per the child baseline data.

section is greater than or equal to the median contamination level for the particular school and 0 otherwise. This variable is used as a stratification variable in our randomization.

G Statistical Power

We present power calculations for our primary outcomes, described in Table A19. We used our baseline sample of 1,446 children to calculate the outcome mean and standard deviation.[11] We conducted two-tailed hypothesis tests using a 5% significance level and power of 0.8. We accounted for the clustering of standard errors and used our baseline data to calculate the intra-cluster (i.e., intra-section) correlation (ICC). We had approximately 33 clusters per arm with a median cluster size of 18 children. We were well-powered to detect conservative effect sizes of 0.05 standard deviations on our primary outcomes, i.e., the "direct effect" of our environment curriculum on the amount of green donations of children (and their parents).

The focus of our study was estimating the intergenerational spillover of pro-environmental knowledge and behaviors within the household, i.e. from child to parent and vice-versa. Since the design and context of our study were novel, we lacked a directly comparable study to draw from for an estimate of the indirect effects (i.e. spillovers) of our intervention. However, given that we could detect small effect sizes, even with conservative assumptions, we believed that our study was powered to detect the indirect effects of our intervention. For instance, by assuming a modest estimate of 0.2 standard deviations for our direct effects, our study was well-powered to accommodate efficiency losses of nearly 75% of the direct effect for our indirect effect. Thus, despite the inherent uncertainties, we expected to be well-powered to detect the indirect effects of the intervention.

[11] All power calculations were conducted using the donation outcome.

H Outcome Variable Definitions

Appendix Table A19: Outcomes: Indices and Definitions

Outcomes Indicator	Definition
Donations to a green organization (individual and household level)	Participants have a 1 in 6 chance of winning 100 INR by rolling a dice. Before the roll, they can opt to donate part of their potential winnings to one of two charities: an environmental one or one supporting children. *We assess the amount paid by the participants to green charity*.
Climate Change Knowledge Index (individual and household level)	*To assess climate change knowledge, beliefs about its existence, local impacts, and causal attributions, we asked the following questions.* 1. How much do you know about climate change? (1-I know nothing; 4-I know a lot) 2. Do you think that climate change is happening? (1-Yes; 2-No) 3. Which of the following do you think is most accurate? Climate change is... (1-Caused mostly by human activities; 2-Caused equally by human activities and natural changes; 3-Caused mostly by natural changes in the environment; 4-None of the above because climate change isn't happening) 4. How strongly do you agree or disagree with the following statement: Climate change is affecting the weather in India by increasing droughts, floods, and extreme heat (1-Strongly Agree; 5-Strongly Disagree) 5. How strongly do you agree or disagree with the following statement? Climate change is affecting the weather in Bihar by increasing droughts, floods, and extreme heat (1-Strongly Agree; 5-Strongly Disagree)
Self-Efficacy (individual and household level)	*We asked the following to measure how participants view the impact and success of their actions and others', in tackling local environmental problems and climate change.* Response Options: (1-Strongly Agree; 5-Strongly Disagree) 1. Small individual actions (such as wasting water or electricity) can add up to a large negative impact on the local environment and climate change. 2. There is no use in taking individual actions to better the local environment or address climate change because they have limited impact. 3. I can make a difference in solving climate change. 4. I can make a difference in solving the local environmental challenges. 5. Through my political actions (e.g. protests, communicating with officials), I can make a difference in addressing local environmental issues and climate change. 6. My actions to improve the local environment and mitigate climate change will encourage others to do the same.

The table contains detailed descriptions of outcome variables. All outcome measures are collected for parents and children separately. Details for index construction provided in the section E.

Appendix Table A20: Outcomes: Indices and Definitions

Outcomes Indicator	**Definition**
Choice of Certificate (Child and Parent)	Participants choose between two options: a certificate printed on regular paper available immediately, or one printed on recycled paper available with a one-week delay.
Climate Change Worry and Risk Perceptions Index	1. How worried are you about climate change? (-) (1-very worried; 4-not worried at all) 2. To what extent will climate change harm future generations of people? (-) (1-A great deal; 4-Not at all) 3. How much do you think climate change will harm you personally? (-) (1-A great deal; 4-Not at all) 4. To what extent will climate change harm people in Bihar? (-) (1-A great deal; 4-Not at all) Details for index construction provided in the section E.

The table contains detailed descriptions of outcome variables. All outcome measures are collected for parents and children separately.

Appendix Table A21: Outcomes: Indices and Definitions

Outcomes Indicator	**Definition**
Self-reported Environmental Behaviors	1. Separated waste into food waste and other type of waste materials 2. Recycled products 3. Composted food waste 4. Recycled newspapers and other paper waste 5. Recycled plastic waste 6. Looked for ways to reuse things 7. Carried own cloth bag when going shopping 8. Carried own water bottle when leaving the house 9. Used paper bags instead of plastic bags 10. Turned off electrical appliances whenever left a room 11. Switched-off the fridge during longer holidays 12. Unplugged/Switched off electronic devices 13. Checked efficiency labels when buying household electronics 14. Changed light bulbs to energy-saving lighting Details for index construction provided in the section E
Discussions about Climate Change	1. In the past 2-3 weeks, how often did you speak with friends, family, or people in your community about climate change? Response Options: 5-pt Likert (Once per day - Not at all)
Perceived Social Norms	1. Thinking about kids at your school, what fraction do you think are worried about climate change? 2. Now thinking about all of the people in your community, what fraction do you think are worried about climate change? 3. Thinking about kids at your school, what fraction do you think regularly take actions to address climate change? 4. Thinking about kids at your school, what fraction do you think regularly take actions to address local environmental issues? 5. Now thinking about all of the people in your community, what fraction do you think regularly take actions to address climate change? 6. Now thinking about all of the people in your community, what fraction do you think regularly take actions to address local environmental issues? Response Options: 0%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, and 100%

The table contains detailed descriptions of outcome variables. All outcome measures are collected for parents and children separately.

Appendix Table A22: Exploratory Outcomes: Indices and Definitions

Outcomes Indicator	**Definition**
Hierarchy Vignette	*Deepa and Rajesh have a child, Anjali, who is in class 7 at* [*School Name*]*. She was recently offered the opportunity to participate in a prestigious science competition, which requires extra classes on weekends. The family is considering what to do.* 1. Who do you think will most likely make the final decision about Anjali's participation in the weekend classes? (1-Anjali; 2-Deepa (the mother); 3-Rajesh (the father); 4-Deepa and Rajesh together; 5-The entire family together) 2. How influential do you think Anjali's parents opinions are in determining whether s/he participates in the weekend? (1-Not influential; 2-Somewhat influential; 3-Neither; 4-Highly influential; 5-The only opinions that matter) 3. Imagine if Anjali was [Child Name]. Who would make the decision about his/her participation in the weekend classes? (1-[Child Name]; 2-[Child Name]'s Mother; 3-[Child Name]'s Father; 4-Both Mother and Father; 5-Entire family together) 4. Imagine if [Child Name] was in Anjali's situation, how likely would [Child Name] be to insist on his/her preference despite your family's differing opinion? (-)(1-Very unlikely; 5-Very likely) 5. [For children] Think of five friends of yours. If they had a child in Anjali's situation, how many of those children do you think would go against their family's wishes if they did not match their own desires? (0-0; 1-1; 2-2; 3-3; 4-4; 5-5)

The table contains detailed descriptions of the vignette used to measure hierarchy for the parents. An adapted version of the questions are used for children. All outcome measures are collected for parents and children separately.

Appendix Table A23: Exploratory Outcomes: Indices and Definitions

Outcomes Indicator	**Definition**
Child-Parent Interaction Index	1. [Child Name] feels comfortable talking to me about his/her values and beliefs (-) 5-pt Likert (Strongly agree - strongly disagree) 2. I often ask [Child Name] about his/her day (e.g. what did you do in school, what did you learn, did the teacher say anything, etc.) (-) 5-pt Likert (Strongly agree - strongly disagree) 3. I encourage [Child Name] to express his opinions (-) 5-pt Likert (Strongly agree - strongly disagree) 4. I help [Child Name] with his/her class assignments/homework (-) 5-pt Likert (Strongly agree - strongly disagree) 5. I regularly monitor [Child Name]'s studies (-) 5-pt Likert (Strongly agree - strongly disagree) 6. How frequently do the following situations take place in your household: Having dinner together with your family (-) (1-Once or Twice a Month; 2-Once a week; 3-Multiple times per week; 4-Almost Everyday; 5-Never) 7. How frequently do the following situations take place in your household: Going to the theatre together with the family (-) (1-Once or Twice a Month; 2-Once a week; 3-Multiple times per week; 4-Almost Everyday; 5-Never) 8. How frequently do the following situations take place in your household: Going outside with your family for a meal (-) (1-Once or Twice a Month; 2-Once a week; 3-Multiple times per week; 4-Almost Everyday; 5-Never) 9. How frequently do the following situations take place in your household: Going for shopping with your family (-) (1-Once or Twice a Month; 2-Once a week; 3-Multiple times per week; 4-Almost Everyday; 5-Never)

The table contains detailed descriptions of the child-parent interaction index for the parents. An adapted version of the questions are used for children. All outcome measures are collected for parents and children separately.

Appendix Table A24: Mapping of Outcomes to Curriculum Sessions

Outcome	Session(s)	Curriculum content linking to the outcome
Incentivized behaviors		
Green certificate	S2, S3	Waste-management and recycling content, including paper waste (S2); framing of low-cost, everyday eco-friendly choices and their trade-offs (S3).
Green donations	S2, S3, S4	Waste-management and recycling content (S2), personal responsibility for environmental action (S3); commitment to pro-environmental causes (S4).
Self-reported behaviors		
Pro-environmental behaviors	S2, S3	Waste segregation and recycling practices (S2); adoption of eco-friendly daily habits and sustainable consumption (S3).
Green discussions	S1, S4	Prompt to discuss environmental change with family (S1); sharing learnings and campaigns with peers and family (S4).
Attitudes and knowledge		
Climate knowledge	S1, S3	Causes of climate change and the human contribution to it (S1); local environmental impacts in Bihar and Patna (S3).
Self-efficacy	S3, S4	Small individual actions aggregating into collective impact (S3); designing and committing to one's own campaign (S4).
Risk perceptions	S1, S3	Awareness of the urgency and local salience of climate change (S1); history of environmental catastrophes in Bihar and Patna (S3).

NOTES: The four curriculum sessions are S1 (Awareness and Identification of Environmental Problems), S2 (Understanding Waste and Its Management), S3 (Behavioral Change Towards Environmental Sustainability), and S4 (Climate Activism and Pro-Environmental Campaigns); see Section 3.1 and Appendix J. Each outcome is mapped to every session whose content provides a plausible basis for an effect. Outcome definitions are in Appendix H.

I Field Operations

G.1 Field team composition

The field team from DAI Research and Advisory Services consisted of 45 enumerators, 6 supervisors, 1 field manager, and 2 project assistants. The field team reported to 1 Senior Research Associate and 1 Research Manager, who was responsible for checking the data quality and ensuring the data collection and intervention activities were undertaken as per the research design and ethics protocols.

G.2 Survey data collection

Student baseline: The baseline data collection was conducted between December 2023 and January 15, 2024. The data collection took place at the school level after obtaining necessary approvals from the school management and consent from the respective student-parent pairs. The field team scheduled prior appointments with the school management before the day of data collection. The baseline surveys for students were conducted in the school classrooms. Depending on the class sizes and the number of students who expressed their interest in participating in our study, the school management provided us with classroom spaces accommodating a maximum of 40 students per class. The baseline surveys were self-administered, and each student was provided with a tablet. The baseline survey instrument (coded in Survey CTO) was pre-loaded on each device. At least two enumerators were present in each classroom, and they were responsible for providing the necessary instructions and guidelines for the self-administered survey. The enumerators were trained to address any technical difficulties faced by the students while answering the questions, and they were also responsible for clarifying any conceptual issues in the comprehension of a question.

Parent baseline: The parent baseline survey was successfully conducted between December 28, 2023, and January 29, 2024. The parent baseline data collection was conducted at the household level. Necessary approvals and appointments were obtained from the participating parents before the data collection visit by the enumerator. The baseline surveys were enumerator-administered. The enumerators were trained to address any technical difficulties faced by the parents while answering the questions, and they were also responsible for clarifying

any conceptual issues in the comprehension of a question.

J Curriculum

Appendix Table A25: Green Warriors Session Plan for children (Sessions 1-2)

Session 1

Key Objectives:
To make students identify environmental problems near their house and to make them think of the connection between human actions and environmental changes.

Lesson Description:
The session will start with a pre-program assessment. In the first activity, the student will be given 2 puzzles. By understanding the contrast between these 2 images, the student will be able to visualize the intensity of problems due to waste generation. After this, the student will watch a video on the intensity of problems due to climate change. At the end of the class, the student will be given an assignment to identify environmental problems near their house and will be given a format for creating a report on the same.

Learning Outcomes:
- Student will be able to (SWBAT) learn about global scale of environment related problems.
- SWBAT understand that human actions cause damage to the environment.
- SWBAT identify environmental problems near their house.
- SWBAT discuss with parents about the environmental changes over the last 30 years.

Materials Required:
- Pre-program assessment – 1 copy per student
- Puzzles – 2 A4 size puzzles per facilitator
- Homework Sheet – 1 copy per student
- Tablet – 1 per facilitator

Session 2

Key Objectives:
To make students aware about:
- Everyday activities that generate waste at an individual level
- Scale of the waste management problem when waste is aggregated at various levels (community, district, state, country, globe etc)
- Positive and negative impact of human actions on the environment around us

Session Description:
The session starts with a recap of the previous session as well as the sharing of the homework from the previous day. After this, the facilitator will distribute a worksheet that will help the student identify everyday activities that contribute to waste generation. The student will then play a game modeled on the Snakes and Ladders game through which he/she will learn about the various causes and effects of environmental pollution. The session will end with a quick recap and sharing of homework sheet along with the instructions for completing the homework.

Learning Outcomes:
- Student will be able to (SWBAT) identify their habits that cause environmental problems
- SWBAT learn about positive and negative consequences of human actions on the environment
- SWBAT gain better understanding of their own contribution to the waste management problem through the waste tracking activity

Materials Required:
- Activity sheet – 1 copy per student
- Homework sheet – 1 copy per student
- Tablet – 1 per facilitator
- Link to Snakes and Ladders Game

Appendix Table A25: Green Warriors Session Plan for children (Sessions 3-4) (continued)

Session 3

Key Objectives:
To make students:
- Understand that small steps that individuals take can create massive positive changes when aggregated
- Commit to habit changes that they can carry out at an individual level
- Understand the practicalities of leading an environment friendly life and familiarize themselves with environment friendly choices currently available when carrying out everyday tasks
- Learn the history of environmental catastrophes in their home state

Session Description:
The session starts with a recap of the previous session as well as a discussion on the homework from the previous session. After this, the teacher will distribute a worksheet that will make each student think of changes that they can bring about in their own life. The student will then play the Eco Treasure Hunt game where they will gain awareness of environment friendly choices available to them when carrying out everyday tasks. The session will end with a quick recap and sharing of homework videos and homework sheet along with the instructions for completing the homework.

Learning Outcomes:
- Students will be able to (SWBAT) identify behavioral changes that they can incorporate in their lives to lead more environment friendly lives and will take a pledge to carry out these positive habits
- SWBAT understand the practical aspects of leading an environment friendly life and will think about the balance between environment friendly choices and the cost of these choices
- SWBAT learn the history of environmental catastrophes that have struck Bihar in recent years

Materials Required:
- Activity sheet – 1 copy per student
- Homework sheet – 1 copy per student
- Tablet – 1 per facilitator
- Links to Homework Videos – 3
- Link to Eco Treasure Hunt Game

Session 4

Key Objectives:
To make students:
- Aware of climate activism by their peers around the world
- Think about pro-environmental campaigns that they can carry out
- Commit to pro-environmental campaigns that they will be able to conduct within their school or in the neighborhood

Session Description:
The session starts with a recap of the previous session as well as a discussion on the homework from the previous session. After this, the facilitator will show 2 videos of young environmental champions and will hold a discussion with the student on whether they can carry out similar pro-environmental campaigns in their school or in their neighborhood. The session will end with a recap of the major learnings from the program and a discussion on potential activities that students can carry out.

Learning Outcomes:
- Student will be able to (SWBAT) get inspired by pro-environmental activities undertaken by other students of their age
- SWBAT commit to leading an environment friendly life themselves as well as to share their learnings with friends and family members
- SWBAT identify a project that they can work on with their friends to spread awareness of environmental problems and the need for coordinated human action to bring about changes

Materials Required:
- Tablet – 1 per facilitator

Note: An adapted version of the same curriculum is used for parents. Contents and language of delivery are made age appropriate for parents.

K Field Images



Appendix Figure A2: Facilitator training conducted by VentureVillage



Appendix Figure A3: Child baseline at school



Appendix Figure A4: Parent engaged in the curriculum



Appendix Figure A5: Child engaged in puzzle