

Peer-Review

Choi, Ethan. 2026. "Beyond Nature and Nurture: A Context-Dependent, Mechanism-Specific Framework for Altruism." *Journal of High School Science* 10 (2): 450–75. <https://doi.org/10.64336/001c.163326>.

Good work. This is an extensive literature review. However, in its current form, it is not acceptable for publication in the Journal. This is because, it is primarily a collation of work that already exists in the public domain. The Journal has a higher bar for review papers as seen here: <https://jhss.scholasticahq.com/for-authors>

I can reconsider your paper if you add a 'perspectives' section where you would propose future work and alternative interpretations. I would like you to treat or reframe 'altruism' not as a single latent variable, but as a profile of conditional responses (empathy, reciprocity, norm sensitivity, kin preference and cost sensitivity). Under this view, the central question shifts from "how altruistic is an individual?" to "under which conditions does an individual exhibit prosocial behavior, and which mechanisms are engaged in those contexts?" This reframing preserves the heterogeneity of prosocial behaviors and allows for more precise mapping between observed actions and their underlying drivers.

I provided this idea to chatgpt; as a series of prompts. Below is the response. (also see attached file)

Perspectives: Toward a Conditional and Mechanism-Specific Interpretation of Altruism

The longstanding debate over whether altruism is innate or learned has largely been framed around the assumption that altruism is a unified, scalar trait that can be measured and compared across individuals. This assumption, while convenient, introduces conceptual and methodological limitations. In particular, it collapses distinct behavioral phenomena—such as kin-directed helping, reciprocal cooperation, empathy-driven responses, and norm enforcement—into a single construct, thereby obscuring underlying mechanisms and creating potential circularity in interpretation.

An alternative perspective is to treat altruism not as a single latent variable, but as a profile of conditional responses. Under this view, the central question shifts from "how altruistic is an individual?" to "under which conditions does an individual exhibit prosocial behavior, and which mechanisms are engaged in those contexts?" This reframing preserves the heterogeneity of prosocial behaviors and allows for more precise mapping between observed actions and their underlying drivers.

Altruism as a Profile of Conditional Responses

Within this perspective, altruism can be operationalized as a vector of behaviors measured across distinct experimental contexts:

[
 $\mathbf{A}_i = (A_{iK}, A_{iR}, A_{iE}, A_{iN})$
]

where:

(A_{iK}): behavior in kin-directed contexts

(A_{iR}): behavior in repeated interaction (reciprocity) contexts

(A_{iE}): behavior in response to perceived distress (empathy contexts)

(A_{iN}): behavior in norm-enforcement or fairness contexts

Rather than aggregating these into a single score, this representation characterizes individuals by their pattern of responses across conditions, thereby avoiding conflation of mechanistically distinct behaviors.

A Multi-Component Hybrid Decomposition Model

To interpret these conditional behaviors, a multi-component framework can be considered in which multiple mechanisms contribute to behavior, but their relative influence is modulated by context. In contrast to purely additive models or strictly exclusive regime-switching models, this hybrid view allows for partial overlap between mechanisms while maintaining context-dependent structure.

Formally, behavior in a given condition may be expressed as:

$$A_{\text{context}} = \sum_{m \in \{K,R,E,N\}} G_m(\text{context}) \cdot X_{im} - C_i$$

where:

(X_{im}): individual predisposition for mechanism (m) (e.g., empathy, reciprocity orientation)

($G_m(\text{context})$): context-dependent activation of mechanism (m)

(C_i): cost sensitivity

Importantly, the activation functions (G_m) are determined by external context, not by the traits themselves, which avoids circular reasoning. For example, an emotionally salient scenario may increase the contribution of empathy-related processes, whereas repeated interactions may increase the relevance of reciprocity-based reasoning.

Measurement Through Mechanism-Specific Constructs

To quantify the components (X_{im}), a structured questionnaire can be used (see below) that targets distinct psychological predispositions without directly measuring “altruism.” These constructs include:

Empathy (E): sensitivity to others’ emotional states

Reciprocity Orientation (R): expectation of future return and strategic cooperation

Norm Sensitivity (N): adherence to fairness rules and moral obligations

Kin Preference (K): prioritization of close relational ties

Cost Sensitivity (C): responsiveness to personal cost

By measuring these components independently, it becomes possible to examine how each relates to behavior under different conditions, rather than assuming a single underlying factor.

Hypothesized Interaction Structure

This framework generates specific, testable hypotheses regarding how individual predispositions interact with contextual conditions and demographic variables.

1. Trait × Condition Interactions

Each mechanism-specific trait is expected to predict behavior preferentially within its corresponding condition, rather than uniformly across all contexts:

Empathy ((E)) should most strongly predict behavior in empathy-driven conditions ((A_E))

Reciprocity orientation ((R)) should most strongly predict behavior in repeated-interaction conditions ((A_R))

Norm sensitivity ((N)) should most strongly predict behavior in norm-enforcement contexts ((A_N))

Kin preference ((K)) should most strongly predict behavior in kin-directed contexts ((A_K))

At the same time, partial cross-condition effects may occur, reflecting overlapping mechanisms, but these effects are expected to be weaker than the primary alignment.

2. Cost Modulation

Cost sensitivity ((C)) is expected to exert a negative effect across all conditions, but with varying magnitude:

Strong attenuation in empathy-driven behavior at high cost

Moderate attenuation in norm enforcement

Variable effects in reciprocity depending on expected return

3. Demographic Modulation

The relationship between traits and behavior is expected to be further modulated by demographic variables:

Sex differences:

Females: stronger empathy → behavior linkage (higher (E → A_E))

Males: stronger reciprocity → behavior linkage (higher (R → A_R))

Age effects:

Younger individuals: greater reliance on empathy-driven responses

Older individuals: increased reliance on norm-based reasoning ((N → A_N))

Education effects:

Higher education: increased norm sensitivity and rule-based reasoning

Limited or no systematic increase in empathy scores

These hypotheses imply that demographic variables do not directly determine altruistic behavior, but rather modulate how underlying mechanisms are translated into action.

From Scalar Measures to Behavioral Profiles

This perspective enables a shift from scalar measurement to multi-dimensional characterization.

Instead of assigning a single altruism score to an individual, behavior can be described in terms of its conditional structure. For example, an individual may exhibit:

high responsiveness in empathy-driven contexts,

low cooperation in reciprocity-based interactions, and

moderate engagement in norm enforcement tasks.

Such a profile may be summarized as:

“Person X shows high empathy-driven helping, low reciprocity-driven helping, and moderate norm enforcement.”

This form of description preserves mechanistic distinctions and aligns more closely with observed variability in behavior across contexts.

Implications for Future Research

Adopting a conditional, mechanism-based interpretation of altruism has several implications. It provides a framework for reconciling conflicting findings across studies that may be probing different components of prosocial behavior. It also emphasizes the importance of experimental design in isolating specific mechanisms, rather than relying solely on aggregate measures. Finally, it highlights the need to distinguish between inputs to behavior (e.g., empathy, norms) and behavioral outputs, thereby reducing circularity in interpretation.

In fact, you can then define an index called "altruistic flexibility, which would be a quantitative measure of variance across conditions. High variance would be context sensitive and low variance would be trait like.

Appendix: Mechanism-Specific Questionnaire

Instructions:

Please indicate how much you agree with each statement on a scale from 1 (Strongly Disagree) to 5 (Strongly Agree).

Empathy (E)

I often feel emotionally affected when I see someone in distress.

When someone is upset, I can easily imagine how they feel.

I find it hard to ignore people who are suffering.

I tend to notice subtle emotional expressions in others.

Seeing someone cry makes me feel concerned or uncomfortable.

Reciprocity Orientation (R)

6. I am more willing to help someone if I think they might help me in the future.

7. Helping others usually pays off in the long run.

8. I consider how my actions today might affect how others treat me later.

9. I am less likely to help if I know I will never see the person again.

10. I keep track of whether people return favors.

Norm Sensitivity (N)

11. People should follow fairness rules even when it is personally costly.

12. I feel bothered when others break social rules, even if it doesn't affect me.

13. It is important to do what is right, even when no one is watching.

14. I would feel guilty if I didn't act according to my moral principles.

15. Rules exist for a reason and should generally be followed.

Kin Preference (K)

16. I feel a stronger responsibility to help family members than strangers.

17. I would be more willing to sacrifice for someone close to me than for a stranger.

18. Family obligations should come before helping others.

19. I feel more connected to the well-being of my close relatives than to others.

20. I would prioritize helping someone I know over someone I don't.

Cost Sensitivity (C)

21. I hesitate to help if it would cost me time or resources.

22. I carefully consider the personal cost before helping someone.

23. I am less likely to help if it inconveniences me.

24. Even small costs can discourage me from helping others.

25. I prefer to help only when it is easy to do so.

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We have added a new section, "Perspectives," to our paper. In the "Perspectives" section, instead of just defining altruism as either innate or learned, we proposed a context-dependent framework solution. Specifically, we outlined four distinct yet also interacting mechanisms that influence prosocial behavior: kin-based behavior, reciprocity-based behavior, empathy-driven behavior, and social norm-based behavior. We expanded the discussion of future research in this section as well by highlighting the importance of designing experimental models that isolate and bring about specific mechanisms of altruistic behavior. Additionally, we have accordingly edited our abstract, introduction and conclusion so that it reflects our changes. We revised our central research question from whether altruism is innate or learned to find out the differences of how individuals exhibit prosocial behavior between the conditions of our context-dependent framework.

Thank you for addressing my comments. The section still needs an expanded rewrite so that the following subheadings

-Eliminates circular reasoning

-Introduces causal identification logic

-Provides a unified, testable experimental design

-Generates falsifiable predictions

are explicitly addressed and - most importantly - your manuscript moves from descriptive review to mechanistic theory.

Please incorporate the flow of the rewrite in the attached chatgpt pdf file in your own words into the perspectives section. Please make sure you agree with the content (it is just an expanded version of your current section).

In addition, please include an appendix, where you present the formal experimental framework.

This is useful for readers who may wish to design an experiment around the mechanistic theory. I have attached an odt file containing this content that you can include in the manuscript appendix.

Please make sure you agree with the content.

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