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Equilibrium in empathic concern and personal distress predict identification with all humanity (IWAH) in Indian adolescents

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While empathy is known to predict Identification with All Humanity, a superordinate social identity linked to reduced prejudice and greater prosociality, the nuances of this relationship in adolescent populations have been rarely explored. Given that adolescence is a critical period of self and identity development through affiliation with different social groups, the investigation of this relationship offers valuable insights for global citizenship education, where empathy training is often central for shaping a global citizen identity. This study examines how equilibrium and disequilibrium in empathic response, comprising other-oriented Empathic Concern (EC) and self-oriented Personal Distress (PD), predict IWAH in a sample of 634 urban Indian adolescents aged 11–16 years (mean (SD) = 13.37 years (1.24); male: female = 53.6%:46.4%). Equilibrium refers to similar levels of EC and PD within the same individual, while disequilibrium refers to differences between them. Using polynomial regression with response surface analysis (PRRSA), the results showed that equilibrium in EC and PD predicted higher levels of trait IWAH, while directional disequilibrium (EC > PD) did not. The study did not observe any age differences. The findings are discussed in relation to adolescent development. In Indian adolescents, an understudied group in empathy and global citizenship research, this study contributes to a broader understanding of the developmental and cultural underpinnings of empathy and global social identification.

Keywords Empathic response, Empathic concern, Personal distress, Identification with all humanity (IWAH), Global citizenship

Empathy is widely recognised as a core social and emotional capacity that enables individuals to respond to others' emotions with appropriate concern and support[1–3]. Defined as the ability to understand and share the feelings of others, empathy is not a unitary construct but comprises at least two interrelated emotional responses: empathic concern (EC), referring to other-oriented feelings of warmth and care for others' suffering, and personal distress (PD), denoting self-oriented aversive reactions such as anxiety and discomfort in response to others' suffering[4,5]. These responses emerge early in development and shape prosocial behaviour and interpersonal relationships[6]. High EC is consistently associated with greater helping behaviour, prosocial tendencies, and enhanced well-being[4,11–15], whereas elevated PD, particularly in the absence of sufficient EC, may inhibit prosocial outcomes or lead to maladaptive responses such as emotional withdrawal or burnout[16,17].

However, empirical evidence on the association between trait-level EC and PD is mixed, with studies reporting weak positive correlations[7,8], no association, or weak negative correlations[9,10]. This inconsistency underscores the need to understand better how the interplay between EC and PD shapes socio-emotional outcomes. Research has also examined how empathic responses are shaped by and interact with emotion regulation processes. Evidence suggests that emotion regulation helps manage aversive reactions such as PD while sustaining EC in emotionally charged contexts, allowing individuals to engage empathically without becoming overwhelmed[18,19]. This capacity to regulate empathic responding may be critical for maintaining adaptive socio-emotional outcomes.

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Empathy does not operate uniformly across social contexts; perceived group boundaries often shape empathic responses and subsequent prosocial behaviour. Empathic concern can promote prosocial and even costly helping, but this tendency is typically stronger toward ingroup members than outgroup members, particularly when the target is perceived as socially close or similar[20–22]. For example, studies with soccer fans show that individuals high in trait EC are more willing to help ingroup members in pain, with weaker effects for rival-group members[23]. These findings highlight the context-dependent nature of empathic responding and suggest that the balance between EC and PD may influence whether empathy motivates helping or withdrawal, particularly toward socially distant others[9,24].

One socially desirable outcome of empathic responding is inclusive self-identity, such as Identification with All Humanity (IWAH). IWAH reflects a form of social identity in which individuals view themselves as part of a shared human group and are more likely to engage in prosocial behaviour beyond immediate social or cultural boundaries[25,26]. Empathy plays a central role in shaping such inclusive identities, as perspective-taking and emotional connection with outgroup members are associated with increased support for humanitarian causes and reduced prejudice[27]. Individuals with narrower ingroup identification tend to show greater prejudice, linked to reduced empathy for outgroup members[28–30], whereas reorganising social boundaries to include all humanity is associated with reduced discrimination toward former outgroups[31,32].

Investigating an imbalance between EC and PD offers deeper insight into how empathy shapes both adaptive and maladaptive outcomes[25,26,33,34]. However, most existing studies examine EC and PD as independent constructions, rather than exploring their intra-individual balance, referred to here as empathic equilibrium or disequilibrium, which influences socio-emotional outcomes. Empathic equilibrium denotes a well-regulated balance between concern for others and self-oriented distress, enabling emotional engagement without overwhelm, whereas (dis)equilibrium refers to an imbalance between the two, where trait levels of one construct supersede the other[36]. Unlike traditional interaction terms, this approach captures the dynamic relationship between EC and PD within individuals. To model this relationship, the present study employs polynomial regression with response surface analysis (PRRSA), which allows for the examination of linear, non-linear, and interaction effects without the limitations of difference scores[37,38]. Prior work has demonstrated the utility of this approach in studying empathy-related individual differences and psychopathology[39].

By examining empathic (dis)equilibrium as a predictor of IWAH, this study aims to advance understanding of how individual differences in empathic responding shape broader social identities. While prior research has applied equilibrium frameworks to cognitive and affective empathy in relation to psychopathology[35,39], no study to date has examined the balance between the two affective components of empathy, EC and PD, in relation to positive psychosocial outcomes. The present study addresses this gap by applying the empathic (dis)equilibrium framework to the prediction of IWAH during adolescence, a developmental period characterised by heightened emotional sensitivity and identity formation[36,40]. In this study, empathic equilibrium refers to relatively similar EC and PD levels, reflected in low EC–PD difference scores, whereas empathic disequilibrium refers to sufficiently divergent EC and PD levels, resulting in higher EC–PD differences[35,39]. We acknowledge that other factors, such as values of equality, justice, and moral reasoning, as well as personality traits such as openness to experience and universalism, also contribute to IWAH[34,41–43]. However, given empathy's developmental relevance and its potential malleability through intervention[44–47], it serves as a particularly compelling focus for adolescent populations.

Adolescence is a critical period for self-identity development, marked by increasing social awareness, consolidation of personal values, moral reflections and social affiliations through the development of abstract and metacognitive thinking[48–51]. These developmental changes enable adolescents to re-categorise their sense of self and extend identification beyond immediate social groups toward more inclusive social identities, such as humanity as a whole[52]. Among Indian adolescents, empathy is shaped by strong interpersonal bonds and collectivist values, with evidence linking empathy to altruistic behaviour and consistently higher empathy reported among girls than boys[53,54]. At the same time, adolescents are navigating rapid socio-cultural change and digital exposure, which may influence emotion regulation and group-based affiliations. In this context, studying the role of empathy in shaping global social identity, a broad term referring to any sense of belonging to the global community, is a significant avenue. In the face of growing global and regional conflicts, delineating the role of empathy in different cultural settings (collectivistic versus individualistic) and its role in global citizenship[55] assumes new relevance and importance.

Adolescent psychosocial development is shaped by intergroup experiences, parental influence, and peer dynamics, which can foster openness to inclusive identities[56]. Well-regulated empathic concern may support moral commitments to values such as justice, equality, and humanitarianism[24,57,58]. Educational and digital interventions targeting empathy and global awareness during adolescence have demonstrated effects in increasing IWAH and reducing prejudice[31,32,42,59,60], suggesting that this developmental period represents a key opportunity for cultivating inclusive social identities. IWAH aligns closely with the United Nations Sustainable Development Goals, particularly SDG 4.7, which emphasises global citizenship education[25,61,62]. Although empathy is a core target of such educational programs[63,64], few studies have examined how individual differences in empathic profiles influence global identity development during adolescence.

For educational programs to foster global citizenship effectively, a clearer understanding is needed of how empathy components interact with trait-level IWAH in adolescents[65]. The present study explores how intra-individual (dis)equilibrium between EC and PD predicts trait-level IWAH in adolescents. Specifically, we examine whether adolescents with balanced EC and PD (low EC–PD difference) show stronger IWAH than those with empathic disequilibrium (high EC–PD difference). Understanding how EC and PD differentially relate to socially desirable traits can inform intervention design that aims to use empathy training to promote such traits, including receptivity to groups beyond one's immediate social identity.

In extending the PRRSA method, it is also the first study to examine the equilibrium between the two affective but opposing aspects of empathy (EC and PD), as opposed to the equilibrium between cognitive and emotional empathy.

Aim

The study sought to understand how equilibrium and disequilibrium in *empathic response* predict IWAH in adolescents. To examine this, the study investigated the following two aims:

Aim 1 How does equilibrium in *empathic response*, i.e., matched EC and PD, relate to IWAH and if the nature of this relationship is linear, nonlinear or both?

Aim 2 How does disequilibrium in *empathic response* relate to IWAH, and if the nature of this relationship will be (a) linear, nonlinear or both, and (b) EC or PD dominant?

Methods

Participants

Three schools from the National Capital Region (NCR) of India (New Delhi and its neighbouring areas) took part in the study based on convenience sampling. As a result, data was obtained from 815 students. 181 participants were excluded due to incomplete, duplicate or invalid responses. Data from the remaining 634 participants were included in the study (M_{age} = 13.37, SD = 1.24). 53.60% of the sample self-identified their gender as male (M_{age} = 13.3, SD = 1.24), and 46.40% as female (M_{age} = 13.40, SD = 1.25). We used how students perceived their parents (or caregivers) at their current level of income as a proxy for perceived socio-economic status. Out of the reported responses (15.6% preferred not to answer), 63.9% of the participants reported that their caregivers "live comfortably with the current income," 17.2% reported their caregivers are "managing with the current income", while 2.84% and 0.47% reported their caregivers "find it difficult or very difficult to live with the present income," respectively (see Table 1).

Procedure

Ethical clearance was obtained from an institutional review board, the Human Research Ethics Committee (HREC) at Ashoka University in June 2023 under protocol 10062023/meeting2/002-2. This study was conducted in accordance with the principles of the Declaration of Helsinki. Parents of all participants consented to the study, and all adolescents assented to taking part in the study.

In March-April 2024, schools from NCR (as mentioned before) were invited to participate in the research through a private partner who specialised in implementing and collecting data on social and emotional learning programs in NCR schools. The implementation partner reached out to several schools through a recruitment brochure and scheduled meetings with school leaders to convey the objectives of the study. School leaders from three schools agreed to participate in the study, and each school randomly nominated approximately 250 students from grades 6–10 to participate in the study. Their parents were provided with a Participant Information Sheet (PIS), which detailed the study objectives and asked for consent through the Informed Consent Form (ICF). After collecting consent, the implementation partner communicated hardware requirements with school-appointed teachers, who took charge of implementing the study in their respective schools. In-school sessions for the study were scheduled in each school's computer laboratories, where students came in groups to complete the questionnaire. Participants were informed about the study's objective, their voluntary participation, and that their involvement would have no impact on their well-being, adhering to the Ethical Principles of Psychologists and Code of Conduct outlined by the American Psychological Association[66]. Informed assent was obtained from all participants before the study commenced. Assistance was provided to students if they encountered any difficulties through the implementation partner, the designated teacher, and the IT personnel. Additionally, at-home responding was made available for students who could not attend school.

The study questionnaire was developed on Qualtrics. It commenced with a welcome screen that provided concise information about the study. After proceeding past the welcome screen, participants completed a section that captured data on several socio-demographic variables (listed in the next section). Following this, self-

Demographic (N = 634)	M (SD)	% (n)
Age[1]	13.37 (1.24)	Range: 10.73–16.58 years[1]
Gender		
Male		53.6% (340)
Female		46.4% (294)
Perceived socio-economic status		
My caregivers are living comfortably on the present income		63.90% (405)
My caregivers are managing with the present income		17.20% (109)
My caregivers find it difficult to live on the present income		2.84% (18)
My caregivers find it very difficult to live on the present income		0.47% (3)
I would rather not say		15.60% (99)

Table 1. Participant characteristics (N = 634). [1] Calculated by subtracting the date of birth from the date of survey administration.

report measures were administered in a randomised order. These included two subscales of the Interpersonal Reactivity Index (IRI)[8], the Identification with All Humanity (IWAH) Scale[42], and the Balanced Inventory of Desirable Responding – 16 (BIDR-16)[67]. To mitigate position bias, items within each self-report measure were also randomised. Additional measures were administered but not used in the present study. For the full questionnaire, participants reported a mean completion time of 29.76 min (SD = 14.59). The complete Qualtrics protocol is available in the Supplementary Materials.

Instruments

Empathic response

Empathic response was measured through two subscales from the Interpersonal Reactivity Index (IRI)[8]: empathic concern, which captures "other-oriented" feelings of sympathy and concern for unfortunate others (e.g., "*I am often quite touched by things that I see happen*"), and personal distress, which captures "self-oriented" feelings of personal anxiety and unease in tense interpersonal settings (e.g., "*In emergency situations*, *I feel apprehensive and ill-at-ease*"). Both subscales present similar interpersonal scenarios but differ in the motivational orientation of responses, i.e., whether individuals focus on others' welfare (EC) or their own emotional discomfort (PD) when encountering others' difficulties. This complementary structure enables examination of equilibrium and disequilibrium in empathic responding patterns. Responses on the items were made on a 5-point Likert scale (ranging from "Does not describe me well" to "Describes me very well"), with higher mean ratings indicating greater empathic concern or personal distress. While Cronbach's alpha indicated modest reliability in our sample (EC = 0.58, PD = 0.68), confirmatory factor analyses revealed that the assumption of tau-equivalence was violated for both scales, suggesting that alpha likely underestimates true internal consistency. Accordingly, we report more robust alternative estimates aligned with congeneric models, including McDonald's omega (EC = 0.59, PD = 0.69), Greatest Lower Bound (EC = 0.65, PD = 0.65) and Coefficient H (EC = 0.74, PD = 0.79), which suggest adequate reliability for both subscales.

Identification with all humanity

Identification with all humanity was measured through the Identification with All Humanity Scale[42]. The scale consists of 27 items derived from nine parallel statements asked about three target groups: (a) people in one's community, (b) people in one's country (adapted from the original "Americans"), and (c) people anywhere in the world (example statements include "How much would you say you have in common with the following groups?" and "How close do you feel to each of the following groups?"). Each item is rated on a 1 ("Not at all") to 5 ("Very much") Likert-type scale. Scores for each group are summed to yield three subscale scores: Identification with All Humanity (IWAH), Identification with One's Community (IWOCOMM), and Identification with One's Country (IWOCOUNT), with higher values indicating stronger identification with the corresponding group. In our sample, all three subscales demonstrated acceptable reliability (α = 0.85 for IWOCOMM, α = 0.89 for IWOCOUNT, and α = 0.87 for IWAH).

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Desirable responding

Desirable responding was measured through the 16-item version of the Balanced Inventory of Desirable Responding (BIDR-16)[67]. Eight items on this scale measure impression management, which refers to the tendency of giving positively inflated self-descriptions to an audience (e.g., "*I don't gossip about other people's business*"), while another 8 measure self-deceptive enhancement, which refers to the tendency to give honest but positively biased reports, i.e., a non-conscious inclination to perceive oneself favourably (e.g., "*I always know why I like things*"). Items are rated on a 5-point Likert-type scale (ranging from "Strongly Disagree" to "Strongly Agree" with higher mean ratings reflecting a greater tendency for desirable responding. Our sample indicated adequate reliability for the overall score ($\alpha = 0.74$).

Demographics

Participants also completed a short demographic form that collected information on their name, email address, date of birth, gender, perceived socio-economic status (SES), and several other variables that were not used in this study (mentioned in the full protocol in Supplementary Materials). These were collected to enhance understanding of the participant sample and add control variables during model building.

Statistical analyses

To investigate the effects of equilibrium and disequilibrium in *empathic response* on IWAH, we employed Polynomial Regression with Response Surface Analysis (PRRSA). While PRRSA was originally used in management research, it can be appropriate for testing the similarity and dissimilarity of any two predictors on an outcome (for example, see[68] for a list of research questions in social and personality psychology that can be answered through PRRSA).

PRRSA is a statistical modelling approach that allows examining the joint effects of two predictor variables and their (mis)alignment on an outcome. Traditional linear or difference-score models often fail to capture complex relationships between two interrelated constructs (e.g., cognitive and affective empathy), particularly when the balance or mismatch between them may matter more than their individual levels.

PRRSA, on the other hand, allows overcoming these limitations through congruence hypotheses[68]. PRRSA holds more explanatory power as compared to difference score testing[68,69] and also outperforms other similarity/dissimilarity approaches, including residual score tests, moderated regressions and truth bias tests, by offering the most information necessary for comprehensive theoretical and practical inferences[70].

Instead of collapsing two predictors into a single score (e.g., a difference), PRRSA uses a second-order polynomial regression (including both linear, quadratic, and interaction terms) to model a 3D response surface. This surface visually and statistically illustrates how different combinations of the two predictors relate to the outcome, highlighting effects like:

- Congruence (when both predictors are at the same/similar level),
- Incongruence (when one is high and the other low), and.
- Nonlinear patterns (e.g., whether high-high differs from low-low).

This method allows for a more nuanced analysis of whether balance, imbalance, or extremity in predictors (e.g., empathy components of EC and PD) affect the outcome (e.g., identification with all humanity), which is particularly relevant in our theoretical framework.

All statistical analyses were performed using R v4.3.3[71]. First, descriptive statistics and bivariate correlations were examined for the measured variables. Then, using the RSA package v0.10.6[72], a PRRSA model was built in the full (N = 634) sample. For this model, variables were first identified - *empathic concern* and *personal distress (empathic response)* as predictors, *age*, *gender*, *perceived SES* and *desirable responding* as controls, and *IWAH* as outcome. We relied on a priori research, which demonstrates that gender, age, and socioeconomic status exhibit reliable associations with empathic tendencies in adolescents, making them theoretically grounded covariates[73–76]. Additionally, because empathy is a socially valued trait, self-report measures of empathy are prone to social desirability bias, and methodological reviews recommend including a measure of desirable responding when using self-reported psychosocial scales[73,74]. Next, observations were classified into equilibrium and disequilibrium conditions to check if sufficient disequilibrium cases existed in the sample. From z-transformed scores calculated through the pooled mean and standard deviation of the predictors, a cut point of $|\Delta$ z-score$| < 0.5$ signified equilibrium, and a cut point of $|\Delta$ z-score$| > 0.5$ signified disequilibrium (see[72] for more details). Next, the predictors were centred around the mid-point of their possible ranges, and control variable(s) were centred around the mean. Centring predictors around the midpoint of the scale is recommended for this type of analysis because they must have a common zero point[68,69]. After centring, a second-order polynomial regression model was built using the *stats* package[71], represented as follows:

$$IWAH = b_0 + b_1EC + b_2PD + b_3EC^2 + b_4EC \times PD + b_5PD^2 + b_6Age + b_7Gender + b_8PSES + b_9DR + \epsilon .$$

where,

IWAH = Identification with All Humanity.

EC = Empathic Concern.

PD = Personal Distress.

DR = Desirable Responding.

PSES = Perceived Socio-Economic Status.

ϵ = Error Term.

b_0 = Intercept.

b_1 - b_9 = Regression coefficients for the predictors, their interactions, and control variables.

Although McFarland et al. (2012) introduced IWOCOMM, IWOCOUNT, and IWAH as parallel identity subscales and demonstrated that IWAH predicts outcomes above and beyond community- and country-level identifications when these are statistically controlled, they also showed that the IWAH items form a coherent and psychometrically strong construct on their own. Subsequent studies (e.g., 34) likewise treat the IWAH score independently as a valid indicator of a broad, inclusive social identity, particularly in developmental and educational research. Following this framework, we conceptualised IWAH as a superordinate identity that extends beyond local and national group boundaries, and thus, IWAH served as the primary outcome for testing our hypotheses.

However, we performed additional analyses, including IWOCOMM and IWOCOUNT as covariates to evaluate the robustness of our findings:

$$IWAH = b_0 + b_1EC + b_2PD + b_3EC^2 + b_4EC \times PD + b_5PD^2 + b_6Age + b_7Gender + b_8PSES + b_9DR + \mathbf{b_{10}IWOCOMM + b_{11}IWOCOUNT} + \epsilon .$$

For these regression models, response surface analysis was conducted using the *RSA.ST* function of the *RSA* package. Surface parameters were estimated, and surfaces were visualised using the *plotRSA* function. On this surface, the slope and the curvature of two significant lines were examined. The slope of the first line, called the Line of Congruence (LOC; the locus of points where values of both predictors are in perfect equilibrium), represents how the equilibrium between EC and PD (i.e., equilibrium in *empathic response*) relates to IWAH.

In contrast, its curvature represents whether this relationship is linear or non-linear. Similarly, the slope for the Line of Incongruence (LOIC; the locus of points where values of both predictors are in perfect disequilibrium) represents how the disequilibrium between EC and PD (i.e., disequilibrium in *empathic response*) relates to IWAH. In contrast, its curvature represents whether the relationship is linear or non-linear. These slopes and curvatures were examined using four surface parameters described as follows:

1. a_1: linear relationship between equilibrium in *empathic response* and IWAH ($a_1 = b_1 + b_2$).
2. a_2: the non-linear relationship between equilibrium in *empathic response* and IWAH ($a_2 = b_3 + b_4 + b_5$).
3. a_3: linear relationship between disequilibrium in *empathic response* and IWAH ($a_3 = b_1 - b_2$).
4. a_4: the non-linear relationship between disequilibrium in *empathic response* and IWAH ($a_4 = b_3 - b_4 + b_5$).

Other R packages (*rstatix*, *ggplot2*, *corrplot*, *dplyr*, *psych*, *ggpubr*) were used for data manipulation and cleaning, as well as plotting additional results.

Scale	Full Sample ($N = 634$)	
	Range	M (SD)
Interpersonal Reactivity Index (IRI)		
Empathic Concern	0–28	16.88 (4.27)
Personal Distress	0–28	14.84 (4.19)
Identification with All Humanity (IWAH)	9–45	27.97 (7.65)
Identification with One's Community (IWOCOMM)	9–45	34.81 (7.74)
Identification with One's Country (IWOCOUNT)	9–45	32.30 (7.35)
Desirable Responding (BIDR)	30–77	51.67 (7.00)

Table 2. Descriptive statistics. Note. Items on IRI are scored between 0 and 4 (5-point Likert-type scale), while others are scored between 1 and 5.

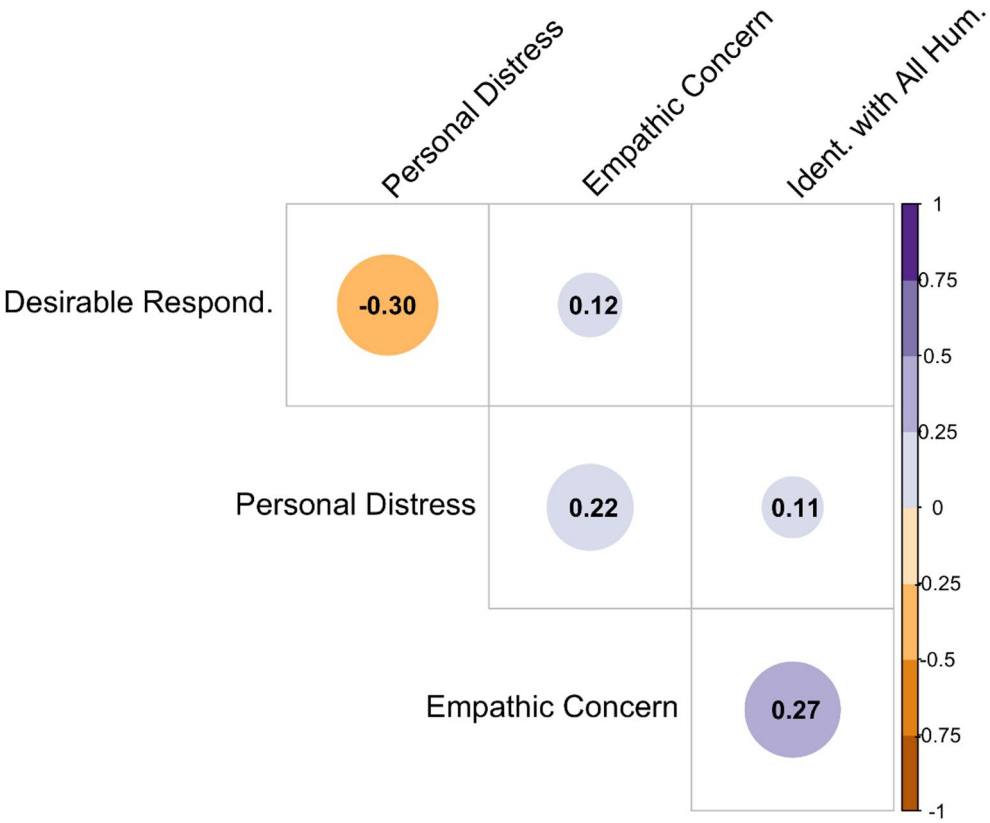

Fig. 1. Correlogram depicting bivariate Pearson (two-tailed) correlations between measured variables in the sample ($N = 634$),$^{**}p < .01$, $^{*}p < .05$.

Finally, although our primary outcome was IWAH, we conducted extended follow-up analyses, **presented in part here and fully in the supplementary materials**, to assess whether empathic equilibrium and disequilibrium also predicted IWOCOMM and IWOCOUNT. These analyses allowed us to evaluate whether the effects were specific to IWAH or existed across identity layers.

Results

Descriptive statistics and bivariate correlations

Descriptive statistics on the measured variables (empathic concern, personal distress, identification with all humanity and desirable responding) are presented in Table 2, and zero-order, Pearson (two-tailed) correlations between them are visualised through a correlogram in Fig. 1.

As evident from Fig. 1, *empathic concern* showed weak positive correlations with *personal distress*. Furthermore, both these variables were positively correlated with the outcome variable, *IWAH*.

Desirable responding displayed small negative correlations with *personal distress* and weak positive correlations with *empathic concern* and *IWAH*.

Prediction of identification with all humanity

Model building

For the PRRSA model, coefficient estimates obtained using polynomial regression are presented in Table 3, along with their β s and *p*-values. Surface parameter estimates (a_1 to a_4) for the corresponding response surface are also present in Table 3, along with their *p*-values. The response surface is plotted in Fig. 2.

Results indicated disequilibrium in *empathic response* (i.e., between EC and PD) for approximately 62% ($N = 393$) of the participants. A full second-order polynomial regression model displayed a significant fit (adj. R^2 = 11.0%, $p < .001$). As seen in Table 3, perceived socioeconomic status was a significant control variable, with several categories showing significant effects compared to the reference group (see Table 3 for full details). Gender, age, and social desirability did not reach statistical significance.

Equilibrium in empathic response

As noted in Table 3, there was a linear association ($a_1 = 0.771$, $p < .001$) between equilibrium in *empathic response* and *IWAH*. Since a_1 was positive, it indicated that IWAH was higher when EC and PD matched at higher levels as compared to lower levels (see Fig. 2). In simpler terms, adolescents who exhibited high levels of both EC and PD (in equilibrium) were more likely to identify with all humanity than those with lower levels of both traits.

Additionally, the curvature along the line of congruence ($a_2 = -0.029$, $p = .019$) was statistically significant, albeit with a small effect size. This suggests that although higher matched EC-PD levels predict higher IWAH (the a_1 effect), this increase tapers off slightly at the highest levels of EC-PD equilibrium.

Disequilibrium in empathic response

As seen from Table 3, the linear association between disequilibrium in *empathic response* and *IWAH* was not statistically significant. This suggests that directional imbalance (EC-dominance versus PD-dominance) did not reliably predict IWAH.

However, there was a non-linear association ($a_4 = 0.061$, $p = .035$) between these variables, albeit with a small effect size, indicating a non-linear pattern in how empathic imbalance relates to IWAH.

Additional controls: IWOCOMM and IWOCOUNT

Results for this analysis are also reported in Table 3, and the response surface is visualised in Fig. 3. Surface parameters showed that the effects of equilibrium in empathic response persisted, although with reduced magnitude relative to our primary model. The linear effect between empathic equilibrium and IWAH remained positive and significant ($a_1 = 0.238$, $p = .018$), indicating that adolescents with jointly high EC and PD continued to report higher IWAH. However, the coefficient was attenuated compared to the uncontrolled model ($a_1 = 0.77$).

	Main Model		With IWOCOMM and IWOCOUNT	
Parameter	**Estimate**	***p***	**Estimate**	***p***
Predictors				
EC	0.478	< 0.001***	0.069	0.311
PD	0.269	0.004**	0.168	0.016*
EC^2	−0.001	0.915	0.001	0.908
PD^2	0.014	0.255	−0.008	0.441
EC × PD	−0.042	0.009**	−0.025	0.029*
Controls				
Gender (male)	0.834	0.161	0.019	0.958
PSES: Comfortable	2.423	0.003**	1.411	0.008**
PSES: Managing	2.948	0.004**	1.728	0.009**
PSES: Difficult	0.339	0.855	2.583	0.034*
PSES: Very Difficult	14.098	< 0.001***	6.591	0.018*
Desirable Responding	0.064	0.156	0.004	0.888
Age	0.224	0.337	0.398	0.008**
IWOCOMM	–	–	−0.188	< 0.001***
IWOCOUNT	–	–	0.927	< 0.001***
Response Surface Parameters				
a_1	0.771	< 0.001***	0.238	0.018*
a_2	−0.029	0.019*	−0.032	0.016*
a_3	0.191	0.218	−0.099	0.299
a_4	0.061	0.035*	0.018	0.33

Table 3. Results of polynomial regression - response surface analysis predicting IWAH. Note. EC = Empathic Concern; PD = Personal Distress; PSES = Perceived Socioeconomic Status. The main model includes demographic and desirability controls only. The extended model additionally includes IWOCOMM and IWOCOUNT as covariates. *$p < .05$. **$p < .01$. ***$p < .001$.

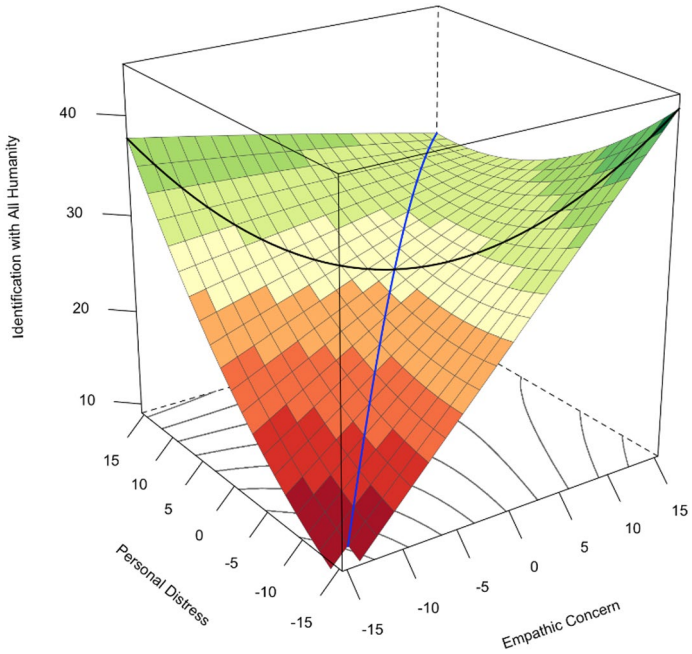

Fig. 2. Polynomial regression plot with EC (empathic concern) and PD (personal distress) predicting IWAH (identification with all humanity), along with response surfaces for the overall sample ($N = 634$), controlling for the effect of age, gender, and socially desirable responding. EC is represented on the x-axis, PD on the y-axis and IWAH on the z-axis. The blue line represents empathic equilibrium (line of congruence) and the black line represents the empathic disequilibrium (line of incongruence); the left side of the black line depicts PD dominance (PD > EC) and the right side depicts EC dominance (EC > PD). The colour of the response surface indicates the IWAH values, with red colour indicating low magnitude of IWAH values, and yellow to green predicting medium to high magnitude of IWAH values, respectively. Response surface parameters: $a_1 = 0.771^{***}$, $a_2 = -0.029^{*}$, $a_3 = 0.191$, $a_4 = 0.061^{*}$. *Note.* $^{***}p < .001$, $^{**}p < .01$, $^{*}p < .05$.

The curvature along the line of congruence also remained significant ($a_2 = -0.032$, $p = .016$), again indicating a slight diminishing-returns pattern at high matched EC–PD levels. As in the main analysis, a_3 was not significant ($p = .299$). In contrast, a_4, which was significant in the primary model, was no longer significant in this model ($a_4 = 0.018$, $p = .330$).

Overall, the persistence of a_1 and a_2 supports the interpretation that equilibrium in empathic response contributes uniquely to global identification.

Additional analyses

Outcome variable: IWOCOMM

We again saw a strong positive linear effect along the line of congruence ($a_1 = 0.872$, $p < .001$), indicating that empathic equilibrium predicted higher community identification, paralleling the pattern observed for IWAH. Unlike the IWAH, however, the curvature on the line of congruence was not significant ($a_2 = -0.025$, $p = .078$).

In contrast to the IWAH findings, the a_3 parameter was positive and significant ($a_3 = 0.421$, $p = .002$), indicating that EC-dominant profiles were associated with higher community identification relative to PD-dominant profiles. Similarly, the curvature along the line of incongruence was significant ($a_4 = 0.066$, $p = .003$), suggesting that greater discrepancies between EC and PD were associated with stronger community identification. See full results in Supplementary Materials Section S1.

Outcome variable: IWOCOUNT

A similar significant effect was seen along the line of congruence ($a_1 = 0.751$, $p < .001$). Similar to the IWOCOMM model and unlike the IWAH model, curvature on the line of congruence was not significant ($a_2 = -0.002$, $p = .874$).

Consistent with the IWOCOMM model, the a_3 parameter was significant and positive ($a_3 = 0.398$, $p = .003$), indicating that EC-dominant profiles were associated with stronger national identification. Curvature along the line of incongruence was also significant ($a_4 = 0.059$, $p = .017$), demonstrating that larger mismatches between EC and PD predicted higher identification with their country. See full results in Supplementary Materials Section S2.

Discussion

The current study examined how equilibrium and disequilibrium in empathic responses, specifically empathic concern (EC) and personal distress (PD), predict Identification with All Humanity in adolescents. To our knowledge, this is the first study to explore how intra-individual differences in empathic responses relate to

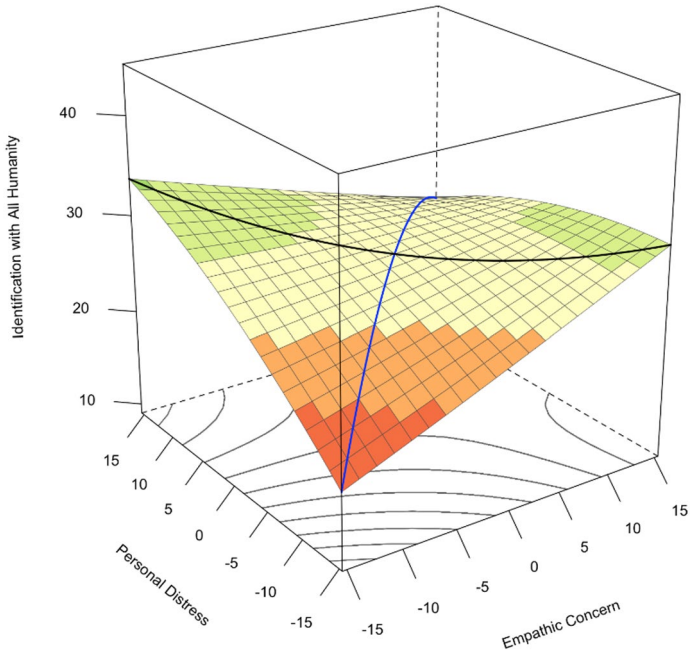

Fig. 3. Polynomial regression plot with EC (empathic concern) and PD (personal distress) predicting IWAH (identification with all humanity), along with response surfaces for the overall sample ($N = 634$), controlling for the effect of age, gender, socially desirable responding, as well as IWAH community and IWAH country scores. EC is represented on the x-axis, PD on the y-axis and IWAH on the z-axis. The blue line represents empathic equilibrium (line of congruence) and the black line represents the empathic disequilibrium (line of incongruence); the left side of the black line depicts PD dominance (PD > EC) and the right side depicts EC dominance (EC > PD). The colour of the response surface indicates the IWAH values, with red colour indicating low magnitude of IWAH values, and yellow to green predicting medium to high magnitude of IWAH values, respectively. Response surface parameters: $a_1 = 0.238^{***}$, $a_2 = -0.032^{*}$, $a_3 = -0.099$, $a_4 = 0.018$. *Note.* $^{***}p < .001$, $^{**}p < .01$, $^{*}p < .05$.

IWAH among Indian adolescents, belonging to a collectivistic cultural setting. This study also contributes to the literature as one of the first to examine equilibrium and disequilibrium between two affective components of empathy (EC and PD), rather than the more common focus on (dis)equilibrium between cognitive and affective dimensions.

Results investigating our first aim found that those adolescents who had higher values, as well as matched levels of EC and PD, reported stronger identification with all humanity compared to those adolescents who had matched EC and PD but lower values, indicating that increases in EC and PD together were positively associated with IWAH. This effect persisted even when controlling for community and country-level identity (see Table 3; Figs. 1 and 2). This aligns with earlier work showing that empathy predicts IWAH[25,33–35] and extends it by highlighting that the alignment of affective empathic response is a meaningful predictor of global social identification in adolescence.

When PD is not overwhelming, individuals can remain focused on others' needs, which is critical for extending empathy beyond familiar social circles. Excessive PD, in contrast, may trigger avoidance, where the motivation shifts toward alleviating one's own distress rather than addressing the needs of others[9,77–80]. Maintaining a balance between EC and PD allows adolescents to stay emotionally engaged while regulating self-focused discomfort, fostering more inclusive social identities.

We argue that caring for all humans, people one does not know, who live far away, and who may be very different, appears to benefit from **elevated levels of both EC and PD**. High EC enables adolescents to emotionally connect with distant others, while elevated PD ensures that others' suffering is felt concretely rather than abstractly. Our finding of slight diminishing returns at the highest joint levels ($a_2 < 0$) supports this notion: extremely elevated empathic responses may approach a threshold where additional intensity provides less benefit, possibly due to regulatory demands or because the distress becomes self-focused rather than other-oriented. When EC and PD are elevated and remain in equilibrium, individuals are able to stay emotionally regulated, maintain perspective, and extend compassion outward to a broad and diverse global community. This balance, therefore, seems to support the development of a more inclusive identity with all humanity[42,59,81–83].

It is also possible that EC remains the key driver of IWAH in adolescents, even with high and balanced empathy profiles, with emotion regulation playing a moderating role. For example, adolescents with average regulation capacity may manage their PD through cognitive appraisal or emotion suppression, allowing EC to remain active. Prior research has shown that low or moderate levels of cognitive reappraisal are positively associated with EC and prosocial behaviour[84], and that EC itself predicts IWAH[34].

Importantly, both EC and PD mature differently across adolescence. Longitudinal studies suggest that EC may remain stable or increase, while PD tends to decline with age[85,86]. However, cross-sectional research reports mixed findings, including no significant age-related change[87] or even a decrease in EC from early to later adolescence[88]. Notably, these studies emphasise group-level trends and not intra-individual variation. Overall, the developmental trajectory of EC and PD remains inconsistent, warranting further research to explore how individual-level change may relate to inclusive social identity formation.

Results addressing our second aim indicate that disequilibrium in empathic response does not uniquely predict IWAH. Notably, this pattern persisted even when controlling for self-identification with community and country.

However, our follow-up analyses with IWOCOMM and IWOCOUNT suggest that disequilibrium in empathic response (when EC > PD) is significantly associated with adolescents' identification with their country and community. One possible explanation is that caring for close or familiar groups does not require the same emotional regulation as caring for distant or abstract groups (such as one's community or country); high EC alone may be enough to create warmth, affiliation, and a sense of belonging. In contrast, higher PD may sometimes limit local identification because distress about suffering within one's own group may feel immediate or overwhelming, leading to withdrawal. This interpretation aligns with past work showing that EC tends to promote approach-oriented social connection, whereas PD is more likely to evoke avoidance[81,82]. Although the significant a_3 values suggest that the effect is mainly driven by higher EC (IWOCOMM: b = 0.647, p <.001; IWOCOUNT: b = 0.575, p <.001) rather than lower PD (IWOCOMM: b = 0.225, p =.026; IWOCOUNT: b = 0.177, ns), these effects should be interpreted in context, and further research is needed to confirm these patterns (see Supplementary Materials for full details). Additionally, significant curvature along the line of incongruence (a_4 = 0.066, p =.003 for community; a_4 = 0.059, p =.017 for country) indicates this EC-dominance effect is non-linear, with the advantage of EC over PD potentially becoming more pronounced at higher levels of imbalance.

Given that adolescents with greater EC relative to PD tend to identify more strongly with their country and community ($a_3 > 0$), a pattern not observed for global identification (a_3 ns), an important theoretical question is raised: might identification with the global community require experiencing both distress and concern at relatively high levels, without one overwhelming the other, whereas identification with more proximal social groups is more strongly driven by empathic concern? It is also important to acknowledge that some of these effects are small in magnitude; therefore, additional research is warranted before drawing firmer conclusions.

To synthesise, we found that identification with all humanity is predicted by relatively high values of both empathic concern (EC) and personal distress (PD). This is surprising, given that prior literature has often found overwhelming PD to have an inhibitory effect, particularly on prosocial action. However, this is not always the case; in some contexts, higher PD can prompt helping behaviour as a form of self-regulation of negative affect[89–95]. Our findings contribute to this literature by showing that **balanced empathic responses**, rather than extreme levels of either component alone, are associated with greater identification with all humanity. In contrast, empathic imbalance does not predict IWAH but is associated with stronger identification at the country and community levels, supporting the view that EC may serve as a more stable emotional foundation for proximal social identification, where emotional demands are more immediate.

These patterns can also be understood through Schwartz's theory of basic human values, particularly the distinction between benevolence and universalism[96,97]. While benevolence reflects concern for close others and aligns with EC, universalism reflects concern for all people and aligns more directly with IWAH. Prior studies have shown that individuals high in EC are more likely to endorse universalistic values when their emotional responses are well-regulated[98]. The current study builds on this by demonstrating that adolescents with balanced empathic profiles exhibit higher IWAH. The findings also suggest that emotional empathy might not bridge concern for close others (benevolence) to a broader moral orientation (universalism), demonstrating that IWAH is a socially motivated, value-based identity only for specific empathy profiles.

These findings also reflect cultural value orientations in India, where collectivistic values hold more relevance. Hence, individuals who have more care and concern towards their country and community also align themselves more with these identities. Adolescents who show high empathic concern and well-regulated distress may be more likely to internalise global values, suggesting that emotional empathy forms an early affective base for moral concern that is culturally reinforced. In collectivist cultures such as India, where moral obligations toward family and community are emphasised, empathy that extends towards closer social groups may be especially significant as an indicator of prosocial development[97,98]. Given that Indian adolescents are underrepresented in global empathy research, this study adds important contextual insight.

Overall, our findings demonstrate that intra-individual differences in empathic profiles vary in how they predict self-identity alignment with broader social groups. While balanced but high empathic response profiles are significantly associated with IWAH in adolescence, the association between country and community level identification also shows the role of disequilibrium in empathic response. These differences offer insights that group-level analyses may overlook and highlight the value of person-centred approaches in developmental psychology. Future studies should investigate how equilibrium and disequilibrium in emotion regulation strategies (e.g., reappraisal, suppression) mediate the empathy–IWAH link.

Given that both empathy and IWAH are associated with outcomes like prosocial behaviour[15,59] and well-being[31,99], it is plausible that IWAH may mediate empathy's influence on positive social behaviour, as suggested in earlier work[100]. Future research could test this mediation directly, using longitudinal data.

In addition to individual traits, contextual factors, such as parenting and school environments, may shape the development of empathy and inclusive identity. Parents who model empathy and openness can shape children's intergroup attitudes and dispositional empathy, which may in turn predict stronger identification with humanity[17,101]. Schools can also reinforce these values through structured global citizenship education and social-emotional learning (SEL) programs.

These findings have practical implications for the design of empathy training and global citizenship education. Programs should account for intra-individual variation in empathic responses, rather than relying solely on aggregate empathy scores. A more nuanced understanding of empathy, as both a dynamic emotional process and a predictor of inclusive social identity, can enhance the impact of educational interventions aimed at fostering global competence, equity, and cooperation.

Moreover, schools in India are increasingly seen as vehicles for value education, with the National Curriculum Framework (NCF) recommending the inclusion of empathy, cooperation, and social responsibility from early grades[102,103]. This cultural prioritisation may help reinforce empathic dispositions like EC in shaping inclusive identities.

While the findings offer key insights, some limitations should be noted. The sample was drawn from three urban schools in the National Capital Region (NCR) of India through convenience sampling. As such, findings may not generalise to adolescents across other regions or socio-cultural contexts. Future studies should use larger, more representative national or cross-cultural samples to explore potential universal and culture-specific patterns in the empathy–IWAH relationship.

Although our study did not observe a linear association between age and IWAH, age remains an important developmental factor. Changes in emotional regulation, perspective-taking, and identity exploration across adolescence may interact with empathic traits to influence IWAH. Future research could investigate non-linear developmental trajectories and test whether these changes moderate the effect of empathic equilibrium on inclusive identity.

The current study finds that equilibrium in affective dimensions of empathy is an important factor that can shape the development of empathy-predicted prosocial traits. Taken together, this study highlights that adolescents' identification with humanity cannot be understood independently of the nuanced ways in which they experience and express empathy. Rather than viewing empathy as a single, uniformly prosocial trait, our findings point to the importance of examining its distinct response components and the balance between them. This approach helps clarify why empathic dispositions sometimes strengthen inclusive identification and at other times have weaker or more variable associations. By showing how different empathic tendencies shape adolescents' self–other boundaries at the broadest level of identification, the study underscores the need for global citizenship education to move beyond the assumption that increasing empathy will directly promote global connectedness. Instead, attention should be given to how particular patterns of empathic response relate to the development of expansive social identities. This more differentiated understanding provides a stronger foundation for designing educational strategies that cultivate global belonging while recognising the complexity of the underlying socio-emotional processes.

Data availability

Data can be made available upon request by contacting the corresponding author of the study.

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Author contributions

Anya Chakraborty: conceptualisation, study design, methodology, investigation, data analysis design, results interpretation, writing—original draft, writing – review & editing, project administration. Mayank Sharma: study design, data analysis, data visualisation, results interpretation, writing – original draft, writing – review & editing. Hritik Gupta: data analysis, data visualisation, results interpretation, writing – original draft, writing – review & editing. Nandini Chatterjee Singh: conceptualisation, writing – review & editing, and overall project responsibility.

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Declarations

Competing interests
The author(s) declare no competing interests.

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