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Affirmative Action and Dalit Representation in Public Employment and Higher Education in Madhya Pradesh

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Abstract

India's reservation policy seeks to address historical caste inequalities by expanding Scheduled Caste representation in public employment and higher education. However, institutional representation may not translate into greater accessibility or reduced caste discrimination. This study examines the relationships among human dignity, inclusive growth, perceived representation of Scheduled Castes through reservation policy, accessibility, and perceived reduction of caste discrimination. We collected primary survey data from 525 Scheduled Caste respondents across nine districts of Madhya Pradesh, India, covering rural and urban settings. We used partial least squares structural equation modelling (PLS-SEM) to assess the hypothesised relationships among five latent constructs. Inclusive growth was positively associated with perceived representation through reservation policy ($\beta = 0.253$, $p < 0.001$), while representation was positively associated with accessibility ($\beta = 0.128$, $p = 0.011$). In contrast, neither the relationship between human dignity and perceived representation through reservation policy, nor that between perceived representation and perceived reduction of caste discrimination, was statistically supported. These findings distinguish institutional representation from substantive inclusion: Perceived representation is associated with greater accessibility, but not necessarily with perceived reduction of caste discrimination. The study contributes a multidimensional perspective on affirmative action by showing that representation, accessibility, dignity, and reduced discrimination constitute distinct dimensions of inclusion in public employment and higher education.

Keywords

accessibility; affirmative action; caste discrimination; representation; Scheduled Castes

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1. Introduction

Affirmative action seeks to widen institutional access and representation for groups that have experienced persistent social exclusion. However, increased representation does not necessarily imply substantive inclusion (Deshpande & Ramachandran, 2024). Historically disadvantaged groups may gain entry into higher education or public employment while continuing to experience unequal participation, restricted institutional mobility, limited access to opportunities, or discriminatory treatment. The distinction between formal representation and substantive inclusion therefore provides an important basis for examining the outcomes associated with affirmative action (Gururaj et al., 2021; Verma et al., 2026a).

India provides a significant setting for this question because affirmative action (commonly known as quota or reservation) has long been institutionalised as a mechanism for addressing caste-based disadvantage. Dr B. R. Ambedkar, chairman of the Constitution's Drafting Committee and a leading advocate of Dalit rights, played a central role in shaping India's constitutional framework for equality and social justice. Constitutional and policy provisions support measures for Scheduled Castes (SCs), the official constitutional and administrative term for communities commonly referred to as Dalits, in education and public employment. In central-government direct recruitment through all-India open competition, 15% of positions are reserved for SCs (Department of Personnel and Training, 2023). These institutional measures must be understood against historical restrictions on education, occupation, social participation, and access to public institutions experienced by SC communities (Cassan, 2019; Kumar et al., 2020).

Empirical research shows that reservations have expanded institutional opportunities, although their benefits are neither uniform nor sufficient to remove broader inequalities. Borooah et al. (2007) found that job reservation increased the representation of SCs and Scheduled Tribes in regular salaried or wage employment, while Kumar et al. (2020) reported a higher probability of government employment among eligible disadvantaged groups after accounting for individual and household characteristics. More recent research nevertheless identifies continuing caste inequalities in employment, occupations, and wages (Behera & Kumar, 2025; Deshpande & Ramachandran, 2024). Representation also varies across institutional hierarchies. Verma et al. (2026b) distinguish expanded access from representation in positions of authority and decision-making, while evidence from Madhya Pradesh indicates differences in access to reservation-related employment benefits across socio-demographic groups (Verma et al., 2026a). These findings suggest that public-employment representation should be considered not only in terms of institutional entry but also in relation to occupational location and participation.

Higher education represents a related but distinct institutional domain. Reservation can facilitate admission and increase SC presence in educational institutions, while educational attainment can shape subsequent occupational opportunities. However, admission access does not necessarily ensure equivalent institutional experiences. Cassan (2019) found educational gains associated with affirmative action among SCs, although gains differed by educational level and gender. Singh (2021) further shows how conceptions of merit can interact with existing social privilege in higher education. Similarly, Sabharwal (2024), drawing on students across public higher education institutions, found that attitudes towards affirmative action were associated with social identities, educational experiences, and caste-related beliefs. These studies indicate that admission, representation, participation, and substantive inclusion should not be treated as equivalent outcomes.

Evidence from public employment and higher education therefore points to a common analytical problem. Formal representation concerns institutional presence facilitated through reserved access, whereas substantive inclusion extends to meaningful accessibility, dignity, recognition, participation, and reduced discrimination. Greater numerical presence may widen institutional participation without necessarily redistributing authority or eliminating unequal treatment. This distinction matters for caste because formal institutional entry can coexist with unequal recognition and exclusionary practices (Singh, 2021; Verma et al., 2026b). The relevant question is consequently not only whether SC representation increases, but also how perceived representation is associated with broader dimensions of inclusion.

Despite substantial research on reservation, three gaps remain. First, previous studies frequently examine educational attainment, government employment, occupational inequality, attitudes towards affirmative action, or discrimination as separate outcomes. Less attention has been given to how representation, accessibility, human dignity, inclusive growth, and perceived reductions in caste discrimination relate within a common analytical framework. Second, institutional representation is often examined through admission, employment, or aggregate representation, but these measures do not, by themselves, establish whether representation corresponds to accessibility or reduced discrimination. Third, public employment and higher education are connected through reservation but involve different institutional processes. Higher education concerns admission, educational participation, and qualification development, whereas public employment concerns entry into and representation within government institutions. The two domains should therefore be examined within a common representation–inclusion framework without treating them as interchangeable.

Madhya Pradesh provides the empirical setting for examining these relationships. The study uses primary survey data from 525 SC respondents across nine districts, covering rural and urban settings. Rather than estimating the causal impact of reservation, it examines respondents' perceptions and the associations among inclusive growth (IG), human dignity (HD), perceived representation of SCs through reservation policy (R), accessibility (A), and perceived reduction of caste discrimination (RCD). Socio-demographic characteristics may also be associated with unequal access to educational and occupational opportunities. Evidence indicates variation in affirmative-action-related outcomes by characteristics such as gender, education, income, and location (Cassan, 2019; Verma et al., 2026a). The supplementary robustness analysis therefore considers age, gender, education, household income, and rural–urban residence. Against this background, the study addresses two research questions:

RQ1: How are IG and HD associated with perceived R?

RQ2: How is perceived R associated with A and the perceived RCD?

The study addresses these questions using partial least squares structural equation modelling (PLS-SEM). Its contribution lies in integrating institutional representation with multiple dimensions of substantive inclusion rather than assuming that numerical presence automatically produces wider social inclusion. It also provides household-level evidence from Madhya Pradesh, while connecting public employment and higher education within a common analytical framework. This approach allows a more nuanced assessment of whether perceived R is associated with A and RCD, and how IG and HD relate to perceived R.

2. Theoretical Framework and Hypotheses Development

Affirmative action can expand the institutional presence of historically disadvantaged groups, but numerical representation does not necessarily establish substantive inclusion. This distinction is particularly relevant to SCs in India, where reservation provides institutional opportunities in public employment and higher education. At the same time, caste-related inequalities may persist within and beyond these settings. Empirical research shows that reservation has increased access to government employment (Borooah et al., 2007; Kumar et al., 2020) and contributed to educational attainment among SCs, although educational gains differ across levels and socio-demographic groups (Cassan, 2019).

The present framework therefore distinguishes formal representation from substantive inclusion. Formal representation refers to the perceived presence and participation of SCs in institutions through reservation policy. Substantive inclusion extends beyond institutional entry to meaningful accessibility, recognition, dignity, equitable participation, and reduced discrimination (Verma et al., 2026b). This distinction is consistent with evidence from higher education showing that institutional access can coexist with caste-related inequalities in merit, recognition, and institutional experience (Sabharwal, 2024; Singh, 2021).

Representation is therefore an institutionally important but incomplete dimension of inclusion. Greater numerical presence can increase visibility and participation without necessarily redistributing institutional authority or eliminating unequal treatment. Research on representation across state, market, and cultural institutions similarly distinguishes participation from representation in authority and decision-making positions (Verma et al., 2026b). The framework therefore does not assume that representation automatically produces substantive equality. Instead, it examines whether perceived R corresponds with A and RCD.

Within this framework, IG and HD are specified as dimensions associated with perceived R, while A and RCD represent dimensions of substantive inclusion associated with representation. Figure 1 presents these theoretically specified relationships. The directional arrows indicate hypothesised associations rather than causal effects, consistent with the cross-sectional design.

2.1. IG and Representation of SCs

IG concerns the extent to which different social groups participate in and benefit from economic and institutional development rather than aggregate economic expansion alone (Ranieri & Ramos, 2013). It matters for caste inequality because unequal access to education, secure employment, income, and institutional resources can limit participation by historically disadvantaged communities.

Reservation can contribute to broader inclusion by widening access to institutional opportunities. Evidence from public employment indicates that reservation has increased the probability of representation of eligible disadvantaged groups in government employment and access to regular salaried or wage employment (Borooah et al., 2007; Kumar et al., 2020). Educational evidence similarly identifies gains associated with affirmative action, though these gains vary across educational levels and gender (Cassan, 2019). More broadly, affirmative action has been situated within debates concerning social justice, inclusion, and equitable participation (Gomez & Premdas, 2012; Gururaj et al., 2021).

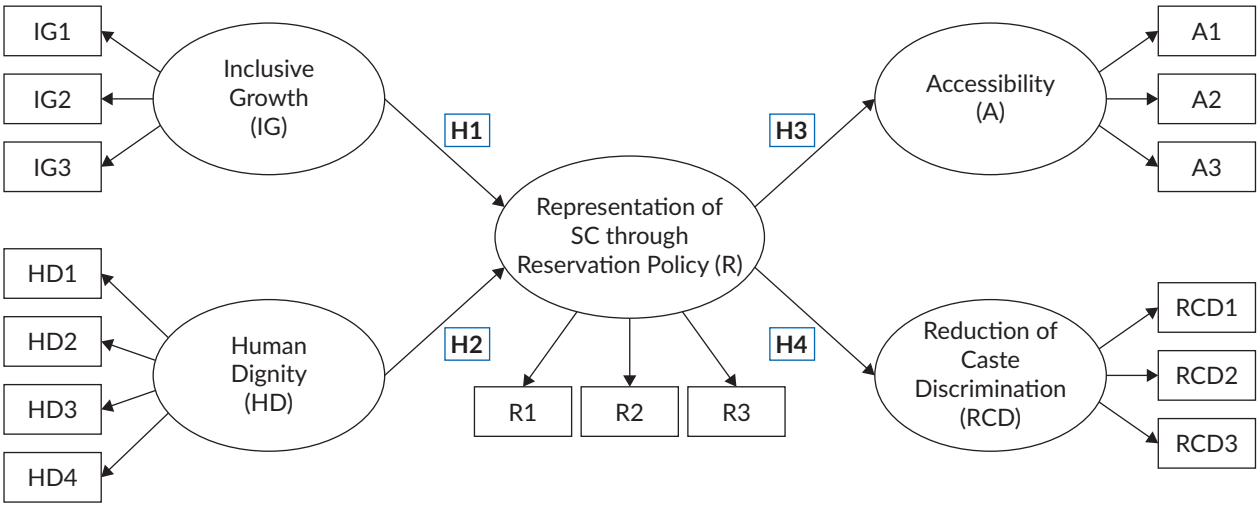


Figure 1. Hypothesised PLS-SEM model. Notes: Ovals represent latent constructs and rectangles represent observed indicators; H1–H4 denote the hypothesised structural relationships; individual measurement-error terms are omitted from the conceptual figure for visual clarity and are assessed through the measurement-model evaluation. Notes: All five latent constructs are measured using respondents' perceptions; R denotes perceived representation of SCs through reservation policy, and RCD denotes perceived reduction of caste discrimination.

The model nevertheless distinguishes IG from R itself. IG captures respondents' perceptions of equitable socio-economic opportunity and participation, whereas R captures perceived SC representation through reservation policy. The hypothesised relationship therefore concerns whether perceptions of broader inclusion correspond with perceptions of institutional representation:

H1: Higher perceived IG is positively associated with higher perceived R.

2.2. HD and Representation of SCs

HD concerns recognition, respect, social worth, and the ability to participate without degrading treatment. Mattson and Clark (2011) conceptualise dignity as a multidimensional experience shaped by social relationships and access to socially valued conditions. This perspective is relevant to caste inequality because exclusion involves not only material disadvantage but also recognition, social standing, and participation. Affirmative action can therefore connect distributive opportunities with questions of dignity and social recognition.

For SC communities, institutional representation may matter beyond admission or employment by increasing visibility and perceptions of equal membership. However, representation should not be equated with dignity. Formal entry may coexist with unequal treatment or caste-related stigma. Evidence from higher education demonstrates that institutional presence can coexist with exclusionary understandings of merit and continuing caste-related attitudes (Sabharwal, 2024; Singh, 2021). The present study therefore examines whether respondents who perceive greater dignity and recognition also perceive stronger SC representation, without assuming causality:

H2: Higher perceived HD is positively associated with higher perceived R.

2.3. Representation of SCs and A

Accessibility refers to opportunities to enter and participate in educational, employment, and institutional settings (Stauber & Parreira do Amaral, 2015). Within affirmative action, accessibility is closely related to representation because reservation is intended to address barriers faced by historically disadvantaged groups (Pant & Sharma, 2026). However, institutional entry and substantive accessibility are not interchangeable.

Research on government employment shows that reservation can alter patterns of entry and representation (Kumar et al., 2020). In education, affirmative action can increase attainment and institutional access, although unequal educational preparation and socio-demographic differences can affect who benefits (Cassan, 2019). Research on Dalit participation in higher education further demonstrates that formal admission does not necessarily remove institutional barriers associated with merit, social privilege, and caste-related attitudes (Sabharwal, 2024; Singh, 2021).

Representation is therefore conceptualised as an institutional condition that may be associated with wider accessibility rather than as evidence that complete accessibility has already been achieved. The proposed relationship directly connects perceived SC representation with access to higher education, public employment, and other institutional opportunities:

> H3: Higher perceived R is positively associated with greater perceived A to higher education, public employment, and institutional opportunities.

2.4. Representation of SCs and RCD

RCD concerns perceived decreases in caste-based exclusion, prejudice, unequal treatment, and barriers to participation (Deshpande & Ramachandran, 2024; Mosse, 2018). It represents a more demanding dimension of substantive inclusion than institutional entry alone. Reservations can increase SC presence in public employment and higher education, but greater presence does not necessarily mean discriminatory attitudes and practices disappear.

Existing research supports this distinction. Caste-based economic discrimination and inequalities in employment and occupational structures remain documented (Behera & Kumar, 2025; Mosse, 2018; Thorat & Newman, 2007). Within higher education, Dalit institutional presence can coexist with exclusionary understandings of merit and caste-related attitudes (Sabharwal, 2024; Singh, 2021). These findings indicate that formal representation and freedom from discrimination constitute analytically distinct outcomes.

At the same time, greater institutional representation may correspond with perceptions of reduced exclusion through increased visibility, participation, and recognition. Whether such an association exists should remain an empirical question rather than an assumption. Accordingly, the study examines whether respondents who perceive stronger SC representation also perceive a greater RCD. The cross-sectional model does not establish that representation causes such a reduction. The hypothesized relationship is therefore stated as follows:

> H4: Higher perceived R is positively associated with a greater perceived RCD.

Taken together, H1–H4 operationalise the distinction between formal representation and substantive inclusion. H1 and H2 examine the associations between IG and HD and perceived R, while H3 and H4 examine whether R is associated with A and perceived RCD. As summarised in Figure 1, the model therefore evaluates whether perceived institutional representation corresponds with broader dimensions of inclusion rather than assuming that numerical representation alone constitutes substantive equality.

3. Method

This study employed a cross-sectional quantitative survey design to examine associations among IG, HD, R, A, and RCD. We collected primary data from SC households in Madhya Pradesh, India, using a structured bilingual Hindi-English questionnaire administered face-to-face. The study examines respondents' perceptions of reservation and related dimensions of institutional and social inclusion. Because the data were collected at one point in time, the structural relationships are interpreted as associations rather than causal effects.

3.1. Study Context

Madhya Pradesh provides a geographically and socio-economically diverse setting for examining SC respondents' perceptions of reservation and institutional inclusion. According to the Office of the Registrar General and Census Commissioner of India (2011), SCs constituted approximately 15.6% of the state's population. Districts within the state differ in literacy, urbanisation, socio-economic conditions, and SC population concentration.

The survey covered nine districts: Bhopal, Indore, Ujjain, Gwalior, Morena, Rewa, Jabalpur, Betul, and Chhatarpur. These districts were purposively selected to capture variation across geographical regions and socio-economic settings, rather than to represent every district in Madhya Pradesh statistically. Supplementary File Figure A presents the geographical distribution of the study districts, and Table A reports district characteristics and survey allocation.

3.2. Participants and Sampling

The target population comprised adults aged 18 years or older from SC households in the nine selected districts. One eligible adult respondent was surveyed from each participating household. We approached the household head or another knowledgeable adult household member who could respond to the structured questionnaire.

We used a multistage purposive-stratified sampling strategy. First, we purposively selected the nine districts to capture variation in geographical location, literacy, urbanisation, socio-economic conditions, and SC population concentration. Second, we incorporated rural and urban settings within the selected districts to reflect differences in access to educational, employment, and institutional opportunities. Rural villages and urban municipal wards served as local survey settings. Within these locations, we identified eligible SC households using available local administrative and household information and approached them for participation. Because district and survey-location selection involved purposive procedures, the resulting sample should not be interpreted as a probability sample statistically representative of Madhya Pradesh's entire SC population.

We determined the target sample size using Cochran's (1977) sample-size procedure and field feasibility. Data collection initially yielded 589 completed questionnaires. After screening, we excluded 64 questionnaires with incomplete or insufficient information for the required analyses. The final analytical sample therefore comprised 525 valid responses, corresponding to an analytical retention rate of 89.13% among completed questionnaires. The total number of households initially approached, including refusals and ineligible contacts, was not systematically recorded during fieldwork; consequently, a survey response rate cannot be reliably calculated.

The final sample was distributed across Indore (70), Ujjain (62), Bhopal (61), Chhatarpur (61), Morena (57), Jabalpur (56), Rewa (55), Gwalior (52), and Betul (51). It included 245 rural respondents (46.67%) and 280 urban respondents (53.33%). Table 1 presents the demographic profile, while Table A in the Supplementary File provides district-level survey allocation.

Table 1. Demographic profile of respondents ($N = 525$).

Characteristic	Category	Frequency (*n*)	Percent (%)
Gender	Male	311	59.24
	Female	214	40.76
Age (years)	18–30	98	18.67
	31–45	199	37.90
	46–60	127	24.19
	Above 60	101	19.24
Educational Qualification	Secondary or below	40	7.62
	Higher Secondary	105	20.00
	Graduate	278	52.95
	Postgraduate and above	102	19.43
Type of Employment	Group A	81	15.43
	Group B	99	18.86
	Group C	153	29.14
	Group D	157	29.90
	Students/Unemployed	35	6.67
Residence	Rural	245	46.67
	Urban	280	53.33
Monthly Household Income	Below ₹20,000	101	19.24
	₹20,001–40,000	144	27.43
	₹40,001–60,000	103	19.62
	Above ₹60,000	177	33.71
Professional Experience (years)	Less than 5 years (including no experience)	338	64.38
	5–20 years	173	32.95
	More than 20 years	14	2.67
Reservation Benefit Status	No benefit received	22	4.19
	Educational benefit only	310	59.05
	Educational and employment benefit	193	36.76

Notes: Groups A–D refer to employment categories used in the survey questionnaire; Group A represents senior administrative positions, Group B supervisory positions, and Groups C and D clerical, technical, and operational/support positions; percentages are calculated using $N = 525$ and may reflect rounding.

The sample varied across age, education, household income, residence, and reservation-benefit status. The subsequent sensitivity analysis accounts for this heterogeneity by adjusting the structural model for age, gender, education, household income, and residence.

3.3. Procedure

Before fieldwork, the first author pilot-tested the questionnaire to assess item clarity, wording, response format, and sequencing. The first author made minor revisions to improve respondent comprehension and contextual relevance. The first author collected primary data between 11 January and 24 May 2025. The researcher personally administered the structured bilingual questionnaire in selected rural and urban locations across the nine districts. Eligibility was confirmed before participation. Prospective respondents were informed about the academic purpose of the research and the voluntary nature of participation, and informed consent was obtained before questionnaire administration. Responses were handled confidentially and used for research purposes.

Face-to-face administration refers to researcher-administered completion of the structured questionnaire rather than qualitative interviewing. The study did not include separate qualitative interviews, interview transcripts, or qualitative coding. This distinction clarifies that the study employed an exclusively quantitative survey design.

3.4. Measures

The questionnaire measured five latent constructs using 16 items: four items for HD and three each for IG, R, A, and RCD. All items were rated on a five-point Likert scale from 1 = *strongly disagree* to 5 = *strongly agree*. The complete wording of all items is provided in Table B in the Supplementary File.

We measured IG, which comprised three items (IG1–IG3) assessing perceived inclusive socio-economic development, equitable opportunities, and participation of SC communities in development. The items were informed by IG literature (Ranieri & Ramos, 2013) and research connecting affirmative action with inclusion and equitable participation (Gomez & Premdas, 2012; Gururaj et al., 2021). A sample item is, "Reservation contributes to inclusive socio-economic development" (IG1). Internal consistency was satisfactory (Cronbach's $\alpha = .808$).

HD had four items (HD1–HD4) assessing perceived dignity, self-respect, social recognition, and equal treatment associated with reservation and institutional representation. The construct drew on literature on dignity, recognition, and social justice (Mattson & Clark, 2011) and research on disadvantaged groups in Indian institutions (Sabharwal, 2024). A sample item is, "Reservation policy has improved the dignity and self-respect of SCs" (HD1). Internal consistency was satisfactory (Cronbach's $\alpha = .857$).

R was measured with three items (R1–R3) addressing perceived representation in public employment and higher education and the perceived adequacy of institutional representation. The items were informed by research on reservation in government employment and higher education (Kumar et al., 2020; Sabharwal, 2024; Verma et al., 2026a). A sample item is, "Reservation has improved the representation of SCs in public employment" (R1). Internal consistency was satisfactory (Cronbach's $\alpha = .817$). R represents respondents' perceptions and should not be interpreted as an administrative measure of actual numerical SC representation.

A comprised three items (A1–A3) assessing perceived access to higher education, government employment, institutional opportunities, and public resources. The items were informed by research on affirmative action and educational and institutional opportunities (Cassan, 2019; Pant & Sharma, 2026; Stauber & Parreira do Amaral, 2015). A sample item is, "Reservation has improved access to higher education for SCs" (A1). Internal consistency was satisfactory (Cronbach's $\alpha = .833$). A is distinguished from R because the former concerns perceived opportunities for access, whereas the latter concerns perceived institutional presence.

RCD was measured with three items (RCD1–RCD3) assessing perceived reductions in caste discrimination in educational institutions, government employment, and wider social settings. Item development drew on research on caste discrimination, institutional exclusion, and affirmative action (Sabharwal, 2024; Singh, 2021; Thorat & Newman, 2007). A sample item is, "Reservation has reduced caste discrimination in educational institutions" (RCD1). Internal consistency was satisfactory (Cronbach's $\alpha = .921$).

We entered all 16 indicators individually into the PLS-SEM measurement model. The primary analysis used no summed or mean composite scores; we estimated each construct as a latent variable from its respective indicators. No item parcelling was applied.

3.5. Scale Development and Adaptation

We developed the measurement instrument from conceptually related measures and prior literature rather than adopting a single established scale in its entirety. We formulated the questionnaire items in accordance with the theoretical definitions of the five constructs: inclusive growth (IG), human dignity (HD), representation of SCs through reservation policy (R), accessibility (A), and reduction of caste discrimination (RCD). The relevant theoretical and empirical sources informing these constructs are presented in Section 3.4. The instrument was adapted to the study context to assess respondents' perceptions of reservation policy and its relationship with institutional representation, A, HD, IG, and RCD.

Items were adapted to the study context by referring explicitly to SCs, reservation, public employment, higher education, institutional opportunities, and caste discrimination. The questionnaire was prepared in Hindi and English and pilot-tested for clarity, wording, response format, and sequencing. The R items separately address public employment and higher education, as do the relevant A items, ensuring that both institutional domains examined theoretically are represented in the instrument.

Because contextual adaptation may affect measurement properties, the study does not assume that the adapted items retained the psychometric properties of measures used in previous settings. The study therefore reassessed reliability and construct validity empirically in the present sample before evaluating the structural relationships. We specified the five constructs as reflective measurement models because we treated their indicators as manifestations of the corresponding underlying constructs. We assessed indicator reliability, internal consistency, convergent validity, and discriminant validity using established procedures (Fornell & Larcker, 1981; Hair et al., 2019; Henseler et al., 2015).

3.6. Common Method Bias and Collinearity Assessment

Because all constructs were based on self-reported perceptions collected through the same questionnaire, we considered potential common method bias (Hair et al., 2019). We used standardised instructions and response categories, and items represented distinct conceptual domains. Collinearity diagnostics were also examined.

In the main theoretical model, inner-model variance inflation factor (VIF) values ranged from 1.000 to 1.100, indicating low predictor collinearity, while outer-model VIF values ranged from 1.574 to 3.601 (Table C in the Supplementary File). Although the largest outer VIF exceeds the conservative 3.3 benchmark discussed by Kock (2015), all values are below 5.0. The diagnostics therefore do not indicate severe multicollinearity. However, VIF statistics are treated as a diagnostic rather than definitive evidence that common method bias is absent. Accordingly, the results indicate that severe collinearity is unlikely to materially distort the model estimates, rather than demonstrating that the study is completely free from common method bias.

3.7. Data Analysis and PLS-SEM Approach

The hypothesised model was estimated using SmartPLS 4. PLS-SEM was used because the framework comprises five latent constructs measured by multiple indicators and specifies structural associations among them. This approach permits simultaneous assessment of the measurement and structural models while retaining indicator-level information. All 16 indicators were modelled individually; no item parcelling or summed construct scores were used.

Following Hair et al. (2019), we assessed the model in two stages. First, we evaluated the reflective measurement model using outer loadings, Cronbach's α, rho_A, composite reliability (CR), average variance extracted (AVE), and the heterotrait-monotrait ratio (HTMT; Henseler et al., 2015). The Fornell-Larcker criterion was reported as supplementary evidence of discriminant validity (Fornell & Larcker, 1981). Second, the structural model was assessed using inner-model collinearity, standardised path coefficients (β), bootstrap standard errors, t-statistics, p-values, 95% confidence intervals, and explained variance (R^2), based on 5,000 bootstrap resamples. PLSpredict and Q^2predict were additionally examined to assess predictive relevance.

A supplementary robustness analysis re-estimated the model with age, gender, education, household income, and residence as observed controls predicting the three endogenous constructs (R, A, and RCD). Age, education, and income were coded as ordered categories, while gender and residence were binary. The analysis assessed whether the principal theoretical coefficients remained stable after adjustment for these characteristics.

Demographic moderation was not tested because the theoretical framework specified no a priori hypotheses that the structural relationships would vary across demographic characteristics. Moderation tests are most informative when interaction effects are theoretically specified (Hair et al., 2019); introducing multiple demographic interactions retrospectively would instead constitute exploratory post-hoc analysis and expand the analysis beyond the hypothesised model (Gelman & Loken, 2014). We therefore used demographic variables as robustness controls and reserve theory-driven tests of demographic heterogeneity for future research. Given the cross-sectional observational design, we interpret all structural relationships as associations rather than causal effects.

4. Results

4.1. Assessment of the Measurement Model

We assessed the reflective measurement model before examining the hypothesised structural relationships. Following established PLS-SEM procedures, we evaluated indicator reliability, internal consistency reliability, convergent validity, and discriminant validity (Fornell & Larcker, 1981; Hair et al., 2019, 2021).

4.1.1. Reliability and Convergent Validity

Table 2 reports the outer loadings, Cronbach's α, rho_A, CR, and AVE for the five constructs.

Table 2. Measurement model assessment.

Construct	Indicator	Outer loading	Cronbach's α	rho_A	CR	AVE
A	A1	0.902	0.833	0.854	0.899	0.748
	A2	0.874				
	A3	0.817				
HD	HD1	0.883	0.857	0.878	0.902	0.698
	HD2	0.807				
	HD3	0.823				
	HD4	0.827				
IG	IG1	0.885	0.808	0.839	0.884	0.718
	IG2	0.835				
	IG3	0.821				
R	R1	0.954	0.817	1.212	0.879	0.711
	R2	0.838				
	R3	0.721				
RCD	RCD1	0.942	0.921	0.991	0.943	0.846
	RCD2	0.869				
	RCD3	0.946				

Note: The rho_A estimate for R exceeded 1.00 and is reported as obtained from the original SmartPLS output.

All outer loadings exceeded 0.70, ranging from 0.721 to 0.954. Cronbach's α ranged from 0.808 to 0.921, CR from 0.879 to 0.943, and AVE from 0.698 to 0.846. These results support satisfactory indicator reliability, internal consistency, and convergent validity based on commonly applied PLS-SEM criteria (Fornell & Larcker, 1981; Hair et al., 2019). The rho_A estimates were below 1.00 for four constructs, while the estimate for R was anomalously above 1.00 (rho_A = 1.212). Accordingly, we interpreted R's reliability primarily alongside Cronbach's α (0.817) and CR (0.879), both of which indicated satisfactory internal consistency. We interpreted the high rho_A estimate for RCD (0.991) alongside its Cronbach's α (0.921), CR (0.943), and AVE (0.846), rather than independently.

4.1.2. Discriminant Validity

We assessed discriminant validity primarily using the HTMT, with the Fornell-Larcker criterion as supplementary evidence (Fornell & Larcker, 1981; Henseler et al., 2015). Table 3 shows that HTMT values ranged from 0.033 to 0.411, well below commonly used thresholds of 0.85 and 0.90 (Henseler et al., 2015), indicating satisfactory empirical separation among the constructs. The supplementary Fornell-Larcker assessment produced the same conclusion: The square root of AVE for each construct exceeded its correlations with all other constructs. The full Fornell-Larcker matrix is therefore reported in Table D in the Supplementary File rather than repeated in the main manuscript.

Table 3. HTMT.

Construct	A	HD	IG	RCD	R
A	—				
HD	0.411	—			
IG	0.219	0.355	—		
RCD	0.044	0.055	0.033	—	
R	0.152	0.171	0.245	0.080	—

4.1.3. Supplementary Model-Fit Diagnostics

We examined model fit using standardised root mean square residual (SRMR), squared Euclidean distance (d_ULS), geodesic distance (d_G), chi-square, and normed fit index (NFI) as supplementary diagnostics rather than as the primary basis for evaluating the PLS-SEM model (Hair et al., 2019).

Table 4 illustrates that the saturated-model SRMR was 0.061, while the estimated-model SRMR was 0.097. The latter warrants caution and is not interpreted as evidence of uniformly good model fit. NFI values were 0.781 and 0.768 for the saturated and estimated models, respectively (Hair et al., 2019; Henseler et al., 2015). These statistics are reported descriptively as supplementary model-data diagnostics; assessment of the model rests primarily on the measurement and structural results.

Table 4. Model-fit diagnostics.

Index	Saturated Model	Estimated Model
SRMR	0.061	0.097
d_ULS	0.514	1.281
d_G	0.287	0.313
Chi-square	960.357	1,019.692
NFI	0.781	0.768

4.2. Assessment of the Structural Model

Following measurement-model assessment, the four hypothesised relationships were evaluated using standardised path coefficients (β), bootstrap standard errors, t-statistics, p-values, and 95% bootstrap confidence intervals based on 5,000 bootstrap resamples. Table 5 reports the results, and Figure 2 presents the estimated structural model.

Table 5. Structural model and hypothesis testing.

Hypothesis	Relationship	*β*	*M*	*SD*	*t*	*p*	95% CI	Decision
H1	IG → R	0.253	0.255	0.051	4.965	< .001	[0.156, 0.351]	Supported
H2	HD → R	0.086	0.091	0.049	1.750	.080	[0.000, 0.191]	Not supported
H3	R → A	0.128	0.136	0.050	2.543	.011	[0.048, 0.234]	Supported
H4	R → RCD	0.057	0.070	0.055	1.030	.303	[−0.078, 0.159]	Not supported

Note: Statistical significance was assessed at the 5% level ($t > 1.96$, $p < .05$); CI = bias-corrected 95% confidence interval.

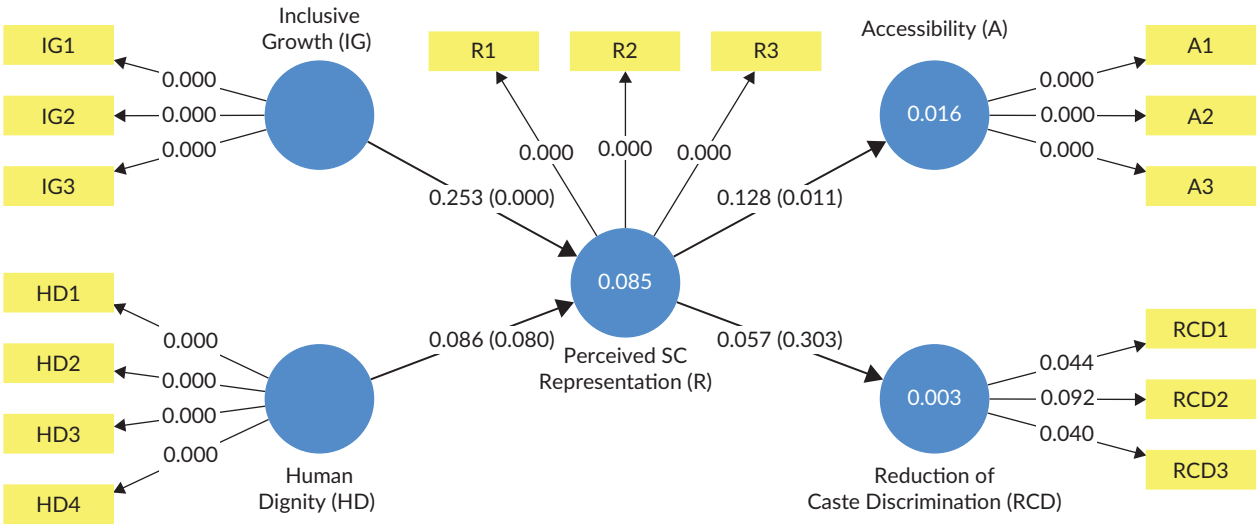


Figure 2. Estimated PLS-SEM structural model. Notes: Structural paths display standardized coefficients (*β*), with *p*-values in parentheses; values inside endogenous constructs represent R^2: IG and HD are exogenous constructs; therefore, R^2 values are not applicable; values displayed beside measurement indicators represent p-values for the outer loadings.

Two of the four hypothesised relationships were statistically supported. IG was positively associated with R (H1: $\beta = 0.253$, $p < .001$), and R was positively associated with A (H3: $\beta = 0.128$, $p = .011$). In contrast, the positive HD → R coefficient did not reach the 5% significance level (H2: $\beta = 0.086$, $p = .080$), while the R → RCD relationship was also not statistically supported (H4: $\beta = 0.057$, $p = .303$). Thus, the results provide evidence for the hypothesised IG → R and R → A associations but not for HD → R or R → RCD.

These findings are consistent with the analytical distinction between representation and substantive inclusion developed in Section 2: Perceived R was positively associated with A, whereas its association with perceived RCD was not statistically supported. Because the data are cross-sectional, the coefficients represent associations rather than causal effects.

4.2.1. Explanatory and Predictive Assessment

The explanatory and predictive performance of the structural model was assessed using the coefficient of determination (R^2), adjusted R^2, and Q^2predict. R^2 indicates the proportion of variance in each endogenous construct explained by its predictor(s), whereas Q^2predict provides evidence of out-of-sample predictive relevance (Hair et al., 2019). Table 6 reports these statistics.

Table 6. Explanatory and predictive assessment.

Endogenous Construct	R^2	Adjusted R^2	Q^2predict
A	0.016	0.015	0.017
RCD	0.003	0.001	0.000
R	0.085	0.081	0.073

Notes: R^2 = coefficient of determination; Q^2predict = predictive relevance obtained from PLSpredict; positive Q^2predict values indicate predictive relevance relative to the corresponding naïve benchmark, whereas values close to zero indicate limited incremental predictive relevance.

The model explained 8.5% of the variance in R (R^2 = 0.085), 1.6% in A (R^2 = 0.016), and 0.3% in RCD (R^2 = 0.003). The corresponding adjusted R^2 values were 0.081, 0.015, and 0.001, respectively. These results indicate limited explanatory power, particularly for A and RCD, suggesting that substantial variation in these perceptions is associated with factors outside the specified model.

The Q^2predict values were 0.073 for R, 0.017 for A, and 0.000 for RCD. Thus, R and A showed positive but limited predictive relevance, while RCD showed no meaningful incremental predictive relevance based on this criterion. Overall, the model should therefore be interpreted primarily as a test of the theoretically specified structural associations rather than as a high-performing explanatory or predictive model.

4.2.2. Robustness Analysis With Socio-demographic Controls

To assess sensitivity to observed respondent characteristics, we re-estimated the structural model after including age, gender, education, household income, and residence as observed controls predicting R, A, and RCD. We used ordered-category coding for age, education, and income, while gender and residence were binary. We used this specification as a sensitivity analysis of parameter stability, not to test differences across demographic groups.

Inner-model VIF values in the controlled model ranged from 1.019 to 4.449. The theoretical predictors had low VIF values (1.019–1.122), while age and residence had the largest values. The controlled model was evaluated using 5,000 bootstrap resamples (Hair et al., 2019; Henseler et al., 2015). Complete control-path estimates and the full controlled model are reported in Table E and Figure B in the Supplementary File.

Table 7 indicates that the principal structural results remained stable after adjustment. IG → R changed from $\beta = .253$ to .241 ($p < .001$), HD → R from $\beta = .086$ to .085 ($p = .093$), R → A from $\beta = .128$ to .123 ($p = .026$), and R → RCD from $\beta = .057$ to .042 ($p = .424$). Absolute changes in the theoretical coefficients ranged from .001 to .015, and neither their directions nor hypothesis-support decisions changed. H1 and H3 therefore remained supported, while H2 and H4 remained unsupported. These results indicate relative parameter stability after adjustment for the observed socio-demographic characteristics, rather than causal robustness.

Table 7. Robustness of structural relationships to socio-demographic controls.

Relationship	Main Model β	Controlled Model β	$\Delta\beta$	Controlled t	Controlled p
IG → R	0.253	0.241	−0.012	4.697	< .001
HD → R	0.086	0.085	−0.001	1.680	.093
R → A	0.128	0.123	−0.005	2.221	.026
R → RCD	0.057	0.042	−0.015	0.799	.424

Notes: The controlled model includes age, gender, educational qualification, household income, and residence as observed controls predicting R, A, and RCD; $\Delta\beta$ = controlled model β − main model β; controlled model p-values are based on 5,000 bootstrap resamples.

5. Discussion and Implications

5.1. Interpretation of the Structural Findings

This study examined the relationships among IG, HD, R, A, and RCD among SC respondents in Madhya Pradesh. The findings support the article's central distinction between institutional representation and substantive inclusion. IG was positively associated with perceived R (β = .253, p < .001), and perceived R was positively associated with A (β = .128, p = .011). In contrast, the HD → R and R → RCD relationships were not statistically supported. R, A, HD, and RCD should therefore be understood as distinct, though potentially related, dimensions of inclusion.

The positive IG → R relationship indicates that respondents who perceived reservation as contributing to equitable opportunities, participation, and socio-economic development also tended to perceive stronger SC representation. This is consistent with conceptions of IG that emphasise participation in economic and social opportunities rather than aggregate economic expansion alone (Ranieri & Ramos, 2013). Scholarship on affirmative action similarly places institutional inclusion within wider structures of opportunity and social inequality (Gomez & Premdas, 2012; Gururaj et al., 2021; Pant & Sharma, 2026). Perceived representation therefore appears connected to a broader developmental understanding of participation rather than functioning as an isolated institutional outcome.

The positive R → A relationship provides further support for distinguishing institutional presence from substantive inclusion. Respondents who perceived stronger SC representation also reported greater accessibility to higher education, government employment, institutional opportunities, and public resources. This result is broadly consistent with evidence that reservation has increased access to government employment among eligible disadvantaged groups (Kumar et al., 2020; Verma et al., 2026a) and contributed to educational attainment among SCs, although educational gains have not been uniform across levels and demographic groups (Cassan, 2019). R and A are consequently related in the present sample, but they are not equivalent outcomes.

The unsupported HD → R relationship requires a different interpretation. HD concerns self-respect, recognition, equal treatment, and social worth, whereas R captures perceptions of institutional presence in public employment and higher education. HD therefore extends beyond institutional participation (Mattson & Clark, 2011). The nonsignificant coefficient does not mean HD is unimportant; it means the current data do not provide sufficient statistical evidence for the hypothesised direct association between HD and R.

The unsupported R → RCD relationship is particularly relevant to the distinction between representation and substantive inclusion. Greater perceived institutional presence was not statistically associated with perceived RCD. Prior studies continue to identify caste-related inequalities in employment and occupational outcomes (Behera & Kumar, 2025; Deshpande & Ramachandran, 2024), while studies of higher education underscore caste-related attitudes, conceptions of merit, and Dalits' institutional experiences (Sabharwal, 2024; Singh, 2021). Institutional entry and freedom from discriminatory treatment should therefore not be treated as interchangeable indicators of affirmative-action outcomes.

These conclusions must also be considered alongside the model's limited explanatory and predictive performance. The model explained 8.5% of the variance in R, 1.6% in A, and 0.3% in RCD, while Q^2predict values were small or zero. The findings therefore identify specific associations within the proposed framework rather than providing an exhaustive explanation of R, A, or RCD.

5.2. Public Employment: Interpretation and Implications

Public employment illustrates why entry, representation, occupational location, and workplace inclusion require separate consideration. Previous evidence indicates that reservation has increased access to government employment among eligible disadvantaged groups (Borooah et al., 2007; Kumar et al., 2020), while caste-related differences in employment and occupational outcomes remain documented (Behera & Kumar, 2025; Deshpande & Ramachandran, 2024). The present finding that R is associated with A but not significantly with RCD is consistent with the possibility that institutional presence and workplace inclusion represent different dimensions of experience.

This distinction has implications for policy assessment. Monitoring aggregate SC representation matters, but an aggregate figure cannot show how representation is distributed across occupational levels or whether entry is followed by progression and inclusion. Assessment of reservation in public employment can therefore distinguish recruitment from career progression and workplace experience. Relevant administrative indicators may include the filling of reserved positions, representation across occupational levels, unresolved reserved vacancies, career progression, and implementation of reservation-related procedures. Where appropriate administrative data are available, these measures can provide a more differentiated picture than aggregate representation alone.

The R → RCD result also cautions against using numerical representation as evidence that discriminatory treatment has disappeared. Institutional mechanisms for grievance reporting, monitoring discriminatory treatment, and accountability therefore address a different policy objective from reserved recruitment. This distinction aligns with research showing that caste can continue to shape employment experiences beyond initial institutional access (Behera & Kumar, 2025; Deshpande & Ramachandran, 2024; Mosse, 2018).

These implications should remain proportional to the evidence. The survey does not directly measure promotion, occupational mobility, workplace grievances, or organisational performance. Accordingly, these recommendations offer directions for monitoring and policy evaluation, based on the distinction between representation and substantive inclusion, rather than effects demonstrated by the structural model.

5.3. Higher Education: Interpretation and Implications

Higher education involves a related but institutionally distinct process. Reservation may facilitate admission and increase SC representation, but admission, continuation, academic participation, institutional climate, and representation in positions of authority are different dimensions of inclusion. The positive R → A relationship indicates that respondents who perceived stronger representation also tended to perceive greater accessibility. It does not establish that admission or numerical presence automatically produces substantive educational inclusion.

Previous evidence reinforces this distinction. Cassan (2019) identifies educational gains associated with affirmative action among SCs, although the magnitude of those gains varies across educational levels. Singh (2021) examines the relationship between caste, merit, and Dalit presence in higher education, while Sabharwal (2024) shows that social identities, educational experiences, caste-related beliefs, and prejudice shape attitudes towards affirmative action. These studies help contextualise the present finding that perceived R was not significantly associated with perceived RCD.

For policy assessment, higher education should therefore distinguish between access, continuation, and institutional participation. Admission and enrolment statistics provide evidence of institutional access, but they do not capture students' subsequent experiences. Monitoring may consequently include retention, academic progression, access to academic and mentoring support, participation in institutional activities, grievance redressal, and reported experiences of discrimination (Sabharwal, 2024). These indicators capture aspects of substantive inclusion that admission numbers alone cannot capture.

Representation should also be differentiated across institutional locations. SC representation among students is conceptually different from representation among faculty or within academic and administrative decision-making positions (Verma et al., 2026b). This point directly addresses the wider issue raised in the theoretical framework: Greater numerical presence may increase visibility and participation without necessarily producing equivalent institutional authority or recognition.

The present study does not separately measure student retention, faculty representation, institutional decision-making, or campus grievance mechanisms. These recommendations therefore identify areas where institutional monitoring could extend beyond admissions, rather than claiming that the study directly estimated their effects. This qualification is important given the cross-sectional and perception-based nature of the data.

5.4. Theoretical Contribution

The principal theoretical contribution of this article is to refine the distinction between formal representation and substantive inclusion. The findings do not support a simple sequence in which institutional representation can be assumed to correspond uniformly with accessibility, dignity, and reduced discrimination. Instead, the different structural relationships indicate that these concepts should remain analytically separate.

Representation captures respondents' perceptions of SC institutional presence through reservation. A concerns perceived opportunities to enter and use educational, employment, and institutional resources.

HD concerns respect, recognition, and equal treatment, while RCD concerns perceived changes in caste-based discrimination. The positive R → A relationship alongside the unsupported R → RCD relationship illustrates the analytical value of distinguishing these outcomes. Institutional presence may correspond with greater perceived A without necessarily corresponding with perceived RCD.

The study also connects public employment and higher education within a common framework while preserving their institutional differences. In public employment, the distinction extends from recruitment and representation to occupational progression and workplace inclusion. In higher education, it extends from admission and representation to continuation, participation, institutional experience, and representation beyond the student body. This responds directly to the need to explain how the two institutional domains are theoretically connected without treating them as identical.

Finally, the findings are based on respondents' perceptions and should not be interpreted as estimates of the causal effects of reservation policy. The cross-sectional design does not establish temporal ordering or causal identification. The contribution instead lies in showing that respondents differentiate among R, A, HD, IG, and RCD and that the estimated associations among these dimensions are not uniform.

6. Limitations and Future Research

This study has four main limitations. First, the analysis is based on 525 SC respondents from nine purposively selected districts of Madhya Pradesh. Although the multistage purposive-stratified design included rural and urban settings, it is not a probability sample. The findings should therefore not be statistically generalised to the wider SC population of Madhya Pradesh or India. Future studies could use probability-based and cross-state comparative designs.

Second, the cross-sectional and self-reported data limit causal interpretation. The structural coefficients represent associations among respondents' perceptions rather than temporal or causal policy effects, and the constructs are not administrative measures of actual representation, employment, admission, or documented discrimination. Longitudinal studies integrating survey and institutional data could address these limitations.

Third, the model showed limited explanatory and predictive performance, particularly for A and RCD. Future research could examine theoretically justified factors such as education, occupational position, institutional awareness, social networks, and institutional climate.

Finally, the study focuses on public employment and higher education. The supplementary demographic analysis assessed robustness rather than moderation. Future research could develop theory-driven tests of demographic heterogeneity, extend the framework to private-sector employment, and use qualitative or mixed-method designs to examine institutional experiences and forms of exclusion not fully captured by structured survey measures.

7. Conclusion

This study examined associations among IG, HD, perceived R, A, and RCD using survey data from 525 SC respondents in Madhya Pradesh. IG was positively associated with R ($\beta = .253$, $p < .001$), and R was positively associated with A ($\beta = .128$, $p = .011$). In contrast, the HD → R and R → RCD relationships were not statistically supported.

These findings refine the distinction between formal representation and substantive inclusion. Perceived R was associated with greater perceived A, but not significantly with perceived RCD. R, A, HD, IG, and RCD should therefore be treated as distinct, not interchangeable, dimensions of affirmative-action outcomes.

The study contributes to the literature on affirmative action and substantive inclusion by examining these dimensions within a common framework spanning public employment and higher education. Given its cross-sectional, perception-based design and limited explanatory and predictive performance, the findings do not establish causal effects of reservation policy. Rather, they show that institutional representation may correspond with some dimensions of inclusion without necessarily corresponding with others, providing a more differentiated basis for examining affirmative action among SCs.

Conflict of Interests

The authors declare no conflict of interests.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to participant confidentiality and applicable ethical requirements.

LLMs Disclosure

The authors used ChatGPT (OpenAI) to assist with language editing, grammatical refinement, and improving the clarity and readability of the manuscript. The authors take full responsibility for the accuracy, integrity, and final content of the article.

Supplementary Material

Supplementary material for this article is available online in the format provided by the authors (unedited).

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