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Policy Feedback across Policy Interfaces: Women's Political Participation in an Indian State

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Tables 1 to 5 are available in the Supplementary Files section.

Policy Feedback across Policy Interfaces:
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Abstract

Policy feedback research explains how public policies shape political behavior through resources, political meanings, and organizational relationships. How these pathways vary across forms of citizen-state engagement remains less clear. This article conceptualizes policy interfaces as the dominant institutional forms through which citizens recognize, evaluate, and experience public programs. As a relational dimension of policy design, interfaces shape access to resources, public recognition, and opportunities for collective engagement. These differences matter for women because gendered household relations may constrain control over benefits and public action. The study compares women-targeted programs centered on public advocacy, individualized material provision, and collective organization to examine associations with political participation and efficacy. In India, gender-targeted provision has expanded amid inequalities in women's political voice. Bihar, a low-income state in eastern India, combines multidimensional poverty and gender inequalities with diverse women-focused initiatives. Using a cross-sectional survey of 664 women across 15 rural and urban sites, the analysis relates policy awareness, perceived benefits, and reported beneficiary status to voting, non-electoral participation, and political efficacy. Perceived benefits are positively associated with future voting intention for advocacy-oriented and community-based livelihoods programs and negatively for the individualized material-benefit program. Reported beneficiary status shows less consistent associations; evidence of associations with reported previous voting, non-electoral participation, and efficacy is limited. The article extends policy feedback research beyond advanced Western democracies and argues that policy feedback is a relational process shaped by how policies position citizens in relation to the state, how citizens interpret those encounters, and which political outcome is examined.

Keywords: *Policy feedback; Policy interfaces; Political participation; Women's empowerment; Gender equality; India.*

Introduction

Public policies do more than distributing resources or regulating behavior. By shaping how citizens encounter government, they can alter political capacities, identities, expectations, and participation (Campbell, 2012; Mettler & Soss, 2004; Pierson, 1993; Skocpol, 1992). Their political significance depends partly on the institutional relationships through which citizens encounter public provision. Policies may provide resources, communicate public recognition, or incorporate participants into collective institutions, while administrative arrangements can create opportunities for voice or reinforce unequal authority relations (Bruch et al., 2010; Campbell,

2012; Goss et al., 2019; Soss, 1999). Comparing these relationships helps specify why policy contact need not carry the same political implications across programs or forms of participation.

This article examines these differences through ***policy interfaces***, conceptualized here as the dominant institutional forms through which citizens recognize, evaluate, and experience public programs. An advocacy-oriented interface may primarily convey interpretive signals about recognition and political standing (Mettler & Soss, 2004). An individualized material interface may alter household resources, while its participatory implications depend on program design and citizens' experiences of delivery (Campbell, 2012; Soss, 1999). An organizational interface may embed participants in networks that transmit information, develop civic skills, and support collective action (Goss et al., 2019; Prillaman, 2023a). These mechanisms can overlap, but distinguishing their dominant interfaces helps specify why public programs need not display equivalent political associations. The theoretical question is therefore: *How do policy interfaces condition the political reach of resource, interpretive, and organizational feedback?*

Examining these institutional relationships is particularly relevant in lower-income democracies, where welfare expansion occurs amid pronounced social stratification, uneven state capacity, and gendered patterns of citizenship. Policy feedback scholarship has developed largely through research on the United States and Europe, while its operation under these conditions remains less fully understood (Béland & Schlager, 2019; Campbell, 2012). Its gendered dimensions are also comparatively underexplored (McDonagh, 2010; Mettler & Soss, 2004). Patriarchal household relations, restrictions on mobility, and unequal control over resources may limit the extent to which policy provision strengthens women's political agency (Prillaman, 2023b). Policies directed toward women may therefore generate different political relationships depending on whether women encounter the state through public communication, individualized household provision, or repeated organizational participation.

India's gendered context provides an interesting setting to examine the role of policy interfaces in shaping political behavior. Its federal democracy combines expanding social provision and rising women's electoral participation with persistent inequalities in mobility, public voice, representation, and control over household resources (Prillaman, 2023b; Rai, 2017;

Thomas & Kaunain, 2025). Women's electoral participation in India has increased markedly. In the 2019 general election, the female turnout rate exceeded the male rate nationally for the first time, forming part of what Kapoor and Ravi (2014) describe as a "silent revolution" in Indian electoral politics (Election Commission of India, 2025). Rising turnout nevertheless coexists with women's continued underrepresentation and substantial barriers to attending public meetings, contacting officials, and seeking representative office (Rai, 2017; Thomas & Kaunain, 2025). The expansion of women-targeted social policy has occurred alongside these contrasting developments, but its relationship with women's broader political incorporation remains insufficiently understood.

Bihar, a low-income state in eastern India, provides a particularly revealing case within this setting (Finance Department, Government of Bihar, 2026). The state combines extensive multidimensional poverty (NITI Aayog, 2023) and pronounced gender inequalities (International Institute for Population Sciences & ICF, 2021) with competitive elections and substantial electoral participation by women (Election Commission of India, 2025) and sustained experimentation with women-focused policies (Hoffmann et al., 2021; Muralidharan & Prakash, 2017). Research on Bihar's employment-guarantee scheme has also documented administrative constraints on implementation (Dutta et al., 2014). Bihar therefore provides a demanding setting in which to examine whether the political relationships associated with public programs vary according to how women encounter the state.

The analysis compares three programs representing contrasting dominant interfaces. *Beti Bachao, Beti Padhao* (BBBP) principally engages citizens through advocacy, public communication, and the symbolic recognition of girls' survival, education, and dignity (Ministry of Women and Child Development, 2022). *Pradhan Mantri Ujjwala Yojana* (PMUY) provides an individualized household benefit - an LPG connection issued in an adult woman's name (Ministry of Petroleum and Natural Gas, n.d.). The Bihar Rural Livelihoods Project, locally known as *JEEViKA*, organizes rural women through self-help groups, village organizations, and federated community institutions (Bihar Rural Livelihoods Promotion Society, n.d.). These categories are not mutually exclusive: advocacy programs can include community activity, material benefits can carry interpretive meanings, and community organizations can provide

material resources. Nor can program interface be separated fully from policy purpose, eligibility, and implementation. The comparison therefore treats policy interfaces as a relational dimension of policy design. Its theoretical value lies in connecting established resource, interpretive, and organizational expectations to the institutional forms through which citizens recognize, evaluate, and experience public programs, while distinguishing the political outcomes associated with these relationships.

To examine these relationships, the analysis uses original survey data collected in 2025 from 664 women across 15 rural and urban survey sites in Bihar. It distinguishes policy awareness, perceived benefits and reported beneficiary status for BBBP, PMUY and BRLP/JEEViKA. The outcomes include reported past voting, future voting intention at local, state and national levels, non-electoral participation and political efficacy. The primary analysis uses adjusted binary- and ordered-logit models with survey site-clustered inference and correction for multiple testing. Supplementary analyses include within-program and cross-program joint models, expanded covariate and district-fixed-effect specifications, small-cluster and functional-form sensitivity tests, and instrumental-variable models under explicitly stated identification assumptions.

The findings reveal differentiated but conditional patterns. BBBP exposure displays the broadest positive prospective pattern, while PMUY's negative associations are concentrated in perceived program benefits. BRLP/JEEViKA perceived benefits and reported beneficiary status are positively associated with prospective voting intention, although the within-program joint models substantially narrow these results. Cross-program same-dimension models and specifications with expanded controls retain the principal positive BBBP and BRLP/JEEViKA patterns and the negative PMUY perceived-benefit pattern. The retrospective association is limited to lower previous national voting among respondents reporting BRLP/JEEViKA beneficiary status, while no association involving non-electoral participation or political efficacy survives multiplicity correction.

The article makes three contributions to policy feedback research. First, it treats policy interfaces as a dimension of policy design through which resource, interpretive, and

organizational expectations can be connected to citizens' relationships with the state. Bihar provides a setting in which to examine these expectations under conditions of poverty, uneven administrative access, and patriarchal social relations. Second, the article develops a multidimensional account of citizens' policy relationships by distinguishing program recognition, subjective evaluation, and reported beneficiary or household-level association. The analysis shows that associations identified for one dimension cannot be assumed to represent program exposure generally. Third, it specifies an outcome boundary for policy feedback. Relationships with prospective voting intentions do not necessarily extend to previous voting, non-electoral participation, or political efficacy. The findings therefore refine claims about political incorporation by distinguishing electoral orientation from broader forms of agency and institutional engagement.

Background and Theoretical Framework

The interface perspective connects established explanations of policy feedback to differences in citizens' institutional relationships with the state. Resource and interpretive mechanisms concern the capacities available for participation and the political meanings conveyed through policy encounters (Campbell, 2003, 2012; Mettler & Soss, 2004). Organizational mechanisms concern the relationships through which citizens acquire information, support, and opportunities to act (Goss, 2010; Goss et al., 2019). These mechanisms can overlap, but a program's dominant institutional interface makes particular expectations salient. Their political reach may also differ: relationships with electoral engagement need not extend equally to non-electoral participation or political efficacy. Program recognition, subjective evaluation, and reported association are consequently treated as distinct aspects of citizens' policy relationships.

India provides an important context for examining these expectations. Social policy has long formed part of its development strategy, while its design and implementation have been shaped by enduring social inequalities (Ghosh, 2004; Pellissery, 2021). National initiatives address women's and girls' education, maternal health, sanitation, clean cooking fuel, financial inclusion, safety, and livelihoods (National Commission for Women, n.d.). These interventions

provide opportunities to examine how different forms of policy engagement position women in relation to households and public institutions.

Research documents rising women's electoral turnout and a narrowing gender gap in voting in India (Kapoor & Ravi, 2014; Spary, 2020). These developments have renewed debate about the extent to which women constitute an autonomous electoral constituency (Deshpande, 2024). Welfare programs also feature in voters' attribution of credit to governments and in patterns of party support (Deshpande et al., 2019). Electoral visibility nevertheless does not establish broader political agency: research on India identifies continuing constraints on women's participation beyond elections (Prillaman, 2023a, 2023b). The comparison therefore distinguishes electoral orientation from wider civic capacities and engagement.

Bihar is located in eastern India and shares an international border with Nepal. The 2011 Census recorded a population of approximately 104.1 million, of whom 11.3% lived in urban areas (Office of the Registrar General & Census Commissioner, India, 2011). Bihar remains one of India's lowest-income states: per capita gross state domestic product was estimated at ₹76,490 at current prices in 2024–25 (Finance Department, Government of Bihar, 2026). In 2019–21, 33.76% of its population was multidimensionally poor (NITI Aayog, 2023). The state's gender report card documents continuing challenges in education, work participation, mobility, and decision-making (Centre for Catalyzing Change, 2020). NFHS-5 reported that 40.8% of women aged 20–24 had married before age 18 (International Institute for Population Sciences & ICF, 2021).

These conditions coexist with competitive electoral politics and substantial women's electoral participation (Election Commission of India, 2025). Bihar has adopted reservations for women in local government (Government of India, 2011), introduced bicycle programs supporting girls' secondary education (Muralidharan & Prakash, 2017), and developed livelihood provision through women's collective institutions (Bihar Rural Livelihoods Promotion Society, n.d.; Hoffmann et al., 2021). These features make Bihar theoretically useful for examining whether expanding policy contact is associated with electoral orientation, broader political incorporation, both, or neither. They also make it important to distinguish participation in

elections from women's capacity to exercise public voice, a distinction emphasized in research on gender and political participation in India (Prillaman, 2023b; Rai, 2017).

The comparison distinguishes an advocacy-oriented program (*Beti Bachao, Beti Padhao*), an individualized material-benefit program (*Pradhan Mantri Ujjwala Yojana*), and a community-based livelihoods program (*Bihar Rural Livelihoods Project*). Beti Bachao, Beti Padhao (BBBP) emphasizes advocacy, public communication, and activities intended to increase the public value accorded to girls (Ministry of Women and Child Development, 2022). Pradhan Mantri Ujjwala Yojana (PMUY) provides an LPG connection to an eligible household in an adult woman's name (Ministry of Petroleum and Natural Gas, n.d.). The Bihar Rural Livelihoods Project, locally known as JEEViKA, combines livelihood and financial interventions with collective institutions, including self-help groups, village organizations, and federations (Bihar Rural Livelihoods Promotion Society, n.d.). These designs make interpretive, resource, and organizational pathways respectively salient, while allowing their mechanisms to overlap. Table 1 compares the programs' launch, financing, benefits, eligibility, coverage, and administration.

[Table 1 goes here]

Interpretive feedback predicts that policies can encourage participation when they affirm citizens' political standing and recognize their interests as legitimate public concerns (Campbell, 2012; Schneider & Ingram, 1993). Such feedback depends on whether citizens recognize a program and interpret its contribution favorably. Awareness makes policy messages accessible, while favorable evaluations may indicate that citizens regard the intervention as serving their interests.

In India, BBBP's emphasis on girls' survival, education, and social value makes this pathway particularly relevant (Ministry of Women and Child Development, 2022). By presenting these concerns as matters of public responsibility, the program may reinforce the legitimacy of women's interests. Among women in Bihar, awareness of BBBP and favorable evaluations of its benefits may therefore encourage prospective electoral engagement.

H1: Awareness of the advocacy-oriented program and its perceived benefits are positively associated with future voting intention at the local, state, and national levels.

Resource feedback predicts that policies can facilitate participation by reducing economic and time constraints and expanding the capacities available for engagement (Brady et al., 1995; Campbell, 2003). Material improvements may increase available resources or reduce competing demands. The conventional expectation is therefore positive when recipients experience provision as an improvement that makes participation more feasible.

In India, PMUY's provision of an LPG connection is intended to improve access to clean cooking fuel and women's household well-being (Ministry of Petroleum and Natural Gas, n.d.; National Commission for Women, n.d.). These potential gains are particularly relevant in Bihar's low-income setting. If women experience PMUY as easing everyday burdens and improving household conditions, favorable evaluations and reported beneficiary status should be associated with stronger voting intentions.

H2a: Perceived benefits and reported beneficiary status for the individualized material-benefit program are positively associated with future voting intention at the local, state, and national levels.

The political consequences of material provision depend partly on how programs structure citizens' encounters with government (Soss, 1999). Administrative arrangements that protect recipients' autonomy and voice may encourage civic and political engagement, whereas paternalistic authority relations may discourage it (Bruch et al., 2010). Material provision may consequently improve welfare without developing civic skills or creating sustained opportunities for public action.

In India, patriarchal household relations can constrain women's independent political participation (Prillaman, 2023b). Bihar's gender report card also documents restrictions on women's mobility and control over resources (Centre for Catalyzing Change, 2020). Applied to PMUY, these conditions suggest that a household benefit may improve domestic circumstances

while leaving constraints on public engagement intact. Its individualized interface therefore provides a less direct basis for expecting broader participation and political efficacy.

H2b: Awareness, perceived benefits, and reported beneficiary status for the individualized material-benefit program exhibit weak or null associations with community-meeting attendance, contacting officials, internal political efficacy, and external political efficacy.

H2a and H2b concern different outcome domains. They distinguish a positive resource-based expectation for prospective voting from a more limited expectation for broader political engagement. Neither predicts a negative relationship with voting intention; an inverse association would therefore require explanation as an unexpected finding.

Organizational feedback predicts that durable relationships and repeated collective interaction can facilitate participation by circulating information, providing social support, and connecting citizens to public institutions (Goss, 2010; Goss et al., 2019). These relationships may encourage electoral engagement by making public affairs more accessible and participation more socially supported.

Research on India identifies women's networks and collective organization as important to overcoming constraints on political involvement (Prillaman, 2023a, 2023b). JEEViKA's self-help groups and federated institutions make this pathway salient in Bihar: its organizational design includes collective learning, resource management, and access to public services and entitlements (Bihar Rural Livelihoods Promotion Society, n.d.). These relationships provide a theoretical basis for expecting favorable evaluations and reported beneficiary status to be associated with stronger prospective electoral engagement.

H3a: Perceived benefits and reported beneficiary status for the community-based livelihoods program are positively associated with future voting intention at the local, state, and national levels.

Organizational feedback also generates expectations about broader civic capacities. Repeated discussion, collective decision-making, and interaction with authorities can develop civic skills and political understanding (Goss, 2010; Goss et al., 2019; Verba et al., 1995). Collective support may facilitate public action, while opportunities to obtain institutional responses may strengthen citizens' perceived ability to influence government. These processes suggest relationships with non-electoral participation and both internal and external political efficacy.

Evidence from India provides support for the participation pathway: Prillaman (2023a) finds that access to women-only credit groups substantially increased women's attendance at public meetings, with suggestive evidence concerning expanded networks, collective capacity, and civic skills. In Bihar, JEEViKA's institutions provide opportunities for collective learning and engagement with public services (Bihar Rural Livelihoods Promotion Society, n.d.). Capacities developed through these encounters may extend beyond program activities into wider public engagement.

H3b: Awareness, perceived benefits, and reported beneficiary status for the community-based livelihoods program are positively associated with community-meeting attendance, contacting officials, internal political efficacy, and external political efficacy.

These hypotheses guide an exploratory cross-sectional analysis of associations. Program interfaces overlap and cannot be separated fully from differences in policy purpose, eligibility, and implementation. Interpretation also reflects the measures' limits: BBBP has no standardized individualized entitlement (Ministry of Women and Child Development, 2022), while the survey's reported BRLP/JEEViKA beneficiary status may refer to the respondent or a household member and does not establish the respondent's own participation in a collective institution. Reported previous voting is examined as a secondary retrospective outcome rather than as evidence of individual-level political change.

Data and Methods

Study Design and Sample

The analysis draws on a cross-sectional survey conducted in Bihar, India, between June and July 2025. The survey tested the survey instrument under field conditions and generated exploratory evidence on whether exposure to different women-targeted programs is associated with distinct patterns of women's political engagement. The survey covered 664 women aged 18 years and above across 15 sites in Patna, Vaishali and Saran districts. The districts were purposively selected to capture variation in socio-economic and program contexts. Within them, villages or urban localities were randomly selected, followed by households within each site. Face-to-face interviews were conducted through a door-to-door household survey. One eligible adult woman was interviewed per household; where multiple women were eligible, one was randomly selected for interview.

The sample included 74.4% rural and 25.6% urban respondents. Because the districts were purposively selected and the study did not use a statewide probability-sampling frame, the sample is not statistically representative of women in Bihar. The findings are interpreted as exploratory within-sample relationships rather than population estimates for the state. The sample reflects substantial socio-economic disadvantage: 41.1% of respondents reported no formal schooling, 31.8% had only primary education, 86.4% were married and 42.9% held a Below Poverty Line card. The sample therefore provides a relevant setting for examining relationships between women-targeted programs and political participation under significant socio-economic constraints.

The research protocol was approved by the ethics review board of the authors' affiliated university. All respondents provided informed consent before participation.

[TABLE 2 goes here]

Measures

The principal explanatory variables capture three dimensions of respondents' relationships with BBBP, PMUY, and BRLP/JEEViKA. Awareness is measured on five-category scales ranging from not at all familiar to extremely familiar and captures program recognition rather

than verified contact or policy attribution. Perceived benefits are five-category assessments of how much respondents believe each program benefits them or their communities. These variables are interpreted as subjective program evaluations rather than objective treatment exposure. Reported beneficiary status is measured through scheme-specific binary questions asking whether the respondent or a household member was associated with or benefited from the program. Exact question wording, response categories, numerical coding, and analytical use are reported in Appendix Table A8.

Reported beneficiary status does not have an equivalent institutional meaning across the programs. For PMUY, it indicates reported respondent- or household-level receipt of an LPG connection. Because BBBP does not provide a standardized individualized entitlement, an affirmative response indicates reported contact with or benefit from scheme-linked activity. For BRLP/JEEViKA, it records association through either the respondent or a household member and does not establish that the respondent personally participated in a self-help group or another community institution. None of the measures was verified against administrative records.

The outcomes distinguish reported previous voting from future voting intention at the local, state, and national levels. Previous voting is binary, while future voting intention is measured using five-category ordinal scales. Secondary outcomes measure meeting attendance, contact with officials or political representatives, internal political efficacy, and external political efficacy. The models control for age, education, household monthly income category, and rural–urban location. Expanded specifications additionally include district fixed effects, Below Poverty Line card status, caste, religion, and marital status.

Analytical Strategy

The primary specifications estimate each program-relationship measure separately. Binary logistic regression is used for reported previous voting, while ordered logistic regression is used for future voting intention, non-electoral participation, and political efficacy. Prospective models control for age, education, household monthly income category, and rural–urban location. Standard errors use HC1 survey-site-clustered covariance estimates with a finite-cluster adjustment and (t)-based inference using 14 degrees of freedom. Benjamini–Hochberg-adjusted

(q)-values are calculated separately for the 27 prospective-voting tests, the 18 non-electoral-participation tests, and the 18 political-efficacy tests. Average changes in the predicted probability of reporting high voting intention, defined as a score of four or five, are presented for substantive interpretation. These changes correspond to a one-category increase in awareness or perceived benefits, or a change from non-beneficiary to beneficiary status.

Supplementary models assess the stability of the primary associations. Within-program specifications enter awareness, perceived benefits, and reported beneficiary status simultaneously. Cross-program same-dimension models simultaneously enter the three awareness measures, perceived-benefit measures, or beneficiary-status indicators. Expanded specifications add district fixed effects, Below Poverty Line status, caste, religion, and marital status. Small-cluster sensitivity analyses estimate cumulative binary-logit models using CR2 covariance adjustment and Satterthwaite degrees of freedom. Nominal-effect tests and partial proportional-odds models assess the proportional-odds restriction, while additional models treat ordinal exposures as categorical. Complete results are reported in the appendices.

Retrospective models apply minimum-age thresholds of 22 for the preceding local election, 23 for the preceding state election, and 20 for the preceding national election. Because the local question referred specifically to a village-panchayat election, that model is additionally restricted to rural respondents. Retrospective inference uses CR2 covariance adjustment, Satterthwaite degrees of freedom, and Benjamini–Hochberg correction across the 27 models.

Supplementary two-stage least-squares models treat the original five-category future voting-intention outcomes as numeric and examine three instrument–exposure pairs: BBBP slogan exposure for BBBP awareness, distance to the nearest LPG distributor for PMUY reported beneficiary status, and recent BRLP/JEEViKA activity for BRLP/JEEViKA reported beneficiary status. Each instrument requires a distinct and contestable exclusion restriction. The models therefore provide conditional directional evidence and do not replace the primary ordered-logit specifications or establish causal program effects.

Results

Overview of Hypothesis Tests

The results are organized around the five expectations stated above: H1, H2a, H2b, H3a and H3b. H1 receives support for prospective electoral participation: BBBP awareness and favorable subjective evaluations are positively associated with local, state and national voting intentions. H2a is not supported: PMUY evaluations are negatively, rather than positively, associated with prospective voting intention, while the beneficiary-status findings are narrower and less stable. The secondary-outcome findings are consistent with H2b because no PMUY relationship remains robust for non-electoral participation or political efficacy, although statistical non-significance does not establish a true null. H3a receives qualified support: BRLP/JEEViKA evaluations and reported beneficiary association are positively associated with prospective voting intention. H3b is not supported because the anticipated relationships with meeting attendance, contact with officials and political efficacy do not survive multiplicity adjustment. The retrospective findings are limited and do not indicate a general participatory advantage associated with the community-based program. These assessments indicate whether the observed associations are consistent with the hypotheses. They do not establish causal effects or directly verify the proposed interpretive, resource, or organizational mechanisms. The following subsections present the program-specific voting results and the tests of non-electoral participation and political efficacy, followed by joint specifications, robustness analyses, and supplementary instrumental-variable estimates.

Appendix Table A1 reports the corresponding bivariate tests. Spearman correlations are consistently positive for BBBP exposure and negative for PMUY, although the PMUY awareness correlations do not survive multiple-testing correction. BRLP/JEEViKA perceived benefits and reported beneficiary status are positively correlated with future voting intention, while its awareness results are weaker. These tests provide descriptive context and are not interpreted as adjusted or causal estimates.

[TABLE 3 goes here]

Hypothesis 1: Interpretive Feedback and Advocacy-Oriented Exposure

BBBP displays the clearest positive association with prospective electoral participation. Descriptively, mean local voting intention rises from 3.15 among respondents with no BBBP awareness to 3.61 among those reporting the highest awareness. Similar positive ordinal trends appear for state and national voting intention.

In the adjusted ordered-logit models, BBBP awareness is positively associated with local ($\beta = .181, q = .010$), state ($\beta = .162, q = .013$) and national voting intention ($\beta = .185, q = .011$). A one-category increase in awareness corresponds to an average increase of approximately 3.7–4.2 percentage points in the predicted probability of high voting intention. Reported BBBP beneficiary status is also positively associated with local ($\beta = .391, q = .013$), state ($\beta = .477, q = .008$) and national voting intention ($\beta = .635, q = .010$). The corresponding increases in the predicted probability of high intention range from 9.1 percentage points for local elections to 14.6 points for national elections. Perceived benefits show similarly consistent positive associations across all three electoral levels.

Taken together, these results support H1 for prospective electoral participation. The positive association appears across electoral levels and exposure dimensions in the separate models, although the joint models show that perceived benefits provide the most consistent independent evidence. H1 should therefore be interpreted as support for an association with future voting orientation, not as confirmation of the proposed interpretive mechanism.

Hypotheses 2a and 2b: Resource Feedback and Individualized Material Provision

PMUY displays a negative but dimension-specific pattern. Awareness is not significantly associated with any prospective outcome. Perceived benefits are negatively associated with local ($\beta = -.153$, $q = .023$), state ($\beta = -.216$, $q = .008$) and national voting intention ($\beta = -.233$, $q = .008$). A one-category increase corresponds to average reductions of approximately 3.6, 5.0 and 5.4 percentage points, respectively, in the probability of high voting intention.

Reported PMUY beneficiary status is negative after multiplicity adjustment only for national voting intention ($\beta = -.387$, $q = .041$); the state estimate is suggestive ($q = .060$), while the local estimate is not robust ($q = .110$). The evidence therefore identifies a negative separate-model association centered principally on perceived benefits rather than a uniformly robust demobilizing effect of beneficiary status.

Taken together, these results do not support H2a. The individualized material-benefit program is not positively associated with prospective voting intention as the resource-mobilization account predicts. Instead, the most consistent negative pattern concerns perceived benefits, while the beneficiary-status evidence is limited. The secondary-outcome results reported below are consistent with H2b: PMUY relationships do not extend robustly to non-electoral participation or political efficacy.

Hypotheses 3a and 3b: Organizational Feedback and Community-Based Exposure

BRLP/JEEViKA exposure is positively associated with future voting intention in the separate-exposure models, whereas its relationship with reported previous voting is narrower.

[TABLE 4 goes here]

The prospective pattern is positive. Reported BRLP/JEEViKA beneficiary status is associated with local ($\beta = .510$, $q = .011$), state ($\beta = .498$, $q = .006$) and national voting intention ($\beta = .633$, $q = .004$). These estimates correspond to increases of approximately 11.6, 11.3 and 14.1 percentage points, respectively, in the probability of high intention. Perceived benefits are also positively associated with local ($\beta = .265$, $q = .002$), state ($\beta = .264$, $q = .001$) and national voting intention ($\beta = .230$, $q = .004$). Awareness survives correction only for national voting intention ($\beta = .116$, $q = .021$); its local and state associations do not.

Appendix Table A6 reports the complete eligibility-restricted retrospective models. Because the local-election question referred to a village-panchayat election, the local model is restricted to rural respondents aged 22 or above. Reported BRLP/JEEViKA beneficiary status is

not associated with previous local voting ($OR = .801$, CR2 95% CI $[.404, 1.589]$, $p = .470$, $q = .917$) or previous state voting ($OR = .805$, CR2 95% CI $[.484, 1.338]$, $p = .369$, $q = .917$). It remains associated with lower reported previous national voting ($OR = .442$, CR2 95% CI $[.290, .673]$, $p = .001$, $q = .032$). Conditional on the covariates, the estimated difference in the probability of previous national voting remains approximately 19.0 percentage points lower among respondents reporting BRLP/JEEViKA beneficiary status than among those not reporting it.

The findings therefore identify positive prospective associations in the separate models and a negative retrospective association limited to the previous national election. They do not demonstrate a transition from non-voting to intended future participation because the cross-sectional survey does not observe within-person change.

Taken together, these results provide qualified support for H3a. Positive associations with future voting intention are evident in the separate and cross-program models, but they narrow substantially when the program's relationship dimensions are modeled jointly. H3b is not supported because no association with meeting attendance, contact with officials or political efficacy survives multiplicity correction. Moreover, because the beneficiary measure includes association through either the respondent or a household member, the results cannot establish that respondents' own participation in collective institutions generated the observed electoral pattern.

Hypothesis Tests for Non-Electoral Participation and Political Efficacy

After survey site-clustered inference and Benjamini–Hochberg correction across the 18 program–exposure tests within each two-outcome family – non-electoral participation and political efficacy – none of the 36 associations involving meeting attendance, contacting officials, internal efficacy or external efficacy remains statistically significant. Some BRLP/JEEViKA coefficients are nominally significant or approach conventional thresholds before correction. Perceived benefits are positively associated with meeting attendance but not under clustered inference ($\beta = .154$, $p = .074$, $q = .443$). Reported beneficiary status is positively associated with internal efficacy before correction ($\beta = .468$, $p = .038$), but its adjusted q-value is .583.

Awareness is nominally associated with contacting officials ($\beta = .076$, $p = .050$) but also fails adjustment ($q = .443$).

The secondary analyses provide no robust evidence that any program-relationship measure is associated with non-electoral participation or political efficacy in this pilot sample. This pattern is consistent with H2b's expectation that PMUY's material interface would not extend to broader participatory feedback, but it does not support H3b's organizational-feedback expectation. H1, H2a and H3a concern prospective voting intention and are not tested by these secondary outcomes. Complete estimates are reported in Appendix Table A5.

Joint Within-Program Exposure Models

Supplementary joint models enter awareness, perceived benefits and reported beneficiary status simultaneously within each program. For BBBP, perceived benefits remain positively associated with local ($\beta = .411$, $q < .001$), state ($\beta = .288$, $q = .001$) and national voting intention ($\beta = .397$, $q = .001$). Awareness and reported beneficiary status do not independently survive correction. For PMUY, no exposure dimension survives correction. Perceived benefits remain negative for state ($\beta = -.214$, clustered $p = .019$, $q = .086$) and national voting intention ($\beta = -.227$, clustered $p = .029$, $q = .111$) before multiplicity adjustment. The local estimate is also negative but not significant. Awareness and reported beneficiary status are not independently significant. For BRLP/JEEViKA, perceived benefits remain robust only for local voting intention ($\beta = .252$, $q = .035$). Their state association does not survive correction ($\beta = .249$, $q = .077$), and the national association is not significant. Neither awareness nor reported beneficiary status remains independently significant.

The joint specifications thus identify perceived benefits as the most stable independent exposure dimension, particularly for BBBP. They substantially narrow the BRLP/JEEViKA pattern, while none of PMUY's negative associations remain robust after adjustment for the other exposure dimensions and multiple testing. Complete estimates appear in Appendix Table A4.

Cross-Program and Additional Robustness Models

Cross-program same-dimension models examine whether each program measure retains its association after adjustment for the corresponding measures of the other two programs. Cross-program exposure correlations are small ($|\rho| \leq .125$), limiting concerns about collinearity in these models, although this does not establish measurement equivalence. By contrast, within-program correlations range from .213 to .675 and are strongest for PMUY (.575–.675), which is consistent with the attenuation observed when PMUY's three dimensions are entered together.

In the cross-program models with expanded controls, BBBP awareness remains positively associated with all three voting-intention outcomes, PMUY awareness remains null and BRLP/JEEViKA awareness remains robust only for national voting intention. Perceived benefits retain positive associations for BBBP and BRLP/JEEViKA and negative associations for PMUY across all three electoral levels. BBBP and BRLP/JEEViKA reported beneficiary status remain positive across all three levels. PMUY beneficiary status remains negative only for national voting intention after multiplicity correction ($q = .018$); its local ($q = .088$) and state ($q = .061$) estimates do not meet the adjusted .05 threshold.

Separate-exposure models adding district fixed effects, Below Poverty Line status, caste, religion and marital status also retain the principal findings. BBBP's three dimensions remain positive across all electoral levels. PMUY perceived benefits remain negative across all three levels, while reported beneficiary status remains robust only for the national outcome. BRLP/JEEViKA perceived benefits and reported beneficiary status remain positive across all three levels, while awareness remains robust only for national voting intention.

Appendix Table A2 reports the representative binary-logit sensitivity analysis in which scores of four or five are classified as high future voting intention. All three BBBP dimensions remain positively associated with high intention. PMUY perceived benefits remain negatively associated, while PMUY awareness and reported beneficiary status do not survive correction. BRLP/JEEViKA perceived benefits and reported beneficiary status remain positive; its awareness estimate falls just above the adjusted threshold ($q = .0501$). Because the dichotomized outcomes are identical across electoral levels, these estimates constitute one sensitivity analysis rather than three replications. The original voting-intention measures are

strongly related but not identical. Their pairwise Spearman correlations range from .792 to .799, while the corresponding polychoric correlations range from .820 to .829 (Appendix Table A1, Panel C). Findings across the three electoral levels should therefore be interpreted as related patterns rather than independent replications.

Formal proportional-odds tests generally support the ordered-logit specification. After Benjamini–Hochberg correction across the 27 tests, evidence of a violation remains only for BBBP perceived benefits in the state-election model (LR $\chi^2(3) = 40.01$, $q < .001$) and BBBP reported beneficiary status in the state-election model (LR $\chi^2(3) = 18.76$, $q = .004$). The corresponding cutpoint-specific coefficients remain positive at all four thresholds, although their magnitudes vary. No other exposure–outcome combination shows adjusted evidence of a proportional-odds violation at the .05 level. The CR2/Satterthwaite cutpoint-specific estimates are reported in Appendix Table A7.

The CR2/Satterthwaite cutpoint models further support a conclusion centered on perceived program benefits. After Benjamini–Hochberg adjustment for multiple testing, perceived-benefit coefficients remain significant at 9 of 12 thresholds for BBBP, 4 of 12 for PMUY and 8 of 12 for BRLP/JEEViKA, with positive coefficients for BBBP and BRLP/JEEViKA and negative coefficients for PMUY. No threshold-specific PMUY beneficiary-status coefficient survives correction. Categorical-exposure models similarly retain the perceived-benefit pattern for BBBP and BRLP/JEEViKA across all three electoral levels and for PMUY at the local and national levels. The categorical PMUY state model exhibits numerical separation and is therefore not interpreted. Complete CR2/Satterthwaite cutpoint estimates appear in Appendix Table A7; cross-program, expanded-control and categorical-exposure results appear in Appendix Table A9.

Supplementary Instrumental-Variable Results

The supplementary two-stage least-squares models retain the original five-category voting-intention outcomes. Table 5 reports conventional and survey site-clustered first-stage statistics and second-stage estimates. These models provide conditional sensitivity evidence and do not replace the primary ordered-logit specifications.

[TABLE 5 goes here]

First-stage evidence varies across programs. BBBP slogan exposure has a clustered partial F-statistic of 40.59. PMUY's clustered statistic is 7.69 ($p = .015$), raising a potential weak-instrument concern that its conventional statistic of 18.07 would conceal. BRLP/JEEViKA's clustered first-stage statistic is exceptionally large ($F = 5247.27$) but does not establish instrument validity. All 540 respondents not reporting beneficiary status also reported no recent program. Among the 124 respondents reporting beneficiary status, 63 reported no recent program and 61 reported one. Recent program activity is therefore observed only among reported beneficiaries, raising common-support and exclusion-restriction concerns.

The second-stage directions correspond to the separate-exposure patterns. Instrumented BBBP awareness is positively associated with local ($\beta = 3.557$), state ($\beta = 3.558$) and national voting intention ($\beta = 3.919$); all three clustered p-values are below .001. Instrumented PMUY beneficiary status is negatively associated with local ($\beta = -1.468$, $p = .047$), state ($\beta = -1.736$, $p = .039$) and national voting intention ($\beta = -2.077$, $p = .041$). Instrumented BRLP/JEEViKA beneficiary status is positively associated with local ($\beta = .981$), state ($\beta = 1.088$) and national voting intention ($\beta = .992$); all three p-values are below .001.

These estimates require substantial caution. Distributor distance may capture remoteness, infrastructure, transport or public-service access; recent BRLP/JEEViKA activity is nested within beneficiary status and may itself represent contact or mobilization; and BBBP slogans may affect political orientations through communication beyond measured awareness. All three specifications are exactly identified, so no overidentification test is available. Wu–Hausman statistics in Appendix Table A3 assess endogeneity under the maintained assumptions but do not validate the exclusion restrictions. The IV estimates therefore do not resolve residual confounding or establish causal policy-feedback effects.

Discussion

The findings provide broad support for the interpretive-feedback expectation, no support for the positive resource-feedback expectation, conditional support for the prospective

organizational-feedback expectation, and no support for its extension to non-electoral participation or political efficacy. BBBP and BRLP/JEEViKA generally display positive relationships with future voting intention, whereas PMUY's negative pattern is concentrated in subjective evaluations of program benefits. These directions persist in cross-program same-dimension models and after expanded covariate adjustment, although the within-program specifications substantially narrow several associations. The evidence therefore identifies differentiated policy relationships rather than uniform program effects.

The first theoretical implication concerns the institutional relationships through which policies engage citizens. The differentiated associations across the three programs suggest the value of connecting resource, interpretive, and organizational expectations to the institutional forms through which citizens encounter the state (Campbell, 2012; Goss et al., 2019; Mettler & Soss, 2004). Household mediation, unequal control over benefits, restrictions on women's mobility, and limited opportunities for autonomous public action may interrupt the relationship between policy contact and participation (Prillaman, 2023b). These are potential scope conditions for policy feedback theory, although the present comparison cannot isolate their effects directly.

BBBP displays the clearest pattern consistent with the interpretive-feedback expectation. Its positive associations are consistent with the possibility that public communication and recognition of girls' survival, education, and dignity increase the political salience of women's concerns. The within-program results refine this interpretation because perceived benefits, rather than awareness or reported beneficiary status, remain consistently robust. This suggests that respondents' evaluations of the program may be more politically relevant than recognition alone. The observational design cannot determine whether BBBP shaped those evaluations or whether politically attentive respondents were already more likely to evaluate it favorably.

PMUY does not support the predicted positive resource-feedback relationship. Negative associations persist most consistently for perceived benefits, whereas beneficiary-status results are narrower and more sensitive to small-cluster correction. Because the negative perceived-benefit relationship was not directly predicted, it should not be interpreted as confirmation that individualized benefits demobilize women. Subjective evaluations may reflect implementation

experience, perceived adequacy, household circumstances, prior political orientations, or broader views of government. Selection and reverse causality remain plausible. The more defensible theoretical conclusion is that material provision does not automatically become an autonomous political resource.

BRLP/JEEViKA provides conditional support for prospective organizational feedback but not for broader civic incorporation. Perceived benefits and reported program association are positively related to voting intention in separate and cross-program models, but only the local perceived-benefit association remains robust when its three dimensions are estimated jointly. More importantly, none of the relationships with meeting attendance, official contact, or political efficacy survives correction. The household-level beneficiary item also cannot establish that respondents personally participated in self-help groups. The findings therefore identify a positive prospective electoral orientation without demonstrating organizational learning, network formation, or expanded political agency.

The second contribution concerns measurement. Program recognition, subjective evaluation, and reported program association capture different citizen–policy relationships and cannot be treated as interchangeable indicators of exposure. Within-program models show that their associations are not always independently distinguishable, while cross-program same-dimension models assess whether a given relationship persists after accounting for corresponding relationships with other programs. The third contribution concerns outcomes. Relationships with voting intention do not extend consistently to previous voting, non-electoral engagement, or political efficacy. Prospective electoral orientation should therefore not be equated with broader political incorporation or behavioral change.

The programs should not be ranked according to these political associations. BBBP, PMUY, and BRLP/JEEViKA pursue different substantive objectives, and their welfare value does not depend on whether they increase political participation. The findings instead suggest that program evaluation should distinguish recognition, perceived usefulness, direct or household-level association, and institutional experience. Monitoring could examine whether participants understand entitlements, attribute policy experiences to identifiable institutions,

encounter responsive administration, and have opportunities to provide feedback or raise grievances. Material improvement, public recognition, collective organization, and political agency remain related but distinct dimensions of empowerment.

Limitations and Future Research

The study uses a cross-sectional pilot survey of 664 women across 15 sites in three purposively selected districts. The sample is not representative of Bihar, and the modest number of clusters limits statistical precision. CR2/Satterthwaite sensitivity analyses reduce reliance on conventional clustered inference but cannot overcome the limited number of independent sites. Previous voting may be affected by recall and social-desirability bias, while voting intention may not translate into turnout. The identical binary high-intention classifications across the three electoral levels constitute one sensitivity outcome rather than three independent replications.

The program-relationship measures also have important limitations. Beneficiary status has different institutional meanings across programs and was not verified through administrative records. BBBP does not provide standardized individual entitlement, and the BRLP/JEEViKA measure does not establish respondents' own participation in collective institutions. Because the BBBP beneficiary item named initiatives such as Sukanya Samriddhi Yojana, affirmative responses may reflect benefits from related girls' welfare schemes rather than exposure to BBBP itself. Perceived benefits are subjective evaluations that may reflect prior political orientations as well as program experience. The survey does not directly measure perceived public recognition, policy attribution, household bargaining, administrative encounters, group deliberation, organizational learning, or collective efficacy.

The observational models cannot eliminate reverse causality or residual confounding, and the supplementary IV estimates do not resolve these problems. PMUY's clustered first stage raises a weak-instrument concern; the BRLP/JEEViKA instrument has restricted support and may itself represent organizational contact; and BBBP slogans may influence political orientations independently of measured awareness. Because the specifications are exactly identified, their exclusion restrictions cannot be evaluated through overidentification tests. The IV estimates therefore remain conditional sensitivity evidence rather than causal estimates.

Finally, each program represents only one instance of its dominant interface. Differences may arise from policy purpose, eligibility, implementation history, and respondent composition as well as from advocacy-oriented, material, or organizational engagement. Larger representative and longitudinal studies should measure direct participation in program institutions, attribution of benefits, household decision-making, administrative experience, and subgroup heterogeneity. Comparisons across multiple programs within each interface or across implementation variation within the same program would provide stronger tests of mechanisms and causality.

Conclusion

This study shows that relationships between women-targeted policies and political participation vary across institutional interfaces, dimensions of citizens' program relationships, and political outcomes. The advocacy-oriented program displays the clearest positive interpretive-feedback pattern, while the individualized material program does not produce the positive association expected under a conventional resource account. The community-based program exhibits positive but conditional relationships with prospective voting and no robust extension to non-electoral participation or political efficacy. The most stable associations involve subjective program evaluations, while evidence concerning beneficiary status is more conditional. By examining these relationships in Bihar, the study highlights poverty, uneven administrative access, and gendered social relations as potential scope conditions for the translation of policy resources and meanings into political capacities. These findings refine policy feedback research in an explicit low-income and Global South context by showing why program recognition, evaluation, and reported association should be distinguished and why prospective voting intention should not be equated with broader political incorporation. Longitudinal and within-program research is required to establish whether these relationships become causal changes in women's democratic participation.

Data Availability Statement

The de-identified survey data and analysis code supporting this study are available from the corresponding author upon reasonable request.

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