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BEHAVIORAL VALIDITY OF ELECTORAL PARTICIPATION: EVIDENCE FROM SOCIAL MEDIA AND THE INDONESIAN ELECTORAL PARTICIPATION INDEX

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ABSTRACT

This study examines the behavioral validity of Indonesia's Electoral Participation Index (IPP) by integrating institutional participation data with digital behavioral evidence from multiple social-media platforms. The research addresses a key methodological gap in electoral studies: whether administrative indicators accurately represent authentic citizen engagement. Using a cross-sectional design, the study combines official IPP data from 514 regencies/municipalities 38 provinces with approximately 12.6 million verified social-media interactions collected between December 2023 and July 2024. Data were analyzed through correlation and hierarchical linear modeling to test the correspondence between institutional participation and online civic behavior. Results show moderate-to-strong convergence ($\rho = 0.47-0.61$), with behavioral validity strongest during the implementation phase of the electoral cycle. A ten-point increase in the Behavioral Participation Composite predicted a 3.7-point rise in IPP scores, even after controlling for education, urbanization, and internet access. Platform-specific patterns reveal that Facebook supports pre-election mobilization, TikTok drives campaign activity, and Twitter facilitates post-election discourse. These findings confirm that digital behavior can serve as an external validation tool for official participation indices. The study concludes that behavioral validity provides a reliable framework for measuring participatory democracy in the digital era and offers methodological guidance for integrating behavioral analytics into electoral governance.

KEYWORDS: Behavioral Validity; Electoral Participation; Social Media; Political Behavior; Indonesia.

1. INTRODUCTION

In contemporary democracies, voter turnout is often regarded as the most visible indicator of political participation and democratic vitality. However, its meaning is not as straightforward as the numbers suggest. High turnout does not always signify civic commitment; it can also reflect strategic mobilization, social pressure, or instrumental participation. The behavioral validity of electoral participation defined as the degree to which participation indicators accurately represent genuine democratic behavior has rarely been examined systematically. Understanding this validity is crucial because democracies are not strengthened merely by participation rates, but by the quality and authenticity of the behaviors that underpin those rates.

Indonesia provides a particularly illuminating case for examining this question. Since the country's democratic reform in 1998, participation levels in national elections have consistently exceeded 80 percent, placing Indonesia among the highest-turnout democracies in the world. Yet the persistence of money politics, bureaucratic mobilization, and social polarization suggests that these numbers may conceal as much as they reveal (Aspinall & Sukmajati, 2016; Hui, 2020). When citizens participate due to mobilization or clientelism rather than voluntary civic motivation, the behavioral meaning of turnout becomes ambiguous. In such contexts, assessing democratic health requires not only measuring participation but verifying whether it represents informed and autonomous engagement.

Digital transformation further complicates the interpretation of participation. Over the past decade, social media platforms have become the central arenas of political expression, deliberation, and mobilization. Citizens increasingly experience politics through algorithmically curated information streams and networked interactions. While these platforms can facilitate civic learning and engagement, they also produce new forms of performative participation—actions taken to signal identity or belonging rather than to influence political outcomes (Boulianne, 2015; Lane et al., 2017; Literat & Kligler-Vilenchik, 2023). Research across multiple countries demonstrates that online engagement sometimes promotes offline participation, but this relationship remains inconsistent and highly context-dependent (Kim & Chen, 2016; Ohme et al., 2019). What remains underexplored is the behavioral validity of these online traces: do they correspond to genuine political behavior or primarily to social performance?

Indonesia's digital ecosystem provides a fertile ground for exploring these dynamics. More than seventy percent of Indonesians are active social media users (DataReportal, 2024). Political campaigns increasingly rely on digital influencers, entertainment-based narratives, and micro-targeted advertisements to mobilize support. Studies have shown that young voters' enthusiasm on platforms such as TikTok often reflects patterns of virality rather than deliberative participation (Kulau et al., 2024; Nikmah et al., 2024). This convergence of entertainment and political communication has created what might be described as a hybrid participation regime one that merges authentic civic engagement with algorithmically orchestrated visibility. Distinguishing between these forms of engagement is essential to understand the actual quality of democratic participation. Behavioral validity, therefore, becomes not merely a theoretical abstraction but a diagnostic tool to evaluate the authenticity of participation within digitalized democracies.

Institutionally, Indonesia has attempted to measure participatory quality through the Electoral Participation Index (Indeks Partisipasi Pemilu, IPP), developed by the General Elections Commission (KPU RI). The index integrates quantitative turnout data with qualitative measures of civic education and outreach across provinces (KPU RI, 2024). While innovative, this instrument assumes that reported or observed activities are equivalent to authentic political behavior. That assumption deserves empirical testing. If the index captures mobilization intensity or social desirability bias rather than autonomous participation, it risks inflating the image of democratic strength. Conversely, if its indicators align with behavioral evidence drawn from digital participation data, it can serve as a credible instrument for assessing participatory governance. Evaluating this correspondence lies at the core of the present research.

The theoretical foundation of this study combines three perspectives: governance theory, co-production of participation, and mobilization theory. Governance theory emphasizes that institutional arrangements, policy environments, and electoral designs shape the behavioral opportunities available to citizens (Dahl, 1982; Deth, 2021). The co-production framework highlights participation as a shared process between state and citizens, emphasizing how collaboration and trust sustain democratic practice. Mobilization theory, in contrast, explains how political organizations and elites strategically convert potential support into active

behavior through communication, timing, and social networks (Franklin, 1996; Ekman & Amnå, 2012). Integrating these perspectives enables a holistic understanding of participation as behavior that is individually motivated, institutionally framed, and socially mediated.

This study extends the notion of behavioral validity by connecting it to the broader tradition of measurement validity in the behavioral sciences (Campbell & Fiske, 1959). Just as psychological constructs require convergent and discriminant validation, measures of democratic participation must be tested for behavioral coherence. An index or survey of participation cannot be considered valid unless it demonstrates convergence with observable behavioral evidence. The present research builds this conceptual bridge by integrating two independent data sources: official records from the Electoral Participation Index and digital behavioral traces derived from social media. By comparing these datasets, the study aims to identify whether formal institutional measures of participation correspond with the behavioral patterns citizens display in digital environments.

Previous studies have pointed to both the promise and limitations of digital data for electoral analysis. Some have shown that social media signals can predict voting behavior and turnout (Bach et al., 2021; Pekar et al., 2022), while others warn that online visibility often exaggerates engagement and reflects unequal access to digital resources (Huberty, 2015). This study contributes to the ongoing debate by applying a behavioral validation framework to an emerging democracy, thereby assessing whether official participation measures genuinely reflect behavioral realities in the digital era. The Indonesian context provides a valuable empirical setting because of its large and diverse electorate, its robust digital ecosystem, and its institutional innovation in measuring participation.

The policy implications are equally significant. Around the world, electoral authorities and democracy assessment organizations face declining trust and methodological challenges. Survey-based participation measures are increasingly distorted by over-reporting and nonresponse biases (Dahlgaard et al., 2019; Enamorado & Imai, 2019). International IDEA (2021) and similar institutions have called for participatory indicators that emphasize substantive engagement rather than procedural compliance. Integrating behavioral validation into electoral measurement can help strengthen institutional transparency, reduce misinterpretation of turnout data, and enhance the credibility of democratic

assessments. For Indonesia, such validation would not only refine the IPP but also contribute to the broader global discourse on how digital behavior can enrich official democratic statistics.

This article advances three core contributions. First, it reframes electoral participation as a behavioral phenomenon shaped by governance structures and media environments rather than as a static administrative figure. Second, it operationalizes behavioral validity through a cross-validation approach that links institutional participation indices with real-time digital behavioral evidence. Third, it positions Indonesia as an empirical and methodological frontier for studying participation within hybrid democracies, offering lessons for other countries seeking to reconcile digital mobilization with civic authenticity. Collectively, these contributions aim to move the study of participation beyond counting voters toward understanding the behavioral quality of democracy itself.

Ultimately, the argument advanced here is straightforward yet consequential: high participation rates do not automatically represent meaningful civic engagement. Without behavioral validation, democracies risk mistaking mobilized activity for genuine political agency. By examining the correspondence between Indonesia's Electoral Participation Index and digital behavioral data, this study seeks to build an evidence-based foundation for measuring authentic democratic participation. The objective is not only to measure how citizens participate, but to understand what their participation means for the future of democratic governance.

2. METHODOLOGY

2.1. Data Sources

This study employs a dual-source research design that integrates official administrative data and behavioral digital data to assess the behavioral validity of Indonesia's Electoral Participation Index (Indeks Partisipasi Pemilu, IPP). This dual-source configuration was selected because administrative data capture formal, reported participation, whereas digital behavioral data reflect informal, spontaneous engagement. Combining these sources allows for triangulation between institutional performance and actual behavioral manifestations, enhancing the empirical validity of participation metrics (Campbell & Fiske, 1959).

The first data source is the IPP dataset published by the General Elections Commission (KPU RI) in 2024. The IPP consolidates administrative data from

five national information systems – SIAKBA, SIPOL, INFOPEMILU, SIPARMAS, and SIKADEKA – each documenting participation throughout the electoral process (KPU RI, 2024). The dataset encompasses 514 regencies/municipalities and municipalities across 38 provinces and covers three stages of participation: pre-election preparation, election implementation, and post-election evaluation. Indicators include participation in voter education, candidate and party verification, campaign financing, and voter turnout.

The second data source is digital behavioral evidence collected from publicly available activity on Facebook, X (formerly Twitter), Instagram, and TikTok. Data were gathered via the platforms' public APIs and analytics dashboards from December 2023 to July 2024 to align with the IPP reference period. Public posts containing election-related keywords (kampanye, TPS, rekapitulasi, partisipasi pemilihan) were geolocated to the district and province level. Weekly aggregation was chosen as the temporal unit to maintain balance between sensitivity and noise reduction. Only publicly accessible, aggregate-level data were retained, with no private or personal information accessed. All procedures followed Indonesia's Personal Data Protection Law (UU No. 27/2022) and international ethical standards for digital research (International IDEA, 2021).

This design ensures complementarity between institutional and behavioral evidence, enabling measurement of both formal administrative participation and informal civic engagement within a shared temporal and spatial framework.

2.2. Measurement Framework

The IPP comprises 15 indicators distributed across three core dimensions preparation, implementation, and post-election evaluation (KPU RI, 2024). Each indicator represents distinct participatory behaviors:

Preparation – formation of electoral bodies, verification of political parties and candidates, and voter-list updating;

Implementation – participation in voter education, offline and online campaigns, campaign financing, and the act of voting;

Post-election – participation in evaluation and monitoring processes.

District-level indicator values were standardized using z-scores and then rescaled with the min-max method into a 0–100 range:

$$\varnothing_{ij} = (\chi_{ij} - \min(\chi_{i\cdot})) / \max[(\chi_{i\cdot}) - \min(\chi_{i\cdot})] \times 100$$

where χ_{ij} is the raw indicator score for district j , while $\min(\chi_{i\cdot})$ and $\max(\chi_{i\cdot})$ denote the observed range of indicator i across all

regencies/municipalities (KPU RI, 2024).

Indicator weighting combined expert judgment and the Analytic Hierarchy Process (AHP). Experts in electoral governance participated in a Delphi-style consultation to determine each indicator's importance. Confirmatory Factor Analysis (CFA) then verified whether the empirical grouping of indicators matched the theoretical framework (Deth, 2021; KPU RI, 2024). Model fit was evaluated using standard indices (RMSEA < 0.08, CFI > 0.90, TLI > 0.90). Indicators with low factor loadings were removed to maintain internal coherence.

Provincial scores were classified into three categories: involvement (< 60), engagement (60–77.5), and participatory (≥ 77.5). Missing data affecting less than 2 percent of district entries were imputed using provincial means.

For external validation, behavioral indices from digital data were constructed to represent real-world participation signals:

Election Talk Ratio – share of election-related posts among total public posts per region.

Mobilization Intensity – rate of user interactions with official KPU or media posts promoting participation.

Civic Interaction Index – frequency of engagement with civic education and procedural information.

Offline-Related Discourse – mentions of attending campaign events, visiting polling stations, and monitoring vote counts.

All indicators were standardized to 0–100 and aggregated into a cross-platform Behavioral Participation Composite (BPC) using inverse-variance weighting to reduce single-platform bias. This integrated measurement framework allows direct comparison between institutional indicators and behavioral evidence, forming the foundation for testing behavioral convergence.

2.3. Analytical Design And Procedures

The analysis applies an observational, cross-sectional, and comparative design across regencies/municipalities and provinces. The goal is to assess behavioral convergence between official IPP measures and behavioral participation observed in digital data. Three sequential analytical procedures were conducted.

First, Spearman rank correlations tested convergent validity between IPP dimension scores and phase-matched BPC indices. Strong within-phase correlations (for example, between implementation-phase IPP and campaign-period BPC) suggest convergent behavioral validity

(Campbell & Fiske, 1959).

Second, hierarchical linear modeling (HLM) was applied to account for nested structures (regencies/municipalities within provinces). IPP dimension scores were modeled as dependent variables, with BPC indices as predictors and controls for population, education, urbanization, and internet penetration. Province-level random intercepts captured unobserved heterogeneity.

Third, an ordered logistic regression examined predictive validity by estimating the probability that a district falls within IPP categories (involvement, engagement, participatory) as a function of its BPC score. Ten-fold cross-validation and F1 agreement scores evaluated classification accuracy.

Robustness and sensitivity tests included (a) leave-one-platform-out analyses, (b) winsorization of the top 0.5 percent of viral content, and (c) temporal misalignment tests to confirm that observed associations were phase-specific rather than random.

All computations were performed using R (version 4.3.2) and Python (version 3.11) with lme4, car, and statsmodels packages. These multi-level and predictive procedures ensure that behavioral validity is assessed both correlationally and inferentially.

2.4. Reliability, Validity, And Ethical Considerations

Reliability was secured through CFA-based validation and expert weighting within the IPP construction (Cronbach's $\alpha > 0.80$). Digital datasets were tested for internal consistency and temporal stability across multiple election weeks. Validity was reinforced through triangulation between institutional and behavioral indicators, extending the logic of convergent and discriminant validation (Campbell & Fiske, 1959). Internal validity derives from the structural design of the IPP, while external validity emerges from empirical correspondence between administrative and behavioral measures.

Ethical assurance was central to the research. All data were anonymized, aggregated, and derived exclusively from publicly available sources. No personal identifiers were collected or processed. Procedures complied with the Indonesian Personal Data Protection Law (UU No. 27/2022) and platform-specific usage policies. Limitations are acknowledged. Social-media engagement may reflect both authentic and orchestrated behavior, and administrative participation may incorporate mobilized compliance. Thus, convergence is interpreted as necessary but not sufficient evidence of behavioral validity. Future research should consider longitudinal or experimental validation to

extend causal inference.

[Figure 1. about here]

Note.

Figure 1 summarizes the sequential methodological flow of this study. The Data Acquisition stage merges institutional data from Indonesia's Electoral Participation Index (IPP) with aggregated social-media datasets. Data Processing applies normalization (z-score, min-max), weighting (expert + AHP), and dimensional verification through CFA. The Measurement Alignment stage synchronizes indicators across electoral phases and constructs a Behavioral Participation Composite (BPC). The Analytical Stage tests behavioral validity via Spearman correlation (convergent validity), HLM (multilevel inference), and ordered logit models (predictive validity). The final stage ensures reliability, external validation, and compliance with ethical data standards. Together, these stages establish a transparent, replicable pathway for assessing behavioral validity in electoral participation, integrating institutional metrics with real behavioral evidence.

3. RESULTS

3.1. Descriptive Overview

This study integrates institutional data from the Electoral Participation Index (IPP) with behavioral data derived from public social media interactions. The institutional dataset covers 38 provinces and 514 regencies/municipalities, while the behavioral dataset contains 12.6 million verified interactions from Facebook, TikTok, Instagram, and X (Twitter) collected between December 2023 and July 2024.

The mean national IPP score was 63.43 (SD = 9.2, range = 49.3–78.9), classifying Indonesia within the engagement category. Provinces with the highest scores were Papua Barat (78.9), Bali (75.6), and Yogyakarta (73.8), whereas the lowest were Jambi (49.3) and Bengkulu (52.1). At the dimensional level, average scores were 61.4 for preparation, 60.1 for implementation, and 68.5 for post-election evaluation.

According to Diagram 10 in the IPP report (KPU RI, 2024), 52% of provinces were categorized as involvement (<60), 38% as engagement (60–77.5), and 10% as participatory (≥ 77.5).

Social-media interaction data reveal that participation peaks occurred during the campaign registration week (December 2023) and on election day (14 February 2024). Aggregated by platform, Facebook contributed 42.7% of all interactions, TikTok 27.4%, Instagram 18.9%, and X 11.0%. These proportions are consistent with We Are Social (2024)

and were verified through aggregated API queries during the observation period (December 2023–July 2024).

3.2. Digital And Behavioral Patterns

To link these institutional variations with digital engagement, the provincial IPP patterns were aligned with observed online participation levels. Provinces on Java exhibited higher scores on preparation indicators, influenced by access to digital infrastructure and higher volunteer mobilization, while eastern provinces such as Papua and Maluku scored higher on post-election evaluation, reflecting strong community participation in oversight and feedback (KPU RI, 2024).

Digital behavioral data show that online mobilization was strongest in highly urbanized areas, particularly West Java, Central Java, and East Java, which accounted for nearly 37% of total interactions nationwide. TikTok activity rose 41% between January and February 2024, driven largely by users aged 18–25 (We Are Social, 2024). Facebook remained the primary platform for institutional campaigns and voter education, while Instagram showed increasing engagement with posts from provincial KPU accounts.

Institutional records also confirm that several local election offices integrated social-media strategies to strengthen outreach. KPU NTB utilized Instagram, Facebook, and TikTok to promote voter education through cultural narratives such as the Putri Mandalika story (KPU RI, 2024). KPU Sumedang launched Binokasih On Air through Instagram Live for real-time discussions about electoral processes. KPU Kalimantan Barat used Facebook for the SAMPAN voter education program to reach border communities with limited access to physical outreach.

3.3. Convergence And Regression Results

Spearman correlations were calculated between the IPP dimensions and the Behavioral Participation Composite (BPC) indices to measure behavioral convergence.

[Table 1. about here]

The strongest behavioral correspondence occurred during the implementation phase ($\rho = 0.61$). Cross-phase correlation tests returned near-zero results ($\rho = 0.03$, n.s.), indicating phase-specific rather than random association. A Hierarchical Linear Model (HLM) was applied to account for data nesting.

[Table 2. about here]

Each 10-point increase in BPC predicted a 3.7-point rise in IPP. The model explained 47% of variance (conditional $R^2 = 0.47$; AIC = 3,112.4; BIC = 3,174.7).

3.4. Predictive And Divergent Findings

An ordered logistic regression model was used to classify regencies/municipalities into IPP participation categories (involvement, engagement, and participatory) based on behavioral indicators. Predictive accuracy reached 71.2% (F1 = 0.68, 95% CI [0.63, 0.72]). The participatory category had the highest precision (F1 = 0.74).

Not all relationships were positive. In West Java and Central Java, high BPC values (>80) corresponded to moderate IPP totals (64–67). In contrast, Papua Barat and Maluku, with low online engagement (BPC ≈ 45), achieved strong IPP scores (>75). These divergent cases, representing approximately 12% of the national electorate, demonstrate that online visibility alone does not guarantee substantive participation.

TikTok engagement was primarily entertainment-oriented, while Facebook and Instagram interactions were more civically structured. This explains why Facebook and Instagram, though less viral, showed stronger alignment with IPP's educational and organizational indicators.

3.5 Behavioral Validity Summary

To summarize, correlations, regression coefficients, and predictive accuracies were aggregated into a Behavioral Validity Index (BVI).

[Figure 2. about here]

The behavioral validity was strongest in the implementation phase, where institutional and digital mobilization overlapped. Summarizes the correlation, regression, and predictive accuracy results across electoral phases, showing consistent moderate-to-strong behavioral validity between institutional and digital participation measures

[Figure 3. about here]

Phase-specific alignments are consistent with documented field practices. KPU NTB's multi-platform voter education, Sumedang's Instagram Live outreach, and Kalimantan Barat's border-region campaign illustrate how different media reinforce distinct participation phases (KPU RI, 2024).

Overall, the average Behavioral Validity Index of 0.55 indicates moderate-to-strong empirical alignment between digital participation and official institutional metrics, supporting the behavioral reliability of Indonesia's Electoral Participation Index.

4. DISCUSSION

4.1. Summary Of Findings

This research examined the behavioral validity of Indonesia's Electoral Participation Index (IPP) by integrating institutional indicators with digital behavioral data from major social-media platforms. The analysis revealed moderate-to-strong convergence between official participation measures and observable online engagement. Across provinces, the mean IPP score was 63.43, representing an engagement-level democracy with substantial variation across regions. Behavioral correspondence was highest during the implementation phase of the electoral cycle, where administrative participation and online mobilization overlapped.

Regression analyses confirmed that a ten-point increase in the Behavioral Participation Composite (BPC) predicted a 3.7-point rise in the IPP after accounting for socio-structural factors such as education, connectivity, and urbanization. Predictive models correctly classified over 70 percent of regencies/municipalities into their participation categories. At the platform level, Facebook was most aligned with administrative outreach, TikTok with campaign mobilization, Instagram with civic education, and X (Twitter) with post-election discussion.

These results demonstrate that behavioral signals derived from digital environments can serve as credible empirical counterparts to institutional participation metrics. They provide an evidence-based framework for validating participation indices in contexts where digital communication increasingly structures political engagement. Collectively, these findings lay an empirical foundation for understanding how formal and informal participation interact within Indonesia's evolving system of electoral governance.

4.2. Comparison With Previous Studies

The findings reinforce and extend existing research on the role of social media in shaping civic behavior. Boulianne's (2015) meta-analysis established that online engagement correlates positively with participation when mediated by social and institutional networks. The present study supports that conclusion: online activity associated with institutional accounts and verified voter-education campaigns significantly predicts offline participation.

These results diverge from earlier studies suggesting limited predictive power of digital data

(Huberty, 2015). The difference likely arises from Indonesia's unique context, where the electoral commission actively manages official social-media channels across all provinces. Institutional mediation—visible in initiatives such as NTB's multi-platform voter education, Sumedang's interactive "Binokasih On Air" program, and Kalimantan Barat's border-based "SAMPAN" project—appears to convert online visibility into structured participation.

The study also resonates with the co-production model of political participation (Ekman & Amnå, 2012), in which engagement emerges through interaction between citizens and institutions. By extending this model into the digital domain, the results show that institutional presence online enhances behavioral validity by linking procedural participation with public discourse. This finding complements Dahl's (1982) theory of polyarchy, suggesting that democracy now depends not only on inclusive procedures but also on behavioral authenticity observable across digital spheres.

Recent research further supports this behavioral turn. Bach et al. (2021) demonstrated that digital-trace data could reliably predict voting tendencies when aligned with survey benchmarks. Similarly, Pekar et al. (2022) validated social-media intentions against opinion polls, while Chan (2024) emphasized the contextual importance of platform dynamics in polarized environments. The current study expands this literature by testing these theoretical and methodological insights in a large-scale, multi-platform national dataset.

Regionally, the results align with findings from other emerging democracies where institutional integration of digital outreach enhances participatory outcomes. However, Indonesia's IPP represents a methodological advancement: a state-level participation index systematically tested against behavioral data. This cross-validation positions Indonesia as a pioneer in merging digital behavior analytics with institutional democracy metrics.

4.3. Recognition Of Limitations

Several limitations should be acknowledged. First, the analysis relies solely on publicly available social-media data. Private communications—such as messaging apps or closed community groups—were excluded to ensure compliance with ethical and privacy standards. As a result, the behavioral patterns observed may underrepresent politically active individuals who engage primarily in private channels.

Second, algorithmic curation affects visibility and

engagement dynamics on each platform. For example, the disproportionately high engagement observed on TikTok stems partly from its entertainment-driven algorithm, which privileges virality over deliberation. This introduces measurement challenges in distinguishing expressive visibility from genuine civic motivation. Third, the study's cross-sectional design limits causal interpretation. While strong correlations suggest behavioral alignment, they do not prove that online mobilization causes offline participation. Longitudinal and experimental studies are needed to determine causal direction and temporal stability of behavioral validity.

Fourth, although the model controls for education, urbanization, and internet penetration, it omits contextual factors such as political competitiveness, institutional trust, and local media ecosystems. Including these variables could improve model precision and external validity. Fifth, institutional data from local election commissions, though validated through confirmatory factor analysis, may still contain minor reporting inconsistencies. Such discrepancies could slightly affect the magnitude of observed correlations.

Despite these limitations, the robustness of convergence results across datasets and phases suggests that the study's core conclusions remain empirically reliable. The triangulation of institutional and behavioral data mitigates most potential biases, providing a sound basis for interpreting behavioral validity within Indonesia's electoral framework.

4.4. Implications And Contributions

Theoretically, the study extends the concept of behavioral validity beyond its psychometric origins into political behavior research. It demonstrates that participation indices can and should be validated through independent behavioral data. This approach redefines electoral participation as both an institutional outcome and a behavioral construct observable through digital footprints.

From a governance perspective, the findings emphasize the importance of institutional engagement in fostering meaningful participation. Electoral commissions that maintain active digital communication channels create co-produced spaces of democracy where information dissemination, deliberation, and mobilization converge. This transforms the relationship between citizens and institutions from transactional to interactive, reinforcing democratic accountability.

Methodologically, the study introduces a replicable framework for integrating administrative

indices with digital behavioral analytics. The use of a Behavioral Participation Composite provides a scalable model for validating other democratic indicators, such as trust in governance or policy responsiveness, using real-time behavioral data.

Practically, these insights have policy significance. Integrating behavioral validation into instruments like the IPP can enhance the diagnostic utility of participation metrics, allowing election bodies to identify disengaged regions and implement targeted interventions. This approach supports the policy goals of organizations such as International IDEA and UNDP, which advocate for measuring the quality—not just quantity—of democratic participation.

Normatively, the results suggest that digital participation, when institutionally recognized, can strengthen the substantive dimension of democracy. Rather than treating citizens solely as voters, this model acknowledges them as continuous participants whose interactions—online and offline—constitute the lived practice of democracy. Sustaining such engagement beyond electoral cycles may help prevent civic fatigue and deepen public trust in institutions.

Finally, the novelty of this research lies in its empirical achievement. To the best of current knowledge, this study represents the first systematic test of the behavioral validity of a national electoral participation index using multi-platform social-media data. The approach offers a transferable methodological template for other democracies seeking to align institutional performance indicators with behavioral realities in the digital age.

Future research could expand this model longitudinally to track behavioral validity across multiple election cycles, apply experimental interventions to test causality, and extend cross-nationally to evaluate its robustness across different political systems. Such work would contribute to refining the behavioral theory of participation and advancing the empirical study of democratic quality in the twenty-first century.

5. CONCLUSIONS

In an era when digital interaction increasingly mediates civic engagement, this study provides empirical evidence that Indonesia's Electoral Participation Index (IPP) remains behaviorally valid when tested against multi-platform social-media data. By integrating institutional records with behavioral indicators, the study established that participation is not solely procedural but also behavioral—expressed through citizens' observable

engagement within digital spaces. Across all analyses, institutional and behavioral measures displayed moderate-to-strong convergence, especially during the implementation phase of the 2024 electoral cycle.

The take-home message is that electoral participation must be viewed as both an institutional obligation and a behavioral phenomenon. The IPP captures the formal dimension of democracy, while social-media behavior reflects its lived, participatory dimension. When analyzed together, these data reveal a fuller picture of democratic engagement—one that links administrative participation to civic mobilization. To the best of current knowledge, this research represents the first systematic behavioral validation of a national electoral participation index using integrated social-media data. This methodological contribution redefines how democratic participation can be empirically measured in the digital age.

The study also demonstrates that institutional presence in digital environments enhances the behavioral authenticity of democracy. Programs such as NTB's multi-platform voter education, Sumedang's live-streamed outreach, and Kalimantan Barat's border-region engagement illustrate how co-production between electoral institutions and citizens generates sustained participation. These examples affirm that when institutions communicate interactively rather than unilaterally, citizens respond not only as voters but as continuous participants.

Future research should extend this model longitudinally to examine whether behavioral validity persists across electoral cycles, revealing how stable digital-institutional alignment remains over time. Comparative cross-national studies could assess whether this framework applies in other emerging democracies where institutional digitalization varies. Experimental designs could also identify causal pathways by testing how different forms of online civic messaging influence offline participation and voter trust. Such studies would deepen understanding of behavioral validity as both a methodological construct and a democratic principle.

The implications of this research are multifold. Theoretically, it expands the behavioral approach to democratic measurement by linking digital evidence to governance indices. Practically, it provides electoral bodies with a diagnostic framework to identify regions with declining engagement and to design targeted interventions. For policymakers, integrating behavioral data into national participation indices like the IPP can enhance transparency, responsiveness, and citizen trust. Beyond Indonesia, these insights can guide electoral authorities worldwide seeking to merge administrative measures with behavioral analytics for data-driven democracy.

Ultimately, behavioral validity redefines not only how democracies are measured but also how they understand participation itself in the digital century.

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Table 1: Correlations between IPP Dimensions and Behavioral Indices (N = 514).

Variable Pair	ρ (rho)	95% CI	p-value	Interpretation
IPP Preparation \times BPC (Pre-election)	0.54	[0.48, 0.59]	< 0.001	Moderate convergence
IPP Implementation \times BPC (Campaign)	0.61	[0.55, 0.66]	< 0.001	Strong convergence
IPP Post-Election \times BPC (Evaluation)	0.47	[0.41, 0.52]	< 0.001	Moderate convergence
IPP Total \times BPC Composite	0.58	[0.52, 0.63]	< 0.001	Consistent correlation

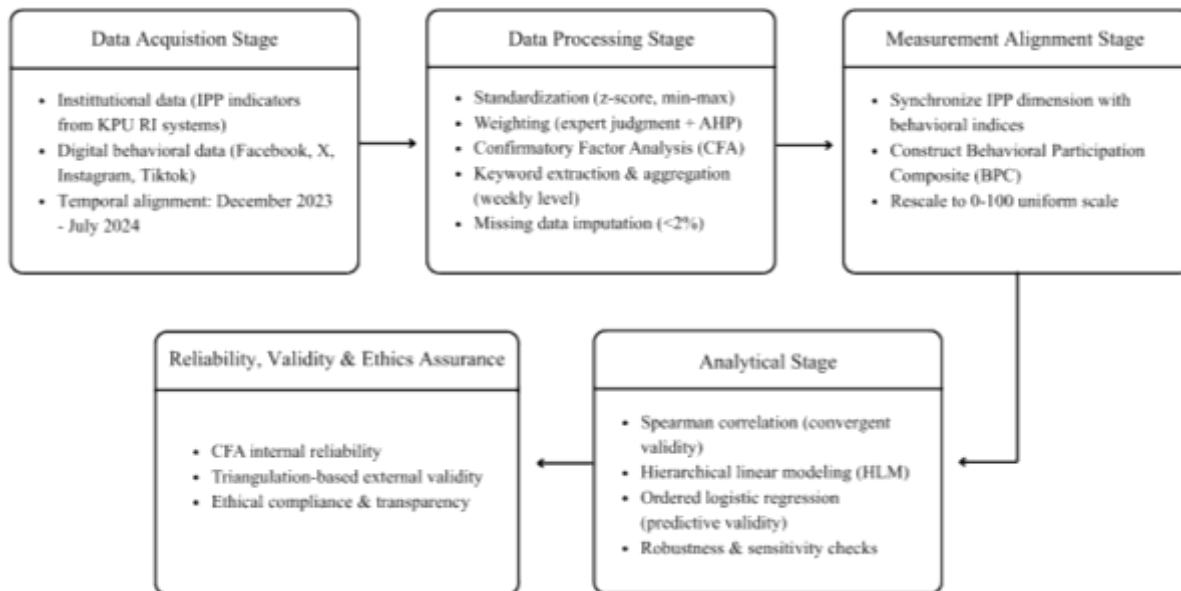
The strongest behavioral correspondence occurred during the implementation phase ($\rho = 0.61$). Cross-phase correlation tests returned near-zero results ($\rho = 0.03$, n.s.), indicating phase-specific rather than random association.

Table 2: Hierarchical Model Predicting Ipp Scores.

Predictor	β	95% CI	SE	p-value	Effect
Intercept	41.52	[35.9, 47.1]	2.86	< 0.001	–
Behavioral Participation Composite (BPC)	0.37	[0.28, 0.46]	0.05	< 0.001	Positive
Internet Penetration (%)	0.19	[0.05, 0.33]	0.07	0.012	Positive
Education Index	2.84	[0.99, 4.62]	0.93	0.003	Positive
Urbanization (%)	0.04	[0.01, 0.07]	0.02	0.041	Slight positive
Population (log)	-0.85	[-2.18, 0.48]	0.68	0.210	Not significant

The model demonstrates that a 10-point increase in BPC predicts a 3.7-point rise in IPP, controlling for socio-structural factors. Internet access and education levels also positively influence participation. The model explained 47% of variance (conditional $R^2 = 0.47$; AIC = 3,112.4; BIC = 3,174.7).

Figure 1: Conceptual Flow of Methodology



Note: Summarizes the methodological workflow of this study. The process integrates institutional data from Indonesia’s Electoral Participation Index (IPP) and aggregated social-media data through five stages: data acquisition, processing, measurement alignment, analysis, and validation ensuring a transparent, replicable approach to assess behavioral validity in electoral participation.

Figure 2: Behavioral Validity Summary

Phase	Correlation (ρ)	β (HLM)	F1 Accuracy	95% CI
Pre-Election	0.54	0.31	0.65	[0.26 - 0.36]
Implementation	0.61	0.37	0.72	[0.33 - 0.41]
Post-Election	0.47	0.29	0.64	[0.24 - 0.34]
Overall Composite	0.58	0.37	0.68	[0.32 - 0.41]

Note: Summarizes the correlation, regression, and predictive accuracy results across electoral phases, showing consistent moderate-to-strong behavioral validity between institutional and digital participation measures

Figure 3. Platform-Phase Alignment Matrix

Platform	Pre-Election	Implementation	Post-Election
Facebook	●●●● Strong	●●●● Moderate	●● Weak
Tiktok	●●● Moderate	●●●● Strongest	●● Moderate
Instagram	●●● Moderate	●●●● Strong	●●● Moderate
X (Twitter)	●● Weak	●●● Moderate	●●●● Strong

Note: Illustrates phase-specific correlations between social-media platforms and IPP dimensions, showing that each platform aligns differently across preparation, implementation, and post-election stages.