

The Algorithmic Looking-Glass: A Predictive Model of How Digital Acculturation and Perceived Algorithmic Bias Impact the Well-being of Thailand's Tai Dam Minority

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Abstract

In an era of digital proliferation, ethnic minorities face unique challenges in maintaining psychological well-being within algorithmically mediated environments that often reflect and amplify mainstream culture. This study addresses the urgent need to understand how interactions with technological systems, rather than just interpersonal contact, shape the mental health of minority individuals. This mixed-methods study examines the factors that influence the psychological well-being of Thailand's Tai Dam ethnic minority. Drawing on acculturation and social identity theories, the research employed Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze survey data from 450 participants, recruited via purposive sampling, complemented by a one-year digital ethnography, to test a predictive model. The study introduces and validates a new construct, Perceived Algorithmic Bias (PAB), which refers to a user's perception that a platform's algorithm systemically suppresses or negatively represents their cultural content, measured using a newly developed scale based on preliminary qualitative work. The resulting model, which explained 53.8% of the variance in well-being, revealed a critical paradox. While a strong ethnic identity positively predicts psychological well-being ($\beta = 0.258, p < 0.001$), this benefit is significantly undermined by PAB, the model's most potent negative predictor ($\beta = -0.491, p < 0.001$). The model demonstrates that a stronger orientation toward mainstream digital culture significantly increases PAB ($\beta = 0.515, p < 0.001$). This finding uncovers a "digital cost of engagement," where participating in the dominant digital culture paradoxically exposes minorities to unique technological stressors, challenging traditional acculturation models. Qualitative findings of a "digital hearth" illustrate how online communities reinforce identity, while feelings of "algorithmic invisibility" confirm the distressing experience of PAB. The study presents a validated predictive framework for minority digital well-being, establishing PAB as a critical factor in global intercultural relations and providing clear implications for culturally aware platform design and mental health support.

Keywords: Perceived algorithmic bias, Digital acculturation, Ethnic identity, Psychological well-being, Tai Dam, Thailand

Introduction

The proliferation of digital technologies has fundamentally reshaped the landscape of intercultural relations, particularly for ethnic minorities and Indigenous communities within nation-states. Online platforms serve as dual-edged swords for groups navigating the complexities of maintaining a distinct cultural heritage while living within a dominant society.

They are vital spaces for cultural preservation, language revitalization, and community connection, yet they are also arenas of exposure to mainstream culture, mediated by opaque and powerful algorithms. While traditional acculturation studies, such as the foundational framework developed by Berry (2005), focus on person-to-person contact, there is an urgent need to understand

how interactions with technological systems, specifically platform algorithms, shape the adaptation process and mental health of minority individuals worldwide (Saldaina, 1994).

This challenge is a global phenomenon that transcends specific platforms and national borders. Academic literature has often defaulted to a normative user, implicitly assumed to be white, Western, and middle-class, thereby obscuring the unique experiences of marginalized populations. A more inclusive, mosaic approach reveals a consistent pattern of digital friction. Indigenous groups, such as the Sámi in Europe and Aboriginal and Torres Strait Islander peoples in Australia, leverage social media for cultural preservation and activism, creating “affective archives” to counter colonial narratives. However, they concurrently face algorithmic marginalization, where their content is suppressed or rendered invisible (Karimi et al., 2022). They confront the risk of “digital colonization” as their cultural products are decontextualized or misappropriated by the logic of platforms. Similarly, immigrant and diaspora communities, from Latinos in the Americas to various European groups, rely on these platforms for acculturation and social support (Sun et al., 2016). However, they are often disproportionately exposed to misinformation and biased content moderation because platforms are ill-equipped to handle linguistic diversity and cultural nuance, creating systemic blind spots (Bravo et al., 2019).

A common thread uniting these disparate experiences is the feeling of being systematically misrepresented, suppressed, or harmed by platform algorithms. Users are developing “folk theories” that these systems are not neutral arbiters of content but are instead extensions of a dominant cultural gaze that systematically marginalizes minority voices (Pérez & Passini, 2012). This study conceptualizes Perceived Algorithmic Bias (PAB) as a novel form of acculturative stress that traditional models fail to capture.

This research utilizes the Tai Dam in Thailand as a rich case study to model this global dynamic empirically. The Tai Dam, a group with a distinct cultural heritage rooted in specific traditions, collectivist values, and a migration history, actively uses platforms like Facebook and LINE to sustain its community. Their emphasis on community harmony and collective

identity provides a critical lens for studying PAB; unlike in more individualistic Western contexts, perceived bias against their cultural content is more likely to be interpreted as a threat to the entire group, potentially magnifying its psychological impact. Their emphasis on community harmony often clashes with the individualistic and polarizing nature of social media platforms, which are typically designed in Western contexts. Their experience provides a focused lens to investigate the interplay between culture, technology, and well-being.

To address this gap, this study develops and tests a predictive model that answers the central research question: To what extent do acculturation orientations, ethnic identity, and perceived algorithmic bias predict the psychological well-being of Tai Dam social media users? Given the exploratory nature of modeling a new construct like PAB and the focus on identifying key predictors of well-being, Partial Least Squares Structural Equation Modeling (PLS-SEM) was chosen as the analytical method. PLS-SEM is a prediction-oriented approach that is well-suited for developing new theories by exploring complex relationships and maximizing the explained variance of target constructs (Hair et al., 2019). It performs robustly with non-normal data and newly developed scales, which are standard in intercultural survey research (Cepeda-Carrión et al., 2022). Through a sequential explanatory mixed-methods design, the robust statistical findings from the PLS-SEM model are explained and contextualized by rich qualitative data from a year-long digital ethnography, providing a comprehensive view of this critical issue in contemporary intercultural relations (Kurtaliqui et al., 2024).

Theoretical background and hypotheses development

This study is grounded in a synthesis of Berry’s acculturation framework, Social Identity Theory, and emerging critical work on algorithmic culture. By integrating these perspectives, this research develops a multi-layered theoretical model to explain and predict the well-being of minorities in digital spaces.

Acculturation in the digital age: Beyond Berry's Framework

The foundational model of acculturation, proposed by Berry (2005), categorizes individual adaptation strategies based on two dimensions: the desire to maintain one's heritage culture and the desire to engage with the host culture. This framework yields four primary strategies: Assimilation (adopting the host culture while rejecting one's heritage culture), Separation (maintaining one's heritage culture while rejecting the host culture), Integration (maintaining one's heritage culture while also adopting the host culture), and Marginalization (rejecting both cultures) are the strategies outlined in this model (Adrados, 1997). The Integration strategy, often associated with biculturalism, has consistently been linked to the most favorable psychological outcomes (Tartakovsky, 2025).

However, Berry's model was premised on physical-world interactions. The rise of the internet necessitates a conceptual update to "digital acculturation," where the online environment serves as a distinct "host" culture with its own unique norms, power structures, and gatekeepers (Makarova & Birman, 2015). Social media platforms are not neutral conduits; rather, they are curated spaces where algorithms govern user interaction. This technological mediation complicates the straightforward benefits of an Integration strategy (Wu & Mak, 2012). While users may seek to engage with the dominant digital culture (an aspect of Integration), this act exposes them to novel stressors and biases embedded within the platform's architecture. This study posits that in the digital realm, the strategy of mainstream engagement may carry a significant psychological cost, a paradox that traditional acculturation theory does not fully anticipate (Fox et al., 2017). This study operationalizes the two dimensions of acculturation as:

□ **Heritage Cultural Orientation (HCO):** The degree to which individuals wish to maintain their Tai Dam culture and identity. It was measured using a multi-item scale adapted for the Tai Dam context, asking participants to rate their agreement on statements related to cultural maintenance on a 7-point Likert scale.

□ **Mainstream Cultural Orientation (MCO):** The degree to which individuals wish to engage with the dominant Thai digital culture. It was measured using a

multi-item scale adapted for the Tai Dam context, asking participants to rate their agreement on statements related to engagement with mainstream culture on a 7-point Likert scale.

Social identity and the digital hearth

Social Identity Theory (SIT) posits that individuals derive a significant portion of their self-concept and self-esteem from their membership in social groups (Galyapina & Lebedeva, 2015). This sense of belonging is crucial for psychological well-being. In the digital age, online communities have become powerful venues for identity construction and reinforcement. For ethnic minorities and Indigenous groups, these digital enclaves often function as a "digital hearth," a virtual space to perform, preserve, and celebrate their collective identity, especially when physical communities have been fractured by migration or colonization. This process is evident globally. Indigenous communities use social media to create "affective archives" that counter colonial histories, host language revitalization campaigns using hashtags, and organize virtual participation in cultural festivals. These identity-affirming practices directly foster a sense of pride, belonging, and collective efficacy, which are core components of psychological well-being (Gurung & Mehta, 2001). This leads to the study's first hypothesis, which is defined as follows.

Ethnic Identity (EID) is the strength of an individual's sense of belonging and commitment to their ethnic group. It was measured using a multi-item scale adapted for the Tai Dam context, asking participants to rate their agreement on statements related to ethnic pride and belonging on a 7-point Likert scale.

H1: Ethnic Identity (EID) positively and significantly predicts Psychological Well-being (PWB).

From algorithmic folk theories to the algorithmic self: Theorizing PAB

While digital spaces can be empowering, they are also governed by less neutral algorithms. Algorithmic bias is a systemic phenomenon where automated systems produce unfair, discriminatory, or harmful outcomes for specific groups (Kassam & Marino, 2022). This bias arises from malicious intent, flawed design, unrepresentative training data that reflects historical societal inequalities, and a lack of diversity among

development teams (Mann & Matzner, 2019). Examples are widespread, from facial recognition systems that are less accurate for women and people of color to predictive policing algorithms that disproportionately target minority neighborhoods.

To understand the psychological impact of this systemic bias, this study introduces the concept of the algorithmic self. The algorithmic self is the data-driven digital representation of a user that platforms construct to predict, classify, and shape their behavior. It is a digital twin built from our clicks, shares, and searches, and it increasingly mediates our experience of reality by determining the information we see, the connections we make, and the identities we are allowed to perform. For minority users, the algorithmic self is often a site of profound conflict. The platform's simplified, data-driven profile can be a gross misrepresentation, a stereotype, or an erasure that clashes with their lived identity and cultural reality. This dissonance between one's felt self and one's algorithmic self constitutes a form of Algorithmic representational harm.

This study conceptualizes Perceived Algorithmic Bias (PAB) as the user's cognitive and affective response to this harm (Kingsley et al., 2024). PAB is not merely a technical observation; it is the deeply felt experience of being systematically suppressed, marginalized, or culturally invalidated by the platform's code—a feeling of “algorithmic invisibility”. This experience of systemic, impersonal rejection is a potent psychological stressor.

Perceived Algorithmic Bias (PAB): A user's perception that a platform's algorithms systematically suppress, marginalize, or negatively represent their in-group's cultural content while amplifying majority content. This construct was measured using a newly developed multi-item scale where participants rated their agreement with statements about their cultural content being less visible or negatively portrayed by platform algorithms. This conceptualization leads to the second core hypothesis:

H2: Perceived Algorithmic Bias (PAB) negatively and significantly predicts Psychological Well-being (PWB).

Furthermore, this framework helps theorize the pathways leading to PAB. A higher Mainstream Cultural Orientation (MCO) implies more frequent and deeper engagement with the platform's core

functionalities, which are often optimized for the dominant culture (Hillekens et al., 2019). This increased interaction forces a more confrontational relationship with the platform's biased logic and the user's dissonant algorithmic self, thus heightening the perception of bias. Conversely, a strong Heritage Cultural Orientation (HCO) might also increase sensitivity to cultural misrepresentation, suggesting a potential link.

H3: Mainstream Cultural Orientation (MCO) positively and significantly predicts Perceived Algorithmic Bias (PAB).

H4: Heritage Cultural Orientation (HCO) positively and significantly predicts Perceived Algorithmic Bias (PAB).

Ultimately, this model suggests that PAB serves as the critical mediating mechanism through which digital acculturation orientations influence mental health. The psychological costs or benefits of engaging with the digital “host” culture are channeled through the experience of algorithmic bias.

H5: Perceived Algorithmic Bias (PAB) mediates the relationship between Mainstream Cultural Orientation (MCO) and Psychological Well-being (PWB). **H6:** Perceived Algorithmic Bias (PAB) mediates the relationship between Heritage Cultural Orientation (HCO) and Psychological Well-being (PWB).

The final construct,

Psychological Well-being (PWB) is measured as the absence of psychological distress, a common approach in studies of acculturative stress (Peeters & Oerlemans, 2009). It was measured using a multi-item scale asking participants to rate their agreement on statements related to their mental and emotional state on a 7-point Likert scale.

Methodology

This study employed a mixed-methods sequential explanatory design, a robust approach where quantitative findings are subsequently explained and enriched by qualitative data (Daniels & Heitmayer, 2024). The initial quantitative phase involved developing and testing a predictive model using PLS-SEM, followed by a qualitative digital ethnography phase that provided deeper context and narrative depth to the statistical results.

Quantitative phase: PLS-SEM

Participants and procedure

A sample of 450 individuals from the Tai Dam ethnic community in Thailand was recruited for this study. Participants were solicited through purposive sampling within community-specific Facebook and LINE groups, which serve as central hubs for the Tai Dam diaspora in the country. Eligibility criteria required participants to be over 18 years of age and currently residing in Thailand. Participants completed a comprehensive online survey after providing informed consent online. The survey contained validated scales designed to measure the study's core constructs: Heritage Cultural Orientation (HCO), Mainstream Cultural Orientation (MCO), Ethnic Identity (EID), Perceived Algorithmic Bias (PAB), and Psychological Well-being (PWB). There is no demographic information on age, gender, education level, or social media usage of the 450 participants.

Measures

All constructs in the model were measured using reflective indicators derived from previously validated scales. These scales were carefully adapted to ensure cultural and contextual relevance for the Tai Dam community (Luijters et al., 2006). All items were measured on a 7-point Likert scale, ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). The scale for Perceived Algorithmic Bias was newly developed for this study. This process involved two key stages: first, preliminary qualitative interviews with community members were conducted to understand their "folk theories" and lived experiences of algorithmic harm; second, these insights were combined with a review of existing literature on algorithmic fairness and bias to generate an initial pool of items. The resulting scale was then refined to ensure its cultural and contextual relevance.

Data analysis

The data were analyzed using the PLS-SEM technique (Romo-González et al., 2018). The analysis followed the standard and recommended two-step process for PLS-SEM. The first step involved a rigorous assessment of the measurement model to ensure the reliability and validity of the constructs. The second step involved evaluating the structural model to test the

hypothesized relationships and assess the model's explanatory and predictive power. The review of the model adhered strictly to the widely accepted criteria and rules of thumb outlined by Hair et al. (2019), which are summarized in Table 1 for clarity and methodological transparency.

Qualitative phase

Method

Following the quantitative analysis, a 12-month digital ethnography was conducted within the same Tai Dam online communities on Facebook and LINE, and it was used for participant recruitment. The researcher adopted a participant-observer role, engaging with the community while systematically collecting anonymized data. This data included public posts, comment threads, shared media artifacts (such as videos, images, and links), and community announcements about cultural events and social issues.

Analysis

The extensive qualitative dataset was imported into NVivo software for thematic analysis (Elliott, 2022). The analysis process involved both deductive and inductive coding, following the reflexive approach of Braun and Clarke (2022). Deductive codes were derived from the constructs in the PLS-SEM model (e.g., expressions related to identity, well-being, and perceived bias). Inductive codes emerged directly from the data, capturing novel themes and nuances in the users' lived experiences (Byrne, 2021). This process enabled a rich, contextualized interpretation of the quantitative results, grounding the statistical model in the authentic voices of community members (Campbell et al., 2021). To broaden the study's implications, the Discussion section presents a secondary analysis of existing global research on the digital experiences of other minority and Indigenous groups. This comparative approach serves to test the external validity and generalizability of the primary findings from the Tai Dam case study.

A note on analytical lens: Critical Techno-Cultural Discourse Analysis (CTDA)

To interpret the qualitative findings of this study, this research is guided by the principles of Critical Techno-cultural Discourse Analysis (CTDA).

Developed by André Brock (2018), CTDA is a methodological framework that integrates analysis of the technological artifact (e.g., the platform’s interface and affordances) with a critical discourse analysis of its users. Crucially, CTDA insists on framing this analysis through critical cultural theories to foreground the

epistemological standpoints of underserved users. This lens provides a robust theoretical justification for connecting the qualitative data, such as users’ descriptions of feeling “invisible,” to the broader systemic and cultural dynamics of algorithmic bias.

Table 1 PLS-SEM evaluation criteria

Assessment Area	Metric/Rule of Thumb	Threshold / Criterion
Measurement Model		
Indicator Reliability	Outer Loadings	> 0.708 (Ideally); > 0.40 acceptable if CR/AVE met
Internal Consistency Reliability	Cronbach’s Alpha	> 0.70 (Exploratory); 0.60-0.70 acceptable
Convergent Validity	Composite Reliability (CR)	0.70 to 0.95 (Avoid values > 0.95)
	Average Variance Extracted (AVE)	> 0.50
Discriminant Validity	Heterotrait-Monotrait Ratio (HTMT)	“< 0.85 (Conservative, for conceptually distinct constructs)”
Structural Model		
Collinearity Assessment	Variance Inflation Factor (VIF)	< 3.0 (Ideally); < 5.0 acceptable
Path Coefficient Significance	“Bootstrapping T-Values (5,000 samples)”	“> 1.96 (for p<0.05, two-tailed)”
Explanatory Power	Coefficient of Determination (R ²)	“0.25=weak, 0.50=moderate, 0.75=substantial”
Predictive Relevance	Stone-Geisser’s Q ²	> 0 for endogenous constructs

Note: Based on Hair et al. (2019)

Results

This section presents the study’s empirical findings, beginning with the quantitative results from the PLS-SEM analysis and then the qualitative results from the digital ethnography. The data is presented in a series of tables that detail the model’s validation and the outcomes of the hypothesis tests.

Quantitative results: PLS-SEM analysis

The PLS-SEM analysis was conducted in two stages: assessment of the measurement model and evaluation of the structural model (Subhaktiyasa, 2024). The results confirm that the model is robust and has strong predictive capabilities.

Measurement model assessment

The quality of the measurement model was evaluated for reliability and validity based on the criteria outlined in Table 1. The results in Table 2 demonstrate a high-quality measurement model suitable for structural analysis. All outer loadings for the indicators exceeded the ideal threshold of 0.708, indicating excellent reliability of the indicators. Composite Reliability (CR) values ranged from 0.901 to 0.938, confirming outstanding internal consistency for all constructs (Tripathi et al., 2022). Furthermore, the Average Variance Extracted (AVE) for each construct was well above the 0.50 benchmark, establishing strong convergent validity and indicating that each construct explains more than half of the variance of its indicators.

Table 2 Measurement model - construct reliability and convergent validity

Construct	Indicator	Loadings	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Heritage Cultural Orientation (HCO)	HCO1	0.852	0.887	0.915	0.683
	HCO2	0.811			
	HCO3	0.835			
	HCO4	0.798			
Mainstream Cultural Orientation (MCO)	MCO1	0.824	0.865	0.901	0.646
	MCO2	0.801			
	MCO3	0.779			
	MCO4	0.815			
Ethnic Identity (EID)	EID1	0.901	0.912	0.938	0.791
	EID2	0.885			
	EID3	0.879			
Perceived Algorithmic Bias (PAB)	PAB1	0.866	0.903	0.929	0.725
	PAB2	0.841			
	PAB3	0.859			
	PAB4	0.833			
Psychological Well-being (PWB)	PWB1	0.888	0.899	0.925	0.712
	PWB2	0.821			
	PWB3	0.855			
	PWB4	0.817			

Note: All constructs demonstrated excellent reliability and convergent validity.

Table 3 Measurement model - discriminant validity (Fornell-Larcker Criterion)

	EID	HCO	MCO	PAB	PWB
EID	0.889				
HCO	0.551	0.826			
MCO	0.288	0.315	0.804		
PAB	0.355	0.410	0.621	0.851	
PWB	0.511	0.298	-0.450	-0.687	0.844

Note: The square root of the Average Variance Extracted (AVE) for each construct is shown in bold on the diagonal. For discriminant validity to be established, these values must be greater than the inter-construct correlations (the off-diagonal values). All constructs meet this criterion. This table replaces the previously presented HTMT ratio to correct for a calculation error in the original manuscript.

Table 4 Structural model - hypotheses testing results

Hypothesis	Path	Path Coefficient (β)	T-Value	P-Value	Decision
H1	EID -> PWB	0.258	4.125	< 0.001	Supported
H2	PAB -> PWB	-0.491	8.201	< 0.001	Supported
H3	MCO -> PAB	0.515	9.033	< 0.001	Supported
H4	HCO -> PAB	0.102	1.67	0.095	Not Supported
H5 (Mediation)	MCO -> PAB -> PWB	-0.253	6.891	< 0.001	Supported
H6 (Mediation)	HCO -> PAB -> PWB	-0.05	1.554	0.12	Not Supported

Note: Bootstrapping was conducted with 5,000 samples. VIF values were all below 3.0, indicating no collinearity issues.

Structural model assessment

Following the successful validation of the measurement model, the structural model was assessed to test the hypothesized relationships. An assessment of collinearity revealed that all Variance Inflation Factor (VIF) values for the predictor constructs were below 3.0, indicating that multicollinearity was not a concern in the model. The results of the path analysis, conducted via a bootstrapping procedure with 5,000 samples, are presented in Table 4.

The model demonstrates strong explanatory and predictive power. It explains a substantial portion of the variance for the key endogenous constructs: the coefficient of determination for Perceived Algorithmic Bias was R^2 (PAB) = 41.2% (moderate), and for Psychological Well-being, it was R^2 (PWB) = 53.8% (moderate to substantial). A blindfolding procedure was conducted to assess predictive relevance. Stone-Geisser’s Q^2 values were 0.285 for PAB and 0.351 for

PWB. As both values are well above zero, the model is confirmed to have strong predictive relevance for its key target constructs.

Qualitative results

The digital ethnography provided rich, contextualizing narratives that illuminate the mechanisms behind the quantitative findings. Thematic analysis revealed three key themes, which are summarized in Table 5. These themes lend a human dimension to the statistical relationships, illustrating how abstract constructs are embodied in the everyday digital lives of the Tai Dam community. For instance, the user quote under “Algorithmic Invisibility”, “The app decides we are not interesting,” is a poignant articulation of the experience of having a devalued “algorithmic identity” imposed upon them by the platform, directly linking lived experience to the theoretical framework.

Table 5 Summary of qualitative thematic analysis findings

Theme	Description & Supporting Observations	Connection to PLS-SEM Model
1. The Digital Heart: Enacting Identity and Well-being	“Online spaces were consistently used to reinforce and perform Tai Dam identity. This included sharing cultural knowledge, using the Tai Dam language, organizing virtual festival participation, and celebrating collective successes. This created a strong sense of community and collective pride. Quote: “When I see our elders teaching weaving on Facebook Live, I feel so proud. It is like our home is everywhere.”	Illustrates the mechanism behind H1 (EID -> PWB). These identity-affirming practices in digital enclaves directly contribute to a sense of belonging and well-being.
2. Algorithmic Invisibility: The Lived Experience of Bias	“Users frequently expressed frustration that platforms systematically ignored their cultural content in favor of mainstream Thai trends. They described feeling “invisible” or that the algorithm was an extension of the dominant cultural gaze. This feeling of being algorithmically othered was a common source of complaint. Quote: “You can post a beautiful video of a traditional ceremony and get 15 likes. Someone else posts a clip from a Bangkok cafe and gets thousands of views. The app decides we are not interesting.”	“This paper offers a comprehensive, narrative explanation of the PAB construct. It shows that this is not an abstract concern but a concrete, emotionally resonant user experience (“algorithmic othering”) that fuels the strong negative predictive path in H2 (PAB -> PWB).”
3. Navigating the Mainstream: The	“Users who actively tried to engage with mainstream Thai audiences reported more negative	It directly supports H3 (MCO -> PAB) and the mediation hypothesis H5 (MCO

Theme	Description & Supporting Observations	Connection to PLS-SEM Model
Double-Edged Sword of Engagement	comments and frustrating encounters with the algorithm. In response, they developed “algorithmic resistance” strategies, such as using specific hashtags or coded language to increase visibility. This constant need to “play the game” was described as a source of stress. Quote: “To get seen, you must use their hashtags... However, when you do, you open yourself up to their judgment... and see how the platform pushes their stuff over yours even more.”	-> PAB -> PWB). It shows that higher mainstream engagement leads to more direct and stressful encounters with interpersonal prejudice and perceived algorithmic bias.

Discussion

This study successfully developed and tested a robust predictive model of psychological well-being for the Tai Dam minority in Thailand’s digital landscape. By integrating a prediction-oriented PLS-SEM analysis with rich qualitative insights, the research provides a nuanced understanding of the complex interplay between identity, acculturation, and technology. The findings not only illuminate the specific experiences of the Tai Dam but also offer a validated framework for understanding a global challenge facing minority and Indigenous communities: navigating intercultural relations in environments governed by non-human, algorithmic actors.

The predictive power of identity and bias

The model’s results paint a straightforward statistical narrative. The strong, positive relationship between Ethnic Identity (EID) and Psychological Well-being (PWB) (H1 supported) confirms the vital role of cultural identity as a psychological resource. This finding aligns with a vast literature on social identity and resilience (Meads, 2020). The qualitative theme of the “Digital Hearth” (Table 5) provides the mechanism: online spaces enable the performance and reinforcement of Tai Dam identity, fostering pride and a sense of belonging. This is not unique to the Tai Dam. Globally, Indigenous peoples use social media for these purposes, from the #SpeakGwichinToMe campaign for language revival in Canada to creating digital archives by various communities to preserve cultural knowledge. These platforms serve as crucial sites for enacting identity and bolstering well-being.

However, the model also reveals a powerful counteracting force. The path from Perceived Algorithmic Bias (PAB) to PWB is the strongest negative predictor in the model (H2 supported, $\beta = -0.491$). This indicates that the psychological harm associated with feeling algorithmically marginalized is a formidable stressor, capable of significantly eroding the benefits derived from a strong ethnic identity. The model’s substantial R^2 value for PWB (53.8%) underscores that the dynamic between identity affirmation and algorithmic invalidation is a primary determinant of minority well-being online.

A global view of perceived algorithmic bias

The PAB construct, validated in this study, provides a powerful lens for interpreting the widespread yet often disconnected reports of digital marginalization from communities worldwide. The Tai Dam’s feeling of “algorithmic invisibility” is not an isolated complaint, but a specific manifestation of a systemic issue (Chapagain et al., 2024).

□ Algorithmic Invisibility and Suppression:

The experience of Tai Dam cultural content being down-ranked in favor of mainstream Thai trends mirrors the experiences of other marginalized groups. Influencers of color and plus-sized creators on Instagram report that their content is more heavily moderated or “shadow-banned,” forcing them to learn how to “play the algorithm game” to remain visible (Lambrecht & Tucker, 2024). Activists have documented the suppression of pro-Palestinian content on Instagram and Sámi activist content in Nordic countries, suggesting that algorithms can systematically silence certain

political and cultural viewpoints. This is compounded by linguistic bias; platforms like Facebook have been shown to have far less robust content moderation in non-English languages, leaving communities like Spanish-speaking Latinos in the U. S. more vulnerable to misinformation and harmful content (Toomey et al., 2018).

□ **Algorithmic Misrepresentation:** Beyond suppression, algorithms actively construct and impose identities. The concept of the “algorithmic self” is critical here. When an AI image generator racializes a user’s photo or a predictive algorithm in Australia targets Indigenous communities for welfare surveillance based on biased historical data, the platform is creating a distorted and harmful algorithmic identity. This misrepresentation is a core component of the harm captured by PAB.

The platform-specific dynamics vary but the pattern is consistent: TikTok’s trend-focused algorithm can sideline niche cultural content that does not fit its rapid engagement model; Instagram’s hyper-visual, aesthetic-driven logic often perpetuates narrow, Westernized beauty standards, marginalizing other forms of artistic expression; and the algorithm on X (formerly Twitter) has been documented to amplify right-wing and extremist content over marginalized voices, creating a hostile environment.

The Digital cost of engagement: A Paradoxical finding

Perhaps the most critical and counterintuitive finding of this study is the strong, positive predictive path from Mainstream Cultural Orientation (MCO) to PAB (H3 supported), which in turn mediates an adverse effect on well-being (H5 supported). This reveals a “digital cost of engagement,” a paradox for acculturation theory. Traditional models suggest that engagement with the host culture (Integration) is psychologically adaptive (Guerra et al., 2019). This study’s model, however, demonstrates that in the digital realm, attempting to participate in the dominant digital culture exposes minorities to the most significant technological stressors. The qualitative data confirms this: Tai Dam users who tried to reach mainstream audiences reported the most frustrating encounters with the algorithm’s perceived bias (Table 5). This finding resonates with the experiences of immigrant

communities in Europe (Pfafferoth & Brown, 2006). While they use digital tools to integrate into society, they simultaneously face increased surveillance and the risk of discrimination from digitized migration management systems that operate on biased data and assumptions.

The non-significant path from Heritage Cultural Orientation (HCO) to PAB (H4 not supported) is equally telling. It suggests that sensitivity to bias is not simply a function of how strongly one holds to a heritage identity (Kunst et al., 2021). Instead, it is a product of the friction generated during active engagement with a mainstream technological system perceived as biased and invalidating. This lack of a significant relationship could be explained in several ways. Individuals with a strong heritage focus may curate their digital environments to prioritize in-group content, leading to less interaction with and exposure to the mainstream algorithms where bias is most acutely felt. Alternatively, a strong sense of cultural identity, reinforced by a supportive “digital hearth,” might act as a psychological buffer or coping mechanism, making individuals more resilient and less likely to perceive algorithmic marginalization as a significant stressor. This repositions the core challenge of digital acculturation. The problem is not merely human-to-human prejudice, but human-to-system friction. This elevates the algorithm from a simple tool to a powerful, non-human actor in intercultural relations. Its logic, biases, and construction of the “algorithmic self” are now central variables in determining the psychological outcomes of minority individuals. Therefore, any modern theory of intercultural relations must account for the algorithm as a primary gatekeeper of visibility, a purveyor of identity, and a systemic source of psychological stress or support.

Practical implications

The findings yield actionable implications for platform designers and mental health practitioners.

For platform designers and policymakers

The claim of algorithmic neutrality is no longer tenable. Platforms must move toward designing for “cultural equity”. This requires a fundamental shift:

□ **Adopt Value-Sensitive Design (VSD):** Rather than attempting to “de-bias” systems after the fact, platforms should use VSD frameworks to proactively embed values like dignity and cultural equity into their

core architecture from the earliest stages of development.

□ **Implement Participatory Design:** Platforms must engage in genuine co-design with marginalized communities to ensure systems are culturally sensitive and meet the needs of diverse users, rather than imposing a one-size-fits-all solution (Niranjan et al., 2024).

□ **Conduct Regular Algorithmic Audits for Cultural Bias:** Independent, third-party audits should become standard practice to assess how algorithms represent, rank, and moderate content from different cultural groups.

For mental health practitioners

This study identifies PAB as a novel and potent source of acculturative stress (Kumar et al., 2024).

□ **Incorporate into Clinical Assessment:** Therapists working with minority clients should explicitly inquire about their online experiences, asking about feelings of “algorithmic invisibility” or digital misrepresentation to uncover this overlooked source of distress (Mamani et al., 2017).

□ **Develop Targeted Interventions:** Clinicians can develop strategies to help clients cope with technology-related stress, including psychoeducation on algorithmic bias, cognitive reframing of negative online experiences, and developing strategies for mindful technology use.

Limitations and future research

This study has several limitations that provide clear directions for future research. First, the reliance on a purposive, online sample of the Tai Dam community means the findings may not be generalizable to the entire population, particularly those with limited digital access. Future work could employ broader sampling strategies. Second, the cross-sectional design captures relationships at a single point in time and cannot establish causality or track changes over time. Longitudinal studies are needed to understand the long-term evolution of PAB and its impact on well-being. Third, while the newly developed PAB scale showed strong reliability and validity in this context, further psychometric testing and validation in other minority

populations are necessary to establish it as a robust instrument.

Future research should build on this model by testing it with other ethnic minority and Indigenous groups globally and across different platforms (e.g., TikTok, X). Experimental designs could also be used to directly manipulate algorithmic exposure to more rigorously test the causal claims of the model.

Conclusion

This research has developed and validated a predictive model that illuminates the critical factors shaping the psychological well-being of the Tai Dam ethnic minority in the digital age. By situating these findings within a global context and grounding them in a multi-layered theoretical framework, this study offers significant contributions to intercultural relations, social psychology, and media studies. It demonstrates that for marginalized communities, the digital world is a space of constant negotiation, where well-being is a function not only of their interaction with people but also of their interaction with code.

The use of a mixed-methods design was instrumental in achieving these insights. The PLS-SEM analysis revealed the “what”—the strong statistical relationships between identity, bias, and well-being—but the digital ethnography provided the essential “why.” It gave voice to the lived experiences behind the variables, allowing us to understand how abstract concepts like PAB manifest as a deeply felt sense of “algorithmic invisibility” and how identity is reinforced in a “digital hearth”. This integration highlights the unique methodological contribution of the study, demonstrating that a complete understanding of human-algorithm interaction requires both robust quantitative modeling and deep qualitative inquiry.

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