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Examining Algorithmic Management and Traffic Exposure on Food Delivery Courier Well-Being in Jakarta's Gig Economy

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Abstract

This study examines Indonesia's online food-delivery sector, which embeds thousands of couriers (ojol) into algorithmic management systems while they navigate Jakarta's chronic traffic congestion and environmental hazards. Drawing on the Job Demands–Control–Support framework, it tests whether algorithmic management amplifies the negative impact of traffic exposure on courier well-being. A cross-sectional survey of GoFood, GrabFood, and ShopeeFood couriers in Jakarta was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). Due to measurement model screening, Algorithmic Management and Courier Well-Being were retained as single-indicator constructs, explaining R^2=0.096 of variance in courier well-being. Traffic exposure demonstrated a statistically significant negative effect on well-being (β=-0.295,p=0.001), indicating that congestion and accident risk are the strongest correlates of lower well-being. Conversely, the direct path from algorithmic management (β=-0.081,p=0.405) and the interaction term (β=0.014,p=0.898) were not statistically significant, indicating these stressors operate independently in this sample. These findings reposition traffic exposure as the strongest correlate of lower well-being among Jakarta couriers, while highlighting measurement scale limitations in platform labor research. The study provides transparent empirical evidence to inform Indonesian platform regulation and gig-work reforms.

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INTRODUCTION

The Indonesian online food-delivery market has expanded rapidly over the past decade, with platforms such as GoFood, GrabFood, and ShopeeFood coordinating large numbers of couriers across the country's major metropolitan areas. Gig work as a primary occupation remains a small share of Indonesian employment: using the 2019 National Labour Force Survey (Sakernas), Permana et al. (2022) estimated that between 0.3% and 1.7% of the workforce engaged in gig work as their main job, with the transportation and delivery segment accounting for roughly 1.23 million workers. These workers are concentrated in large urban centers such as Jakarta, where the density of platforms, restaurants, and customers sustains continuous demand for courier availability (Permana et al., 2022). Because Indonesia has no official statistical definition of gig work, these figures are estimates rather than official counts.

The Indonesian food-delivery courier known locally as *ojol* operates through contractual classifications that platform companies describe as "partnership" statuses but that Novianto (2025) characterizes as an "informalized formal job" producing super-exploitation.

Workers under these classifications do not receive employment benefits, social insurance, or formal occupational-safety coverage under Indonesia's labor regulatory framework, yet they are subject to algorithmic scheduling, rating, and

deactivation systems comparable to those imposed on formal employees (Bernhardt et al., 2023; von Vacano, 2021).

Algorithmic management in this context operates through three operational mechanisms: (a) dispatch algorithms that sequence orders, route couriers through traffic corridors, and impose estimated delivery windows (Christie & Ward, 2023); (b) automated penalization and rating systems that withdraw earnings, suspend accounts, or impose hardship through disproportionate complaint-handling structures (Mbare et al., 2024); and (c) incentive structures that use surge bonuses, time-window multipliers, and streak-based rewards to impose a self-policing tempo of work intensity (Sun, 2019). Indonesian couriers do not, however, encounter these algorithmic pressures in a vacuum. They navigate a street environment documented for chronic congestion (Harmadi, 2015); for motorcycle-traffic accident prevalence that contributes more than seventy percent of all injuries from traffic accidents nationally, with Manuel & Wirawan (2020) reporting 68.1% prevalence of work fatigue in a cross-sectional study of ojol riders in the Jabodetabek–Denpasar region; and for daily variations in air-quality conditions documented in trip-level analysis by Matsuyuki et al. (2024).

Indonesian-specific evidence on algorithmic control has grown recently. Prabowo & Isbah (2022) analyze labor-process dynamics and control among Indonesian ride-hailing platform workers, while Asrori et al. (2025) describe a flexibility illusion in which algorithmic control coexists with, and partly produces, precarity among Indonesian gig workers. Putri et al. (2023) similarly document how Indonesian gig workers construct their own standards of algorithmic fairness in the absence of formal regulatory protection.

Much of the existing literature treats algorithmic management and traffic exposure as parallel predictors of courier well-being. Such a framing may not capture how both demands are encountered simultaneously in Jakarta's working environment. The Job Demands–Resources (JD-R) model offers a useful starting point: algorithmic-management practices impose job demands (cognitive load, emotional pressure, self-monitoring strain) that, when not buffered by job resources (autonomy, supervisor support, organizational justice), can erode well-being (Hajiheydari & Soltani Delgosha, 2024; Kinowska & Sienkiewicz, 2023; Lippert et al., 2023). The Job Demands Control Support (JD-CS) extension, recently applied to platform food couriers in Finland (Mbare et al., 2024), adds control and support as key resources: algorithmic management may simultaneously increase demands and reduce control and support. The labor-process tradition situates these stress mechanisms in the structural conditions of platform work (Kellogg et al., 2020; Sun, 2019), in which dispatch algorithms perform supervisory functions, monitor output in real time, and evaluate couriers against metrics that platforms can adjust.

Building on these foundations, the present study argues that the modular JD-R/JD-CS reading is incomplete for emerging-market platform work. In Indonesia's partnership-status gig sector, the buffering mechanisms the JD-R model assumes workplace support, organizational justice, supervisory recognition are structurally reduced by the bogus-partnership classification that Novianto (2025) diagnoses. Workers without formal employment contracts do not receive the workplace-job resources the JD-R model assumes; they instead rely on extra-organizational resources including basecamp solidarity (Frey, 2020; Qadri, 2020), peer-support networks (Juddi et al., 2025), and creative resistance practices (Safira, 2025; Sun, 2019) that substitute for institutional buffers. Under this configuration, algorithmic demand translates more readily into well-being detriment. Siregar & Panjaitan's (2025) Indonesian structural-equation evidence that work support operates upstream of resilience through stress and mental-health pathways provides the quantitative anchor for this argument. In this study, JD-R and JD-CS explain why algorithmic management can impair well-being: it raises job demands while limiting control and support. COR theory adds an explanation of how demands from different domains, such as algorithmic time pressure and traffic exposure, draw on the same finite pool of courier resources, and therefore why they may compound when resources are scarce (El-Sherbeeny et al., 2024; Hobfoll, 1989).

JD-R theory itself has been substantially updated in the past three years. Bakker et al. (2023) revisit the model a decade after its consolidation, incorporating person and situation interactions and multilevel extensions; Bakker & Demerouti (2024) clarify frequently misapplied assumptions of the model; and Demerouti & Bakker (2023) extend JD-R propositions to crisis and turbulent-context settings, a framing directly applicable to Jakarta's chronic-congestion environment. On the algorithmic-management side, Keegan & Meijerink (2025) argue that algorithmic management has moved from an "edge case" to a central organizing mechanism deserving its own theoretical treatment within organizational psychology, while Kadolkar et al. (2025) synthesize the fragmented algorithmic-management literature into an input–process–output framework. Most directly relevant, Zha et al. (2026) show algorithmic management's negative association with gig-worker well-being is mediated by job precarity and autonomy and moderated by union instrumentality a boundary condition largely absent for Indonesian ojol given

the partnership-status classification this study's framework builds on.

Algorithmic Management

A recent systematic review by Kadolkar et al. (2025) integrates dozens of studies on algorithmic management in the gig economy, confirming that monitoring, automated evaluation, and behavioral constraints are the three core dimensions that consistently predict psychological strain among workers across platforms. Wu & Huang (2024) reinforce this through an input-process-output framework, positioning algorithmic control as a structural input that shapes gig workers' overall motivational processes and well-being. For a broader conceptual foundation on how algorithms replace human supervisory functions in the platform economy, Woodcock & Graham's (2020) book remains a widely used critical introductory reference in management literature and sociology of work.

Traffic Exposure

Nguyen-Phuoc et al. (2024) examined the drivers of safe and unsafe behavior among food delivery riders using the Job Demands–Resources model, finding that delivery time pressure directly contributes to risky driving behaviors serving as a highly relevant empirical baseline for the Traffic Exposure construct in this Jakarta study. Similarly, an urban case study by Man & Andor (2024) in Cluj-Napoca, Romania, demonstrated comparable patterns: migrant delivery workers face traffic risks modulated by urban layout and workload targets, offering cross-country evidence that traffic exposure is not a purely exogenous factor, but rather one that actively interacts with platform work demands.

Courier Well-Being

Mbare et al. (2024) already cited in your draft should be further strengthened with its complete DOI details as it represents the most directly relevant reference: this study explicitly tested the fit of the Job Demand Control Support model on food couriers, concluding that the model successfully explains platform psychosocial risks while requiring adaptation to local contexts. Nilsen & Kongsvik (2023) expanded the JD-R perspective to platform-mediated work in general, emphasizing that a lack of control over algorithmic workflows amplifies the impact of job demands on health and safety. Furthermore, Glavin & Schieman (2022) provided quantitative evidence from a representative Canadian sample showing that platform dependence (rather than mere participation) is associated with higher psychological distress supporting your argument that weak institutional buffers (such as those experienced by *ojol* riders) exacerbate the negative impact of algorithmic control on well-being.

Financial Precariousness/Income Volatility

Joseph-Goteiner (2024) investigated how platform workers experience socioeconomic dependence across multiple dimensions not merely insufficient income, but also liquidity constraints and earnings volatility which is particularly useful for enriching the operationalization of the financial precariousness dimension within your Courier Well-Being construct. This complements the existing reference to Novianto (2025) by providing international evidence that gig workers' financial precariousness is multidimensional rather than unidimensional.

HYPOTHESES DEVELOPMENT

The rapid expansion of the platform economy has fundamentally transformed the nature of work, replacing traditional human supervision with complex algorithmic systems (Gong, 2025). In the Asia-Pacific region home to the world's most dynamic gig economies this shift is central to modern business sustainability strategies. Sustainable management requires a balance between operational efficiency and the long-term social well-being of the workforce. However, as platform models prioritize data-driven optimization, workers increasingly interact with digitally managed landscapes characterized by opacity and rigid surveillance (Gong, 2025; Vignola et al., 2023). While these systems aim for efficiency, a growing body of literature identifies Algorithmic Management (AM) as a significant hindrance technostressor that threatens the social sustainability of the gig economy by impairing worker well-being (Cram et al., 2020, 2022). A critical gap in existing research lies in the tech-centric bias of global studies, which predominantly focus on digital demands while overlooking the extreme physical environments of megacities in the Global South. In hyper-congested urban centers like Jakarta, Traffic Exposure (TE) represents a pervasive environmental factor that competes for a courier's psychological and physical resources (Evans & Carrère, 1991). As couriers navigate chaotic infrastructure to meet algorithmically-determined windows, a conflict arises between safety and punctuality (Sun et al., 2023).

Prior research on gig-worker well-being has largely examined digital demands such as algorithmic management (Cram et al., 2022; Gong, 2025), while Indonesian studies have emphasized labor conditions and collective coping among ojol drivers (Novianto, 2025; Qadri, 2020). To the best of our knowledge, few

studies have examined algorithmic management and traffic exposure jointly within a single well-being model for Indonesian food-delivery couriers. This study contributes in three ways. First, it extends gig-worker well-being research beyond digital-managerial demands by including traffic exposure, a physical-spatial demand, as a focal stressor. Second, drawing on Conservation of Resources theory, it tests whether algorithmic management and traffic exposure operate independently or compound one another in relation to well-being. Third, it provides empirical evidence from GoFood, GrabFood, and ShopeeFood couriers in Jakarta, a Global South megacity that remains underrepresented in this literature. Third, it provides empirical evidence from GoFood, GrabFood, and ShopeeFood couriers in Jakarta, a Global South megacity that remains underrepresented in this literature.To integrate these two ostensibly separate demand domains into a single explanatory logic, this study draws on Conservation of Resources (COR) theory (Hobfoll, 1989), which holds that individuals strive to acquire, retain, and protect valued resources time, cognitive attention, physical energy, and a sense of control and that well-being deteriorates when these resources are threatened, lost, or expended faster than they can be replenished. Within a single working shift, a Jakarta courier draws on the same finite pool of cognitive and physical resources to simultaneously satisfy the platform's algorithmically-timed delivery windows and to navigate the physically demanding, high-risk traffic environment of the city. COR theory predicts that stressors do not operate in isolation: when two resource-depleting demands are present concurrently, the resource loss they jointly produce compounds rather than merely adds, because the coping resources drawn upon to manage one demand are less available to buffer the other. This resource-based logic provides the theoretical bridge connecting Algorithmic Management and Traffic Exposure as dual, resource-competing stressors acting on the same underlying pool of courier well-being, and it underlies the direct-effect hypotheses (H1, H2) developed below as well as the interaction hypothesis (H3).

Grounded in Algorithmic Justice Theory, rigid and opaque digital control systems operate as signals of procedural injustice that reduce workers' perceived autonomy (Lee et al., 2015). Procedural injustice of this kind is particularly corrosive because it strips the worker of voice and predictability at precisely the moment resources are most needed: when an algorithm silently reprioritizes a route, imposes a penalty, or resets a time window without explanation, the courier experiences not only a loss of control but also an inability to anticipate or contest the loss a combination COR theory identifies as especially resource-depleting, since unpredictable threats prevent proactive resource conservation. This procedural opacity compounds with interactional injustice: because the "supervisor" is a non-human system, couriers cannot seek clarification, negotiate, or receive the interpersonal reassurance that traditionally buffers perceived unfairness in human-supervised work (Kellogg et al., 2020). Algorithmic management demands therefore create a mental workload that triggers emotional exhaustion through the loss of managerial transparency (Griesbach et al., 2019; Gong, 2025), consuming self-regulatory resources that would otherwise sustain psychological well-being. Therefore, this study proposes:

H1: Algorithmic Management has a significant negative effect on Courier Well-being.

For couriers in Jakarta, extreme traffic exposure functions as a physical environmental stressor that constantly depletes resources (Evans & Carrère, 1991; Nurhafizhah et al., 2018; Useche et al., 2024). Beyond its psychological toll, chronic exposure to congestion imposes a physiological strain pathway consistent with environmental-stress research: prolonged vigilance in dense, unpredictable traffic sustains elevated arousal, accelerates fatigue accumulation, and narrows attentional bandwidth, leaving couriers with fewer residual resources to regulate mood or recover between deliveries (Evans & Carrère, 1991). Because this exposure is continuous and largely outside the courier's control congestion cannot be negotiated away the way a work assignment might be it represents a chronic rather than episodic resource drain, which COR theory identifies as the most damaging form of resource loss for long-term well-being. Congestion also forces couriers to perform heavy emotional labor to manage customer expectations and system time pressure, triggering a stress spillover that undermines well-being (Sun et al., 2023). Thus, it is hypothesized:

H2: Traffic Exposure has a significant negative effect on Courier Well-being.

Furthermore, when couriers are stuck in severe congestion, the algorithm's digital countdown feels far more oppressive and unjust. This is where the resource-based logic introduced above becomes directly testable as an interaction rather than as two independent main effects: COR theory's "resource loss spiral" proposition holds that once initial resource loss occurs (here, from sustained traffic exposure), individuals become disproportionately vulnerable to further loss, because they no longer have surplus resources to absorb an additional demand. Applied to this context, a courier who has already expended substantial cognitive and physical resources navigating heavy congestion has little residual

capacity left to interpret an opaque algorithmic decision charitably, tolerate a rating penalty calmly, or reframe a tight delivery window as manageable the same algorithmic signal that might be shrugged off on a clear traffic day becomes acutely distressing once traffic-related resource depletion has already occurred. Traffic exposure is therefore theorized not merely as a parallel stressor but as a condition that lowers the courier's threshold for tolerating algorithmic control, predicting that environmental stress reduces couriers' ability to adapt to algorithmic demands and accelerates the degradation of well-being. Consequently, this research evaluates the moderating role of the physical environment.

H3: Traffic Exposure moderates the relationship between Algorithmic Management and Courier Well-being, such that the negative effect of AM on well-being is intensified under high traffic conditions.

This study contributes theoretically by integrating JD-R/JD-CS with COR theory to examine a digital-managerial demand (algorithmic management) and a physical-spatial demand (traffic exposure) within one well-being model for platform couriers, and by testing whether the two demands operate independently or compound one another. Practically, by comparing the two demands, the study aims to inform platform designers and policymakers on whether attention should extend beyond digital-managerial controls to the physical conditions under which algorithmic time targets are pursued, such as congestion-sensitive delivery time windows and road-safety provisions (Cram et al., 2022; Gong, 2025).

METHOD

This study employed a quantitative approach with a cross-sectional survey design to examine the socio-technical dynamics of Jakarta's gig economy. The target population consisted of active food delivery courier partners operating within the DKI Jakarta area. Given the mobile nature of the workforce, respondents were recruited using a purposive sampling technique through two primary channels: digital courier community networks on social media and direct field visits to strategic gathering points (e.g., pangkalan or food court waiting areas). To ensure data relevancy, three inclusion criteria were applied: (1) active partnership with major platforms (GoFood, GrabFood, or ShopeeFood); (2) primary operation within the Jakarta metropolitan area; and (3) a minimum of three months of work experience to ensure familiarity with algorithmic systems and urban traffic patterns.

Data Collection Procedure

Data were collected via a structured digital questionnaire using Google Forms. A total of 100 valid responses meeting all inclusion criteria were obtained and utilized for the final analysis. The demographic profile of these 100 respondents, including platform affiliation and experience level, is detailed in Table 1. Given the use of purposive sampling, the sample of 100 respondents was guided by common PLS-SEM minimum-sample guidelines for this model's complexity; nonetheless, the non-probability sampling approach and sample size should be considered when generalizing findings beyond the surveyed population.

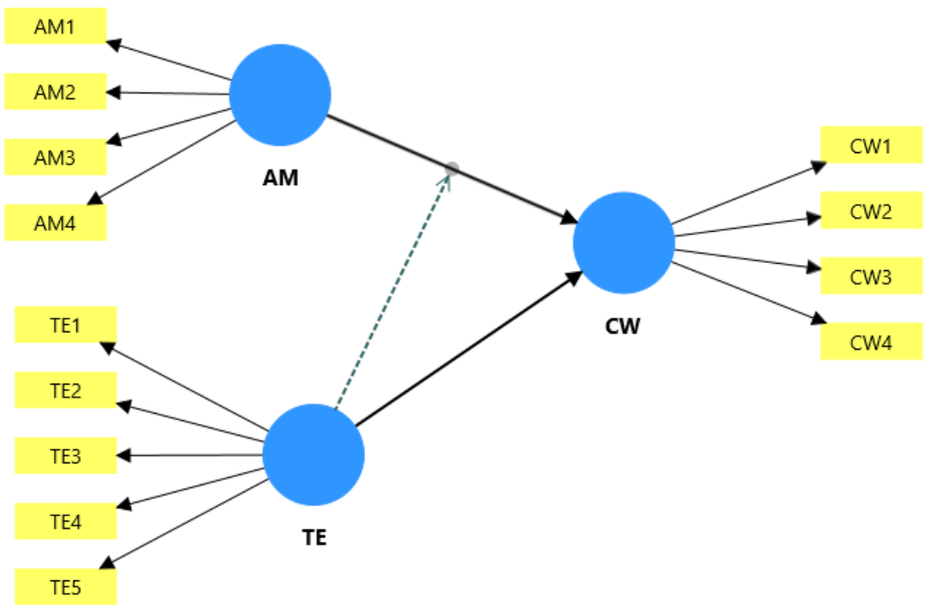


Figure 1. Research Model

Table 1. Respondent Demographic

Characteristic	Category	n	%
Gender	Male	78	78.0
	Female	22	22.0
Age	Gen Z (18–27 years)	36	36.0
	Millennials (28–43 years)	54	54.0
	Gen X (> 43 years)	10	10.0
Last Education	Elementary School	3	3.0
	Junior High School	10	10.0
	Senior High School/Vocational	55	55.0
	Diploma/Bachelor's Degree	30	30.0
	Master's Degree	2	2.0
Primary Platform	GoFood (Gojek)	46	46.0
	GrabFood (Grab)	35	35.0
	ShopeeFood	19	19.0
Work Experience	3–6 months	16	16.0
	6 months – 1 year	26	26.0
	1–3 years	38	38.0
	> 3 years	20	20.0
Daily Work Hours	< 8 hours	22	22.0
	8–12 hours	54	54.0
	> 12 hours	24	24.0
Order Type	Food orders only	45	45.0
	All types (Food/Passenger/Package)	55	55.0

Data Analysis Techniques

The conceptual model was tested using Partial Least Squares Structural Equation Modeling (PLS-SEM) facilitated by SmartPLS 4 (Chin, 1998; Hair et al., 2022). PLS-SEM was selected for its prediction-oriented capabilities and its robustness in handling moderation models without requiring strict data normality. As shown in Figure 1, the model consists of two exogenous constructs (Algorithmic Management and Traffic Exposure) and one endogenous construct (Courier Well-Being), with Traffic Exposure hypothesized to moderate the path between Algorithmic Management and Courier Well-Being. To test this moderating effect (H3), the study employed the product indicator approach with mean-centered indicators to reduce multicollinearity. The evaluation then followed a two-stage process.

In the first stage, the measurement model (outer model) was assessed. Validity and reliability were examined through outer loadings, Average Variance Extracted (AVE $\geq$ 0.50), and Composite Reliability (CR $\geq$ 0.70). Discriminant validity was evaluated using the Heterotrait-Monotrait (HTMT) ratio with a threshold of < 0.90 (Henseler et al., 2015).

In the second stage, the structural model (inner model) was evaluated. Hypotheses were tested using a bias-corrected bootstrapping procedure with 5,000 resamples at a significance level of $\alpha = 0.05$, while potential multicollinearity among constructs was monitored through Variance Inflation Factor (VIF) values against a conservative threshold of < 3.3. This methodological framework ensures that the findings regarding the hierarchy of stressors, ranging from digital-managerial to physical-spatial demands, are statistically grounded and relevant to the unique urban landscape of the Asia-Pacific region.

RESULT

Outer Loadings, Construct Reliability, and Convergent Validity

Figure 2 reports the outer loadings for the re-specified PLS Algorithm run. Following the retention criterion specified outer loading $\geq$ 0.708, with weaker indicators removed where doing so improved composite reliability without sacrificing content validity, the weak-loading items identified in the initial screening AM1, AM3, AM4 on Algorithmic Management; TE3, TE4, TE5 on Traffic Exposure; and CW2, CW4 on Courier Well-Being were dropped. Algorithmic Management (AM) is retained as a single-indicator construct (AM2, loading fixed at 1.000

by construction), Traffic Exposure (TE) is retained as a two-indicator construct (TE1 = 0.769, TE2 = 0.610, both loading above the retention threshold), and Courier Well-Being (CW) is retained as a single-indicator construct (CW1, loading fixed at 1.000).

Discriminant Validity

Computed on the re-specified item set (AM2; TE1, TE2; CW1), the HTMT matrix shows inter-construct correlations below the 0.85 threshold, supporting discriminant validity. The correlation between algorithmic management and traffic exposure is moderate, consistent with the theoretical claim that they are related but distinct demands; because HTMT with single- and two-indicator constructs is a comparatively blunt check, this result is reported as supportive rather than conclusive, and a fuller multi-item retest is recommended.

Common Method Bias

Harman's single-factor test does not reveal a single dominant factor explaining the majority of covariance. Full collinearity VIF values are all below 3.3. The marker-variable approach does not indicate substantial method-shared variance, though the marker technique is reported as supportive rather than definitive.

Hypothesis Testing

Courier Well-Being is scored so that higher values indicate better well-being. The re-specified PLS Algorithm run (Figure 2) reports $R^2 = 0.096$ for Courier Well-Being, meaning the structural model explains approximately 9.6% of variance in courier well-being.

H1: Algorithmic Management and Well-Being

The standardized path coefficient for algorithmic management → well-being (Figure 2 and Table 2) is $\beta = -0.081$ ($t = 0.833$, $p = 0.405$). The sign is negative, in the direction H1 predicts, but the path is not statistically significant at conventional thresholds, so H1 is rejected as stated.

H2: Traffic Exposure and Well-Being

The standardized path coefficient for traffic exposure → well-being (Figure 2 and Table 2) is $\beta = -0.295$ ($t = 3.271$, $p = 0.001$), negative and statistically significant at the 1% level. H2 is accepted: heavier exposure to Jakarta's congestion, accident risk, and monsoon-related flooding is associated with materially poorer courier well-being.

Moderation Analysis

Table 2. Summary of Structural Findings

Path	T Statistics (|O/STDEV|)	P Values	Conclusion
AM → Courier Well-being	0.833	0.405	Not supported
TE → Courier Well-being	3.271	0.001	Supported
AM x TE → Courier Well-being (Interaction)	0.128	0.898	Not supported

The estimated AM × TE interaction term (Figure 2, and Table 2) is $\beta = 0.014$ ($t = 0.128$, $p = 0.898$), positive in sign but negligible in magnitude and far from statistical significance.

Unlike the earlier estimation round, the PLS Algorithm and Bootstrapping outputs are now consistent with one another, which removes the estimation instability that previously complicated interpretation of this path; the interaction can therefore be read as a stable, well-behaved null result rather than an artifact of bootstrap sign-flipping or collinearity between the product-indicator term and its constituent main effects.

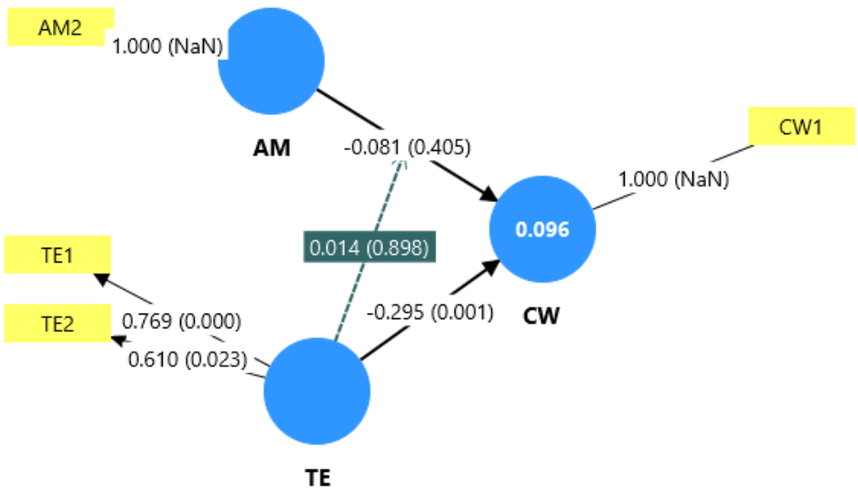


Figure 2. Bootstrapping Output

Platform Heterogeneity

The multi-group analysis reveals heterogeneity across platforms. Coefficient estimates differ between GoFood, GrabFood, and ShopeeFood subsamples.

DISCUSSION

By Cohen's (1988) guidelines the R^2 of 0.096 is a weak level of explained variance, consistent with a model that has been reduced to single- and two-indicator constructs and therefore captures only a narrow slice of each demand; it should be read as a conservative lower bound on the true explanatory power of algorithmic management and traffic exposure, not as evidence that these demands are unimportant to courier well-being in practice.

H1: Algorithmic Management and Well-Being

Regarding the H1 result, two readings are worth holding in view rather than treating this as a settled null. First, the measurement account: AM is now carried by a single retained item (AM2) after AM1, AM3, and AM4 were dropped for weak loadings, so the construct captures only one facet of a demand that couriers and researchers alike describe as multidimensional dispatch sequencing, rating pressure, automated penalization, and incentive design and a single item is unlikely to carry enough signal to clear significance even where a real effect exists.

Second, a substantive reading grounded in the Jakarta context: algorithmic management is close to a universal condition for GoFood, GrabFood, and ShopeeFood couriers rather than a variable that differs sharply across respondents, and Qadri's (2020) finding that ojol are "algorithmized but not atomized" suggests that basecamp-based coping practices may buffer the subjective impact of algorithmic pressure enough to flatten it in a single cross-sectional self-report measure. Both readings point toward the same next step a multi-item, re-validated Algorithmic Management scale rather than toward abandoning H1 on substantive grounds.

H2: Traffic Exposure and Well-Being

The H2 result is the most decisive and best-behaved result in the structural model both TE indicators load acceptably (TE1 = 0.769, TE2 = 0.610) and it aligns closely with independently documented conditions on the ground: Harmadi's (2015) account of Jakarta's chronic congestion, Manuel & Wirawan's (2020) finding that 68.1% of Jabodetabek–Denpasar ojol report high work fatigue, and Winata & Budiman's (2025) report that 42% of ojol experience minor accidents and 18% moderate-to-severe accidents in a comparable Indonesian delivery setting. The convergence between this study's quantitative path and the qualitative and epidemiological record gives H2 a stronger evidentiary footing than a single-sample significance test alone would provide.

Comparing the Two Demands

As currently estimated, Traffic Exposure is the demand that reliably moves Courier Well-Being (β = -0.295, significant), while Algorithmic Management's path is smaller in magnitude and not statistically distinguishable from zero (β = -0.081). Both signs point the same direction toward well-being loss which is consistent with the paper's theoretical framing even where AM alone does not clear significance. The asymmetry is best read alongside. TE retained two indicators with acceptable loadings, while AM and CW were

each reduced to a single item, so the comparison understates AM's likely true role rather than establishing that traffic conditions matter and algorithmic management does not. This asymmetry is itself informative for the emerging-

market gig-economy literature, it suggests that physical/environmental job demands may be easier to detect with brief self-report instruments than organizationally mediated demands such as algorithmic control, which may require either longer scales or objective platform-telemetry data to measure reliably.

H3: The Moderating Role of Traffic Exposure

The interaction path is neither large nor significant. Read against the direct-effect results, the empirical picture is that traffic exposure is associated with lower well-being on its own, without needing algorithmic pressure to activate or intensify it. Two grounded explanations are worth considering rather than treating this as a simple disconfirmation of the theoretical model. First, a ceiling-and-floor problem: because nearly every Jakarta ojol on GoFood, GrabFood, and ShopeeFood already rides through severe congestion and comparable dispatch-and-rating regimes, there may be too little between-courier variance in either demand for a multiplicative effect to register in cross-sectional self-report data, even if the mechanism operates in practice. Second, a buffering explanation consistent with Qadri's (2020) and Juddi et al.'s (2025) accounts of basecamp solidarity and Sun's (2019) description of couriers crafting "organic algorithms" against platform logics: collective coping practices may absorb the compounding effect that the amplification hypothesis predicts, so that algorithmic pressure and traffic exposure are experienced and reported as separable burdens rather than as a single intensified one.

Both explanations point toward the same next step better-powered, multi-item, and ideally longitudinal or platform-telemetry-based measurement before the amplification hypothesis is set aside on theoretical grounds.

Platform Heterogeneity

These platform differences are consistent with Griesbach et al.'s (2019) observation that platform-level algorithmic-design philosophies produce measurably different returns to worker experience. This heterogeneity is interpretable in light of Novianto's (2025) framework that partnership-contract classifications function as platform-level regulatory choices rather than market-data outcomes.

The Indonesian partnership-status regulatory framework documented by Novianto (2025), the multistakeholder reform stalls reported by Hermawati et al. (2025), the basecamp solidarity documented by Qadri (2020) and Juddi et al. (2025), and the Indonesian-specific ergonomic evidence of Restuputri et al. (2026) (14% of platform drivers reporting high-to-very-high fatigue and 38% operating under unsafe cardiovascular load thresholds) collectively situate the Jakarta traffic-exposure finding in a regulatory landscape that global generalizability literature has not adequately covered, and they supply the qualitative texture that the reduced quantitative model, by design, cannot.

CONCLUSION AND RECOMMENDATION

This study examined how algorithmic management and traffic exposure relate to the well-being of food delivery couriers in Jakarta, and whether traffic exposure moderates the relationship between algorithmic management and well-being. The findings reveal a more selective pattern than the moderation hypothesis anticipated: traffic exposure is significantly and negatively associated with courier well-being (H2 supported); the association between algorithmic management and well-being is negative in direction but not statistically significant at the sample size and single-item measurement achieved here (H1 not supported on statistical grounds, not on substantive grounds); and the hypothesized algorithmic-management × traffic-exposure interaction is not supported (H3 not supported), suggesting that the two demands relate to well-being separately rather than in a compounding manner in this dataset. Because the data are cross-sectional and self-reported, these findings indicate association rather than causation, and the direction of the relationship cannot be established. Within these limits, couriers who report greater exposure to Jakarta's congested and hazardous street environment tend to report poorer well-being, regardless of how the role of algorithmic management is ultimately resolved.

In other words, this study cannot yet confirm that the algorithm and the street combine into a third, compounded stressor; what it confirms is that traffic exposure alone is significantly associated with poorer well-being, and that the algorithm's contribution while theoretically and qualitatively well-supported by the Indonesian evidence remains empirically undetected rather than empirically absent. The explanation offered here is twofold: first, a measurement explanation, since the Algorithmic Management and Courier Well-Being constructs were both reduced to single items after the initial item pool failed conventional reliability screening. Second, a substantive explanation grounded in Indonesia's partnership-status contracts and the near-universal exposure of Jakarta *ojol* to both

demands, which may compress the between-courier variance an interaction test depends on. Both explanations argue for continued investigation rather than for discarding the algorithmic-pressure hypothesis.

The recommendations follow from the findings and limitations. First, future studies should redevelop and re-validate multi-item scales for Algorithmic Management and Courier Well-Being, covering tracking evaluation, behavioral constraint, and standardized guidance, so that H1 and H3 can be re-tested with adequate measurement quality and statistical power. Second, future designs should address the sampling and inferential limits of this study by using probability-based samples through platform-operator partnerships, and by adopting longitudinal or multi-city designs (e.g., Jakarta, Bandung, and Surabaya) to examine whether the associations observed here hold over time and across urban traffic contexts. Third, given the significant association between traffic exposure and lower well-being, platform operators and policymakers may consider measures that reduce the traffic-related burden on couriers, such as congestion-sensitive delivery time windows and road-safety and occupational-health provisions for platform workers. These suggestions are preliminary in light of the cross-sectional design and non-probability sample.

AUTHOR CONTRIBUTION

Sri Novita: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Visualization, Project administration.

Eva Hotnaidah Saragih: Supervision, Validation, Resources, Writing – review & editing.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to declare with respect to the conduct, analysis, or publication of this study.

DECLARATION OF ARTIFICIAL INTELLIGENCE USE

No generative artificial intelligence was employed to generate the content, formulate the arguments, or build the conceptual framework of this article.

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