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EMPLOYMENT CONDITIONS AND QUALITY OF LIFE OF GIG WORKERS: A STUDY OF FOOD DELIVERY WORKERS IN AHMEDABAD

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Abstract

Digital labour platforms have revolutionised service delivery and work relations in terms of coordinating workers via data-driven systems. In this study, the association between three factors—Earning instability, Algorithmic Management, Regulatory Protection—with the autonomy, job satisfaction, quality of life, and overall well-being of the app-based food delivery workers of Ahmedabad, India was examined. The research designed was quantitative cross section with descriptive and explanatory. A structured questionnaire that used five point Likert scale measures was used to collect data from 174 food delivery workers. The test of internal consistency was carried out using Cronbach's alpha and the test of the hypothesis was carried out using linear regression. Measurement scales were found to have acceptable to good reliability ranging between .76 and .85. Results indicated that there was a significant and negative correlation between income instability and quality of life. Algorithmic management was also negatively and significantly related to worker autonomy and job satisfaction. However, there was perceived regulatory protection, and this was positively and significantly related to worker well-being. The results suggest that the employment access and scheduling flexibility should not be the only measures used to assess platform work. Employment quality is also about the predictability of earnings, transparency of automated employment decisions, meaningful worker discretion and access to institutional safeguards. The study draws on Job Demands-Resources Theory (JD-R) and Labour Process Theory, which are theories that have focused on physically mediated work, and introduces two new structural job demands, "income uncertainty" and "algorithmic control," to apply them to digitally mediated work. It also provides concrete implications for the platform managers and policymakers in terms of transparency in compensation, grievance systems, social protection systems, and responsible algorithmic governance.

Keywords: *algorithmic management; food delivery workers; gig economy; income instability; worker well-being*

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1. INTRODUCTION

1.1 Background and Research Context

Digital labour platforms have revolutionized the organization, delivery and management of services. The platforms are digital platforms that integrate consumers with the workers, manage transactions, payments, performance evaluation, and service delivery. More recently, especially in the urban labour market, location-based platforms such as food delivery applications have been of great importance. They are relatively easy to access and offer earning prospects, particularly for those labourers who are unable to access formal employment. But their development has also resulted in working conditions that are markedly non-traditional employer-employee ones (International Labour Organization [ILO], 2021).

India has seen a massive growth within the gig and platform economy. NITI Aayog estimated the number of people who engaged in the gig economy in India in 2020-21 to be around 7.7 million. It was estimated that this workforce would grow to 23.5 million in 2029-2030. Also, food delivery is a significant component of this growing labour market as platforms can facilitate the logistics of large groups of geographically dispersed workers via mobile apps, and data-driven systems (NITI Aayog, 2022). This model has been growing and is making jobs more accessible and consumers more convenient. It has also sparked concerns about wages, working status, worker protection and risk transferring between platforms and workers.

Gig work is often billed as a form of independence, flexibility and entrepreneurial opportunity by the platform companies. Employees can choose their time of access to an application and some flexibility in work hours. However, this flexibility is within a system which assigns orders, and provides for the calculation of incentives, monitoring location, recording acceptance rate, assessing customer rating and consequences based on performance. So, algorithmic systems are systems that undertake functions that have previously been the domain of supervisors and human resource managers (Duggan et al., 2020, 2023). These systems can help coordinate and enhance the efficiency of operations, but they can also lead to information asymmetries and limit meaningful worker discretion.

Automated order allocation is not the only thing algorithmic management can be about. It can guide workers with recommendations and restrictions; assess them with ongoing recordings and rating and discipline them with rewards, limited access to work, or even disable their accounts (Kellogg et al., 2020). When working in food delivery, these mechanisms are compounded by delivery timelines, tracking and monitoring, varying incentive packages, customer feedback, and unclear benchmarks. Workers can thus have formal scheduling flexibility, with significant behavioural and economic control (Veen et al., 2020; Wood et al., 2019). There is also evidence from recent studies in India that food delivery platforms have systems of surveillance, geo-fencing, performance assessment, and data-based decision systems for organizing and controlling work (Hussain, 2024).

1.2 Research Problem and Gap

This may have significant implications for workers' wellbeing if the conditions of the employment generated by platform work are detrimental. It's common for food delivery workers to rely on volume of orders, incentive schemes that change over time and pay-for-performance. As a result, earnings can vary if workers are working long hours. Costs for vehicles, fuel, maintenance, communication and expenses due to accidents, may be transferred to the workers, further decreasing income security. These conditions can impact on financial security, mental health and quality of life. There are still several areas where Fairwork has been able to highlight the shortcomings on Indian platforms, including fair pay, fair conditions, fair contracts, fair management, and worker representation. This means that employment flexibility does not necessarily mean good employment quality and/or employment protection (Fairwork 2024).

Autonomy and job satisfaction are other issues of concern with regard to the influence of algorithmic management. Although platform workers are formally classified as independent service providers, their ability to work and earn may be subject to rules which they cannot fully observe or challenge. Studies have reported the presence of flexibility and control in gig work. Whilst workers might appreciate the flexibility of working in platform employment, it can also come with high levels of monitoring, pressure to perform, irregular working hours, and a lack of bargaining power (Duggan et al., 2023; Wood et al., 2019). Job design, performance management, organisational control, perceived fairness and worker well-being are all key areas that are affected by these tensions, thus placing them at the heart of management research.

The platform economy and the importance of algorithmic control and precarity of employment have been well documented in existing studies. But much of evidence has come from western countries, far away digital labor markets, or wide-spread comparisons of various forms of gig work. There are still relatively few

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studies based on Indian urban food delivery contexts. The research is also currently conducted separately on income insecurity, algorithmic control, autonomy, satisfaction and well-being. This constrains knowledge of the different work conditions that exist and function in an identical platform based work system. Ahmedabad offers a crucial context in which to tackle this divide as it has a growing urban service economy with a significant volume of food delivery, and local workers have not yet entered India's more formal and better protected labour market.

1.3 Research Objectives and Contribution

This paper looks at the working conditions and quality of life of the food delivery workers in Ahmedabad who work with Apps. It has four objectives. First, it takes a look at the working and employment circumstances of food delivery workers. Second, it examines the association between income insecurity and self-reported quality of life. Third, it examines the connection between the algorithmic management, job satisfaction and worker autonomy. Fourthly, it assesses the link between the perception of regulatory protection and workers' well-being.

The study makes a unique contribution to the field of business and management research by viewing digital platforms as organisational systems as opposed to a neutral technology intermediary. It brings together algorithmic management and well-known issues of HRM, job design, labour control and employee welfare. It also differentiates precarity in the financial sector and managerial control via technology. This separation allows a finer-grained understanding of impacts on workers based on platform practice. Lastly, the study presents findings from an under-researched city in India and suggests implications for platforms, policymakers and institutions that wish to reconcile efficient operations and sustainable and equitable working conditions.

2. LITERATURE REVIEW, THEORETICAL FRAMEWORK, AND HYPOTHESIS DEVELOPMENT

2.1 Platform Employment, Income Instability, and Quality of Life

Platform-based food delivery offers low barriers to entry into work, but also places a large economic burden on workers. No guaranteed monthly/hourly wage for food delivery workers. Their income is based on the orders they receive, how far they have to deliver, what customers want to pay, incentives, and calculations by the platform. The workers also have to cover costs like fuel, vehicle maintenance, mobile data and accident costs. Gross receipts thus may not give a full picture of their level of disposable earnings and financial security.

Income instability means that one may not know if the work he or she has will bring in enough and steady income. It's not just a variation in payment for a short period of time. It also involves reliance on fluctuating incentives, variable order quantities and a lack of control of the platform incentive systems. Financial uncertainty can force workers to work longer hours, less desirable orders and/or work when physical risks are greater. These responses can help to preserve the gains in the short term, but can also extend recovery time and cause physical and psychological stress.

In the context of gig work, financial precarity is shown to be one of the key pathways that can lead to a decline in subjective wellbeing. Gig workers also reported lower levels of life satisfaction and mental health compared to those with regular full-time and part-time jobs, as Wang et al. (2022) discovered. Much of these differences could be accounted for by financial precarity. The results of a study with food delivery workers have also revealed that well-being is a function of the interplay between food delivery workers' work autonomy, perceived competence, meaningfulness, and platform-related constraints (Wu et al., 2022).

Quality of life is a measure of worker's perceptions of their physical, psychological, social and material conditions. Food delivery work has very close links with these dimensions. Households' capacity to plan and access services is limited by uncertain earnings. Working long hours may disrupt sleep, family life and/or social activities. There can be other physical hazards involved with delivery schedules and constant exposure to the road. Additionally, there is no paid leave or earnings replacement, and sickness and injury can result in a loss of income right away. Economic security, autonomy, and subjective work experience have therefore been considered as interdependent elements of the quality of a job in the research on job quality in food delivery (Goods et al., 2019).

Income uncertainty is a Job Demands-Resources job demand as workers must constantly cope with an unstable stream of work and income. Income security, on the other hand, is a resource which can help with planning and alleviate psychological tension. Formal flexibility can turn into a binding constraint on working

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time, if it is necessary to extend working hours in order to earn a basic level of income. Based on the above, the following hypothesis is proposed:
H1: Income instability is negatively associated with the perceived quality of life of food delivery workers.

2.2 Algorithmic Management, Worker Autonomy, and Job Satisfaction

Algorithmic management is the term that describes when data-driven systems are used to manage. These functions involve work allocation, monitoring, scheduling, setting goals, compensating, evaluating performance and terminating / deactivating (Parent-Rocheleau & Parker, 2022). The app can allocate orders, set routes, estimate delivery times, work out incentives, log acceptance and cancellation behaviors, and take customer feedback into account for performance decisions, in food delivery. Platforms can thus maintain organisational control without having to continuously supervise.
Algorithms have enabling and limiting features to management. Can decrease co-ordination costs, can offer speedy access to tasks, can also give workers information they need in order to deliver. But, it can be limiting if rules are not clear, targets are strict, or refusal of assignments is an economic disincentive. According to Meijerink and Bondarouk (2023) this is called the duality of algorithmic management. Algorithms can afford workers flexibility, but at the same time can restrict the extent to which this flexibility is realized.
Autonomy is more than logging in/out of an application. It involves flexibility regarding work speed, task order, timing, technique and accepting assignments without undue consequences. Platforms can restrict these options over time, by offering incentives based on geographic location, percentage of acceptance and performance to do future work. When algorithmic matching is coupled with managerial control, there are tensions around work execution and compensation, and a sense of belonging to the organisation, that platform workers feel (Möhlmann et al. 2021).
Algorithmic opacity also impacts workers autonomy in ways that can be considered to be less than meaningful. Workers can change their behaviour based on ratings or performance classifications, without understanding the criteria used to make the rating. Rahman (2021) termed this situation as an invisible type of control as workers try to meet evaluation standards which cannot be fully seen. This opacity can make people more reliant on the platform, and limit their ability to contest negative decisions.
Recent studies show that perceived control by algorithms also influences the ways in which gig workers adjust their jobs. Liu and Yin (2024) identified that algorithmic management had an impact on job crafting behavior, in part, due to perceived autonomy. The relationship is important because workers have to be allowed some discretion to make variations in the demands and to maintain a sense of personal effectiveness. A systematic review by Kadolkar et al. (2025) also found that algorithmic management has significant implications for workers' attitudes and behavior—with varying impacts for specific practices and platform contexts.
Minimized autonomy can also lead to decreased job satisfaction. Job satisfaction is the general affective assessment by the worker of the work experience. Its form is determined by the control, fairness, rewards, demands and treatment of the organisation. Flexible entry and schedules are nice for food delivery workers, but so can be the sudden, unexplainable changes in employment payments, automated penalties that can't be challenged or customer ratings that affect employment access. These conditions produce a disconnect between the independence of the platform and the workers' dependence on automated decisions of managers.
Continuous monitoring, time pressure, rating dependence and unclear performance standards, in the Job Demands-Resources Theory, are all classified as job demands. Job resources are autonomy, procedural transparency and accessible review mechanisms. An increase in algorithmic demands, in the absence of resources, is likely to lead to a decrease in workers' control and evaluations of their work. Based on this, the following hypotheses are suggested:
H2: Algorithmic management is negatively associated with the perceived autonomy of food delivery workers.
H3: Algorithmic management is negatively associated with the job satisfaction of food delivery workers.

2.3 Regulatory Protection and Worker Well-Being

Having a precarious status of being a platform worker may be a liminal state between employment and self-employment. They are classified according to whether they are entitled to access to minimum earnings protection, paid leave, occupational injury compensation, social insurance, collective representation and formal grievance procedures. According to the International Labour Organization (2021), many platform workers have no access to social-security protection, and are not covered by conventional labour-protection systems. For location-based workers, in particular, these gaps have significant consequences as their earnings

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depend on being physically present and available and on being exposed to traffic, the weather, and people.
Regulatory protection may be seen as an institutional asset which diminishes the personal impact when risks are linked to employment. Accident insurance, health coverage, income protection, clear contracts, and efficient mechanisms to deal with disputes can all have a positive impact on workers' capacity to cope with illness and injury, unfair penalties and abrupt loss of access to platforms. Gig worker social insurance studies have shown a significant gap in such coverage for unemployment, retirement, medical and occupational injury protection (Ghorpade et al., 2024).
Regulatory protection is not just about the direct benefit of it. When workers believe that there are enforceable safeguards in place, this can impact their level of security, and their judgement of whether they are at risk or not. Certain regulations and easy-to-understand remedies minimize uncertainty over deactivation, payment disputes and work injuries. Regulatory protection from a Job Demands-Resources point of view can be considered as a resource to decrease exposure to economic and physical demands. It can also help to reduce the risk of operational risks that platforms pass on to individual workers. The following hypothesis is put forward:
H4: Perceived regulatory protection is positively associated with the well-being of food delivery workers.

2.4 Integrated Theoretical and Conceptual Framework

This study combines Job Demands-Resources Theory and Labour Process Theory as they provide explanations about complementary aspects of platform work. Job Demands-Resources Theory suggests that job features may be considered as either demands or resources. Jobs include extended periods of physical or mental exertion and can cause stress when they are too much. Job resources are elements in the job that enable them to reach work goals, cope with demands and stay motivated (Bakker & Demerouti, 2017).
Income volatility, delivery pressure, constant tracking and rating dependency are work demands in the field of food delivery. Job resources are autonomy, salary predictability, open procedures, complaint systems and protection by regulation. Studies on the applicability of the Job Demands-Resources (JD-R) framework to the digital gig economy align with the relevance of compensation, job security, workload, physical demands, and platform governance to attitudes and behaviour of workers (Zhao & Liu, 2024). The framework offers, in this way, some explanation for the ways in which job demands can negatively affect quality of life and job satisfaction, and how job resources can buffer workers' wellbeing.
Labour Process Theory is about the labour capacity being transformed into productive activity, and the control of the work process being established by organisations. Platform employment is when managerial power is built into software, data gathering, incentive systems and performance ratings. This provides an explanation of how workers can legally or rhetorically be characterized as independent and their work still be closely directed and evaluated. Gandini (2019) suggested the use of ratings, rankings, and feedback mechanisms have managerial and monitoring roles in gig work. Algorithmic systems can also make it difficult to distinguish the managerial authority as instructions and sanctions are technically produced and do not look like human decisions.
Incorporation of these theories links with the organisational arrangements that make them. Job Demands-Resources Theory can be used to understand how fluctuations in income and pressure from algorithms can lead to lower levels of quality of life, autonomy, and job satisfaction. Labour Process Theory is an explanation of how platform companies produce and sustain such conditions via digitally-mediated control. Regulatory protection is conceived as a type of institutional resource that can enhance well-being by decreasing the level of exposure of workers to unmitigated economic and occupational risks. These perspectives combine to explain the four proposed relationships and offer a management-based explanation of employment quality in app-based food delivery. The proposed relationships in Figure 1 are based on the integrated theoretical arguments.

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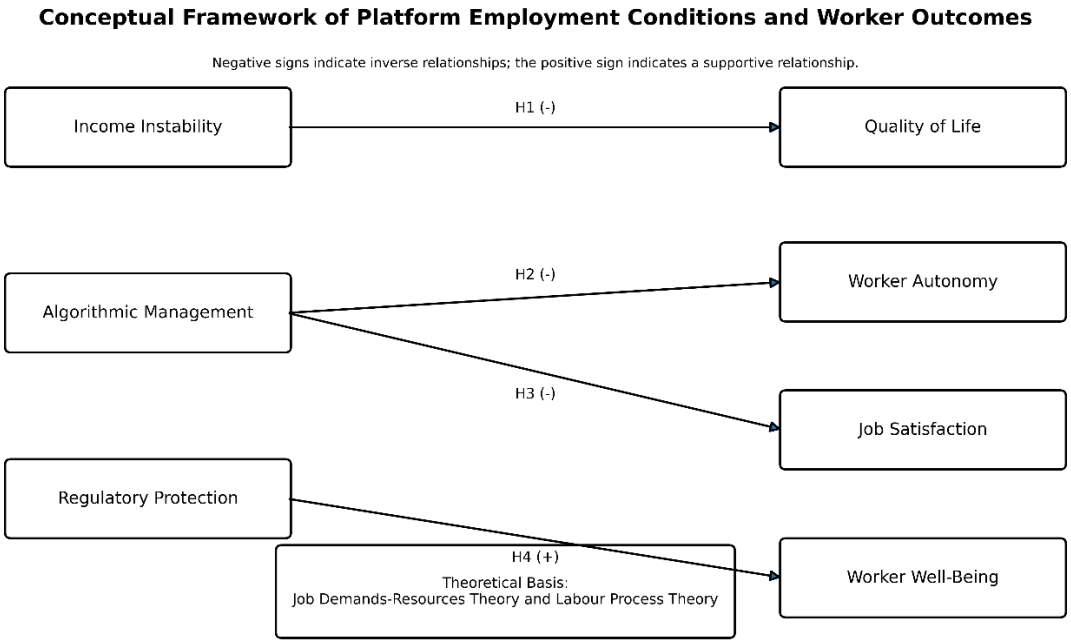

Figure 1. Conceptual framework of platform employment conditions and worker outcomes

3. RESEARCH METHODOLOGY

3.1 Research Design, Study Setting, and Sample

This study was conducted using a quantitative approach, cross sectional, descriptive and explanatory research. The design allowed for the study of employment and worker outcomes at a given time. It aided in the statistical testing of the relationships proposed in the conceptual framework as well. The study population included food delivery workers working in Ahmedabad through the food delivery apps, which include workers from major food delivery companies like Zomato and Swiggy.

An a priori power analysis was done with GPower 3.1 to determine the target sample. The size of the effects was set at medium ($f^2 = .15$), the significance level was .05, and the statistical power of .95 was set, along with 5 predictors for the largest planned regression model. GPower helps with sample-size and power calculations for correlation and regression procedures (Faul et al., 2009).

The questionnaires were distributed during a fieldwork period of 3 months with a total of 200 questionnaires given. After screening the data from these, 182 were returned and 174 complete questionnaires were retained. Of the 87% effective response rate, 50% were women. A non-probability field based sampling was used for approaching the respondents at high density restaurant and delivery clusters in eastern and western Ahmedabad. Eligibility screening was done with a view of adding a purpose to it because the participants had to be having at least six months of active food delivery experience in the city. This criterion guaranteed that the respondents possessed sufficient experiences with platform payment systems, automated task allocation, rating systems and working conditions related to delivery.

3.2 Research Instrument, Variables, and Pilot Testing

A structured questionnaire was used to collect data from two sections, namely demographic and employment while the third section was construct-measurement. All constructs items were rated on a five-point Likert scale from ‘strongly disagree’ to ‘strongly agree'. For all the constructs measured, higher scores reflected a higher level of the construct measured. The questionnaire included six constructs: income instability, algorithmic management, regulatory protection, autonomy, job satisfaction and quality of life.

Instability in income was assessed by the five items that measured the fluctuation in income, income predictability, reliance on variable incentives, uncertainty about future income. Algorithmic management was assessed using 6 items related to automated order allocation, rating pressure, performance monitoring and lack of transparency of platform decisions. Regulatory protection was measured via four items related to perceived access to labour protection, social-security and institutional grievance mechanisms. These measures were adjusted for the working conditions of food delivery work via an application.

Four items that tapped into discretion of scheduling and task execution were used to measure autonomy. It

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was operationalised based on previous work-design research that considers autonomy as discretion over the way, when and/or what of work (Morgeson & Humphrey, 2006). Job satisfaction was measured by five items that were based on the Brayfield-Rothe Job Satisfaction Index (Brayfield & Rothe, 1951). Quality of life was assessed using 6 items from WHOQOL which included physical, psychological and financial domains of quality of life. WHOQOL sees quality of life as a multi-faceted evaluation of a person's situation and their position in life (The WHOQOL Group, 1998).

Table 1 Operationalisation of the Study Variables

Construct	Analytical role	Items	Operational focus	Meaning of higher score
Income instability	Predictor	5	Earnings fluctuation, incentive dependence, and income unpredictability	Greater income instability
Algorithmic management	Predictor	6	Automated allocation, monitoring, ratings, and decision opacity	Greater perceived algorithmic control
Regulatory protection	Predictor	4	Labour safeguards, social security, and grievance mechanisms	Greater perceived protection
Autonomy	Outcome	4	Scheduling freedom and discretion over task execution	Greater perceived autonomy
Job satisfaction	Outcome	5	Overall affective evaluation of delivery work	Greater job satisfaction
Quality of life	Outcome	6	Physical, psychological, and financial well-being	Better perceived quality of life

Note. Worker well-being in H4 was operationalised using the quality-of-life measure.

The English version of the questionnaire was translated into Gujarati and Hindi and later back translated into English. To check the semantic equivalence between the source and target versions, back-translation was used, following the procedures of cross-cultural research (Brislin, 1970). A pilot test was then administered to 20 other food delivery workers not in the final analysis sample. The pilot exercise evaluated the clarity of the items, appropriateness of the context, and how well the questionnaire was filled out. Few wording changes were made where participants indicated that they were unclear about the meaning of the words, and the construct structure and response scale were left the same.

3.3 Reliability, Data Analysis, and Ethical Considerations

Cronbach's alpha was used to determine the internal consistency. The coefficient assesses the degree of interrelatedness of the items in a multi-item scale. It should be considered in conjunction with the content of the items and the breadth of the construct and not as a stand-alone validity measure (Tavakol & Dennick, 2011). The coefficients for income instability, algorithmic management, regulatory protection, autonomy, job satisfaction and quality of life were, respectively, .84, .82, .76, .79, .85 and .81. Reliability of this scales was checked by the values which showed acceptable to good internal consistency across the six scales.

IBM SPSS Statistics version 28 was used to analyse the data. The characteristics of the respondents were summarised using frequencies and percentages. Linear regression was used to test the four hypotheses. Four models were created to analyze the correlations between income instability and quality of life, algorithmic management and autonomy, algorithmic management and job satisfaction, and regulatory protection and worker well-being. The quality-of-life measure was the indicator of worker well-being in the fourth model.

The direction and magnitude of the relationships were determined using standardised and unstandardised coefficients, t-values and p-values, coefficients of determination and adjusted coefficients of determination were used to determine the statistical significance of the relationships. Preliminary tests for normality, homoscedasticity and multicollinearity were performed. VIF values were below 2.5 which did not pose any problem in the interpretation of regression estimates due to multicollinearity. The .05 level of statistical significance was used to analyze the data. Since the data in this study was a cross sectional self-reported data, the results of the regression were interpreted as association which is predictive rather than temporal

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causation.
Ethical measures were taken during data collection. The participants were informed of the purpose of the study prior to answering the questionnaire and gave their informed consent. Responses were self-selected and the respondents were allowed to drop out without penalty. None of the personally identifiable information was kept. The questionnaires were completed on a voluntary basis, and the information was kept in a confidential manner and only used for research purposes.

4. RESULTS

4.1 Respondent Profile

174 valid responses were analyzed. Table 2 shows the characteristics of the respondents (age, sex, and number of working hours). The ages of most of the participants were in the range of 26-35 years representing 44.8% of the sample. 37.4% of the respondents were between the age group of 18 and 25 years. Smaller percentage was in the age group 36-45 years and only 4.6% were over 45 years. The age distribution shows that the Ahmedabad food delivery job market was dominated by the younger working population who were using “apps” for delivery.
As for education, 47.1% and 36.8% of the respondents were secondary/high school and higher secondary educated, respectively. Just 16.1% had an advanced (graduate level or higher) qualification. There was a lot of work intensity in the working hour profile. Over 50% of the respondents were working more than 10 hours daily. Another 19.6% indicated that they had worked over 12 hours a day. Hence, a little over three quarters of the sample was engaged in active work for at least 10 hours a day.

Table 2 Demographic and Working-Hour Profile of Respondents

Characteristic	Category	Frequency	Percentage
Age	18–25 years	65	37.4
	26–35 years	78	44.8
	36–45 years	23	13.2
	Above 45 years	8	4.6
Education	Secondary or high school	82	47.1
	Higher secondary	64	36.8
	Graduate and above	28	16.1
Daily working hours	8–10 hours	42	24.1
	10–12 hours	98	56.3
	More than 12 hours	34	19.6

Note. (N = 174). Percentages may reflect rounding.

The reliability assessment results showed that the internal consistency of the six constructs in the study were acceptable to good. Cronbach's alpha's were between .76 for regulatory protection and .85 for job satisfaction. All the measures were thus kept for hypothesis testing.

4.2 Hypothesis Testing

The proposed relationships have been tested using linear regression analysis. Table 3 includes all the regression coefficients, standardised beta values, t-values, significance levels and hypothesis decisions which have been authenticated.

Table 3 Regression Results for the Hypothesised Relationships

Hypothesis	Predictor	Outcome	B	β	t	p	Decision
H1	Income instability	Quality of life	−.452	−.421	−5.842	< .001	Supported
H2	Algorithmic management	Autonomy	−.398	−.385	−5.210	< .001	Supported
H3	Algorithmic management	Job satisfaction	−.312	−.294	−3.890	< .01	Supported
H4	Regulatory protection	Worker well-being	.245	.228	3.150	< .01	Supported

Quality of life was significantly and negatively related to income instability. The standardised coefficient (β = -.421) showed that higher income instability was related with lower perceived quality of life. The model accounted for 38% of the variance in the quality of life, and .37 of the variance in the adjusted (R2). The overall model was statistically significant, ($F = 52.40$), ($p < .001$). H1 thus was supported.
There was a significant and negative relationship between algorithmic management and autonomy. A

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negative value of the coefficient (β = -.385) showed that the more participants felt given control over the algorithm, the less they felt autonomous. The model accounted for 31% of the variance in autonomy. Hence, H2 was given a thumbs up.

Job satisfaction had a significant and negative relationship with algorithmic management as well. The standardised coefficient (β) was -.294 and the t-value was −3.890 which was statistically significant. The model accounted for 27% of the variance of job satisfaction. H3 was thus given support.

There was a strong positive relationship between regulatory protection and workers' well-being. The fact that both coefficients were positive meant that increased perceptions of protection of workers, social-security support, and grievance mechanisms were associated with greater worker well-being. Therefore, the support of H4 was provided. Figure 2 shows graphically the direction and relative size of the standardized regression coefficient of the four hypothesized relationships.

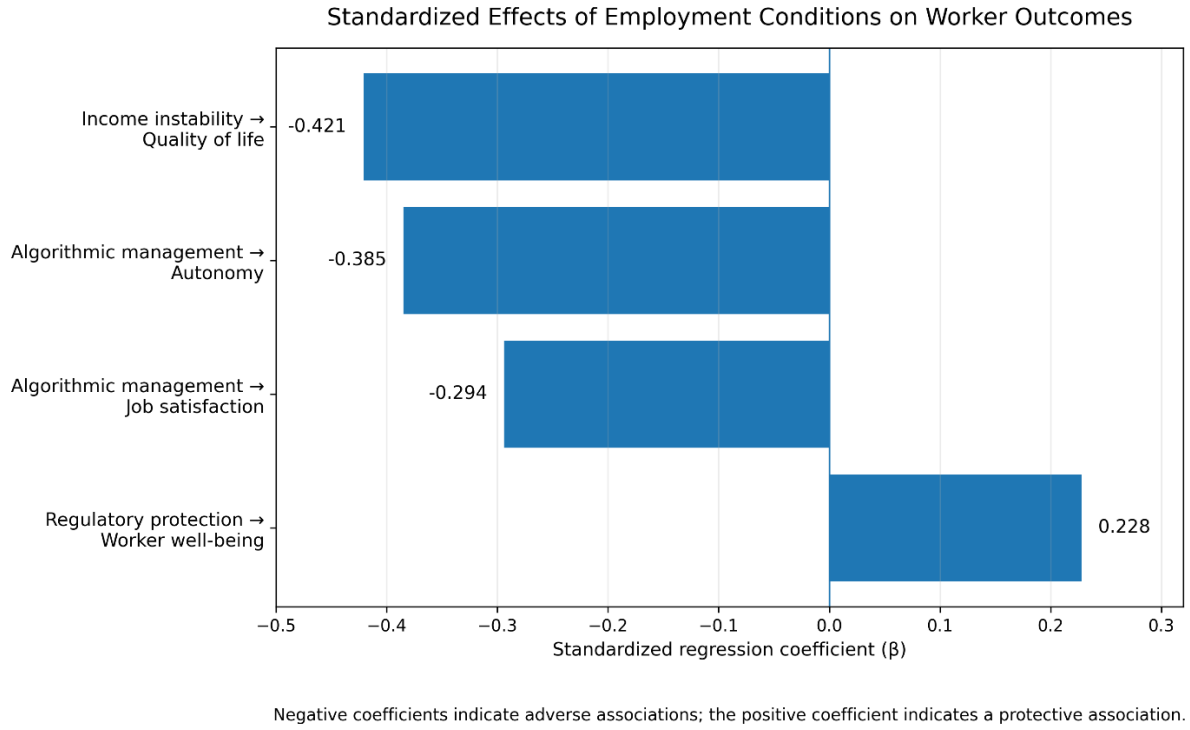

Figure 2. Standardized regression coefficients for the hypothesised relationships

4.3 Summary of Hypothesis Decisions

All four hypotheses were supported by the results. The most significant negative relationship was found between algorithmic management and autonomy followed by income instability out of the tested relationships. Also, the relationship between algorithmic management and job satisfaction was found to be significant and negative. There was a positive correlation between Regulatory Protection and worker well-being.

Table 4 Summary of Hypothesis Testing

Hypothesis	Proposed relationship	Result
H1	Income instability is negatively associated with quality of life	Supported
H2	Algorithmic management is negatively associated with autonomy	Supported
H3	Algorithmic management is negatively associated with job satisfaction	Supported
H4	Regulatory protection is positively associated with worker well-being	Supported

The findings provide empirical support for the proposed conceptual framework. Their theoretical and practical meanings are examined in the following discussion section.

5. DISCUSSION

5.1 Interpretation of the Findings

This study looked at the relationship between income instability, algorithmic management, and regulatory protection, and the well-being of food delivery workers in Ahmedabad. The results were consistent with all

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four hypotheses. The results suggest that the nature of the platform work and its quality is not solely a function of access to earning opportunities but also of predictability, transparency and protection that are part of the employment package.

The results of the negative correlation between income instability and quality of life support H1. The most significant correlation, out of the ones tested, was income instability. This finding implies that irregular earnings have impacts on workers not just in their current financial circumstances. The unpredictable nature of income may limit household planning and foster anxiety and the need for workers to lengthen their work hours or find other jobs to meet a minimum income level. This interpretation is supported by descriptive results. 75.9% of the respondents reported being engaged in a job for at least 10 hours in a day. The working patterns may be a reflection of the economic pressures generated by payment schemes which are based on an incentive to work based on order volumes.

This result aligns with the literature showing that financial precarity leads to a decrease in life satisfaction and mental health among gig workers (Wang et al., 2022). This also aligns with studies on food delivery employment, which found that the quality of an employment is important in terms of the welfare status outside of work, income security and pressure of the role (Lin et al., 2023). The present finding is a further add on to this evidence and is located in Ahmedabad. It indicates that the flexibility of platform work can have a negative impact where there are risks the work will not be remunerative.

Income uncertainty can be considered as a persistent job demand from a Job Demands-Resources Theory perspective. The fluctuations require workers to spend time and psychological resources to adjust to the changes, in part out of their control. Predictable income is also missing, further limiting a resource to aid in financial security and recovery from work. The conclusion is thus that flexibility in employment and quality in employment should not be equated. Practically speaking, there may be a freedom for workers to decide on their working hours but they are economically forced to work for a longer duration.

The results of this relationship between algorithmic management and autonomy are significant and negative, supporting H2. This finding suggests that more positive attitudes on automated monitoring, allocation of orders, pressure of rating and opacity of decision making were associated with less perceived discretion. While workers might still be able to turn the platform on or off, they also need to have some autonomy over the speed of their work, whether they accept jobs and how they execute them. Under restrictive economic conditions, nominal choice may be in effect when refusing orders impacts incentives or ratings or future orders.

This is in line with Umer's (2021) characterisation of platform-worker freedom as ‘half a freedom'. It also connects with the studies that indicated the ability of platform systems in time targets, automated task assignment, data collection and performance evaluation (Li & Jiang, 2022). These allow platforms to effectively manage their distributed workers. They can also diminish workers' abilities to comprehend or question decisions that determine income and workload.

The outcome also corroborates the Labour Process Theory. Managerial control is not only visible in supervisors, but also in the application in platform work. The algorithm organizes work to be done, the pace at which it should be done and the measurement of performance. This technological method of control can mask the organizational decisions behind seemingly technical decisions. The negative sign of the association with autonomy suggests that part of the improvement in algorithmic efficiency may come from a decrease in discretion of the workers.

H3 was also supported as there was a significant negative association between algorithmic management and job satisfaction. This indicates that the perception of the food delivery jobs, which is the basis for the workers to value their jobs, is related not only to the flexibility of the jobs, but also to the way the platform manages the workers. When workers perceive that incentive calculations, ratings, penalties or account restrictions are difficult to understand, it can affect satisfaction – automated decisions can have the same effect. Without personal human assistance, it can heighten dissatisfaction as workers may not have the means to rectify mistakes or appeal when a decision is made against them.

The results align with the fact that role conflict as well as platform-related pressures can reduce the employment experience among food delivery workers (Lin et al., 2023). It also aligns with other studies that have demonstrated that the greater the congruence between the platform organisation and workers' preferences for autonomy and security, the higher their well-being. Where platform work may seem flexible, repeated violations of these preferences can lead to a decrease of well-being (Felix et al., 2023).

The Job Demands-Resources Theory is useful to explain this relationship. Demands are: Algorithmically monitoring, opaque evaluation, delivery pressure. Resources are transparent procedures, decision latitude and responsive support. High demands in absence of resources makes workers evaluate jobs negatively. The

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outcome thus calls for a nuanced understanding of algorithmic management. While algorithms can increase the speed of services and facilitate coordination, their use can also have a negative impact on worker trust, discretion and satisfaction, which can detract from their organisational value.

The positive relationship between regulatory protection and worker well-being is supportive of H4. Labourers who felt they had greater access to labour protection, social security and complaint system also had higher levels of well-being. This finding suggests that regulatory protection is not a factor outside of the organisation's performance. It's a resource that can minimize the impact of the loss in income, injury, payment issues and platform deactivation.

The discovery is significant in the context of India where the regulatory and social-protection framework for platform work is still in its early stages. Expansion of social protection, social dialogue and institutional participation in the increasing gig economy is among the main priorities identified by the International Labour Organization. It also has underscored the relationship between platform-worker welfare and platform pay, working time, occupational safety, employment status, and transparency of algorithms (ILO, 2024).

5.2 Theoretical, Managerial, and Policy Implications

The study makes a theoretical contribution by combining Job Demands-Resources Theory with Labour Process Theory. The findings reveal that income insecurity and algorithmic pressure is not an isolated grievance of workers. They are job requirements that are created structurally as a result of the platform business model. Demands on these resources can be diminished through autonomy, transparent management, predictable earnings and regulatory protection. Labour Process Theory also theorises the way in which platform companies maintain a significant degree of managerial control over workers, despite their being registered as independent.

The results also suggest a new addition to platform-work research: separating out financial precarity and algorithmic control. Income instability and algorithmic management were linked with quality of life and autonomy and job satisfaction, respectively. This distinction is significant because it is unlikely that one intervention will be able to tackle all aspects of employment quality. Incentives have the potential to encourage greater satisfaction, though improvements to incentives may not be sufficient to overcome dissatisfaction due to unclear ratings. Also, having the flexibility to schedule may not make up for volatile net earnings.

The findings suggest that workforce sustainability is more than just improving order efficiency for platform managers. The pay should be enough for employees to make some idea about what they will be making. How incentives, ratings and order allocation work should be communicated by the platforms. All automated penalties and decisions to deactivate should be reviewed by a human being. Responsive mechanisms for grievance and clear appeals procedures should also be available for workers.

The platforms should have meaningful autonomy: workers should be able to refuse work without facing disproportionate consequences. Performance measures should include traffic, weather conditions, delays in restaurants, customers and other factors beyond the control of the workers. Having a safety support, accident insurance and transparent deductions may also help to enhance perceptions of organisational fairness. These practices can help keep customers, by preventing unnecessary dissatisfaction and distrust.

The results also help to improve the level of policy coordination. Social-protection should cover occupational injury, health insurance, income loss, and security. There should be open contracts and easy ways to resolve disputes. They should also explain what platforms are accountable for when it comes to working conditions, pay, data usage and automated decision making. Employer and business organisations can help by supporting common standards and social dialogue, and by not viewing platform work as completely outside of the realm of conventional employment governance.

5.3 Limitations and Future Research

The results must be interpreted with several cautions. First, the cross-sectional design can only detect statistical relationships and not a temporal cause. Second, the sample was restricted to food delivery workers of Ahmedabad. It may not apply to the other cities, platforms or types of gig work. Thirdly, the non-probability sampling strategy employed in the field may have missed workers in less conspicuous places or at other times.

A set of self-reported measures was also used. This results in possible common method bias and socially desirable responses. The quality of life and regulatory protection was measured by perceptions of the workers, not administrative indicators. There is need to use a combination of surveys and verified earnings records, working-hour logs, accident data and platform policy information in future studies.

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Longitudinal studies could be used to determine if the outcomes of workers change over time, in response to changes in incentives or changes in algorithmic systems. Research in multiple cities may be able to shed light on the influence of the local labour market and regulatory environments on platform work. Future studies should also examine differences between platforms, and whether transparency, access to grievance or social protection moderates the link between employment demands and worker well-being.

6. CONCLUSION

The correlation between income instability, algorithmic management, regulatory protection and well-being of app-based food delivery workers in Ahmedabad was explored in this study. The results indicated that there was a negative association between income instability and the perceived quality of life. Algorithmic management was also negatively related to worker autonomy and workers' satisfaction. Perceived regulatory protection, on the other hand, was positively related to the wellbeing of workers. The results show that the flexibility and access to employment are not the only measures by which to assess platform-based employment. Platform work quality also relies on earnings predictability, managerial transparency, the discretion of decisions and the availability of institutional safeguards. Digital platforms can help to better coordinate operations and make the services more efficient, but they can also take away from workers' control over their work and diminish job satisfaction due to intensive monitoring and opaque automated decisions. Income instability and algorithmic pressure are important job demands in relation to digitally mediated work, thus contributing to the Job Demands-Resources Theory. It also offers a more complex understanding of Labour Process Theory that reveals how managerial authority can be built into platform applications, rating systems, incentives and automated performance controls. Sustainable workforce management solutions for platform companies involve clear and fair compensation structures, streamlined grievance processes, manual intervention in the automated sanctions system, and increased worker autonomy. Policymakers need to ensure greater social-security protection, occupational protection, dispute-resolution mechanisms and accountabilities for algorithmic decision-making. There's a need for more balanced governance model which can guarantee that the economic gains of digital food delivery are not reliant on chronic financial insecurity and diminished wellbeing for workers.

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