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Understanding the viability conundrum in online crowdwork: The costs of unprecedented autonomy

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ABSTRACT

Online crowdwork is an increasingly established phenomenon in the labor market, offering millions of workers opportunities for non-standard employment. However, the new psychological contract for such workers is characterized by various challenges. This study investigates online crowdworkers' viability challenge, focusing on the interplay between individual income dependence, perceptions of pay inadequacy, autonomy, and locus of control. While online crowdwork provides autonomy and flexibility, such benefits may come at a steep price for workers. Our study, based on data from 581 crowdworkers, reveals that a viability challenge exists, driven by individual income dependence and perceived pay inadequacy. Autonomy serves as a buffer. Importantly, workers with a strong internal locus of control navigate challenges better, particularly in managing perceptions of inadequate pay and harnessing the autonomy of online crowdwork. These findings shed light on workers' ability to navigate the viability challenges associated with online crowdwork.

1. Introduction

Online crowdwork is a thriving labor market segment, offering millions of workers non-standard labor opportunities. Broadly, the gig economy provides individuals with income opportunities by completing various short-term assignments or tasks without full-time commitments or labor contracts, often formally not recognized as 'employees' of online labor platforms in a legal sense (Cropanzano et al., 2023). In this study, we focus on a specific segment of the gig economy known as online crowdwork. Online crowdwork, also known as micro-tasking crowdwork, refers to work where online labor platforms, such as Amazon Mturk, mediate a tripartite labor process where requesters subdivide tasks into smaller units for piecemeal work to be completed by a 'crowd' of remote workers (Duggan et al., 2020). Organizations or individuals make tasks available (e.g., data labeling or content moderation) on an online labor platform, and workers then select the tasks they want to work on and receive compensation per completed task. Typical tasks include data labeling, transcribing, and software coding. Notably, well-known companies like Microsoft, Google, Meta, and X (formerly Twitter) are known to capitalize on online crowdworkers to improve their machine-learning algorithms (Gray & Suri, 2019). Because tasks are completed remotely, mediated by online platforms

deploying algorithms to match labor supply and demand and govern workers, there is no discernible employer or transparent labor relationship for these workers (Berg, 2015).

The rapid growth of online crowdwork has also led to a flourishing accumulation of scholarly work on the intricacies of job arrangements and work experiences in the gig economy. One consistent finding is that crowdworkers value the high levels of flexibility, independence, autonomy, and discretion regarding when and where to work afforded by these work arrangements (Cropanzano et al., 2023; Deng et al., 2016; Deng & Joshi, 2016; Durward et al., 2016; 2020; Kuhn & Maleki, 2017; Strunk et al., 2022; Wood et al., 2019). However, algorithmic governance practices inherent to online labor platforms may also create mechanisms of control that result in low pay (Wood et al., 2019) and may render autonomy an illusion (Malhotra, 2021; van Zoonen et al., 2023), as workers remain constantly vigilant searching for new labor and income opportunities on the platform (Toxtli et al., 2021). Notably, financial instability and job insecurity are oft-cited sources of viability challenges for gig economy workers (Ashford et al., 2018; Kuhn & Maleki, 2017; Schor et al., 2020). We examine this viability challenge's antecedents (i.e., income dependence and autonomy) and its implications for workers' experiences (i.e., work stress). A viability challenge in online crowdwork refers to the situation where workers need to find

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“enough money to sustain a desired lifestyle, coping with unpredictable work leading to “feast and famine” income cycles, and concerns about basic income continuation” (Caza et al., 2022, p. 31).

To understand whether and how workers can exercise the autonomy afforded to them, it is important, if not crucial, to understand their (economic) dependence (Vallas & Schor, 2020). Indeed, both industry and academia have expressed concerns over the common practice of low payment in online crowdwork (micro-tasking: Deng & Joshi, 2016). Felix and colleagues (2023) articulated the concept of autonomy-security elasticity to highlight the tension between autonomy and security (including financial security) in online crowdwork. Recent research on gig work more broadly identified the importance of workers' resilience (Singh et al., 2022) and individual traits (e.g., mindful metacognition; Açikgöz & Latham, 2022) in navigating transactional relationships between platform-dependent workers and their clients (Yao et al., 2022). We seek to unpack the implications of workers' dependency on the one hand (individual income dependence as the percentage of income generated from crowdwork and perception of pay adequacy) and autonomy and individual's ability to utilize this freedom on the other hand in understanding the prevalence of the viability challenge and its consequences (e.g., work stress) in online crowdwork.

By examining the factors surrounding the perceived viability challenge in crowdwork, we posit that the interplay between poor pay and individual income dependence intensifies the viability challenge, leading to work-related stress. At the same time, autonomy may present a resource for workers to mitigate this challenge. We further suggest that online crowdworkers with an internal locus of control are less susceptible to perceiving a viability challenge due to individual income dependence and will be better equipped to leverage the autonomy inherent to this work more effectively. Hence, in doing so, we seek to make several contributions.

First, we illuminate how two core dimensions of crowdworkers' lives – i.e., autonomy and the degree of individual income dependence (Cropanzano et al., 2023; Kuhn & Maleki, 2017) affect the viability challenge central to the gig economy (Ashford et al., 2018; Caza et al., 2022). We build on the psychological contract theory to theorize how these core dimensions of crowdworkers' new psychological contract affect stress by presenting a viability challenge. We will demonstrate how autonomy operates as a potential buffer against the viability challenge while poor pay and individual income dependence drive such a challenge. Second, this study investigates the impact of an internal locus of control on workers' ability to navigate the viability challenge and extends earlier theorizing on the implications of the viability challenge by considering work-related stress beyond factors that are indicative of thriving (e.g., learning) and surviving (e.g., financial wellbeing), in the gig economy (Ashford et al., 2018).

2. Theoretical framework

Online labor platforms revolutionized work relationships, supposedly unlocking several advantages for workers, such as improved flexibility and autonomy (Cropanzano et al., 2023; Gerber, 2021). For instance, workers have ‘unprecedented autonomy’ regarding when, where, and whether to work (Strunk et al., 2022). This autonomy extends to job selection – i.e., the freedom to select or ignore available microtasks – as workers can do any number of tasks available to them in any given period (Deng & Joshi, 2016). Furthermore, online labor platforms have been heralded as catalysts for economic development and potential equalizer of labor opportunities, particularly for those traditionally distanced from the labor market (Newlands & Lutz, 2021). However, online crowdwork is increasingly associated with controversy over work classification, the treatment of workers, and the precarity associated with gig work (e.g., Berg, 2015; Heeks et al., 2021; Wood et al., 2019). We use the psychological contract theory (Rousseau, 1995) to understand the work relationships between crowdworkers and the platform and requesters. Subsequently, we scrutinize the ‘costs’ of

autonomy in these crowdwork relationships by exploring the feasibility of online crowdwork as a (primary) source of income (Newlands & Lutz, 2021).

Psychological contract theory is based on individual-level cognitive interpretations of exchange relationships (Rousseau, 1989). In standard employment, a psychological contract refers to the perception of an exchange agreement between oneself and another party (e.g., the employing organization) (Rousseau, 1995). In such employment situations, employees are implicitly or explicitly promised certain inducements. In return, they owe the employing organization effective work behavior. The idea of a psychological contract draws on workers' subjective perceptions of fair and reciprocal exchange between themselves and the employer (Shanahan & Smith, 2021). Hence, the psychological contract is promissory because the exchange of tangible and intangible promises impacts the development and maintenance of ongoing labor relationships (Rousseau, 1989).

Traditionally, the psychological contract shifted the risk from the individual worker to the employing organization. Employees enjoyed labor protection, received training, a clear career path, stable wages, and opportunities for long tenures (Bidwell et al., 2013), and organizations received stable labor environments and control over work activities (Cropanzano et al., 2023). Over the past decades, the business environment has changed, demanding more flexible arrangements and, as a result, demanding psychological contracts that shift the risk more to the individual worker. A case in point for such new psychological contracts is the employment relationships of crowdworkers (e.g., Claussen et al., 2020; Costa, 2021; Cropanzano et al., 2023; Duggan et al., 2020). Specifically, crowdworkers operate under a narrowly defined, short-term, transactional contract focusing on economic concerns and *quid pro quo* exchanges that can be easily monitored (Cropanzano et al., 2023; Rousseau, 1995).

The archetypical psychological contract with pay-for-attendance models has morphed into ultra-short-term pay-per-task exchanges (de Cuyper & de Witte, 2006). Costa (2021) cautions that this emergent form of psychological contracts implies uncertain careers, high levels of independence, “work without a boss,” and payment based on the quantity of completed work. The uncertainty for crowdworkers is further fueled by low labor costs, lack of job obligations, and the freedom to hire or fire crowdworkers on an ad-hoc basis (Behl et al., 2022; Jabagi et al., 2019). On a practical level, this uncertainty related to financial instability and job insecurity creates a viability challenge for crowdworkers (Ashford et al., 2018). Hence, while workers in these new employment relationships may experience greater autonomy (Ashford et al., 2018; Costa, 2021; Wood et al., 2019), this may come at the cost of financial instability and, ultimately, a viability challenge, raising questions about whether the new psychological contract of the gig economy is a Catch-22. Hence, we scrutinize the feasibility of crowdwork as a viable source of income by considering contributing or deterring factors underlying the viability challenge of crowdwork (Newlands & Lutz, 2021).

Specifically, we delve into two fundamental dimensions of crowdworkers' new psychological contract by juxtaposing challenges related to remuneration for work and the benefit of highly autonomous work (Cropanzano et al., 2023; Kuhn & Maleki, 2017; Schor et al., 2020). In gig work, workers bear the risk and responsibility of employment, requiring them to ensure continued revenue streams (Cropanzano et al., 2023). Hence, while gig work is characterized by high autonomy, it may be challenging to exercise it in a competitive labor market. This means that, in general, gig work may promise flexibility in work times and decisions to take on work, but in reality, even high-paid gig workers (e.g., IT contractors; Evans et al., 2004) may find lulls between gigs stressful and typically manage this by taking on extra work, work long hours, stay on-call and struggle to enjoy downtime (Caza et al., 2022; Cropanzano et al., 2023). Evans and colleagues (2004) studied how technical contractors in the US (i.e., IT specialists) took advantage of the autonomy afforded by their jobs. Their findings demonstrated that these

contractors rarely adopted flexible work schedules despite acknowledging the availability of such flexibility.

Hence, similar to online crowdwork, these workers are constrained by the market and need to maintain a good reputation to ensure continued income opportunities, escalating their engagement to work (Evans et al., 2004; Wu & Huang, 2024). The idea that competitive labor market dynamics constrain workers' ability to exercise autonomy is reflected in recent theorizing on online crowdwork (Caza et al., 2022; Cropanzano et al., 2023; Malhotra, 2021) and is further exacerbated by the notion that remuneration in online crowdwork is particularly problematic making it difficult for workers to anticipate and plan for financial instability (Ashford et al., 2018; Hornuf & Vrankar, 2022). Hence, the reality is that most gig workers, especially those with lower remuneration, have to work long hours to generate (a small) income (Cropanzano et al., 2023), giving rise to a viability challenge – i.e., concerns about income continuation to sustain a desired lifestyle – which may be experienced as stressful by workers. Hence, a viability challenge refers to prevalent concerns over generating sufficient income opportunities (Moorman et al., 2023), buffering against financial instability and insecurity (Ashford et al., 2018), and seeing a clear long-term path (Granger et al., 2022). We suggest that this challenge is exacerbated by income dependency and perceptions, and mitigated by autonomy.

2.1. The cost of autonomy: Viability challenge

It is worth noting that the gig economy hosts a diverse and multifaceted array of gig employment opportunities ranging from highly skilled freelance work (e.g., Upwork) to app-based work on location (e.g., Uber, Deliveroo) and capital platform work (e.g., Airbnb or Etsy) (Duggan et al., 2020). Several scholars provide typologies identifying various segments of the gig economy (see, for instance, Duggan et al., 2020; Howcroft & Bergvall-Kåreborn, 2019; Vallas & Schor, 2020). Here, we focus on online crowdwork – i.e., a labor process where business processes are broken up into the smallest possible discrete tasks that take seconds or minutes to complete and are transacted at low pay under a piece-rate compensation system (i.e., pay-per-task as opposed to for instance hourly wages; Hornuf & Vrankar, 2022; Jiang et al., 2021; Toxtli et al., 2021). This differs from higher-skilled online freelancing, where workers with specific specialist training typically perform contracted work with clients for slightly longer and better-paid tasks (Howson et al., 2022).

Notably, pay levels differ across segments of the gig economy, with some workers obtaining similar or even higher earnings than in traditional employment contexts (Cropanzano et al., 2023). Indeed, Hornuf and Vrankar (2022) concluded that the wage of online crowdworkers is typically roughly three times lower than that of online freelancers (not factoring in unpaid work). In online crowdwork, compensation for low and unskilled work tends to be problematic, and controversy over the fairness of pay rates is particularly persistent (Caza et al., 2022; Hornuf & Vrankar, 2022; Jiang et al., 2021). This sentiment reflects a broader problem: Online crowdworkers often feel they are not adequately compensated for their time and efforts (Heeks et al., 2021). These feelings are exacerbated by a lack of accountability for requesters and platforms (Deng et al., 2016), while reports of labor market violations are rising with reports of wage theft (e.g., unfair dismissal of work) and unpaid labor (e.g., qualification tasks) (Howson et al., 2022).

Hence, like other workers in the gig economy, crowdworkers worry about their finances and income volatility (Caza et al., 2022; Kuhn & Maleki, 2017). However, the financial compensation for online crowdworkers seems particularly desolate. Fieseler and colleagues (2019) reported moral outrage by workers about their “abysmal pay,” with workers likening their situation to servitude. Ravenelle (2019) suggested that workers may associate perceived psychological contract violations with pay volatility and the feeling that platforms do not feel responsible for the workers. Indeed, fair financial compensation is often

one of the few tangible measures of crowdworkers' work value, so inadequate compensation may be viewed as a psychological contract violation.

Notably, these perceptions resonate with findings on crowdworker compensation. For comparison purposes, research often relies on reporting hourly wages inferred from pay-per-task compensations. For instance, Berg (2015) found that workers on Amazon MTurk (AMT) earned, on average, between \$1 and \$5.50 per hour, while workers on Crowdflower averaged an hourly wage of \$1.77. Only about 10 % of the workers on AMT reported relatively high earnings in excess of \$10 per hour. Toxtli and colleagues (2021) used a plugin to track 100 workers on AMT completing 40,903 tasks, finding workers accumulated compensation for tasks worth \$3.76 per hour. Correcting for invisible and unpaid labor such as reading task instructions or viewing their worker dashboards (e.g., payment sections), hourly earnings dropped to \$2.83.

These findings largely align with a recent meta-analysis suggesting that the average earnings of crowdworkers range between \$3.27 and \$5.48 per hour (Hornuf & Vrankar, 2022). Hornuf and Vrankar (2022) conducted a comprehensive meta-analysis on wages in online crowdwork, drawing on 105 wages and 76,765 data points from 22 platforms and eight different countries during ten years. This granular view goes beyond identifying varied pay scales and ranges and highlights that low pay is not just a reflection of task simplicity and required skill set but also a prevalent issue related to the hidden costs of crowdwork (e.g., unpaid work involving task searching and communication) that operates to the detriment of effective hourly earnings. Hence, while workers may have autonomy over their tasks and schedules, the unpaid labor required for task searching, communication with requesters, and dealing with rejected tasks significantly reduces their effective hourly wage.

Individuals who voluntarily choose this new work arrangement might appreciate the autonomy and perhaps even the opportunity to earn a supplemental income (Cropanzano et al., 2023). However, supplementing one's income with an hourly wage far below minimum wage hardly seems rational or economically viable if the decision to engage in crowdwork is financially motivated. We suggest that a greater dependence on crowdwork for one's income contributes to viability challenges as crowdworkers would need to make at least twice as many hours to make a monthly minimum wage (e.g., not considering hours for unpaid labor, income volatility, increasing competition, technological glitches on labor platforms). Hence, the viability challenge will be more severe when the individual income dependence (percentage of personal income derived from platform work) is higher (Ashford et al., 2018).

Research has widely problematized financial precarity and concerns around the viability of crowdwork (Ashford et al., 2018; Granger et al., 2022). Perceptions of a viability challenge among crowdworkers have been associated with lower (financial) wellbeing (Ashford et al., 2018), increased depletion (Caza et al., 2022), and feelings of being undervalued (Fieseler et al., 2019). Similarly, prior research has shown that violating psychological contracts, such as failing to fulfill employer obligations, signals to workers that the organization does not care for their wellbeing and is associated with employee stress (Cakovic & Tetrick, 2003). In the context of crowdwork, greater individual income dependence and pay inadequacy could fuel the perception that the platform is not upholding the inducement of offering viable income opportunities to workers. Furthermore, Pichault and McKeown (2019) noted that income volatility in gig work may create a permanent source of anxiety for workers. As viability may represent a persistent job stressor, coping with such a challenge may deplete, reducing wellbeing and increasing stress (Ashford et al., 2018; Hobfoll, 1989). As such, we hypothesize that individual income dependence and perceptions of inadequate compensation are positively related to the viability challenge of online crowdwork. This viability challenge, in turn, is positively related to work stress.

H1: The positive relationship between individual income dependence and stress is mediated by a viability challenge.

H2: The positive relationship between perceptions of pay inadequacy and

stress is mediated by a viability challenge.

2.2. The buffering effect of autonomy

Perhaps one of the most valued aspects of crowdworkers is the ability to “work without a boss” (Costa, 2021). Crowdworkers can choose when and how long to work, typically with little to no direct supervision on task completion (Howcroft & Bergvall-Kåreborn, 2019). Indeed, research on what motivates individuals to engage in crowdwork highlights that flexibility and autonomy are the most frequently discussed benefits of online crowdwork (Deng & Joshi, 2016; Strunk & Strich, 2023). For instance, Deng and colleagues (2016) showed that crowdworkers appreciated the autonomy and flexibility of microtask crowdwork, articulating feelings of empowerment. Later studies confirmed the central role of autonomy, freedom, and flexibility as key characteristics of the new psychological contract in online crowdwork (Cropanzano et al., 2023; Kuhn & Maleki, 2017; Wood et al., 2019). Ashford and colleagues (2018) discuss several structural characteristics that differ between “the old world of work” and the “new world of work.” Importantly, next to financial instability and job insecurity, which are higher in online crowdwork compared to traditional work arrangements, they identify higher levels of autonomy as the second key structural difference. While autonomy is not absolute, crowdworkers tend to operate with little human oversight, leaving them to decide which tasks to pursue and when.

Research on job characteristics (e.g., Hackman & Oldham, 1976) has widely demonstrated that autonomy is an important resource of any job, affecting workers’ psychological states and work outcomes. Research on autonomy in online crowdwork has already shown that autonomy is negatively related to work frustration (Strunk et al., 2022), positively associated with meaningfulness (van Zoonen et al., 2023), and perceived satisfaction with crowdwork (Durward et al., 2020). Research has suggested that autonomy can create feelings of empowerment (Deng et al., 2016) and positively affect work motivation and work performance (Moussawi & Koufaris, 2013). Similarly, Durward and colleagues (2020) suggested that crowdworkers used their autonomy to create more favorable working conditions, while this may be particularly true for those who earn relatively well. Putting in more hours and completing more tasks at the worker’s discretion may alleviate the viability challenge by helping workers navigate and manage income variability and continuation. Notably, research has demonstrated that volatile income flows may be a permanent source of stress and anxiety for crowdworkers (Pichault & McKeown, 2019). Crowdworkers often formulate daily income goals (Toxtli et al., 2021) and may exercise their autonomy by working on as many tasks as they need to meet income goals or requirements (Strunk et al., 2022). As such, autonomy may reduce the viability challenge by helping workers increase their hourly wages or extend their work hours (Schor et al., 2020). In crowdwork, individuals are not dependent on offices or fixed working locations and times, affording the autonomy to decide the extent of their time investment and the intensity and volume of their work (Ihl et al., 2018). Thus, crowdworkers who experience autonomy may utilize their freedom to take on more tasks and put in more hours, or as many hours as they need, which may reduce the viability challenge and, ultimately, the stress associated with crowdwork. Hence, we hypothesize:

H3: The negative relationship between autonomy and stress is mediated by a viability challenge.

2.3. Locus of control

Locus of control refers to “a generalized expectancy that rewards, reinforcements, or outcomes in life are controlled either by one’s actions (internality) or by other forces (externality)” (Spector, 1988, p. 335). Hence, locus of control pertains to individual’s beliefs about their role in influencing events in their (work) lives (Kolb & Aiello, 1996). Concepts such as autonomy and locus of control are important as they inform how

individuals interpret the situations they find themselves in (Aubé et al., 2007) and their perception of their capacity to change aspects of their work environment. Autonomy refers to the extent to which individuals are given independence and flexibility in when, where, and how to complete work tasks. This distinction is particularly important in the context of crowdwork, as the provision of proclaimed autonomy for crowdworkers is accompanied by an inherent power asymmetry between workers, the platform, and the requester in a work environment characterized by high competition, opaque managerial processes, and low compensations per task (Deng et al., 2016; Wood et al., 2019). Indeed, workers may experience high autonomy but weak structural power to influence the outcomes of their work (Wood et al., 2019).

Locus of control pertains to an individual’s belief in their ability to control the events in their lives. In that sense, locus of control was often viewed as a trait-like part of self-evaluation, but more recent research has argued for a more malleable and fluid view where individuals’ locus of control can fluctuate (Galvin et al., 2018). People with internal locus of control (internals) generally believe that they are the masters of their fate and, as such, proactive in attempting to control their external environments (Ng et al., 2006). Hence, an internal locus of control should help crowdworkers overcome structural work stressors (e.g., individual income dependence and poor pay) and utilize their autonomy more efficiently, thereby reducing the viability challenge of crowdwork. Research on income volatility and locus of control in gig work suggested that individuals with a greater internal locus of control may make better financial decisions (Peetz et al., 2021). For instance, workers with a higher internal locus of control may forego immediate gratification in favor of longer-term financial goals and savings. Hence, while perceptions of inadequate pay and individual income dependence may be high, individuals with a higher internal locus of control may experience lower viability challenges as a result of those conditions due to better financial choices.

Moreover, research suggests that those with an internal locus of control acknowledge their responsibility for the outcomes (i.e., failures and successes) they achieve (Spector, 1988). In other words, internals have a relatively strong belief that the outcomes of their work are largely contingent on their behaviors (Ng et al., 2006). Hence, in a work context where workers are largely independent and have a lot of autonomy, internals may be more prone to utilize the afforded autonomy to improve their conditions by reducing viability challenges. This is supported by findings that suggest that individuals with an external locus of control (externals) (as opposed to internals) experience greater stress in situations that provide them with more autonomy (Kolb & Aiello, 1996). Similarly, Lonergan and Maher (2000) noted that ‘internals typically “make things happen” combined with the considerable opportunity to do so (high autonomy)’ (p. 221). This may result in more favorable job outcomes. Hence, as internals believe they master their environment and control their outcomes, they should be more likely to act on their circumstances (Allen et al., 2005). In this case, that would mean that individual income dependence and poor pay would be less likely to result in a viability challenge for internals, and the positive impact of autonomy on viability challenge would be greater for internals as they utilize the leeway their work affords more effectively.

This reasoning is further supported by research from Bucher and colleagues (2019; 2024). Disentangling the narratives of online crowdworkers as mere cogs in the machine versus empowered digital entrepreneurs, Bucher and colleagues (2019) note that workers who manage to ensure their mattering by reinforcing the larger significance of their contributions will be less bothered by disenfranchising aspects of crowdwork. Bucher and colleagues (2024) further highlight that crowdworkers feel a sense of control, which, coupled with the knowledge and skills to exert it, may help them navigate online labor platforms more successfully. Hence, we hypothesize:

H4: Locus of control moderates the relationship between individual income dependence and the viability challenge, such that the positive relationship between individual income dependence and the viability challenge is

reduced in strength for those with a higher internal locus of control.

H5: Locus of control moderates the relationship between perceived pay inadequacy and the viability challenge, such that the positive relationship between perceptions of inadequate pay and the viability challenge is reduced in strength for those with a higher internal locus of control.

H6: Locus of control moderates the relationship between autonomy and the viability challenge, such that the negative relationship between autonomy and the viability challenge is reduced in strength for those with a higher internal locus of control.

3. Methods

3.1. Sample and procedures

Data were collected using the online labor platform Clickworker in September 2022. Clickworker is an online labor platform that operates globally but is headquartered in Germany. We were specifically interested in examining European crowdworkers as much of the research has been based on US and Indian samples.

We solicited responses from crowdworkers by posting a task on the platform to complete our online questionnaire. We did not impose any restrictions on qualification criteria for the task. However, we did include several attention checks in the questionnaire. This resulted in a sample of workers from across Europe, with bigger cohorts of workers from Germany (55 %), Spain (15.8 %), Italy (11.2 %), and Portugal (4.8 %). A total of 581 crowdworkers completed the questionnaire and passed the attention checks in the survey.

The crowdworkers in our sample (N=581) were, on average, 39 years old (SD=11.49), and 58.4 % identified as male. They reported doing platform work for 4.91 years (SD=5.63). On average, the respondents indicated conducting crowdwork 12.75 h per week (SD=10.69) and generating 20.57 % (SD=27.06) of their income through crowdwork. Most respondents (52 %) indicated an average household income below €29,999. We further obtained information about their educational background, suggesting the highest completed education was an undergraduate or graduate degree for 50.1 % of the respondents and high school for 21.3 %. Others indicated less than high school (2.2 %), professional qualifications (24.1 %), or a doctorate (2.2 %). A total of 54.9 % of the respondents indicated having a full- or part-time employment contract next to their crowdwork activities.

3.2. Measurement

Table 1 reports all measurement items and factor loadings. Unless indicated otherwise, statements were answered on a seven-point Likert-type scale ranging from strongly disagree to strongly agree.

Individual income dependence. We measured individual income dependence with one question, asking respondents to indicate the percentage of their individual income they generated through platform work. The percentage of personal income is a good indicator of individual income dependence and can be more steadily interpreted than, for instance, income in dollars or euros, as this will be highly dependent on the socio-economic conditions of the region or country in which someone lives. We asked to provide an average for their monthly earnings as gig workers' income is volatile (Wood et al., 2019).

Perceived pay inadequacy. Pay inadequacy was measured by adopting three statements of the adequate pay dimension of the decent work scale (DWS; Duffy et al., 2017). Sample items include: "I am not properly paid for my work." Higher scores indicate greater perceived inadequacy.

Autonomy. Autonomy was measured using three items from the job characteristics questionnaire by Morgeson and Humphrey (2006). In accordance with the research on crowdwork (e.g., Durward et al., 2020; Strunk et al., 2022), the wording of the items was adjusted to our research context. Sample items include: "Working on the platform allows me to make my own decision about how to schedule my work."

Viability Challenge. The viability challenge was measured using three

Table 1
Measurement items in the hypothesized model.

Item	Mean (SE)	R ²	St. Factor loading	Unst. Factor loading ^a	Se
Individual income dependence					
What percentage of your individual income is generated by platform work, on average? ^c	20.73 (27.06)	—	—	—	—
Pay inadequacy					
I am not properly paid for my work.	4.17 (1.57)	0.73	0.845	1.000 ^b	
I feel I am not paid enough based on my qualifications and experience.	4.36 (1.62)	0.75	0.861	1.051	0.05
I am rewarded adequately for my work.	3.97 (1.43)	0.77	0.651	0.702	0.04
Autonomy					
Working on the platform allows me to make my own decisions about how to schedule my work.	5.12 (1.44)	0.68	0.871	1.000 ^b	
Working on the platform allows me to decide on the order in which things are done in my work.	5.07 (1.43)	0.72	0.892	1.013	0.04
Working on the platform allows me to plan how I do my work.	5.02 (1.44)	0.64	0.813	0.929	0.04
Viability Challenge					
I often have no idea where my next Euro will come from.	4.21 (1.93)	0.69	0.830	1.000 ^b	
It is hard for me to plan for large expenses as it is difficult to predict what my income will be in any given year	4.44 (1.84)	0.68	0.822	0.945	0.05
I often can't predict when I will get my next paycheck.	3.72 (1.86)	0.48	0.691	0.802	0.05
Locus of Control					
On most jobs, people can pretty much accomplish whatever they set out to accomplish.	4.42 (1.48)	0.34	0.586	1.000 ^b	
If you know what you want out of a job, you can find a job that gives it to you.	4.38 (1.60)	0.53	0.730	1.346	0.03
Promotions are given to employees who perform well on the job.	4.81 (1.48)	0.33	0.575	0.982	0.04
People who perform their jobs well generally get rewarded for it.	4.71 (1.51)	0.47	0.682	1.191	0.03
Stress					
I feel a great deal of stress because of my platform work	2.94 (1.48)	0.72	0.846	1.000 ^b	
Platform work is extremely stressful	2.76 (1.52)	0.75	0.863	1.049	0.06
I almost never feel stressed about platform work (r)	3.65 (1.57)	0.20	0.446	0.558	0.05

^a All factor loadings are significant at p < 0.05.

^b Unit loading indicator constrained to 1.

^c Since this is a single observed item, no factor loadings are calculated.

items developed and validated by Caza and colleagues (2022). The viability challenge refers to concerns over income continuation due to unpredictable and insufficient income cycles. This challenge is more central to online crowdwork compared to traditional employment as income is less predictable, yet important as jobs are typically expected to be able to satisfy one's existence needs (Alferfer, 1972; Caza et al., 2022; Moorman et al., 2024). Sample items include "I often can't predict when I will get my next paycheck." Higher scores indicate a greater viability

challenge.

Locus of Control. Locus of control was measured using a unidimensional four-item scale adopted for work situations (Spector, 1988; Rodriguez et al., 2001). Sample items include: “People who perform their jobs well generally get rewarded for it.” Hence, higher scores on this scale represent internality.

Stress. Stress was measured using three items adapted from Motowidlo and colleagues (1986) and Puranik and colleagues (2021). Where the original items referred to ‘at work’ or ‘my job,’ the wording was changed to ‘platform work’ to reflect the context of our study. Example items were: “Platform work is extremely stressful.”

Control variables. We added several control variables to our model to examine potentially confounding influences. First, we examined the role of average household income. Research identified that gig workers (and crowdworkers specifically) frequently worry about their finances and income stability (Caza et al., 2022). As such, the influence of the percentage of personal income derived from crowdwork on viability and stress may be impacted by average household incomes. Since household incomes and economic situations widely differ across Europe, we followed Morgan and colleagues (2023). We computed a weighted average household income corrected for the average household income in the respondents’ respective countries. Using Eurostat data, we examined whether individuals’ reported household income was below or above the average in their country of residence. Second, we examined the influence of working hours; the assumption is that the number of hours individuals need to put in crowdwork may account for part of the felt challenge and stress. Finally, we controlled for tenure because crowdworkers with more experience may be better equipped to navigate the complex tradeoff between platform earnings and autonomy.

3.3. Analysis

We employed Structural Equation Modeling (SEM) in AMOS to test our hypotheses. Initially, we conducted a Confirmatory Factor Analysis (CFA) to establish a measurement model, assessing validity and reliability statistics. Subsequently, we evaluated the hypothesized relationships through structural equation modeling (SEM), utilizing a maximum likelihood estimator with bias-corrected model parameters obtained via bootstrapping (5,000 bootstrap resamples). Goodness of fit was evaluated using the chi-square/df ratio (χ^2/df), along with the Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), Standardized Root Mean Square Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA). A chi-square/df ratio < 5 , TLI and CFI $> .90$, and RMSEA and SRMR $< .08$ indicate a good model fit.

The hypothesized interactions were probed using the Johnson-Neyman technique (Bauer & Curran, 2005). Furthermore, it is noteworthy that we utilized partially latent structural equation modeling since the representation of the percentage of personal income from platform work was probed using a single item rather than multiple parallel indicators loading onto a latent construct. To address potential measurement errors associated with a single-item measure, we followed the procedures suggested by Cole and Preacher (2014). Specifically, we constrained the measurement error for the single-item indicator to 0.1 * variance.

4. Results

4.1. Measurement model

The confirmatory factor analysis demonstrated that the model fitted the data well: $\chi^2/df = 3.19$; TLI=0.93; CFI=0.94; SRMR=0.05, and RMSEA=0.061. A closer inspection of the measurement model suggested that all constructs indicated good reliability, with the composite reliabilities ranging between 0.74 and 0.89, while the reliability coefficient (H) ranged between 0.75 and 0.90 (well above the 0.70 threshold). The model also demonstrated discriminant and convergent

validity. Discriminant validity was evidenced by the finding that the maximum shared variance (MSV) was less than the average variance extracted (AVE) for each construct. Furthermore, the results indicated that the square root of the AVE exceeded the inter-construct correlations, confirming that each latent construct measured distinct concepts.

Furthermore, the results demonstrated that all measurement constructs exhibited satisfactory convergent validity. For all constructs (except locus of control), the average variance extracted (AVE) exceeded the recommended threshold of 0.50 (Hair et al., 2017). Locus of control marginally fell below this threshold (0.42). However, the construct was retained due to its strong internal consistency, as indicated by high composite reliability (CR) values. This decision is supported by the argument made by Fornell and Larcker (1981), suggesting that constructs with high CR can still demonstrate convergent validity even if AVE is slightly lower. Also, Malhotra and Dash (2011) noted that the AVE is a relatively strict measure of convergent validity.

Finally, since this study’s data are cross-sectional and self-reported, we examined common method variance. First, we used the Harman Single Factor (HSF) test, which suggested that one factor explains about 28 % of the variance, which is below the recommended threshold of 50 %. However, given that HSF is prone to type 1 errors (e.g., Podsakoff et al., 2003; Fuller et al., 2016), we also used an Unmeasured Latent Method Construct (ULMC) approach. This analysis indicated that adding a latent construct to capture shared variance between the method and the substantive constructs did not substantially affect the model parameters. These results indicate that any shared variance did not likely result in bias (Fuller et al., 2016). Hence, overall, the CFA demonstrated sufficient reliability and validity (See Table 2), and no concerns emerged from additional analyses, justifying further exploration of the structural model.

4.2. Structural model

The structural model, including household income, work experience, and average work hours per week, indicated good model fit: $\chi^2/df = 2.83$; TLI=0.92; CFI=0.94; SRMR=0.05, and RMSEA=0.056. Below, we report the standardized solution for our hypotheses testing. Before we discuss the results of hypotheses testing, it is noteworthy that the control variables demonstrate several significant associations with the proposed outcomes in the model. For instance, household income negatively correlates with viability challenge ($b = -0.169$ CI95% [-0.235; -0.103], $p = 0.001$). This suggests that when the average household income exceeds the average household income of the country of residence, the viability challenge perceptions are lower. Furthermore, the results indicate a positive relationship between work hours and stress ($b = 0.135$ CI95% [.061; 0.212], $p = 0.003$), suggesting that individuals who allocate more hours to crowdwork also report higher stress levels. No other significant associations were detected between the control variables and the outcomes in the model.

Hypothesis 1 posits that individual income dependence positively relates to stress through a perceived viability challenge. The results indicate that the percentage of income crowdworkers derive from online crowdwork is not significantly related to stress ($b = -0.009$ CI95% [-0.088; 0.080], $p = 0.867$). However, the percentage of income derived from online crowdwork was positively related to a perceived viability challenge ($b = 0.204$ CI95% [.139; 0.271], $p = 0.001$), and a perceived viability challenge was positively associated with stress ($b = 0.142$ CI95% [.051; 0.228], $p = 0.012$). As a result, the indirect relationship between the percentage of income derived from platform work on stress through the viability challenge was positive and significant ($b = 0.023$ CI95% [.009; 0.042], $p = 0.006$). These results support the reasoning underlying hypothesis 1 (See Fig. 1).

Hypothesis 2 states that perceptions of pay inadequacy positively relate to stress through a viability challenge. We note that the results indicate that perceptions of pay inadequacy are also directly related to stress ($b = 0.264$ CI95% [.187; 0.339], $p = 0.001$). In line with our

Table 2
Reliability and validity statistics.

	Mean (Sd)	MaxR (H)	CR	AVE	MSV	1	2	3	4	5	6	7	8	9	10
1. Percentage of income	20.57 (27.06)	–	–	–	–	–									
2. Pay inadequacy	4.19 (1.32)	0.86	0.83	0.63	0.22	0.11*	0.79								
3. Autonomy	5.07 (1.30)	0.90	0.89	0.74	0.29	-0.05	-0.28*	0.86							
4. Viability challenge	4.26 (1.37)	0.87	0.86	0.60	0.13	0.29*	0.36*	-0.25*	0.78						
5. Locus of control	4.58 (1.13)	0.75	0.74	0.42	0.29	-0.08*	-0.47*	0.54*	-0.30*	0.65					
6. Stress	3.34 (1.04)	0.85	0.74	0.55	0.20	0.16*	0.43*	-0.45*	0.36*	-0.33*	0.74				
7. Gender ^a	0.42 (0.49)	–	–	–	–	0.10*	0.03	0.02	0.16*	0.04	-0.05	–			
8. Age	38.98 (11.49)	–	–	–	–	-0.10*	0.07	-0.05	-0.09*	-0.09*	-0.11*	-0.05	–		
9. Tenure	4.91 (5.63)	–	–	–	–	-0.02	-0.03	0.02	-0.06	0.06	-0.10*	0.02	0.19*	–	
10. Work hours	12.75 (10.69)	–	–	–	–	0.50*	0.13*	-0.01	0.19*	-0.05	0.12*	0.01	0.05	0.12*	–
11. Annual household income ^b	3.99 (2.55)	–	–	–	–	-0.24*	0.01	0.05	-0.38*	-0.02	-0.07	-0.12	-0.00	0.02	-0.15*

Note: CR=Composite Reliabilities; MaxR(H) = Maximum Reliability H; AVE=Average Variance Extracted; MSV=Maximum Shared Variance; the Square Root of the AVE is reported on the diagonal. Reliability and validity statistics are only provided for latent constructs retained in the final measurement and structural model. Significant correlations are flagged *.

^a Gender was coded 0 = male, 1 = female,

^b Annual household income was divided into 12 categories: 1 (less than €10,000), 2 (€10,000 to €19,999), 3 (€20,000 to 29,999), until 12 (> € 150,000).

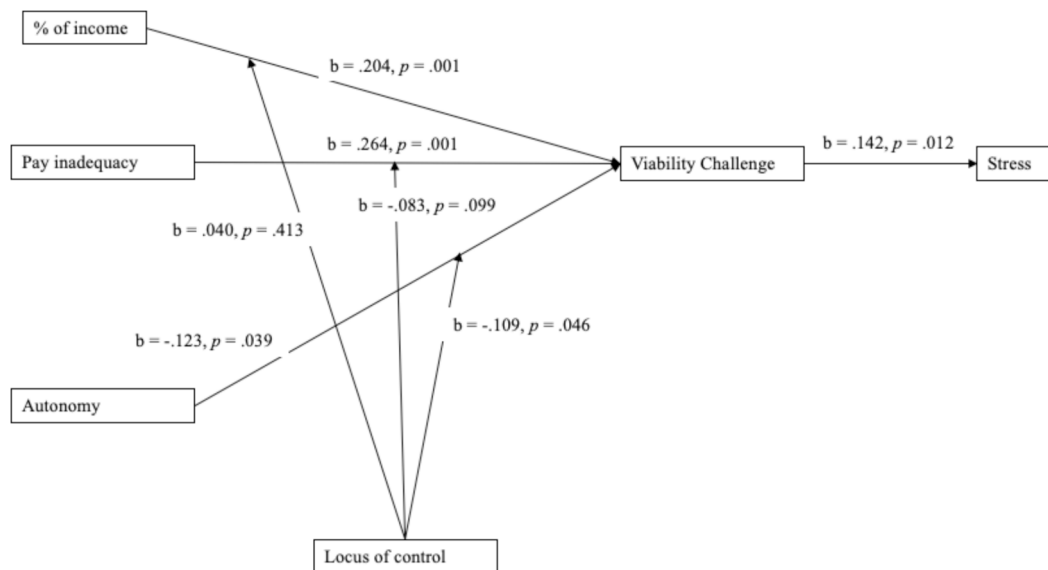


Fig. 1. The structural model with standardized results.

hypothesis, the results also confirm a positive relationship between pay perceptions and viability challenge ($b = 0.264$ CI95% [.166; 0.354], $p = 0.001$). As we already established the positive and significant relationship between viability challenge and stress, the indirect relationship was also positive and significant ($b = 0.029$ CI95% [.012; 0.057], $p = 0.006$). These findings support hypothesis 2.

Hypothesis 3 reflects that autonomy is negatively related to stress by being negatively associated with the viability challenge. The results indicate that autonomy has a direct and negative association with stress ($b = -0.333$ CI95% [-0.415; -0.254], $p = 0.001$). Furthermore, in line with our hypothesis, autonomy is negatively related to viability challenge ($b = -0.123$ CI95% [-0.221; -0.028], $p = 0.039$). Consequentially,

the results demonstrate a significant negative association between autonomy and stress through the viability challenge ($b = -0.014$ CI95% [-0.032; -0.004], $p = 0.024$). These results provide support for hypothesis 3.

4.3. Moderation analysis

Hypotheses 4 through 6 probe the moderating role of locus of control on the relationships between income, pay perceptions, and autonomy on the viability challenge. The interactions were proposed using the Johnson-Neyman technique (Bauer & Curran, 2005). Hypothesis 4 assumes that locus of control moderates the relationship between the

percentage of income derived from crowdwork and the experience of a viability challenge. The results indicated no significant interaction effect ($B = .040$ CI95% [-0.056; 0.136], $p = 0.413$). Hence, hypothesis 4 was not supported.

Hypothesis 5 states that locus of control moderates the relationship between pay inadequacy and the viability challenge. The results suggest that the positive relationship between perceptions of pay inadequacy and experiencing a viability challenge may be weakened when the internal locus of control increases. However, this relationship fails to reach significance ($B = -0.083$ CI 95% [-0.181; 0.016], $p = 0.099$). Hence, the findings do not support hypothesis 5.

Finally, hypothesis 6 reflects that locus of control moderates the negative relationship between autonomy and viability challenge. The findings demonstrate a significant negative interaction effect ($B = -0.109$ CI 95% [-0.216; -0.002], $p = 0.046$). This suggests that when the locus of control represents greater internality, crowdworkers are more effective in diminishing the viability challenge by utilizing their autonomy (See Fig. 2). Specifically, the results suggest that when the mean-centered value on the locus of control exceeds -1.15 , the negative relationship between autonomy and viability is significant, and the effect size increases as internality increases. These findings support hypothesis 6.

5. Discussion

This study examined the viability challenge faced by online crowdworkers. We uncover several key findings contributing to our understanding of this challenge. While online crowdwork offers unparalleled flexibility, autonomy, and independence, it is challenging. Our results affirm the presence of a viability challenge among online crowdworkers, driven by factors such as individual income dependence and perceptions of pay inadequacy. This challenge poses a significant threat to the wellbeing of these workers as viability challenge is associated with work-related stress. Our study highlights the importance of individual income dependence, suggesting that workers who are heavily reliant on crowdwork earnings are more susceptible to this challenge. However, autonomy may serve as a buffer as it is negatively associated with the viability challenge. Notably, the findings also reveal that crowdworkers' internal locus of control plays a crucial role in moderating the relationship between pay perceptions, autonomy, and the viability challenge. Workers with a strong internal locus of control are better equipped to navigate the challenges of inadequate pay perceptions. They

are also more adept at harnessing the autonomy afforded by online crowdwork to their advantage.

5.1. Theoretical implications

First, the findings present empirical evidence for the viability challenge of crowdwork (Ashford et al., 2018; Caza et al., 2022) and how this may originate from two key dimensions of the lives of crowdworkers – i.e., autonomy and (economic) dependence (Cropanzano et al., 2023; Kuhn & Maleki, 2017). Autonomy and individual income dependence may present a difficult tension inherent to crowdwork and its governance structures. The new psychological contract for crowdworkers (Costa, 2021; Corpanzano et al., 2023) presents a tradeoff where individuals need to manage the elasticity between autonomy and (economic) security (Felix et al., 2023). The security offered to workers in more traditional employment relationships comes at a price. For instance, labor rights and protection, stability, predictability, and fringe benefits may come at the expense of losing flexibility and autonomy in work.

Similarly, extreme autonomy may be accompanied by poor financial compensation, extreme short-term commitments, and the absence of labor protections and rights (Felix et al., 2023; Heeks et al., 2021). Indeed, Deng and colleagues (2016) noted that job crafting through autonomy for crowdworkers came at the expense of other values, such as unreasonably low payment. Hence, navigating the dilemma between autonomy and (economic) dependence creates a reality for crowdworkers characterized by a viability challenge that may be experienced as particularly stressful.

Second, the findings contribute to earlier studies that have demonstrated that the effects of autonomy for creating favorable conditions may be contingent on the financial compensation of workers (Durward et al., 2020). We illustrate the importance of locus of control in highly autonomous work situations and in the face of financial precarity. Research has problematized the lack of control of crowdworkers by highlighting the absence of structural power of workers vis-à-vis the platform and requesters (Wood et al., 2019), the problem of marginalization of workers (Deng et al., 2016), and the demand for rapid responsiveness (Ashford et al., 2018) in a highly competitive environment (Strunk et al., 2022). We demonstrate that autonomy for crowdworkers may fail to materialize without an internal locus of control. The findings suggest that only at high levels of internal locus of control do workers seem to effectively utilize the autonomy afforded to them to

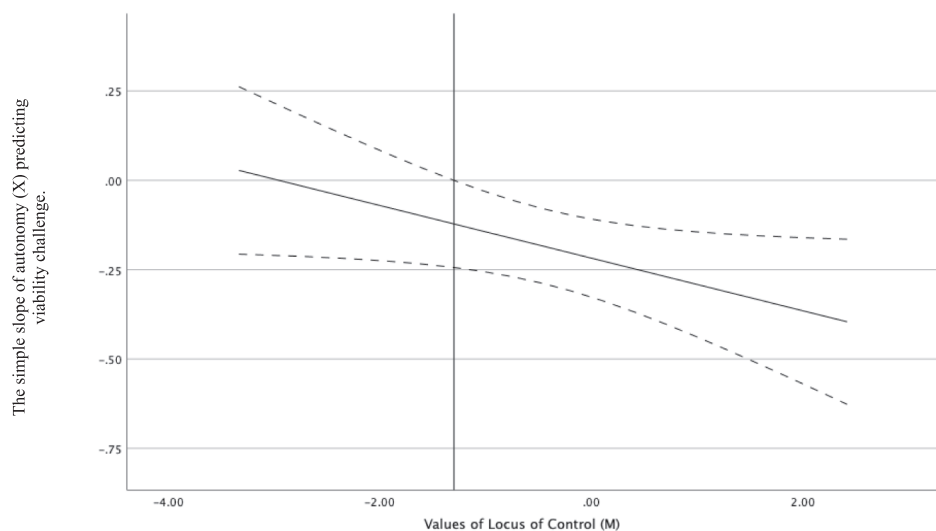


Fig. 2. J-N interaction plot for autonomy and locus of control on viability challenge.

mitigate the viability challenge of crowdwork.

Third, we demonstrate that internal locus of control may mitigate the impact of pay inadequacy on viability. This finding resonates with research on locus of control in financial decision-making. In situations of income volatility, an internal locus of control may help workers make better financial decisions and plans (Peetz et al., 2021), reducing the negative implications of pay inadequacy. This confirms that crowdworkers with higher degrees of internality proactively attempt to control their external environments and create more favorable outcomes by mastering their fate (Spector, 1988; Ng et al., 2006). Hence, control (internality) can buffer the effects of occupational stressors (such as pay inadequacy) and boost the utilization of occupational resources (job autonomy).

Finally, this study contributes to the psychological contract literature in the context of crowdwork (Bankins & Formosa, 2021; Costa, 2021; Cropanzano et al., 2023). Psychological contract theory argues that when workers perceive the exchanges between them and their employer to be fair and reciprocal, they perceive the promised obligations to be fulfilled. In contrast, violations in psychological contracts may harm workers' wellbeing (Conway et al., 2011). Our study highlights that crowdworkers face a complex dilemma and experience a viability challenge as a potential psychological contract breach. By affording workers autonomy, the platform partially fulfills its inducements to workers. However, by failing to safeguard adequate payment structures, autonomy becomes illusory, and the platform may not be perceived to fulfill its duty in offering a viable income opportunity. Notably, crowdworkers with a strong internal locus of control can mitigate the challenges related to viability and benefit from autonomy, indicating a better fulfillment of the psychological contract.

Hence, the study findings provide ways to help workers deal with some of the challenges associated with crowdwork. Notably, the challenges associated with crowdwork conditions are prevalent and structural (e.g., Wood et al., 2019), and the ambiguous employment status and psychological contract shift the risk of employment almost exclusively to the worker (Cropanzano et al., 2023). Newlands and Lutz (2024) add that relative to other occupations in the digital economy, online crowdwork suffers from low social value and prestige (Newlands & Lutz, 2024), fueling workers' sense of being left powerless and alone in the gig economy (Glavin et al., 2021). One way to help crowdworkers deal with the stigmatization and precarity of their jobs is to support the development of an internal locus of control. While the precarity of online crowdwork needs to be resolved as we strive for more fair and equitable employment in the gig economy (Heeks et al., 2021), our findings highlight that supporting the internal locus of control of workers may also help workers navigate some of the complexities of online crowdwork.

5.2. Practical implications

If we are to consider crowdwork as a viable and serious alternative form of employment, workers, requesters, and platforms need to re-evaluate the new psychological contract that has emerged. The flexibility and autonomy in online crowdwork seem to come at a very steep price for crowdworkers. Online labor platforms often hide behind semantics and shy away from taking responsibility and bearing the full costs and risks of employment (Vallas & Schor, 2020). Many labor platforms have been criticized for exploiting workers and avoiding responsibility for providing benefits and security, evading industry regulation (International Labor Organization, 2016; Ticona & Mateescu, 2018). This includes coverage between paid gigs, financial malfeasance, and mistreatment (Vallas & Schor, 2020). Overall, online labor platforms have been linked to the demise of the "standard employment relationship" by pushing labor markets deeper into casualization and informalization of work (Cherry & Aloisi, 2017; Ticona & Mateescu, 2018). The labor platforms orchestrate the market to reduce operating costs and maximize labor flexibility for requesters, incentivizing work

through high competition (i.e., high worker-to-task ratios) (Berg & Rani, 2021). This creates a problem for workers as the excess supply of job seekers compared to the demand for work increases competition and reduces the financial income of workers (Kvirkvaia, 2023).

As a result, workers' hourly wages are dubious at best, but a case could be made that they are even unethical, often failing to match minimum wages (Vankar & Hornuf, 2022). Our findings demonstrate that crowdworkers perceive their individual income dependence and perceptions of pay inadequacy as stressful, creating a viability challenge for workers. Both the platforms and requesters have a responsibility and obligation to safeguard fair compensation for the tasks these workers complete. Requesters could follow examples set by academics who formulated compensation rules for crowdwork, recommending compensation that at least matches minimum wage (Aguinis et al., 2021). Similarly, some online labor platforms, such as Prolific, ask requesters to ensure they pay a minimum wage (Whiting et al., 2019). If not self-regulated, initiatives by legislators may provide guideposts to improve labor practices in this currently unregulated labor market.

Our findings also provide some valuable insights for workers and society more broadly. Workers with a stronger internal locus of control benefit from the autonomy afforded by online crowdwork. Research has suggested that individuals may develop and enhance an internal locus of control, especially in environments that support individual agency (Wu et al., 2015). In addition, Wu and colleagues (2015) note that occupational status is important for enhancing employees' internal locus of control. This is particularly interesting, as crowdworkers seem to be at a disadvantage. Newlands and Lutz (2024) recently demonstrated that online crowdwork suffers from low occupational social value and prestige within the digital economy. As such, this may create additional barriers to developing an internal locus of control. Toti and colleagues (2021) emphasized that it is important to promote the idea that "everyone can do something, even little things" (p. 178), as this will help boost internal locus of control. In the context of online crowdwork, platforms, requesters, and workers may share experiences and ideas to promote the empowerment of workers.

Specifically, from a developmental perspective, small increments in internal locus of control may benefit workers by reducing the impact of pay inadequacy on viability challenges and boosting the buffering impact of autonomy on viability challenges. Online labor platforms can help workers by offering resources and training to improve competencies. Furthermore, online labor platforms seldom utilize their technological capabilities to support collective voice or online community where workers can share experiences (Gegenhuber et al., 2021). These efforts may help enhance workers' sense of control. For requesters, it will be important to provide clear and constructive feedback. This may help workers to learn and develop a better understanding of the impact of their actions (Ashford & Tsui, 1991). For workers, research on organizational behavioral and psychology has identified various pathways to increase internal locus of control (Wu et al., 2015). For instance, goal setting may aid in developing a greater internal locus of control as goal-setters may experience positive reinforcement and develop a belief in their ability to achieve specific goals and influence individual outcomes (Locke & Latham, 2002). Finally, we acknowledge that the internal locus of control is not a solution to the structural precarity embedded in the operating mechanisms of the gig economy. However, it may help workers become more resilient against adversity in their work environment.

5.3. Limitations and future research

This study's contributions should be interpreted in light of its limitations. At the same time, these limitations, coupled with our findings, provide prolific opportunities for future research. First, the cross-sectional nature of our data limits the possibility of drawing any conclusions on the directionality or temporality of the relationships we studied. Future research would benefit from attempts to examine how

the prevalence of a viability challenge may unfold over time. Longitudinal research designs may also uncover and test the (reverse) causality of the relationships in our model. For instance, it is also possible that a perceived viability challenge will increase perceptions of pay inadequacy and lead to reduced autonomy.

Second, the findings of this study provide important insights into how individual income and autonomy tradeoffs inform the viability challenge and stress in online crowdwork. However, research has also acknowledged that online crowdworkers often juggle multiple jobs, care responsibilities, or both (Gerber, 2021) and work on a variety of platforms at the same time (Morgan et al., 2023). In addition, viability and stress may be influenced by other factors, such as household composition. Hence, further research should aim to capture more detailed contextual and demographic information to refine our understanding of viability challenges in online crowdwork (Caza et al., 2022).

Third, this study provides an empirical investigation into the antecedents and consequences of a viability challenge in online crowdwork. We have done so by focusing on two key dimensions in crowdworkers' lives – autonomy and dependence – however, future research may expand this focus to other elements of the transactional contract between crowdworkers, the platforms, and requesters (Costa, 2021; Cropanzano et al., 2023). For instance, research suggests that the number of registered workers far outnumbers the available tasks, creating highly competitive environments (Strunk et al., 2022) that may fuel worker viability challenges. In addition, many crowdworkers consider online crowdwork a side hustle, are serially employed, and juggle multiple jobs simultaneously. For instance, a recent study by Morgan and colleagues (2023) suggested that most crowdworkers hold some other form of employment next to doing crowdwork. Future studies should consider whether and how juggling multiple jobs constrains workers or allows them to generate viable and sustainable careers. In addition, future research should consider that many workers may not engage in this work out of financial necessity but rather from more hedonic motivations (Ihl et al., 2018). More research on utilitarian and hedonic motivations for crowdwork could shed light on the prevalence and importance of the economic viability of crowdwork.

Fourth, our study covers crowdworkers from one online labor platform. However, worker experiences and job characteristics may vary across online labor platforms (van Zoonen et al., 2023). In addition, most research on online crowdwork thus far relies on traditional research methodologies such as interviews and surveys. We call for expanding the methodological repertoire by including, for instance, observational data and platform data logs on workers' work times and earnings. Future multi-platform, multi-method studies may advance crowdwork knowledge by improving the findings' generalizability and ecological validity.

6. Conclusion

The current study makes important advances in understanding the viability challenges experienced by online crowdworkers. We highlight how individual income dependence and inadequate compensation are associated with workers' stress by presenting a viability challenge. Autonomy alleviates stress by reducing this viability challenge. However, workers with internal locus of control seem more aptly equipped to minimize the consequences of economic precarity while maximizing the benefits of the autonomy afforded to them in this work environment.

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CRedit authorship contribution statement

Ward van Zoonen: Writing – review & editing, Writing – original

draft, Resources, Methodology, Funding acquisition, Formal analysis, Data curation, Conceptualization. Anu E. Sivunen: Writing – review & editing, Writing – original draft, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- Açıköz, A., & Latham, G. P. (2022). Self-set learning goals and service performance in a gig economy: A moderated-mediation role of improvisation and mindful metacognition. *Journal of Business Research*, 139, 1553–1563.
- Aguinis, H., Villamor, I., & Ramani, R. S. (2021). MTurk research: Review and recommendations. *Journal of Management*, 47(4), 823–837.
- Allen, D. G., Weeks, K. P., & Moffitt, K. R. (2005). Turnover intentions and voluntary turnover: The moderating roles of self-monitoring, locus of control, proactive personality, and risk aversion. *Journal of Applied Psychology*, 90(5), 980–990.
- Ashford, S. J., & Tsui, A. S. (1991). Self-regulation for managerial effectiveness: The role of active feedback seeking. *Academy of Management Journal*, 34(2), 251–280.
- Ashford, S. J., Caza, B. B., & Reid, E. M. (2018). From surviving to thriving in the gig economy: A research agenda for individuals in the new world of work. *Research in Organizational Behavior*, 38, 23–41.
- Aubé, C., Rousseau, V., & Morin, E. M. (2007). Perceived organizational support and organizational commitment: The moderating effect of locus of control and work autonomy. *Journal of Managerial Psychology*, 22(5), 479–495.
- Bankins, S., & Formosa, P. (2021). Ethical AI at work: The social contract for artificial intelligence and its implications for the workplace psychological contract. In M. Coetzee, & A. Deas (Eds.), *Redefining the psychological contract in the digital era: Issues for research and practice* (pp. 55–72). Springer.
- Bauer, D. J., & Curran, P. J. (2005). Probing interactions in fixed and multilevel regression: Inferential and graphical techniques. *Multivariate behavioral research*, 40(3), 373–400.
- Behl, A., Jayawardena, N., Ishizaka, A., Gupta, M., & Shankar, A. (2022). Gamification and gification: A multidimensional theoretical approach. *Journal of Business Research*, 139, 1378–1393.
- Berg, J. (2015). Income security in the on-demand economy: Findings and policy lessons from a survey of crowdworkers. *Comparative Labor Law & Policy Journal*, 37, 543–576.
- Berg, J., & Rani, U. (2021). Working conditions, geography and gender in global crowdwork. In *Work and labour relations in global platform capitalism* (pp. 93–110). Edward Elgar Publishing.
- Bidwell, M., Briscoe, F., Fernandez-Mateo, I., & Sterling, A. (2013). The employment relationship and inequality: How and why changes in employment practices are reshaping rewards in organizations. *Academy of Management Annals*, 7(1), 61–121.
- Bucher, E., Fieseler, C., & Lutz, C. (2019). Mattering in digital labor. *Journal of Managerial Psychology*, 34(4), 307–324.
- Bucher, E., Fieseler, C., Lutz, C., & Buhmann, A. (2024). *Professionals, purpose-seekers, and passers-through: How microworkers reconcile alienation and platform commitment through identity work* (pp. 190–215). New media & society.
- Caza, B. B., Reid, E. M., Ashford, S. J., & Granger, S. (2022). Working on my own: Measuring the challenges of gig work. *Human Relations*, 75(11), 2122–2159.
- Claussen, J., Kretschmer, T., Khashabi, P., & Seifried, M. (2020). Two to tango? Psychological contract breach in online labor markets. *Psychological Contract Breach in Online Labor Markets*, 20–078. Article.
- Cole, D. A., & Preacher, K. J. (2014). Manifest variable path analysis: Potentially serious and misleading consequences due to uncorrected measurement error. *Psychological Methods*, 19(2), 300–315.
- Conway, N., Guest, D., & Trenberth, L. (2011). Testing the differential effects of changes in psychological contract breach and fulfillment. *Journal of Vocational Behavior*, 79(1), 267–276.
- Costa, S. (2021). New psychological contracts, old breaches? In M. Coetzee, & A. Deas (Eds.), *Redefining the psychological contract in the digital era: Issues for research and practice* (pp. 111–127). Springer.
- Cropanzano, R., Keplinger, K., Lambert, B. K., Caza, B., & Ashford, S. J. (2023). The organizational psychology of gig work: An integrative conceptual review. *Journal of Applied Psychology*, 108(3), 492–519.
- De Cuyper, N., & De Witte, H. (2006). Autonomy and workload among temporary workers: Their effects on job satisfaction, organizational commitment, life satisfaction, and self-rated performance. *International Journal of Stress Management*, 13(4), 441–459.
- Deng, X. N., & Joshi, K. D. (2016). Why individuals participate in micro-task crowdsourcing work environment: Revealing crowdworkers' perceptions. *Journal of the Association for Information Systems*, 17(10), 648.
- Deng, X., Joshi, K. D., & Galliers, R. D. (2016). The duality of empowerment and marginalization in microtask crowdsourcing. *MIS Quarterly*, 40(2), 279–302.
- Duffy, R. D., Allan, B. A., England, J. W., Blustein, D. L., Autin, K. L., Douglass, R. P., & Santos, E. J. (2017). The development and initial validation of the Decent Work Scale. *Journal of Counseling Psychology*, 64(2), 206–221.

- Duggan, J., Sherman, U., Carbery, R., & McDonnell, A. (2020). Algorithmic management and app-work in the gig economy: A research agenda for employment relations and HRM. *Human Resource Management Journal*, 30(1), 114–132.
- Durward, D., Blohm, I., & Leimeister, J. M. (2020). The nature of crowd work and its effects on individuals' work perception. *Journal of Management Information Systems*, 37(1), 66–95.
- Felix, B., Dourado, D., & Nossa, V. (2023). Algorithmic management, preferences for autonomy/security and gig-workers' wellbeing: A matter of fit? *Frontiers in Psychology*, 14, 1088183.
- Fieseler, C., Bucher, E., & Hoffmann, C. P. (2019). Unfairness by design? The perceived fairness of digital labor on crowdworking platforms. *Journal of Business Ethics*, 156, 987–1005.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.
- Galvin, B. M., Randel, A. E., Collins, B. J., & Johnson, R. E. (2018). Changing the focus of locus (of control): A targeted review of the locus of control literature and agenda for future research. *Journal of Organizational Behavior*, 39(7), 820–833.
- Gegenhuber, T., Ellmer, M., & Schüßler, E. (2021). Microphones, not megaphones: Functional crowdworker voice regimes on digital work platforms. *Human Relations*, 74(9), 1473–1503.
- Gerber, C. (2021). Community building on crowdwork platforms: Autonomy and control of online workers? *Competition & Change*, 25(2), 190–211.
- Glavin, P., Bierman, A., & Schieman, S. (2021). Über-alienated: Powerless and alone in the gig economy. *Work and Occupations*, 48(4), 399–431.
- Granger, S., Caza, B. B., Ashford, S. J., & Reid, E. M. (2022). Adapting to a jolt: A mixed methods study identifying challenges and personal resources impacting professional gig workers' wellbeing during COVID-19. *Journal of Vocational Behavior*, 138, Article 103784.
- Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Performance*, 16(2), 250–279.
- Heeks, R., Graham, M., Mungai, P., Van Belle, J. P., & Woodcock, J. (2021). Systematic evaluation of gig work against decent work standards: The development and application of the Fairwork framework. *The Information Society*, 37(5), 267–286.
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513–524.
- Hornuf, L., & Vrankar, D. (2022). Hourly Wages in Crowdworking: A Meta-Analysis. *Business & Information Systems Engineering*, 64(5), 553–573.
- Howcroft, D., & Bergvall-Kärebörn, B. (2019). A typology of crowdwork platforms. *Work, Employment and Society*, 33(1), 21–38.
- Howson, K., Johnston, H., Cole, M., Ferrari, F., Ustek-Spilda, F., & Graham, M. (2023). Unpaid labour and territorial extraction in digital value networks. *Global Networks*, 23(4), 732–754.
- Ihl, A., Strunk, K. S., & Fiedler, M. (2018). The influence of utilitarian and hedonic motivation on success in crowd work. In *Thirty Ninth International Conference on Information Systems, San Francisco* (pp. 1–17).
- International Labour Organization (2016). Non-standard employment around the world: understanding challenges. Shaping Prospects. Available at: http://www.ilo.org/wcmsp5/groups/public/-dgreports/-dcomm/-publ/documents/publication/wcms_534326.pdf.
- Jabagi, N., Croteau, A. M., Audebrand, L. K., & Marsan, J. (2019). Gig-workers' motivation: Thinking beyond carrots and sticks. *Journal of Managerial Psychology*, 34(4), 192–213.
- Jiang, L., Wagner, C., & Chen, X. (2021). Taking time into account: Understanding microworkers' continued participation in microtasks. *Journal of the Association for Information Systems*, 22(4), 893–930.
- Kolb, K. J., & Aiello, J. R. (1996). The effects of electronic performance monitoring on stress: Locus of control as a moderator variable. *Computers in Human Behavior*, 12(3), 407–423.
- Kuhn, K. M., & Maleki, A. (2017). Micro-entrepreneurs, dependent contractors, and instasferfs: Understanding online labor platform workforces. *Academy of Management Perspectives*, 31(3), 183–200.
- Kvirkvaia, M. (2023). Digital work platforms in the modern labor market. In M. Kupiek, & R. A. Brandmeier (Eds.), *The Digital Transformation of Georgia: Economics, Management, and Policy* (pp. 3–22). Cham: Springer International Publishing, 10.1007/978-3-031-26451-1.
- Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist*, 57(9), 705–717.
- Loneragan, J. M., & Maher, K. J. (2000). The relationship between job characteristics and workplace procrastination as moderated by locus of control. *Journal of Social Behavior and Personality*, 15(5), 213.
- Malhotra, N. K., & Dash, S. (2011). *Marketing research an applied orientation*. London: Pearson Publishing.
- Malhotra, A. (2021). The postpandemic future of work. *Journal of Management*, 47(5), 1091–1102.
- Moorman, R. H., Lyons, B. D., Mercado, B. K., & Klotz, A. C. (2024). Driving the extra mile in the gig economy: The motivational foundations of gig worker citizenship. *Annual Review of Organizational Psychology and Organizational Behavior*, 11(1), 363–391.
- Morgan, R. A., van Zoonen, W., & ter Hoeven, C. (2023). Lost in the crowd? An investigation into where microwork is conducted and classifying worker types. *European Journal of Industrial Relations*.
- Morgeson, F. P., & Humphrey, S. E. (2006). The Work Design Questionnaire (WDQ): Developing and validating a comprehensive measure for assessing job design and the nature of work. *Journal of Applied Psychology*, 91(6), 1321–1332.
- Motowidlo, S. J., Packard, J. S., & Manning, M. R. (1986). Occupational stress: Its causes and consequences for job performance. *Journal of Applied Psychology*, 71(4), 618–629.
- Moussawi, S., & Koufaris, M. (2013). The crowd on the assembly line: Designing tasks for a better crowdsourcing experience. *Thirty Fourth International Conference on Information Systems*, Milan 2013.
- Newlands, G., & Lutz, C. (2021). Crowdwork and the mobile underclass: Barriers to participation in India and the United States. *New Media & Society*, 23(6), 1341–1361.
- Newlands, G., & Lutz, C. (2024). Mapping the prestige and social value of occupations in the digital economy. *Journal of Business Research*, 180, Article 114716.
- Ng, T. W., Sorensen, K. L., & Eby, L. T. (2006). Locus of control at work: A meta-analysis. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 27(8), 1057–1087.
- Peetz, J., Robson, J., & Xuereb, S. (2021). The role of income volatility and perceived locus of control in financial planning decisions. *Frontiers in Psychology*, 12, Article 638043.
- Pichault, F., & McKeown, T. (2019). Autonomy at work in the gig economy: Analysing work status, work content and working conditions of independent professionals. *New Technology, Work and Employment*, 34(1), 59–72.
- Puranik, H., Koopman, J., & Vough, H. C. (2021). Excuse me, do you have a minute? An exploration of the dark-and bright-side effects of daily work interruptions for employee wellbeing. *Journal of Applied Psychology*, 106(12), 1867–1884.
- Ravenelle, A. J. (2019). "We're not Uber:" control, autonomy, and entrepreneurship in the gig economy. *Journal of Managerial Psychology*, 34(4), 269–285.
- Rodriguez, I., Bravo, M. J., Peiró, J. M., & Schaufeli, W. (2001). The demands-control-support model, locus of control and job dissatisfaction: A longitudinal study. *Work & Stress*, 15(2), 97–114.
- Rousseau, D. (1995). *Psychological contracts in organizations: Understanding written and unwritten agreements*. Sage publications.
- Rousseau, D. M. (1989). Psychological and implied contracts in organizations. *Employee responsibilities and rights journal*, 2, 121–139.
- Schor, J. B., Attwood-Charles, W., Cansoy, M., Ladegaard, I., & Wengronowitz, R. (2020). Dependence and precarity in the platform economy. *Theory and Society*, 49, 833–861.
- Shanahan, G., & Smith, M. (2021). Fair's fair: Psychological contracts and power in platform work. *The International Journal of Human Resource Management*, 32(19), 4078–4109.
- Singh, P., Bala, H., Dey, B. L., & Filieri, R. (2022). Enforced remote working: The impact of digital platform-induced stress and remote working experience on technology exhaustion and subjective wellbeing. *Journal of Business Research*, 151, 269–286.
- Spector, P. E. (1988). Development of the work locus of control scale. *Journal of Occupational Psychology*, 61(4), 335–340.
- Strunk, K. S., & Strich, F. (2023). Building professional holding environments for crowd work job crafting through online communities. *Information Systems Journal*, 33(5), 1239–1274.
- Strunk, K. S., Faltermaier, S., Ihl, A., & Fiedler, M. (2022). Antecedents of frustration in crowd work and the moderating role of autonomy. *Computers in Human Behavior*, 128, Article 107094.
- Ticona, J., & Mateescu, A. (2018). Trusted strangers: Carework platforms' cultural entrepreneurship in the on-demand economy. *New media & society*, 20(11), 4384–4404.
- Toti, J. F., Diallo, M. F., & Huaman-Ramirez, R. (2021). Ethical sensitivity in consumers' decision-making: The mediating and moderating role of internal locus of control. *Journal of Business Research*, 131, 168–182.
- Toxtli, C., Suri, S., & Savage, S. (2021). Quantifying the invisible labor in crowd work. *Proceedings of the ACM on human-computer interaction*, 5(CSCW2), 1–26.
- Vallas, S., & Schor, J. B. (2020). What do platforms do? Understanding the gig economy. *Annual review of sociology*, 46(1), 273–294.
- van Zoonen, W., ter Hoeven, C., & Morgan, R. (2023). Finding meaning in crowdwork: An analysis of algorithmic management, work characteristics, and meaningfulness. *The Information Society*, 1–15.
- Whiting, M. E., Hugh, G., & Bernstein, M. S. (2019). Fair work: Crowd work minimum wage with one line of code. In *Proceedings of the AAAI Conference on Human Computation and Crowdsourcing* (pp. 197–206).
- Wood, A. J., Graham, M., Lehdonvirta, V., & Hjorth, I. (2019). Good gig, bad gig: Autonomy and algorithmic control in the global gig economy. *Work, Employment and Society*, 33(1), 56–75.
- Wu, C. H., Griffin, M. A., & Parker, S. K. (2015). Developing agency through good work: Longitudinal effects of job autonomy and skill utilization on locus of control. *Journal of Vocational Behavior*, 89, 102–108.
- Wu, D., & Huang, J. L. (2024). Gig work and gig workers: An integrative review and agenda for future research. *Journal of Organizational Behavior*, 45(2), 183–208.
- Yao, Q. M., Baker, L. T., & Lohrke, F. T. (2022). Building and sustaining trust in remote work by platform-dependent entrepreneurs on digital labor platforms: Toward an integrative framework. *Journal of Business Research*, 149, 327–339.

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