



‘Your Duties Are To Sweep A Floor Remotely’: Low Information Quality in Job Advertisements is a Barrier to Low-Income Job-Seekers’ Successful Use of Digital Platforms

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ABSTRACT

Digital platforms have become central in job search. Job-seekers’ experiences with these platforms, however, is a relatively new research area. This paper presents findings from 27 interviews with US low-income job-seekers. Job-seekers encountered many job ads with low information quality on the platforms they used in their searches. These included ads where important information, such as job pay, duration, hours, location, or requirements were missing, unclear, contradictory, or misleading; ads for unethical or illegal work; and ads that did not correspond to paying work but were designed to lure job-seekers into performing free labor or into scams. While job-seekers developed heuristics to navigate low quality ads, these did not always work, and may have caused job-seekers to miss relevant job opportunities. This paper helps answer an open question in HCI research about barriers to low-income job-seekers’ successful use of digital platforms: one barrier is *low information quality job ads*.

CCS CONCEPTS

- Human-centered computing → Empirical studies in HCI;
- Information systems → Online advertising; Web searching and information discovery;
- Social and professional topics → Governmental regulations; Economic impact; Socio-technical systems; Social engineering attacks.

KEYWORDS

job search, low-income job search, digital job search platforms, low-income users, work, employment, labor markets, information quality, scams, incentives of platform operators, platform governance, policy, economics and HCI

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1 INTRODUCTION

Digital platforms have come to play a central role in job search. In the United States, for example, most people search for their next paid work opportunity using digital platforms [24]. Job-seekers use a wide range of platforms in their searches. These include general-purpose search engines such as Google; social networking sites such as Facebook, Instagram, and LinkedIn; job search platforms such as Indeed and Monster.com; ‘crowd-,’ ‘gig-,’ and shift work platforms such as Amazon Mechanical Turk, Upwork, and Snagajob; and general-purpose messaging applications such as WhatsApp. Finding work is an unavoidable step in securing a livelihood for most people. These platforms, in their roles as tools for job search, are therefore essential livelihood tools.

Job search and job matching are topics of long-running interest in fields including economics [4, 42, 112, 129], management [92], organizational psychology [144], and sociology [9, 52, 110, 132, 142]. As the internet became economically important, researchers in these fields investigated its impact on job search. While early studies were ambiguous about the value of internet-based job search [46, 84], later studies found it to be advantageous for job-seekers [20, 83, 135]. As the internet has become ‘taken for granted’ in many parts of the world, however, and internet-mediated work has diversified beyond ‘traditional’ full-time employment into online crowd work, app-based on-location ‘gig work,’ shift work, and other digitally mediated ‘non-standard forms of employment’ (e.g., [40, 105, 106, 126]), the picture has grown more complex, and it has become inadequate to talk monolithically of the role of ‘the internet’ in ‘job search.’ Many different kinds of internet-based services and practices have come to play a role in searches for different kinds of work. Despite the long-running interest in job search, however, and despite the growing importance of digital platforms

in job search, empirical research on digital platforms and job search is relatively limited. Research on how job-seekers use different types of platforms, how different platforms' features and operation strategies (e.g., content moderation) influence job search outcomes, and how job-seekers' demographics and social capital influence their success with digital platforms are relatively new research topics, studied mainly by a small group within HCI [28, 30, 33, 34, 72, 103, 146]. Additionally, early optimism that internet-based job advertising and search would improve the overall efficiency of job matching has given way to a more nuanced picture. The reduced cost and increased ease of posting job ads and applying to jobs means there are more job ads and more job applications. Job-seekers therefore spend more time navigating the increased quantity of job ads available to them, and employers spend more time evaluating the increased quantity of applications they receive [24, 46].

This paper contributes to this growing body of research on job-seekers' use of, and experiences with, digital platforms. It reports findings from 27 in-depth semi-structured interviews with low-income job-seekers in the United States. The 27 interviewees were selected from among 293 respondents to a 103-question survey of low-income persons living in the United States. The survey was designed based on an interdisciplinary review of literature on low-income job search.

Interviewees reported encountering many job ads with low information quality on the platforms they used in their job searches. Low information quality job ads took various forms. Some ads were missing information job-seekers needed to determine if the potential job was relevant for them, such as location or wage information. Others corresponded to 'real' (i.e., paying) work that was nonetheless unethical or illegal. Others did not correspond to real paying work at all but were intended to entice job-seekers to follow social media accounts, perform free labor, or fall prey to scams.

This paper documents and discusses these findings in detail. It makes four main contributions—two empirical, one conceptual, and a set of implications for practice—and outlines open questions for future research. The first contribution is to answer an open question in HCI research: What barriers exist to low-income job-seekers' successful use of digital platforms? (See esp. [31], p. 2.) Our interview data yield a clear answer: *Low information quality in job ads*. The second contribution is a detailed empirical account of low-income job-seekers' experiences with low information quality job ads on digital platforms. This includes, on one hand, a first empirical taxonomy of characteristics of low information quality job ads (Sec. 4.1) and, on the other, an account of job-seekers' responses to these ads. Job-seekers developed heuristics to navigate the low quality ads they encountered. However, these heuristics did not always work; in fact, they may have made the problem worse. Encountering low quality job ads, for example, led some job-seekers to 'spam' applications, making it more difficult for employers to reply to all applicants.

The paper's conceptual contribution arises from its empirical findings. Like many conceptual contributions, it may seem simple once the point has been made. This is to direct our attention to the behavior of employers and platform operators as key factors in the often-suboptimal outcomes in digital job search. Previous HCI research on low-income job search has focused largely on training,

tools, and social support for job-seekers and other 'worker side' actors (e.g., job center workers [29]; see Sec. 2). That work is important and should continue. Yet our findings make clear that—to make the point bluntly—*job-seekers are not, largely, the problem*. Rather, it is the behavior and decisions of employers and platform operators that produce low quality job ads and creates barriers to successful digital job search. To address the problem, *it is employers and platforms that must change*—if necessary, through regulation. To our knowledge only one HCI study has considered this view ([89]; see Sec. 2.1). This paper significantly further empirically substantiates this view and discusses its practical implications.

The paper's fourth contribution consists of novel practical recommendations for employers, platforms, and policymakers. The paper foregrounds recommendations made by interviewees; i.e., by low-income job-seekers themselves. Interviewees suggested, for example, that employers aim to reply to all applicants to their job ads; take down ads once positions are filled; and avoid including requirements in job ads not truly necessary for doing the job. They also made suggestions for platform operators, such as giving employers tools to 'pause' or hide job ads once many applications are received; and displaying employer response statistics on job ads to encourage them to reply to applicants.

Finally, the paper outlines open questions for related future research.

2 BACKGROUND AND RELATED WORK

Job search and job matching are hard problems. Research on these topics dates back at least to 1932, in economics ([59]; for later work in economics see e.g. [42, 112]; for references to work in other fields see Sec. 1). The practical challenges facing job-seekers and employers, however, have not been 'solved' by any academic discipline, industry, field, system, or community of practice.¹

Before the development of the internet, most job advertisements were distributed through print media such as newspapers and magazines. The internet made it easier and cheaper for employers to post and update job ads. It also made it easier for job-seekers to discover job ads, search for particular kinds of job openings, and apply to jobs [7]. Some early commentators were optimistic that this reduction in 'search costs' would lead to 'improved [...] communication' between employers and job-seekers [7], and perhaps even improve overall economic productivity [82].

Beginning in 2005, however, research indicated mixed impacts of internet-based job advertisement and search. On one hand, researchers have generally found that job-seekers who use the internet in their job searches have an advantage over those who do not [20, 83, 135]. On the other hand, research also indicates that the reduced costs of posting job ads and applying to jobs has not improved the *overall 'efficiency'* of job search and matching. This is because job-seekers spend more time navigating the increased quantity of job ads they can now access, and employers spend more time evaluating the increased quantity of applications they now receive [24, 46].

¹A widely-quoted criticism of the economics research on job search was made by the behavioral economist Richard Thaler, who wrote wryly that 'an economist who spends a year finding a new solution to a nagging problem—such as the optimal way to search for a job when unemployed—is quite content to assume that the unemployed have already solved the problem and search accordingly' [136].

The internet can therefore be said to have had a complex and ambiguous impact on job search and job matching. This impact became even more complex with the development of digital labor platforms. Where digital job search platforms (or ‘job boards’) aim to match job-seekers with employers for longer-term employment relationships, digital labor platforms match self-employed workers with customers for short-term ‘gigs’ or even ‘microtasks’ that may take only a few minutes to complete. These platforms have created new paying work opportunities and enabled entirely new livelihood strategies. However, workers on these platforms report a variety of persistent challenges, such as low pay (sometimes below minimum wage), unpredictable work volume and hours, opaque and error-prone algorithmic management systems, physical and psychological health and safety risks, employment misclassification, and, in some cases, scams and fraud (e.g., [106]; for additional references see Sec. 2.2).

Some job-seekers interviewed in this study reported using both job boards to search for longer-term work and labor platforms to obtain short-term work. The remainder of this section therefore provides background on three topics in this complex landscape. Section 2.1 reviews HCI research on low-income workers’ use of digital platforms for job search. Section 2.2 provides a broader overview of HCI and CSCW research on digital labor platforms (i.e., ‘crowd’ and ‘gig’ work platforms). Section 2.3 focuses on recent research on scams and fraud on those platforms. Section 2.4 provides a brief ‘gap analysis’ of this literature and restates the paper’s main contributions in light of the foregoing literature review.

2.1 Low-income job search on digital platforms

To our knowledge, the ‘core’ of HCI research on low-income job search specifically is the body of work by Tawanna Dillahunt and her collaborators, including Joey Chiao-Yin Hsiao, Julie Hui, Aarti Israni, Alex Jiahong Lu, Ihudiya Finda Ogbonnaya-Ogburu, and Earnest Wheeler (e.g., [19, 29, 30, 32, 33, 89, 103, 146]). This body of work has developed over at least a decade and includes empirical studies with traditional quantitative and qualitative methods (i.e., surveys and interviews of individual participants), community-based participatory research (e.g., field research in employment centers), workshops, and the development and deployment of both technical and social interventions. Broadly described, this body of work takes a sociologically and economically sophisticated view on the utility of information technology in economic life. It does not advance technology as a panacea for socioeconomic challenges such as unemployment or social exclusion, nor does it assume that technology, appropriately socially scaffolded, cannot play a role in addressing such challenges. Later contributions to this body of work (in particular [89]) begin to explicitly examine the ‘inherent’ limitations of mainly technical interventions, in particular in the labor market context, and begin offering policy recommendations (for further discussion see Sections 5.1–5.2 of this paper). This paper builds on this body of work and aims to continue developing the capacity of HCI research to build recommendations for other actors in the ‘ecosystem’ of the labor market—here employers, platform operators, and policymakers (see Section 6).

2.2 ‘Crowd’ and ‘gig’ work in HCI and CSCW

HCI and CSCW researchers have investigated the diverse, complex, and evolving experiences and livelihood strategies of workers on ‘crowd’ and ‘gig’ work platforms going back at least to 2010 (e.g., [10, 55, 69, 78, 87, 121, 122]; see also, more recently, e.g., [53, 56–58, 95, 139, 147]). Since approximately 2015 this body of work in HCI and CSCW has also overlapped, in terms of individual researchers, methods, field sites (i.e., platforms and locations), questions, and findings, with research published in the fields of science and technology studies (‘STS’) (e.g., [15, 68]), sociology (e.g., [118, 128, 143]), management and organization studies (e.g., [37, 39, 48–50, 100]), and labor law and industrial relations (e.g., [11, 25, 79, 106, 114]). In our reading, four main themes emerge from this body of research anchored in HCI and CSCW. First, crowd and gig work platforms have become important—for workers, customers, and the economy broadly. Second, despite this importance, crowd and gig workers report low wages and other serious risks in their work. Third, researchers have traced the low pay and risks experienced by platform workers to three features whose combination appears relatively unique to platform work. Fourth, platform workers have developed tactics for navigating these risks—and while these tactics have produced notable achievements, they all appear to have encountered limitations and trade-offs. Sections 2.2.1–2.2.4 further articulate these themes. Section 2.3 focuses further on the topic of scams in platform work. Section 2.4 articulates the connection between research to date on platform work and this paper.

2.2.1 Crowd and gig work platforms have become important for workers, customers, and the economy. First, crowd- and gig work platforms create significant new paid work opportunities for workers and significant new capabilities for customers; as a result, they have become important for workers’ livelihoods, for businesses, and in the economy at large. This is the case both for online and in-person platform work. Early HCI research reported that approximately 20% of workers surveyed on one online labor platform, for example, reported relying on their platform income to meet their basic needs [121]. More recent research indicates that this reliance has only grown as platform work has grown, diversified, and globalized. A global survey of 12,000 platform workers from 2021, for example, reported that ‘the overwhelming majority’ of location-based platform workers, and about one third of online platform workers, surveyed indicated platform work was their main source of income ([106], p. 22). Labor platforms have also become important for the client businesses and households that use them. Restaurants, for example, have come to rely on delivery platforms ([106], p. 21); platform-based delivery workers were even legally classified as ‘essential’ workers during the Covid-19 lockdowns ([14, 18]; [107], pp. 6–9). Platforms for online work have become key intermediaries in data labelling and cleaning supply chains, and therefore important vendors for operators of global social media platforms and ‘artificial intelligence’ services, who rely on them for content moderation and production of training data [53, 125].

Platforms have achieved this level of importance in various value chains largely by connecting workers to customers beyond those they would otherwise have access to—thereby attracting workers—and by automating or structuring common aspects of work

management such as transaction handling, worker-client communication, conflict resolution, performance evaluation, and market access [71]. CSCW researchers Jarrahi et al. refer to this as ‘platformic management,’ a term they use to highlight the ways in which digital labor platforms structure (i.e., both enable and constrain) work beyond purely ‘algorithmic’ management [71].

2.2.2 Crowd and gig workers report low wages and other serious challenges, including occupational health and safety risks. Second, both online and location-based platform workers report relatively low wages (in many cases below minimum wage); significant quantities of unpaid working time [65]; pay inaccuracies [81, 98]; significant health and safety risks—including, for in-person workers, sexual harassment, assault, and injury [43, 91], and for online workers, psychosocial risks such as mental illness arising from reviewing large quantities of violent and/or sexually explicit content ([11], p. 86)—and other serious challenges (see generally e.g. [134]). HCI research for example has found that US-based workers on Amazon Mechanical Turk earned on average USD 3.01 per hour [58]—less than half the US minimum wage—and spent about half of their working time doing unpaid work, such as searching for work and doing tasks that were eventually ‘rejected’ (i.e., completed and submitted but not remunerated) or not completed (for example because they took significantly longer than advertised, or due to technical problems) ([57], p. 2). HCI researchers have also identified serious challenges facing location-based platform workers. Ma et al. [91], for example, found that women workers on ride-hail, delivery, and domestic work platforms encounter sexual harassment. Further, the way in which customer ratings affect workers’ future access to work both contribute to a gender pay gap on these platforms, with women earning less than men, and effectively pressure women workers to develop informal coping strategies to deal with inappropriate and unwanted sexual comments and behaviors from customers. The platforms ‘fail to enforce effective harassment prevention policies [in] their rating, matching and recommendation features,’ summarized the authors [90]. Sociologists and interdisciplinary empirical researchers have reported similar findings (see e.g. [118]; [43], p. 25).

2.2.3 The ‘decent work deficits’ in platform work have been traced to the combination of employment status, algorithmic management, and frequent unilateral changes to work organization. Third, the relatively low pay and other ‘decent work deficits’ have been traced to three overlapping features common to much platform work: algorithmic management, and, in particular, the important but often opaque role played by customer ratings of workers; frequent, often unilateral and immediate, changes to work organization and platform design; and the lack of legal protections afforded to traditional employees.

The basic business model of most digital labor platforms combines two elements. The first element is the requirement that workers agree to be classified as self-employed (or ‘independent contractors’) rather than employees of the platform or of any particular customer [12, 16, 106]. The second is the use of complex systems of individualized, data-driven incentives and sophisticated interface and interaction design decisions to encourage workers to work at particular times and/or in particular locations, to accept particular pieces of offered work, and to work in certain ways [35, 87, 117, 120].

These ‘algorithmic management’ practices allow platforms to manage workers without setting explicit work quality standards or issuing direct orders. This is extremely desirable for platforms, as this allows them to achieve service quality standards for customers while reducing the risk that courts will consider the platforms to be employers (see e.g. [124]). Generally it is important for platforms to avoid being considered employers under the law, as employing workers is typically significantly more expensive than working ‘with’ self-employed workers (on the order of 30% more in the US; see e.g. [47]).

Finally, the need to manage workers while avoiding being classified as employers, combined with the necessity to eventually achieve financial sustainability, incentivizes platform operators to iteratively refine and ‘tweak’ the rules and parameters of the many elements of their systems—sometimes quite frequently, and often without consultation with workers [26, 80, 93, 111, 128].

2.2.4 Platform workers develop tactics for navigating the decent work deficits of platform work, but their effectiveness thus far has been limited. Fourth and finally, platform workers have developed sophisticated ‘workarounds’ and tactics for navigating—and, in some cases, attempting to challenge—the decent work deficits, risks, and other challenges presented by platform work. These include online forums in which workers share information [75, 86, 94]; the use of external platforms to work or transact ‘outside’ the digital labor platform [77]; bespoke software tools [56, 70, 98, 131, 147]; use of ‘classical’ industrial relations mechanisms such as works councils and strikes [22, 44, 81, 116]; litigation [2, 17, 60, 61]; and policy advocacy leading to new regulation [36, 51].

All of these have produced notable achievements, especially for individual workers and groups of workers. They have all, however, also encountered limitations and trade-offs. Information sharing through forums and specialized software tools entails extra unpaid work for workers, many of whom are already relatively low-paid (see e.g. [147]). In countries where platform workers have attempted to establish works councils, some platforms have responded by ‘failing to renew’ the contracts of the workers elected to the councils—i.e., effectively firing them, despite the nominal legal protections from retaliation against works council members [97, 99]—or even terminating operations in the country entirely (see e.g. [115]; [73], pp. 9–10). In instances where litigation outcomes have favored platform workers—for example, when courts have found that platform workers classified as self-employed should have been considered employees—platforms make small changes to their business practices, app designs, or contracts, and continue to treat workers as self-employed, apparently under the assumption that the changes effectively annul the litigation outcomes [5]. Even in jurisdictions that have passed targeted legislation to regulate platform work, platforms have responded with ‘creative compliance strategies’ that continue to shift the burden of risk onto workers. Some jurisdictions, for example, have passed laws establishing that platform workers are to be considered employees. In some cases, however, platforms have responded by contracting with, or creating, small and effectively powerless intermediary firms. These firms are nominally the workers’ employers, but the platforms continue to set prices and shape working conditions through algorithmic management (see e.g. [51, 130]). In other cases, as in California,

platforms initiated political campaigns to overturn the legislation [17, 36].

2.3 Scams on crowd and gig work platforms

In addition to being venues for legitimate employers to recruit workers, digital platforms also serve as venues for schemes designed to hook unwary users for the direct financial benefit of the person(s) posting the information—that is, for scams and fraud. Literature on online fraud goes back at least two decades (e.g., [8]). A small but rich literature going back at least a decade has investigated the circumstances and motivations of individuals involved in uses of platforms perceived by others as fraudulent (e.g., [13]). More recently, research by journalists, social scientists, and computing researchers has documented financial scams, identity theft, and click fraud in platforms, especially in ‘gig economy’ platforms (e.g., [76, 113, 119, 138]). Even when workers do not fall victim to these scams, navigating them is time-consuming and reduces their effective working time. One study, for example, found that workers on Amazon Mechanical Turk spent 33% of their daily working time on ‘invisible’ and unpaid labor including ‘wading and sorting through spam or suspicious offers for at-home work’ [140].

A recent special issue of *New Media & Society* reports on a variety of scams in gig work and job platforms [113]. One article, for example, reports on two types of scams in digital job ads in the market for precarious and gig work in New York City: ‘financial mark’ scams—job ads for jobs that do not exist, but simply aim to ‘bilk job seekers out of funds’—and ‘scapegoat’ scams aiming to involve job seekers in illegal activity in exchange for payment [119]. Other articles report on scams in care work platforms [138], on how platform workers respond to each other’s reports of being scammed [145], and on recruitment of platform workers for unethical work, such as participating in political disinformation campaigns [54]. The United States Federal Trade Commission (‘FTC’) has also become active in this area, warning workers about ‘fake check’ scams that recruit victims through digital job platforms [21] and scams masquerading as legitimate care work opportunities [74]. The FTC has also published research on ‘questionable’ and ‘potentially abusive’ work on lesser-known microtask markets [148].

2.4 ‘Gap analysis’ and specific contributions of this paper

Overall, the existing research on crowd and gig work in HCI, CSCW, and related fields shows that digital labor platforms have become important for workers, customers, and the economy at large, but produce serious risks and challenges for workers. Our review of this research identified four main gaps or limitations that this paper aims to help address.

First, despite a growing discourse in HCI on information and power asymmetries in crowd and gig work platforms (e.g., [77, 95]), patterns of information and power asymmetry—and their causes and consequences—in ‘traditional’ digital job boards are to our knowledge much less well-studied. Indeed we found only one paper in the HCI research on job search in digital platforms that considers explicitly how workers’ lack of access to job-relevant information inappropriately exacerbates the power imbalance between employers and job-seekers [89]. The current paper significantly empirically

substantiates and analytically develops this area of study. The empirical findings in this paper show that this dynamic is central to inappropriate power disparities in job search *beyond* crowd and gig work platforms, and shows how it harms job-seekers and the job market overall. Additionally, the paper provides an empirically-based taxonomy of low information quality job ads that could be used in future research, especially into design or policy interventions seeking to address the problem.

Second, most HCI research on job search in digital platforms considers the challenges encountered by job-seekers as problems to be addressed mainly through interventions with job-seekers; for example, by building software tools for, or providing training to, job-seekers. This approach is necessary and research following it should continue. At the same time, the findings reported in this paper foreground the limitations of focusing on job-seekers. They show that a complementary focus on the problematic behaviors of employers and the inaction of platforms is likely needed to improve the usefulness of digital platforms for job search, especially for low-income job-seekers.

Third, we found only one paper in HCI research—again, [89]—that considers that policy intervention may be needed to adjust the incentives facing employers and platforms in a way that motivates them to address the challenges to job-seekers’ successful use of digital platforms that lay largely outside job-seekers’ control. The findings reported in this paper further empirically substantiate this consideration, and the paper uses these findings to significantly extend the body of practical, empirically-based recommendations for employers, platforms, and policymakers aiming to improve the usefulness of digital platforms for job-seekers. It foregrounds recommendations proposed by job-seekers themselves.

Fourth and finally, we found very little research in HCI that considers digital *labor platforms* (i.e., platforms facilitating ‘crowd’ and ‘gig’ work) and digital *job boards*, especially those hosting work for low-income workers, as two categories of tool used simultaneously by the same group of job-seekers—that is, as part of the same ‘ecosystem.’ Low-income workers often work in, and search for, multiple types of jobs simultaneously—and use multiple types of platform to do so. Digital labor platforms and ‘platform work’ have attracted much research—and public and policy debate—on account of their visibility and novelty. However, the fact that digital job boards are troubled by similar challenges has gone relatively unremarked. This paper foregrounds this phenomenon and provides a detailed empirical account of its nature and consequences. This account reveals four facts. First, some patterns of harm arising from low information quality job ads on digital job boards are different from those in digital labor platforms. This is because the structure of work advertised through the two types of platforms is largely different: digital labor platforms offer mostly very short-term work (i.e., ‘gigs’), while digital job boards typically advertise longer-term ‘jobs.’ Second, some patterns of harm, such as scams, are nonetheless common to both types of platform. Third, in both types of platform the ‘underlying’ problem is arguably the same: although the problem of low information quality job ads could be significantly addressed through technical and operational changes, employers and platform operators do not appear to have adequate incentives to make those changes. Fourth and finally, despite the ‘structural’

commonalities, different practical and policy strategies are likely needed to address the problems in the two types of platforms.

Taken together, these contributions advance HCI knowledge on the role of platforms in labor markets, challenges facing job-seekers in using those platforms, the causes and consequences of those challenges, and possible ways forward for addressing them.

3 METHODS

This paper reports findings emerging from an analysis of transcripts of 27 recorded interviews with low-income persons living in the United States who had searched for paid work in the previous 2 years. Interviewees were persons who had indicated they wanted to participate in an interview after completing a survey about use of digital platforms for job search among low-income workers. This section explains the recruitment, data collection, and analysis procedures. The structure of the section is informed by [96].

3.1 Participant recruitment and data collection

Participant recruitment had three phases. First, we posted a screening form to a wide range of online forums, digital platforms, and email lists. Thousands of respondents completed the screening form. Second, those respondents to the screening form who met our eligibility criteria were emailed a survey. For a respondent to be eligible to complete the survey, we required that they (1) be at least 18 years old; (2) currently live in the United States; (3) have searched for paid work in the last 2 years; and (4) have earned US\$45,000 or less in the past year.² 638 eligible respondents completed the survey.

Third, we used a second set of eligibility criteria to select survey respondents to invite for one-hour semi-structured interviews. To be eligible for an interview invitation, we required survey respondents to have answered every question and to have passed data quality checks, such as not having answered every question with the same answer. Of the 638 survey responses, 377 met these eligibility criteria. Of these, 101 indicated that they would be interested to participate in a follow-up interview.

We invited these 101 respondents to interview. Of these, 29 accepted, 28 interviews were completed, and 27 transcripts were analyzed.³ Interviews were recorded over Zoom. Interviewees were compensated for their time with a US\$25 gift card.

Aggregated data on participant demographics, locations, and occupations; socioeconomic information; and specific platforms used by participants for job search are included in Appendices A–D.

3.2 Data analysis

We used thematic analysis to analyze the interview data. In thematic analysis, researchers code data using labels to identify salient categories and features in a dataset [23]. Once the data are annotated, researchers report on the categories by describing what each category represented for interviewees and with respect to the study's

²The threshold of US\$45,000 was based on the United States Department of Health and Human Services poverty guidelines for a family of four [102]. We did not attempt to make quantitative adjustments for individual versus household income. Instead, in view of job-seekers' reported costs of living and need to cover other people's expenses (who may or may not have been direct household members), we used US\$45,000 of reported individual pre-tax income as our eligibility threshold.

³One transcript was excluded from analysis because the interview revealed that the participant did not in fact meet the screening criteria.

research questions or phenomena of interest. Our goal was to surface job-seekers' experiences, workflows, difficulties, and beliefs. We therefore used thematic analysis to identify common processes, information sources, tools, and challenges among our interviewees.

To code the data, we created an initial code book—a reference document containing the labels we would apply to the transcripts—by reading our interview guideline document and parsing the sections and questions from the document into categories. In the first round of coding, two authors tested the initial code book by using it to annotate two transcripts. The authors then met to discuss how well the initial codes represented the themes observed in the data. The researchers then annotated two further transcripts, revising and expanding the initial code book. Then, a third researcher independently annotated the same four transcripts. The three researchers then met to discuss and finalize the code book. Data analysis took place over 16 weeks. For further detail, see Appendix E.⁴

3.3 Limitations

3.3.1 Recruitment. We identify five main limitations of our recruitment procedure that could have biased or otherwise affected our participant sample. First, we used keywords to find online forums, groups and email lists to publish our recruitment materials to. Our keyword choices could have affected participant demographics.

Second, more broadly, our recruitment strategy was entirely online. This almost certainly affected our participant demographics. For example, all but one of our participants were under age 65.

Third, our recruiting and screening materials and our survey and interviews were written and administered in English. US Census data indicates that 8% of the US population aged 5 years and older speaks English less than 'very well' ([27] p. 4). Our choice of language could therefore have biased our participant pool in ways that were meaningful for our study. For example, few of our interview participants reported being Hispanic, and none reported being Asian. The US Federal Trade Commission has reported that "consumers who live in majority Black and Latino communities" may be at greater risk for certain kinds of fraud [141]; the under-representation of Hispanic and Asian interviewees in our study may have led us to overlook or under-represent patterns of fraud or harm that are particularly salient for Hispanic and Asian job-seekers.

Fourth, we excluded screening form responses submitted by persons whose IP address indicated they completed the form while not located in the United States, as well as persons using proxy IP addresses. Excluding these participants could have excluded persons traveling outside the United States and persons who were privacy-sensitive and using proxy IP addresses for that reason.

Fifth and finally, we were limited in our capacity to verify the geographic locations and incomes of our participants. It is therefore possible that some survey respondents did not in fact meet our study eligibility criteria but were nonetheless included.

3.3.2 Data collection and analysis. This research reports the perspectives of job-seekers. It was not designed or intended to produce

⁴We did not measure inter-coder reliability for two reasons. First, measuring inter-coder reliability requires that coders annotate the same units of text. To ensure this, it would have been necessary to divide the interview transcripts into sentences. This would have been inappropriate for thematic analysis. Second, measuring inter-coder reliability could have impaired our ability to identify the most salient concerns of under-represented groups in the data [96].

causal findings—i.e., evidence of factors explaining why job-seekers had the experiences they described. Additionally, this work was not designed to *quantitatively measure* the extent, scale, or cost of job ad mis- and disinformation in digital platforms. Future research using complementary methods such as platform audits, or survey and interview studies with other actors such as employers and platform operators, could build on the findings presented here to address causal and quantitative questions (see further Section 7).

Finally, we did not analyze systematically how job-seekers' income levels, or other demographic characteristics, influenced their experiences of the themes that emerged from our findings. For example, we did not examine systematically how job-seekers' income levels, educational attainment, or past work experience mediated their experience of low information quality job ads or correlated with the adoption of specific search strategies upon encountering low quality ads. A more structured data collection method such as structured interviews or surveys, potentially with a larger sample size, would be ideal for exploring these correlations.

4 FINDINGS

This section presents five main findings from the interviews. First, job-seekers encountered significant quantities of low information quality job ads on digital platforms, and this significantly negatively affected their job searches. Second, job-seekers adopted heuristics to navigate (i.e., assess) the low information quality ads they encountered. However, these heuristics did not always work, and may have had negative consequences for job-seekers and employers. Third, some job-seekers changed their overall job search strategies in response to encountering low information quality job ads. These 'alternative strategies' produced mixed results. Fourth, encountering low information quality job ads on digital platforms eroded job-seekers' trust in employers and platforms. Fifth, job-seekers' experiences undertaking extensive, often unsuccessful, job searches on platforms with significant quantities of low information quality job ads were not consistent with widespread narratives about the economy and workers from media, experts, and politicians. Job-seekers witnessed these authorities claiming the economy was strong and employers were desperately seeking workers, including low-wage workers. Unemployed people were often portrayed as lazy and entitled, 'sitting at home' collecting unemployment benefits—rather than trying, persistently but unsuccessfully, to find work.

4.1 Low information quality job ads: common and harmful

Job-seekers encountered significant quantities of low information quality job ads on digital platforms. Some ads, for example, lacked crucial information such as location or payment structure (e.g., flat payment vs. commission). Some ads corresponded to jobs that exposed workers to ethical or legal risks. And some ads did not correspond to 'real' jobs but were posted to ensnare job-seekers in scams. These low quality ads significantly affected job-seekers' job searches.

4.1.1 Common low information quality job ad scenarios. Our interviewees reported three common scenarios involving job ads

they interpreted as either fundamentally questionable or of unclear relevance for them personally.

Immediate suspicion. First, a job-seeker could feel suspicious of a job ad's legitimacy or relevance immediately upon reading it. Typically this resulted from omissions, inconsistencies, or implausible claims in the ad. Common topics of such omissions, inconsistencies or claims were pay, location, and working hours.

Some ads, for example, did not include clear information about the pay structure or amount. Some jobs were remunerated on a commission basis, but this was not clear from the ad. Other ads might indicate a pay range—e.g., 'up to \$20 per hour' or '\$45,000 to \$120,000 per year'—but when the job-seeker spoke directly to the employer, the employer might clarify that the job paid at the lower end of the range (e.g., a firm \$10 per hour). Interviewees often interpreted such ranges as suspicious. P24, for example, said, 'There will be a pay range listed, but that is often sort of a bait and switch advertising tactic; you'll have a pay range listed, but the employer intends to give the person who gets the job the lower wage. The high end of the range was bait, essentially.'

P04 reported similar challenges relating to unclear location requirements in job ads. Some ads indicated the job was fully remote, but it was not listed many locations (sometimes including 'remote'), making it impossible to tell from the ad alone where the job was located. Because many job-seekers had location constraints, this forced job-seekers to decide whether to invest time trying to clarify where the job was really located, to apply while knowing their time spent applying might be wasted, or to avoid applying—to avoid wasting time—even though the job might be suitable. P04 said, for example:

I would go to LinkedIn and click 'remote.' I only want remote jobs. And then you go into the job description and in the location field it would say, like, 'Minnesota (Remote).' Then you read the actual job [information] and it doesn't say anywhere whether it's remote or not. That makes you think, 'Okay, is this really remote? Are you just trying to get people's eyes on it?' And if you ask they might say, 'We said remote, but training is in the office in Pennsylvania.' Well, I'm states away.'

Similarly, some ads had inaccurate, missing, or unclear information about working hours. Some ads indicated only that the job was 'full-time' or 'part-time,' but this meant different things for different employers, and for different job-seekers. For example, for one employer, 'full-time' might mean '40 hours per week,' while for another it might mean '35 hours per week.' Especially for hourly workers, this difference meant a difference in weekly earnings, and was therefore crucial information for job-seekers' calculation of whether or not they could afford to perform the job given the expenses involved, such as childcare. P22 explained:

Sometimes it's not clear if they want part time or full time, or what hours or days of the week they're looking for. It's very vague: they'll just be like, 'hiring part time or full time workers.' Okay, are you gonna want me to work every Saturday? Are you gonna

want me to work double shifts? I don't know what you're going to ask.

These and similar omissions, inconsistencies, or implausible claims led job-seekers either to avoid applying to the job, or, if they were desperate for work, to apply with as little effort as possible.

Information later discovered to be misleading. Second, a job-seeker could encounter an ad that seemed legitimate and relevant, and apply, but later, upon communicating with the employer, learn some elements of the ad had been misleading—and that the ad was either not a good match for them or not legitimate at all. P27, for example, described a situation in which she applied for a secretarial position, but the prospective employer then revealed that they wanted her to perform complex accounting work, which would have required professional licensing that she did not have.

Unnecessary and discriminatorily dissuasive requirements. Third, a job-seeker could encounter an ad that indicated potentially unnecessary requirements that dissuaded them from applying, even if they might have been suitable. For example, an ad for a desk job involving mostly seated work and no heavy lifting could indicate candidates were required to be able to stand all day, or be able to lift 50 pounds. At least two disabled interviewees (P04, P24) reported these requirements dissuaded them from applying. We refer to these as 'unnecessary and discriminatorily dissuasive requirements' (see further Section 7.1 & Appendix F). P04 explained:

Th[e employer] put[s] the statement [in the ad], 'We don't discriminate based on...' a long list of qualifications, but then they'll put, 'You have to be able to lift 50 pounds and stand on your feet for four plus hours straight. And I'll read the job description and I'm like, that's a desk job, that is me sitting at a desk for eight hours a day. That's fine, but why are you asking if I could lift 50 pounds? To me, that's pure ableism, that's saying, we don't want you if you're in a wheelchair—it doesn't matter that you can do 100% of the tasks.

4.1.2 Unintentionally misleading—or intentionally deceptive? All three scenarios above could involve *unintentionally* or *intentionally* misleading information. Intentionally deceptive job ads, however, often also asked job-seekers to provide personal data irrelevant to the job, or take other actions which could harm the job-seeker and benefit the (supposed) employer. Such ads might, for example, ask candidates to supply a Social Security Number, or to send advance payment for a background check, ostensibly as part of the application process.

Table 1 lists common content characteristics in low information quality job ads generally. Table 2 lists 'warning signs' commonly interpreted by job-seekers as indicating that the ad could be expected to correspond either to unethical or illegal work, or to a scam (i.e., not to correspond to 'a real job' at all). There were various types of scams. Some aimed to entice job-seekers into paying for goods or services they did not need (i.e., ostensibly as part of the 'job' duties) while others 'merely' aimed to get them to perform free labor, visit websites, sign up for newsletters or other free services, or follow social media accounts. P03, for example, recounted:

You click through [on a job ad], like, 'Oh, this job sounds cool,' but then you have to go through all this clickbait just to find the job you were looking for. Sometimes it doesn't actually lead to the job you wanted, it leads to like [another] website and they make you sign up for newsletters and all this other nonsense. So there's certain websites that take advantage of you looking for a job to get clicks to drive revenue—I guess, or whatever, I'm not sure. I mean, I'm sure they're making money somehow, but not by finding anybody a job. That's for certain.

Appendices F and G provide further detail, examples, and quotations from interviewees.

Classification	Definition
Ambiguous	Content can be interpreted in different ways
Unspecific	Content is not detailed
Incomplete	Content provides some but not all relevant details
Absent	Content is missing
Outdated	Content is old
Irrelevant	Content is tangential or immaterial
Inaccurate	Content is not factual or correct
Contradictory	Content calls into question other information or expectations about the job
Biased	Content is associated with a prejudice against a particular demographic group

Table 1. Characteristics of low information quality job ads.

Classification	Definition
Privacy Invasive	Ad or employer asks for personal data unnecessary for hiring process
Inappropriate	Ad or employer asks for inappropriate communication, software use, payments, purchases, labor, or other actions
Atypical	Ad says the employer will provide unusual communication, software use, payments, purchases, labor, or other actions

Table 2. 'Warning signs': characteristics of job ads likely to be interpreted by job-seekers as corresponding to illegal or unethical work, or to scams.

4.2 Heuristics for navigating low quality ads: necessary but imperfect

Job-seekers developed heuristics for navigating low information quality job ads. These heuristics, however, did not always work, and often had 'costs.'

Job-seekers used the ad characteristics listed in Section 4.1 to decide whether to avoid, 'queue' (i.e., save for later), or immediately pursue job ads they encountered. For example, some interviewees reported avoiding ads that requested unusually large amounts of, or unusually sensitive, personal data; indicated that the job was remunerated on a commission basis; indicated multiple locations; or included ambiguous payment information. P06, for example, said, 'I avoid companies [whose ads] say "up to \$20 an hour," because if

they say that—that [all but] guarantees they're paying minimum wage. It's a red flag, in my opinion.'

In low-wage markets, however, ads for legitimate jobs (in the sense that they were 'real' jobs that paid money) often had some of the characteristics that job-seekers came to associate with illegitimate ads (e.g., ads that did not correspond to real jobs that paid real money). As a result, job-seekers' heuristics often produced both 'false positives' and 'false negatives'—i.e., led them both to avoid ads for legitimate jobs after concluding, based on the characteristics of the ads, that they were illegitimate, *and* to apply to job ads that turned out to be illegitimate—that is, not to correspond to real jobs.

Additionally, sometimes job-seekers needed income so urgently they felt it necessary to pursue jobs whose ads had some characteristics of illegitimate ads. P01, for example, described performing a series of unpaid tasks on social media platforms in response to a job ad that ultimately appeared to be a scam designed for the supposed employer to acquire more social media followers:

You apply for the job, you give them your information, they tell you to go back to [Instagram]. Like, for example, that one [job ad] I found on Instagram, so they tell you to go back to Instagram, follow some pages, follow some people, now what is that? Why should I follow all those? They didn't text me again after that. Sometimes, when you need something [i.e., a job], there's no room for, maybe, getting upset; you just have to do what you have to do.

Finally, some ads turned out to be legitimate in that they corresponded to real jobs that paid money—i.e., they were not scams targeting job-seekers—but the jobs raised ethical or legal risks for the worker who performed them. P11 did paying work in this category for some time and was reluctant to discuss it, but eventually gave the following description:

I used to write for [a website]. It wasn't [...] that accepted, because they pay out people, then people do the assignments for [students] and send them [to the students]. As long as the work is done perfectly [without plagiarism], they pay. That [kind of work] isn't that good because ... it's kind of—it's cheating. It's lots of cheating.

That is, P11 did students' homework for them in exchange for pay. While this work paid real money and was likely not, strictly speaking, *illegal*, P11 considered it unethical—and it seems likely that the teachers and administrators at the students' schools would have agreed.

4.3 Adapting search strategies to low information quality

Experiencing persistently unsuccessful job searches in the context of low information quality job ads on digital platforms led some of our interviewees to change their job search strategies. Their new strategies, however, had mixed results.

Interviewees reported three main 'alternative strategies': 'spamming'; refocusing on smaller platforms and digital groups; and refocusing on local, in-person social networks.

4.3.1 'Spamming'. Some interviewees reported switching from carefully selecting which job ads to respond to, and submitting carefully tailored applications in response to them, to 'spamming' un-tailored application materials in response to a large quantity of ads. P03 referred to this method as the 'blitzkrieg' approach. Perhaps even more extreme, P27 (Florida, grant writer, former job coach) reported:

Someone [on Reddit] wrote a bit of code, and they basically [automated] spamming the LinkedIn 'apply now' button with a resume [CV], and shot out hundreds and hundreds of resumes. [On Reddit] he even provided a link where you could pick that code [to spam LinkedIn] up.

P27 noted that the person who posted the code to Reddit claimed they had successfully landed a job via LinkedIn using the method. For this reason, P27 was considering using it as well.

4.3.2 Smaller platforms and digital groups. Some interviewees reported changing the focus of their job search from large digital platforms to smaller, occupationally-focused (or otherwise 'niche') platforms such as archivesgig.com and UnionJobs.com (P04, P13, P14, P15, P24, and P27), or to occupationally-focused WhatsApp groups for job-seekers in a particular local area (e.g., 'construction workers in Chicago') (e.g., P02, P10, P14, P16, P25).

4.3.3 Local, in-person social networks. Some interviewees reported effectively changing their job search strategy to avoid relying primarily on digital platforms, instead relying mainly on their local, in-person social networks, including family members and in-person visits to potential employers.

4.3.4 Results of the 'alternative strategies.' These 'alternative' strategies produced mixed results. For example, 'spamming' applications on large platforms resulted in job offers for some interviewees. Occasionally, they accepted these offers. The jobs, however, participants said often turned out to be either poor fits for their skills or interests, or less well-paid than their previous jobs (e.g., P01, P03).

On the other hand, some interviewees who reported switching to smaller, more 'niche' platforms and groups, reported better outcomes with them than with larger platforms (e.g., P4, a librarian and archivist from Minnesota; and P15, a substitute teacher and nanny from Michigan). Interviewees who experienced positive results from switching to small platforms theorized that this may have been because there was more human review of content on small platforms than on large platforms.

Finally, interviewees who changed their job search strategy to focus on local, in-person social networks also reported mixed success. Job-seekers with strong local social networks found jobs through them, while those without did not. Notably, the success of this strategy depended not only on the connections of the job seekers, but also on the overall economic 'connectedness' of their communities. Interviewees who were members of historically marginalized and economically disadvantaged demographic groups—specifically, immigrants and disabled job-seekers—struggled the most when relying on local, in-person networks to find paid work, as they often had fewer connections to employers and currently employed persons.

4.4 Erosion of trust in employers and platforms

Many job ads turned out to have low information quality. As a result, job-seekers knew that there was some likelihood that the job associated with any given ad would turn out to be unsuitable (in the case of an unclear, incomplete, or misleading ad) or illegitimate or nonexistent (e.g., a scam). We call this baseline awareness that an ad might not be what it seemed ‘distrust.’ Distrust might take a relatively mild form, such as questioning the competence of other actors, or the amount of time or effort they had taken to ensure that job ads were accurate and complete. Or it might take a more serious form, such as making the assessment that someone who had posted an ad had likely done so with malicious, deceptive, or illegal intentions. Our interviewees offered a nuanced view of this diversity of reasons for distrust, not all of which had to do with malicious intent. For example, they distinguished ‘real’ employers—who, for whatever reason, might post incomplete or misleading ads—from scammers. Overall, however, persistently encountering low information quality job ads on digital platforms eroded job-seekers’ trust in both employers and platforms.

4.4.1 Features and practices contributing to distrust. Interviewees reported several phenomena that contributed to distrust, including:

Reuse of job descriptions. Employers sometimes posted ads with outdated, irrelevant, or obviously incorrect information. Some interviewees believed this might be because hiring managers reused and edited existing, previously published job descriptions when creating new job ads. When reused job descriptions were clearly not fully tailored to the new job, the new ads had visibly low information quality and created distrust. P04, articulated this concern concisely: ‘If I’m looking for an office job, [the description] [could] be a generic listing of duties that I’m going to do in an office that they could have copied and pasted [from anywhere], and maybe it’s an outdated description.’

Implausible claims about working conditions or workplace culture. Interviewees reported encountering in job ads claims about workplace culture that they perceived to be misrepresentations or lies. For example, a job-seeker might encounter an ad claiming a workplace had a positive and inclusive culture, but be aware of multiple pending discrimination lawsuits against the company, or have read reviews on employer reputation sites such as Glassdoor documenting dysfunctional, toxic, discriminatory, or abusive management. This led job-seekers to perceive these ads as intentionally misleading, and to distrust the employers posting them. P22 explained:

[Some ads] mislead you into thinking that it’s a very honest company, like everyone there is ‘treated like family’ and all that. And then it turns out to be a multi-level marketing scheme. Or they’re like, ‘We treat everyone like family,’ and then they work you like no other. But, oh, you get pizza on Friday. That’s not my idea of family.

Lack of employer identity verification. Because job-seekers were vigilant to the risk of scams, but had to balance this vigilance with the risk of not applying to a job that was in fact legitimate, job-seekers invested significant effort in investigating the veracity of ads. For example, if they encountered an ad for a company they had

not heard of before, they would try to verify independently that the company existed, was a legitimate business, operated in the locations listed in the ad, and was in fact hiring. Interviewees noted, however, that it would be relatively easy for the platform to verify the employer’s identity and indicate in ads that it had been verified. That platform operators did not to do this, and indeed appeared to be content to allow people to post ads claiming to be entities they were not, led job-seekers to distrust platform operators—and specifically to disbelieve they were invested in protecting job-seekers from fraudulent actors on the platform.

No response to job applications. Typically, job-seekers received no signal indicating whether or not a hiring manager had reviewed their application. If they did not receive an offer for a position they applied for, but also received no other information, they did not know if they did not receive an offer because they were unqualified for the position; because, although they were qualified, there were many other qualified applicants; because they had been screened out by an automated resume/CV screening system (which might indicate a solvable problem with their resume/CV); because the position had been filled before the hiring manager read their application materials (or before they applied); or because of a technical problem that had led to the hiring manager never receiving or reading their application. Job-seekers therefore had no feedback that might allow them to improve their applications or search strategy over time.

This situation was compounded when job-seekers saw a new ad for a position for which they had previously applied, but for which they had received no communication in response to their application. While perhaps not inherently low information quality ads, such ads created uncertainty for job-seekers, and therefore contributed to the overall ‘low information quality environment.’ Because job-seekers did not know whether the hiring manager had read their first application, and if so, how it was evaluated, they did not know if they should invest time applying again. This led job-seekers to distrust platform operators, as job-seekers were of the view that platforms could make design changes to mitigate this problem (see Section 6.2), but chose not to do so. This indicated, in the view of some job-seekers, that platform operators were not invested in job-seekers’ success.

4.4.2 Folk theories. Job-seekers reported ‘folk theories’ explaining the prevalence of low information quality job ads, such as: *Platforms have an incentive to run as many ads as possible, and no incentive to remove ‘bad’ ads, since they are paid for them; Some businesses (e.g., social media marketers) use ‘fake’ job ads to drive traffic to their websites; Businesses have an incentive not to include information such as wage rates in their job ads⁵; and Businesses are unaware of how bad their job ads are.* These theories were ‘charitable’ in that they allowed that employers could have reasons for posting low-quality ads, and platforms could have reasons for not removing them. However, this did not change the fact that the ads were low quality and were therefore ultimately harmful in that they needlessly consumed job-seekers’ time. As a result, these theories contributed to job-seekers’ distrust toward employers and platforms

⁵In fact, one interviewee (P02) later became a business owner and admitted they did not include wage rates when posting job ads—but, while a job-seeker, had been frustrated when this information was absent from job ads.

rather than reducing it: job-seekers believed these actors had stable reasons for their harmful or negligent actions and would therefore persist in them.

Somewhat less charitably, some job-seekers hypothesized that some companies were posting job openings only because they were required to do so as a condition of receiving pandemic-related financial assistance from the government—but that the companies had no real intention of actually hiring people to fill the positions. This interpretation, understandably, contributed to distrust among job-seekers. P06, for example, reported explicitly that they would never again apply to job openings posted by those companies.

4.5 Disconnect with common media and government portrayals of the economy and workers

During the study period (2019–2022), and especially in summer 2021, some media outlets, politicians, and businesses reported that unemployed workers were refusing to apply to open positions, and that businesses were in desperate need of workers, especially for low-wage positions (see e.g. [62, 63, 67]). In some of these narratives, unemployed workers were portrayed, implicitly or even explicitly, as lazy or entitled, ‘sitting at home,’ collecting pandemic-related unemployment benefits, refusing to work. These portrayals were used to justify specific policy proposals such as the reduction or termination of pandemic-related unemployment benefits.

Our interviewees, however, reported that they applied to hundreds—or thousands—of open positions, including some posted by companies who had publicly claimed workers were not applying to work for them. Our interviewees reported that, typically, they did not hear back from these companies, even when they were confident they were qualified to perform the jobs for which they applied. P6, a ride-hail and delivery driver and former Walmart and fast food worker in New York, said:

I don't know if you've heard the narrative—the media outlets and politicians are saying, 'Oh, you know, everyone's hiring right now, unemployment benefits are not needed.' I've applied to literally thousands of jobs on Indeed.com and I've gotten maybe three or four interviews. And some of the jobs I applied for were with companies complaining, 'Oh, yeah, nobody wants to work anymore.' I applied for those jobs, and they never got back to me. Back in 2018, when I would look for a job, within two days I would get multiple interviews. That seems like a dream to me now.

These job-seekers also reported being willing to work for less pay than they had earned in the past, as long as the pay was not so low it made them unable to cover both their expenses (e.g., rent, food) and the cost of doing the job (e.g., transportation, childcare). P3, a Pennsylvania-based client support worker in finance who had been unemployed due to Covid, explained both sides of this calculation:

The one thing I loved about these two positions that I interviewed for was that the bosses were honest about the pay. They were very upfront: “Look, you don't have that much experience in what exactly I want you to do so I'm going to lowball you from what you

were making prior.” In my last position I was making \$46,000 a year; now I'll be lucky to clear \$36,000. But something like entry-level data entry making \$14 an hour—I would scroll right past those. That's not gonna be worth my time. I wouldn't be able to pay my bills on that. That's even worse than having no money; it's making money and still not being able to pay for the things you need.

Job-seekers reported proactively seeking work even while receiving pandemic-related unemployment benefits, as well as after losing them. At the same time, however, many media outlets were reporting a narrative that people receiving pandemic-related unemployment benefits were *choosing* not to look for work (for discussion see e.g. [6, 64]). Specifically, job-seekers reported persistently hearing the narrative from media outlets, businesses, government officials, and experts that unemployed people were ‘sitting at home’ receiving benefits and not looking for work—while they were in fact applying unsuccessfully to hundreds or even thousands of jobs, in some cases to positions they felt confident that they were qualified for, posted by the very companies claiming to be in desperate need of workers. This created a disconnect between job-seekers’ experiences and the narratives they encountered in the public sphere describing the overall economic situation—especially when these narratives portrayed unemployed workers as lazy and entitled.

Notably, one of our interviewees (P27), who was both a job-seeker and a former government job coach, highlighted a fact that may have made the narrative of recipients of unemployment benefits ‘sitting at home’ particularly confusing: in many US states, recipients of unemployment benefits were (and are) required to report to government-operated computer centers for 40 hours per week to apply for jobs. If they failed to do so, they risked losing the benefits. While our other interviewees did not make this connection explicitly, it seems possible that in these states in particular the widespread narrative of ‘unemployed people “sitting at home” receiving benefits, not looking for work’ may have been particularly dissonant for job-seekers.

5 DISCUSSION

This section interprets our findings in the context of previous research. Section 5.1 considers the findings in view of prior HCI research on low-income job search on digital platforms, and in particular in light of our main motivating question: ‘What barriers exist to low-income job-seekers’ successful use of digital platforms?’ Our findings yield a concise answer: *Low information quality job ads*. This answer, however, raises new questions, such as: What should be done about low information quality job ads? Why do (legitimate) employers post low quality job ads? Why have platforms not taken seemingly obvious steps to eliminate deceptive or fraudulent job ads and improve the quality of legitimate ads, such as verifying employers’ identities?

Our data do not enable us to answer these questions definitively, but our interviewees did not hesitate to offer their own hypotheses (see e.g. Section 4.4.2). Section 5.2 explores these hypotheses in light on prior HCI research calling for policy intervention into digitally mediated job application processes.

5.1 Low information quality job ads: a barrier to low-income job-seeker use of digital platforms

Our interview data positions us to provide an answer to a question posed by previous HCI research on low-income job search in digital platforms. Dillahunt et al. [31] articulate it most precisely, calling for future work to ‘examin[e] qualitatively specific barriers that might prevent low-income job seekers from using [digital] platforms in an exploratory way’ (p. 2). Here ‘exploratory’ refers to a type of job search; other types are ‘focused’ and ‘haphazard’ (i.e., random) ([31], p. 3). Dillahunt et al. explain that exploratory and focused searches are generally more successful than haphazard searches. We interpret their question in a slightly broader frame, therefore, and ask simply, ‘What barriers exist to low-income job-seekers’ successful use of digital platforms?’ Our interviewees indicated that low information quality job ads pose a major—and previously underdiscussed—barrier. Indeed to our knowledge the only prior HCI research to surface low-income job-seekers’ challenges acquiring complete, accurate, trustworthy, and timely information about job opportunities is Wheeler and Dillahunt [146], published in 2018. They note (pp. 4–5) that many of their participants had ‘unanswered questions regarding jobs they were interested in’ (p. 4). These included arguably basic topics such as ‘wages, benefits, job details, and workplace culture’ (p. 4). Notably—and perhaps, for those unfamiliar with low-income or informal work, astonishingly—Wheeler and Dillahunt report that some of their participants ‘said that there was no reliable way to get this vital information before they went to the official interview, or even until orientation’ (i.e., after they had *accepted and started* the job) (p. 4). One of their participants said they had learned not to ask questions about pay, as in their experience employers would reply that this would be addressed *after* the worker started the job. Another participant said she ‘did not ask about the pay rate, benefits, or schedule, out of fear that the employers would change their minds about hiring her if she asked’ (p. 4).

Our findings confirm and triangulate the existence, prevalence, and high cost to job-seekers and workers of this challenge, and we refer to it simply as ‘low information quality.’ Our findings furthermore indicate that low information quality may be a key barrier to realizing the promise of digital platforms in supporting low-income job search.

5.1.1 Information, power, and digital technology in the informal economy. Readers with limited experience or knowledge of informal work arrangements may find themselves asking how it can be that workers accept job offers without knowing the pay, schedule, benefits, or details of the work, and may even be afraid to ask for this important information. The short answer is that low-income employment has a higher propensity to take place in the ‘informal sector.’ The informal sector comprises firms and workers who do not comply with all applicable business registration and tax reporting requirements, and therefore often operate in a legal ‘gray area,’ where workplace laws such as minimum wage, overtime pay, occupational health and safety regulations, and trade union rights are at best incompletely honored and enforced (see e.g., [137], p. 5; [85]). Empirical research reports that informal sector workers typically

earn less money and have less secure work, poorer working conditions, and less workplace voice than workers in the formal sector (e.g., [104], pp. 48, 58–60). Our findings, like those of Wheeler and Dillahunt [146], regarding the challenge of access to information raise questions regarding the possibility that many digital platforms hosting ads for low-income work are allowing the information and power asymmetries that have long characterized informal sector work to be ‘translated’ into the digital realm.

Perhaps unsurprisingly, a similar question has been raised regarding crowd- and gig-work platforms. Some analysts have observed that these platforms create, at least in theory, opportunities for reducing informality in sectors (such as transport and domestic work) long dominated by informal work (e.g., [101], pp. 17–18; [85]). Others, however, have observed that at least in some regions and sectors, the introduction of digital intermediaries (i.e., platforms) into informal sector working relationships may only lead to reductions in informality if ‘formalizing’ work is consonant with the platforms’ business model and overall organizational aims (e.g., [45]; see further [133], esp. [1]). If it is not, it may instead lead to existing (often inequitable) patterns of recruitment and management ‘going digital’ (see e.g. [12]). Our findings suggest that the latter dynamic is significant, and perhaps dominant, in U.S. low-wage labor markets: rather than transforming the existing power relationships and practices, the new digital technologies may to a large extent simply reproduce them through another medium (cf. [123]).

This in turn raises the question of what changes would be needed for digital platforms to contribute to reducing informality in practice, or at least to reducing the negative consequences for low-income workers that often arise from it. It may be that some of the necessary changes are also the changes needed to address the problem of low-quality job ads, which are discussed in the three subsections below and in Section 6.

5.2 Low information quality job ads as a policy problem

Our interviewees furnished a number of suggestions for employers and platform operators who wish to take steps to mitigate the problem of low information quality job ads (Sections 6.1–6.2). However, our interviewees also furnished a number of theories that could explain why employers and platforms had not taken these steps, even though they were clearly possible (Section 4.4.2). All of these theories can be described as versions of the general hypothesis that employers and platforms are not bothered much by the significant quantities of low information quality job ads on the platforms, do not perceive themselves to be significantly negatively impacted by it, and are not adequately motivated or incentivized to take steps to address it. If this is the case, we can follow interviewee P03’s line of reasoning and consider the possible role for policy intervention (see Section 7.5) to motivate the necessary action. While P03’s particular story shows that policy intervention cannot always solve job ad information quality problems on its own, it is an informative starting point.

Neither we nor our interviewees are the first to raise the question of policy intervention in the context of HCI research on low-income job search in digital platforms. To our knowledge, the first to do so

were Lu and Dillahunt, writing in 2021 [89]. In research reporting findings from interviews with employers who use social media to recruit low-wage workers, they highlight the ‘power imbalance’ or ‘power asymmetry’ between employers and low-wage job-seekers (pp. 1, 11). Drawing on the work of organization theorist Wanda Orlikowski [108, 109], they interpret their findings as reinforcing the view that ‘technology alone cannot address the asymmetry of power embedded into the structure of the low-wage labor market’ and that ‘policies and legislation should [therefore] work in concert with technology interventions to mitigate’ this power asymmetry. As a ‘starting point,’ they offer three suggestions for policy intervention (p. 11):

employers should be required to provide job seekers with feedback on whether job seekers’ applications have been reviewed, why employers decided to end engagement with the job seeker on social media, and more (e.g., number of positions available, number hired in the past week).

Sections 6.1 and 6.2 below build on the base established by Lu and Dillahunt, and set out further recommendations for employers and platform operators made by our interviewees. Section 6.3 sets out relatively broad implications for policymakers; more granular or substantive recommendations such as those developed in policy-oriented CHIWORK research (e.g., [66]) could be developed in this domain. This paper, however, leaves specific substantive policy recommendations for future work. As noted in Sections 7.5–7.6, future research could examine the legal configurations of particular jurisdictions and make specific policy recommendations.

6 IMPLICATIONS FOR PRACTICE

This section of the paper sets out recommendations for employers and platform operators who wish to take steps within their sphere of influence to reduce the frequency and impact of low information quality job ads. Two tasks, however, are beyond the scope both of this study and of individual employers and platforms. The first is answering quantitative questions about the scale and socioeconomic impact of low information quality job ads. The second is ensuring that employers’ and platforms’ incentives are structured so as to motivate them to take appropriate steps to address the problem of low information quality in job ads. The first is a task for large-scale research; the second, for policy. This section therefore concludes with recommendations for policymakers; the following section sets out open questions for future research.

6.1 Implications for employers

Interviewees made six main recommendations for employers. First, employers should aim to reply to all applicants to their job ads. Second, employers should take down ads once the positions they refer to are filled. Third, to the extent possible given platforms’ technical limitations, employers should ‘pause’ or hide job ads once they have received enough applications to begin reviewing them.

Fourth, employers should avoid posting requirements in job ads that are not truly necessary for performance of the job. Unnecessary requirements can produce unintentional, and invisible, discriminatory effects, dissuading disadvantaged job-seekers, such as disabled job-seekers, from applying—even though they might be

qualified for the job. Employers using ‘template’ job descriptions should ensure that any templates used actually describe the job being advertised.

Fifth, employers should avoid listing pre-hiring screening procedures, such as security clearances or background checks, in job ads unless these procedures will definitely be used in screening applicants. Such procedures, if listed but not in fact used, can unintentionally discriminate against certain groups of job-seekers (see further Sec. 7.1). Relatedly, employers should use the least intrusive pre-hiring screening procedures possible.

Sixth and finally, employers should ensure ads are clear about payment structure and timing, payment ranges, and job location.

6.2 Implications for platform operators

Our interviewees made six main recommendations for platforms. First, platforms should let employers ‘pause’ or ‘hide’ ads once they have received a reasonable number of applications to review.

Second, platforms should encourage employers to respond to all applicants and provide tools and workflows that make it easy to do so. Platforms could encourage employers to reply to applicants by adding response statistics to job ads (e.g., ‘This employer responds to X% of applications within Y business days’). Notably, some platforms already include these statistics on some ads.

Third, platforms should provide clear and mutually exclusive location options, such as ‘on-location’ (in a specific location), ‘fully remote,’ and ‘partly remote’ (e.g., ‘mostly remote but requires monthly in-person meetings’). Employers should not be permitted to indicate that a job is ‘fully remote’ *and also* in a particular location, as this is contradictory and therefore produces a low information quality ad.

Fourth, employers sometimes post information for multiple related positions (e.g., with different experience requirements, pay, and locations) in one ad. Platforms should encourage employers to ensure these ads are clear or they risk becoming low information quality ads. Alternatively, platforms could prohibit this practice.

Fifth, platforms should consider requiring payment (i.e., wage or salary) information in every job ad.

Sixth and perhaps most importantly, platforms should provide more information to job-seekers about the identities of employers, including by verifying the identities of persons posting job ads.

6.3 Implications for policymakers

Our findings raise potential implications for policy. First, policymakers should note that low information quality in job markets is a phenomenon with potentially significant economic and social costs that may require policy intervention.

Second, regulators may wish to investigate and monitor the extent and impact of low information quality in digital job ads, with special attention to disparate impacts on groups protected by antidiscrimination law.

Third, regulators may wish to develop a strategy or roadmap for monitoring compliance with existing regulations; improving compliance where compliance deficits exist; and identifying needs for new rulemaking or legislation. For example, to facilitate compliance monitoring, job platforms could be required to maintain ad libraries, as other platforms have been required to do [38, 88]. Job

search platforms could also be required to regularly report statistics to regulatory bodies, such as number of fraudulent ads removed.⁶

Fourth, policymakers could lead or fund research on specific phenomena on job search platforms, such as the impact of 'fake' employer reviews and the lawfulness of 'pay-to-apply' schemes and paywalls.

7 OPEN QUESTIONS FOR FUTURE RESEARCH

Our findings, our interviewees' recommendations for employers and platforms, and the potential policy implications raise a wide range of questions for future research. These include empirical questions; design or technical questions; policy questions; and theoretical questions at the intersection of HCI and other fields. This section lists a selection.

7.1 Unnecessary and discriminatorily dissuasive requirements in job ads

Our findings highlighted the existence of 'unnecessary and discriminatorily dissuasive requirements' as one type of low quality information in job ads. These requirements, when included in job ads corresponding to ads for which they were not truly requirements, caused job-seekers to avoid applying to jobs for which they might have been well-suited. The examples we surfaced especially affected disabled job-seekers. Future research could investigate:

- (1) Are there other types of 'unnecessary and discriminatorily dissuasive requirements' (UDDR); i.e., requirements that differentially dissuade job-seekers by race, ethnicity, gender, sexual orientation, or other characteristics (especially characteristics protected under antidiscrimination law)?
- (2) How widespread are UDDR?
- (3) What are the impacts?
- (4) Are employers aware of the potential impacts of UDDR, and of the legal risk they may be exposed to in posting ads that include them?
- (5) Why do employers post such ads?
- (6) What strategies can platforms use to reduce UDDR?

7.2 Economic costs

Our findings highlighted the fact that low information quality job ads made it more difficult for job-seekers to find work. This was the case even for job-seekers who, a few years before, had been able to find work relatively easily, suggesting that 'the problem' did not lay with the job-seekers. Nor was the problem that there were no jobs; indeed, during the study period, media outlets reported that employers were vigorously (in some cases even 'desperately') seeking workers, especially low-wage workers. Something, therefore, was going wrong in the processes by which employers and workers were seeking each other out: in the 'mechanisms' of the job market. Our findings suggest that low information quality job ads may have been a significant part of the problem. This raises a broader empirical question: what are the economic costs and consequences of low information quality job ads—for job-seekers,

employers, platforms, and the economy generally? Indeed, how could these costs be estimated?

7.3 Political effects

Our findings indicate that job-seekers' experiences were inconsistent with widespread narratives—voiced by media outlets, experts, and government officials—that the economy was healthy and that employers were in great need of low-income workers. In some versions of this narrative, unemployed former workers, including former low-wage workers, were 'sitting at home,' collecting pandemic unemployment benefits and refusing to work, despite employers' great need for workers. This portrayal did not align with the experiences of job-seekers who had spent dozens of hours per week applying unsuccessfully to hundreds or even thousands of jobs through digital platforms. The low information quality environment on the platforms played a significant role in this experience. This raises a question: to what extent did these experiences affect low-income job-seekers' and workers' trust in public institutions such as media and government? Were these shifts significant enough to change their media consumption, political beliefs, or voting behavior?

7.4 Platform strategies

What steps can platforms take to improve job ad information quality, and reduce the prevalence and impact of low information quality ads? For example, what interface and interaction designs could guide or incentivize employers to avoid posting low quality ads? What scalable moderation strategies could catch fraudulent (i.e., scam) ads? Could the 'digital job search platform' industry as a whole build shared standards or infrastructures to improve both the effectiveness and cost-effectiveness of these efforts?

7.5 Policy

Our interviewees reported that some employers took a 'creative' approach to compliance with regulations regarding the content of job ads. P03, for example, described one employer's response to new requirements imposed by the state of Colorado that job ads must include salary information: "They offer the job to people that live outside of Colorado so they don't have to reveal the salary. Then they say, 'Requirement for this job is to relocate to Colorado.'"

This raises a question: what policies—including enforcement, administrative rules, and new legislation at various levels—could reduce the prevalence and impact of low information quality job ads—in practice, not just in theory? The landscape of relevant law and enforcement is complex and evolving, and state regulators' ability to address the issues may be, as P03's story illustrates, somewhat limited. Getting 'a good law on the books' is one task; enforcing it may be another task entirely.

7.6 Different contexts

Do job-seekers in other countries, segments of the economy, and platforms encounter similar challenges? How do different policy regimes (e.g., the regulatory framework governing digital services in the European Union, i.e., the General Data Protection Regulation and the recently in force Digital Services Act) shape outcomes in digital job search?

⁶The European Union has adopted similar measures in the 'gig economy' ([41], Articles 16-17 [pp. 56-57]).

7.7 Building theory across disciplines: Toward 'human-centered market design'?

Our findings raise the question of whether low-income labor markets in the United States, especially those significantly mediated by digital platforms, suffer from the ‘market for lemons’ pattern. In this pattern, a lack of reliable information about the quality of goods or services in a market (or, more generically, the fit between buyers’ preferences and the goods or services on offer) impairs market functioning. In the classic example of used car markets [3], sellers of low- and high-quality used cars offer their wares at the same price. Buyers know that some cars are low-quality (i.e., ‘lemons’) but cannot distinguish them from high-quality cars. They therefore lower the price they are willing to pay for *any* car. As a result, sellers of high-quality cars cannot get the full value of their offering and exit the market. This reduces the number of high-quality cars available. In the worst case, buyers *further* lower their offers, a ‘vicious cycle’ results, and the market collapses.

The ‘market for lemons’ pattern is a concept from economics research. Some computing research communities, such as the community associated with the ACM Economics and Computation conference, have built extensively on this and other economics concepts. These communities have not traditionally taken the ‘human-centered’ perspective of HCI and CSCW. Recent years, however, have seen stronger interest in economic concepts (indeed even in ‘heterodox’—and arguably more ‘human-centered’—frameworks for economic analysis such as ‘post-growth economics’; see e.g. [127]) within HCI, on one hand, and, on the other, growing interest in human values or ‘social good’ among scholars working at the intersection of computing and economics. The latter has resulted in the development of the ‘Mechanism Design for Social Good’ workshop, which starting in 2020 became an independent ACM conference: ACM EAAMO (‘Equity and Access in Algorithms, Mechanisms, and Optimization’). Our findings and discussion highlight how interface and interaction design factors (traditional HCI questions) relate to ‘macro’ or ‘higher-level’ dynamics and outcomes, such as the ‘market for lemons’ dynamic; the ability of job-seekers and employers to successfully find each other; and the differential vulnerability borne by low-income job-seekers (traditional economic questions). This in turn suggests a possible fruitful intersection of HCI and economic concepts—a theory of ‘human-centered market design.’ What might the core concepts and propositions of such a theory be? What insights and value for practice might it offer?

8 CONCLUSION

One question we asked interviewees was, “If you could tell the President of the United States anything about your job search experience, what would it be?” This question prompted interviewees to consider what someone with the authority to change job search, or public discourse around it, should keep in mind. P25 replied: “I would tell the President that looking for paid jobs is not an easy task. And if the employers would just be just be fair to those who are looking for jobs, that would make the process easier.” P17 said: “Looking for paid work is challenging.” These responses are notable because during the study period (2019–2022), a common narrative in the US labor market was that many jobs were available, and workers should be able to find work easily. Yet job-seekers reported

severe difficulties finding legitimate work—even those who had no difficulties a few years earlier. Our findings show how low information quality in job ads on the main platforms used by job-seekers can make it hard for them to get jobs, no matter how many jobs are available. Our findings suggest steps employers and platforms could take to address low information quality in job ads. However, they also alert us to the possibility that employers’ and platforms’ existing incentives may not predispose them to take these steps; policy action may be needed to incentivize them to act.

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A INTERVIEWEE DEMOGRAPHICS

Race: Asian: 0 (0%), Black: 18 (67%), Hispanic: 2 (7%), white: 8 (30%).

Ethnic origin: African: 11 (41%), African American: 2 (7%), American Indian: 1 (4%), Colombian: 1 (4%), French: 2 (7%), Finnish: 1 (4%), German: 3 (11%), Irish: 3 (11%), Italian: 2 (7%), Kenyan: 1 (4%), Liberian: 1 (4%), Mexican: 3 (11%), Jewish: 1 (4%), Puerto Rican: 1 (4%), Russian: 1 (4%), Scottish: 1 (4%), Prefer not to say: 1 (4%).

Location: California: 6 (22%), Colorado: 1 (4%), Florida: 1 (4%), Georgia: 1 (4%), Illinois: 3 (11%), Michigan: 1 (4%), Minnesota: 2 (7%), New Jersey: 1 (4%), New York: 4 (15%), Oregon: 1 (4%), Pennsylvania: 2 (7%), Texas: 2 (7%), Washington: 1 (4%), Wisconsin: 1 (4%).

Gender: Woman: 13 (48%), Man: 11 (41%), Nonbinary: 2 (7%), Self-describe: 1 (4%).

Transgender: 5 (19%).

LGBA (Lesbian, Gay, Bisexual, Asexual): 10 (37%).

Disabled: 8 (30%).

Current or Former Labor Union Member: 7 (26%).

Active Military Service, Reservists, and Veterans: 4 (15%).

B INTERVIEWEE SOCIOECONOMIC DATA

Food Assistance (prior 12 months): 14 interviewees (52%) reported they were or had been a recipient of the Supplemental Nutrition Assistance Program (“SNAP”), a nutritional policy of the U.S. federal government providing income to persons for food.

Housing Assistance: 11 interviewees (41%) reported their housing costs were lower because the government was paying part or all of the cost of their housing.

Medical Insurance Assistance: 12 interviewees (44%) reported they were or had been a recipient of Medicaid, Medical Assistance, or another government assistance plan for those with low incomes or a disability.

Current Housing Type: Apartment: 10 (37%); Boat, RV, Van, or Truck: 1 (4%); Hotel: 1 (4%); House: 12 (44%); Mobile Home: 2 (7%); Shelter/safety house: 1 (4%).

C CROWD, GIG, AND SHIFT WORK PLATFORMS USED FOR JOB SEARCH

Crowd work platforms: Amazon Mechanical Turk: 5 (19%), Amara: 2 (7%), oDesk: 1 (4%), eLance: 2 (7%), crowdSpring: 1 (4%), UHRS: 0 (0%), Microworkers: 1 (4%), Lionbridge: 2 (7%), Prolific: 5 (19%), Clickworker: 2 (7%), Crowdflower: 1 (4%), Google Opinion Rewards: 4 (15%), Upwork: 5 (19%), None of these: 13 (48%).

Gig work platforms: Uber: 5 (19%), Lyft: 2 (7%), InstaCart: 1 (4%), TaskRabbit: 1 (4%), Care.com: 3 (11%), Handy: 2 (7%), Rover: 3 (11%), PostMates: 1 (4%), Shipt: 2 (7%), Dumpling: 1 (4%), ThumbTack: 0 (0%), DoorDash: 2 (7%), None of these: 15 (56%).

Shift work platforms: InstaWork: 6 (22%), SnagaJob: 4 (15%), Staffy: 2 (7%), Jobble: 1 (4%), Wonolo: 0 (0%), Upwork: 4 (15%), None of these: 16 (59%).

D INTERVIEWEE OCCUPATIONS

P01: Cook. **P02:** Car mechanic, car detailing worker. **P03:** Client support for a financial company, data worker. **P04:** Librarian, archivist. **P05:** PhD candidate (economics), teaching assistant, researcher. **P06:** Food delivery and passenger driver, courier. **P07:** Designer for shoe manufacturer, software engineer. **P08:** Substitute teacher, PhD student, educator. **P09:** Transport worker. **P10:** Electrical technician (installation and repair work), engineer. **P11:** Caretaker, online promotion jobs like social media advertising, online transcription jobs. **P12:** Coffee shop attendant, phone repair person. **P13:** Translator, correctional officer. **P14:** Construction worker, day laborer, plumber. **P15:** Substitute teacher, nanny. **P16:** Fast food worker.

P17: Claims administrator (insurance rebate verification), administrative worker. **P18:** Uber driver, delivery driver. **P19:** Home health care worker, health care worker. **P20:** Shampooer. **P21:** Bank teller. **P22:** Cashier, nonprofit youth advisor. **P23:** Handy worker, customer care agent, customer service representative, restaurant and coffee shop worker. **P24:** Full-time student. **P25:** Waiter. **P26:** Senior living facility well-being coordinator, wellness coordinator, fitness instructor. **P27:** Grant writer, former job coach.

E APPLIED DATA ANALYSIS PROCEDURE

Data analysis took place over a 16-week period. Each week, we compiled a spreadsheet of our interview coding data. The spreadsheet contained three columns: document ID, code name, and the text to which the code was applied. Coders 1-3 assigned themselves a code every week to study, and analyzed the text data in the spreadsheet labeled with the code. During our weekly meetings, for the first 10 interviews, each coder-analyst was allotted 10 minutes to present their observations of the data assigned to their code for the week.

During the first set of meetings about interviews 1-10, we developed our preliminary “theory of the data,” i.e., the narrative we concluded was the most salient and compelling to emerge from the interviews, and which interviews, particular pieces of text, and narratives answered important aspects of our research questions.

Subsequently, we met weekly to discuss our observations of the remaining interviews (i.e., interviews 11-27), and text data assigned to our codes. To formalize our findings from these meetings, we wrote theme memoranda describing our characterization of the data assigned to each code. We then organized these memoranda into written report describing our overall theory of the data.

F MANIFESTATIONS OF LOW INFORMATION QUALITY IN JOB ADS

Our interviewees reported 13 common characteristics that could render a job ad ‘low information quality’:

Missing or old timestamp. A job ad might have no timestamp, or clearly have been on the platform a long time. As a result, it could be unclear if the job was still open, as employers did not always take down ads once positions were filled. P04 said, “If the job is no longer posted on a website, the [aggregator platform] needs to re-crawl [the site] and see that and take down [the ad on the aggregator]. But they don’t—or if they do, not frequently enough.”

Inaccurate or missing payment structure information. Some jobs were remunerated on a commission basis, but this might not be clear in the ad. Interviewees (e.g., P06) reported this was important information for them in evaluating whether a job was desirable.

Inaccurate, missing, or unclear pay information. An ad might indicate the job paid “up to \$20 per hour,” but when the job-seeker spoke to the employer, the employer might clarify the job paid a firm \$10 per hour. Alternatively, an ad might indicate a very wide pay range (e.g., “\$45,000 to \$120,000 per year”). Some interviewees viewed such wide ranges with suspicion. P24, for example, said, “There will be a pay range listed, but that is often sort of a bait and switch advertising tactic; you’ll have a pay range listed, but the employer intends to give the person who gets the job the lower wage. The high end of the range was bait, essentially.”

Inaccurate, missing, or unclear location information. Some ads indicated the job was fully remote, but it wasn't. The job-seeker might suspect this upon reading the ad, or might discover it after communicating with the employer. Other ads listed many locations (sometimes including "remote"), making it impossible to tell from the ad where the job was located. Because many job-seekers had location constraints, this forced them to decide whether to invest time trying to clarify where the job was really located; to apply while knowing the time spent applying might be wasted; or to avoid applying even though the job might be suitable.

Unnecessary and discriminatorily dissuasive requirements. Some ads listed requirements job-seekers considered unnecessary for the job, such as being able to stand all day or lift heavy loads for 'desk jobs.' While company policies might have required employees to stand for certain roles, if it was not truly necessary, workers with disabilities would have been legally entitled to receive accommodations, and would not have needed to meet the posted requirements in practice. The requirements' presence in the ads, however, dissuaded some job-seekers from applying (e.g., P04).

Inaccurate, missing, or unclear working hours. Some ads indicated only that the job was "full-time" or "part-time." These terms meant different things for different employers; for one employer, "full-time" meant 40 h/wk, for another, 35 h/wk. For hourly workers, this meant a difference in weekly earnings, and was therefore crucial information for job-seekers calculating whether they could afford to perform the job given the expenses involved (e.g., childcare).

Missing or unclear job duration. Some ads did not clearly indicate whether the term of employment was open-ended or temporary, or, if temporary, how long it was intended to last.

Occupational misclassification. Some ads indicated the worker would be performing one kind of job, but the worker would later discover they were also expected to perform other, unrelated tasks. P11 described how they obtained a job as a house cleaner, only to later be told they were also expected to perform care work such as bathing the employer—a task they had no training for.

Inappropriate education requirements. Some ads seemed to require "too much education" and others too little. For example, some ads indicated that a college degree was required for a job common sense would suggest did not truly require one (e.g., entry-level fast food work). These requirements could be (likely unintentionally) discriminatorily dissuasive; some interviewees described them as evidence of bias against people without college education—and therefore, effectively, against people from low-income backgrounds (P03, P06, P27). In cases of "too little education required," an ad for a job which would normally require a degree (and potentially further certification) would indicate that no degree was required. Job-seekers often avoided such ads, out of a general sense that they were likely illegitimate and out of concern that they might end up in a job they could not perform (e.g., P01).

Inappropriate occupational licensing requirements. Some ads indicated no occupational license was required, even if the job required one by law. P27, for example, described a situation in which she applied for a secretarial position, but the prospective employer then revealed they wanted her to perform complex accounting work, which would have required professional licensing she did not have.

Implausible claims about workplace culture or physical environment. Some ads made claims about the workplace culture or physical

environment of the job that job-seekers found implausible given their existing knowledge of the workplace (acquired, e.g., from employer review sites such as Glassdoor and their own consumer experiences) (e.g., P22).

Missing employer identity. Some ads did not include the name of the employer, or explicitly indicated the employer was confidential.

Incomplete information about background checks or security clearance requirements. Some job ads indicated that successful applicants would be subject to background checks or required to obtain a security clearance. These procedures differed significantly among employers (even in the same sector), leading some job-seekers to develop inaccurate expectations from past experiences. P13, for example, had held several jobs as a prison guard in one state, but unexpectedly encountered much more stringent screening procedures when applying to work in a police department in another state. This led to wasted time for both job-seekers and employers.

G 'WARNING SIGNS'

Interviewees reported nine characteristics of ads or interactions with prospective (supposed) employers they interpreted as signals the ad was a lure to unethical, illegal, or otherwise illegitimate work, or part of a scam:

Requests for personal or sensitive data not essential to application process such as bank account information, Social Security Numbers, and insurance information (P01, P09).

Unnecessary payment requests. Some interviewees reported employers asked them to send money during the application process. In some cases this was presented as an application fee (e.g., P09).

Unnecessary advance checks (e.g., P22). In some cases, these were part of "fake check" scams documented by US regulators [21].

Unnecessary advance purchases for equipment (e.g., printers, P09).

Unnecessary or unusual pre-employment requests for significant amounts of unpaid labor, in some cases framed as "onboarding." In some cases job-seekers were directed to follow social media accounts. One interviewee, P26, an experienced physiologist, was directed to buy unregulated nutritional supplements and to promote the products using their personal social media accounts.

Requests to do illegal or unethical work; e.g., creating "fake" social media accounts (P01), doing someone's schoolwork (P11), promoting unproven nutritional supplements (P26), or doing work which by law required a certification the worker did not possess (P27).

Unusual grammar, spelling, or typography. Some interviewees (e.g., P06, P26) reported that job ads with unusual grammar, spelling, or typography—especially text in all capital letters—also often included other features they took to signal they were part of a scam.

Irrelevant or ambiguous links. Some interviewees (e.g., P03, P11, P26, P27) reported some job ads would include links that sent job-seekers to websites that appeared to be unrelated to the job. In some cases, the linked website would include a signup form for a newsletter or other service. Interviewees sometimes suspected the purpose of these ads was simply to drive traffic to the linked websites or collect personal data such as email addresses.

Inappropriate requests to download software. Some interviewees (e.g., P06, P26) reported they were asked to install specific software, ostensibly in support of a specific part of the application process.