

The Role of Assistive and Mainstream Technologies in Contingent Employment

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INTRODUCTION

Non-traditional work arrangements -- often referred to as *contingent employment*, such as contract work, app-based work (e.g., Uber), or freelancing -- are increasing in the United States and elsewhere. The Bureau of Labor Statistics defines *contingent employees* as workers "without an explicit or implicit contract for long-term employment" [1-2]. Contingent employment is characterized by both a lack of attachment between employer and employee, and as a conditional factor of employment, that is, a fixed, limited period of time to perform a specific job.

Very little is known about the effect of these new work arrangements on individuals with disabilities, who continue to be unemployed and underemployed at higher rates than the general U.S. population according to the most recent (pre-Covid) data (e.g., 12.5 percent unemployment rate versus 5.9 percent) [3]. Schur (2003) observed the complex nature of these non-standard work arrangements, which frequently offer lower pay and less job security but provide flexibility for health and functional needs [4]. Other studies by Hotchkiss [5], Jones ([6] and Ali, Schur & Blanck [7] tentatively have reinforced these observations, but the actual participation and experiences of individuals with disabilities within contingent employment remains understudied.

The overall purpose of this project is to identify key variables and themes associated with contingent work practices and experiences among workers with disabilities through semi-structured interviews. These data were used to develop and operationalize items derived from key concepts and themes identified through qualitative data analysis for a new survey: The Contingent Employment Participation Survey (CEPS). The CEPS is a self-report instrument designed to capture key descriptive data about contingent workers, and will be used establish a preliminary, generalizable evidence base about contingent work practices among persons with disabilities.

This paper focuses on a key insight we learned from the interviews regarding the interrelationship between assistive technology (AT) use, the onset of disability, and the employment choices and practices of study participants. The variables we discuss here emerged as a consistent theme throughout our interviews and provided us with new insights into technology use within this increasingly popular form of employment.

METHODS

Qualitative methods were used to develop, administer, and analyze semi-structured phone interviews of 22 workers with disabilities between June 2018 and February 2019. Nonrandom sampling was used in order to capture differences across impairments, employment type, and demographic variables such as gender and age. Participants were recruited from various disability organizations including independent living centers and vocational rehabilitation organizations. The University's Institutional Review Board approved the study and all participants were consented. Interviews lasted between 60-90 minutes and, with permission, were taped and transcribed verbatim. Participants were asked about the nature of their disability(ies) and its impact on their daily lives and work; the types of assistive devices used for work; their work accommodations; work history; their strategies for finding and choosing opportunities for employment; their payment and benefits, and, lastly, social relationships (family and friends, employers and coworkers). In addition, we probed for a sense of autonomy at work, a sense of inclusion, physical comfort, job satisfaction, and also for negative experiences such as stigma, employer prejudice, or task difficulties.

All interview data were entered into the qualitative analysis software program NVivo. Data analysis was ongoing throughout data collection in order to refine initial coding and emergent constructs. Analyses used an iterative, constant comparative method consistent with a grounded theory approach [8] to search for broad themes and patterns within the data. During data collection and analysis four team members met twice weekly to discuss, organize, and define codes and derived constructs. Where interpretations differed, disagreements were reconciled through discussion. The different professional backgrounds of the core research team helped ensure that coding was minimally biased and represented the broadest perspectives [9].

RESULTS

Over 60% of participants were women and the median age for all individuals was 43.8 years. Nearly all participants held college degrees and more than half had moderate to high household incomes as described in Table 1. All participants were employed as contract workers, freelancers, and/or doing internships at the time of our interviews. Many had worked in full-time positions prior to their contingent employment, and some preferred and were actively seeking a full-time position again. Others preferred the freedom, autonomy, flexibility, and/or independence that freelancing and contract work offered.

Congenital vs acquired disability

A key finding from our interviews was the interrelationship between participants' 1) goals for contingent employment (e.g., strictly for income purposes or as part a career path), 2) their disability onset (i.e., whether a disability was congenital or acquired -- see Table 2), and their AT use and choices.

The 12 participants with *acquired* disabilities, such as a spinal cord injury or a genetic disorder that manifested later in life, were more likely to have had established, full-time careers at the time of onset. Because of changes in their abilities, many felt forced to earn a living in a seemingly piecemeal fashion, often performing work they had not done before. In addition, they were more reliant on special function technologies acquired through agency resources and clinical evaluations. Dependence on these experts and agencies to evaluate, prescribe, modify and repair these technologies, contributed to an essential discomfort and frustration with them. The contrast between “before” and “after” disability onset was especially challenging in adapting to AT use; technology was often construed as an obstruction to employment rather than a support.

One participant noted “I think sometimes you really just want to be quote-unquote *normal*. It’s work to work these items. It’s hard. Sometimes I can’t get places to do things because [the technology] is not available to me. And then just sometimes it won’t work.” Another participant said, “I have more ambition than my software – my accommodations – can’t keep up with, to tell you the truth.”

In contrast, the 10 participants with *congenital* disabilities -- due most frequently to a sensory impairment in this study -- were well-adapted to technology use and savvy in self-accommodation practices. Contingent employment was frequently viewed as a means towards developing a career. In addition, participants pursued internships or volunteering as a strategy to gain both work experience and to locate employment. However, they

Table 1. Participant demographics

	Participant demographics (n=22)	
Gender	Male – 8	Female – 14
Race/Ethnicity	Asian – 2 White/Latino – 2	Black/African American – 4 White/Not Hispanic - 14
Education	Master’s or Doctorate – 8 Bachelor’s degree – 9 Associate degree – 3 Some College – 2	
Total household income (including benefits) (* Note: 3 participants declined to answer)	\$100,000 or higher – 2 \$50,000-\$74,999 – 5 \$25,000-\$34,999 – 2 Less than \$15,000 - 1	\$75,000-\$99,000 – 3 \$35,000-\$49,999 – 3 \$15,000-\$24,999 – 3
Age	Range: 25-75 years old Mean: 44.6 years old (SD +/- 13.8 years) Median: 43.8 years old	

Table 2. Participant’s Functional Limitations

Participants’ functional limitations	Type of disability	Number
Type of functional limitation	<u>Sensory</u>	
	Total blindness (no light perception)	2
	Low vision/Legally blind	6
	Deafness	2
	Hearing impairment	5
	<u>Mobility</u>	
	Spinal cord injury	4
	Spinal muscular atrophy (SMA)	3
	<u>Psychological</u>	
	Schizoaffective disorder	1
	Post-traumatic stress disorder (PTSD)	2
	<u>Genetic and chronic conditions</u>	
Genetic disorder	3	
Fibromyalgia	1	
Chronic fatigue syndrome	3	
Acquired or congenital onset	Congenital	10
	Acquired	12

were less focused on finding traditional, full-time employment, and more concerned with finding work in their chosen field, which often meant freelance or contractor work.

In addition, participants with congenital disabilities were less reliant on specialized AT, preferring to adapt mainstream technologies for their needs -- for example, smartphones for their daily activities and work accommodation needs.

One participant noted that, "Dictation software has gotten way better, and so that I can type on my own, but sometimes speaking is easier and now it's usually integrated into the operating system of whatever you're using if you know where to find it." Another said, "Now the phones have like -- you triple tap and you can zoom in on stuff, so it's like -- yeah, my phone is really helpful."

Participants also had developed personal networks -- online, at school, work or with family -- and learned what newer technologies were available and most useful. One woman said, "So I'm like, there has to be something I can do, so someone just told me to search 'magnifier' on my phone because they make apps for everything now." Another said, "I've seen it on my Facebook. I have a couple of groups that I'm in with other people who have disabilities . . . other people talked about how they had got it and what they've been through. So I was like, "Oh! I should look into that.' So I did and -- yeah. I'm currently fighting with my insurance company about it."

This comfort level with technologies translated into a sense of both confidence and independence in negotiating with employers for accommodations. As an example, one participant said, "You can go to your employer and say, "Listen, I have an extra tool so I don't need to keep asking someone for help if JAWS freezes. I have these glasses and I can connect to a live agent. How about we make it an accommodation so if there's something visual that I could use the agent to help with -- something that's more faster in real-time."

DISCUSSION

This paper focuses on the importance of the onset of disability and its relationship to both the use of and attitudes towards assistive and mainstream technologies, and their employment goals. Participants' accounts of their employment experiences reflected the contexts in which they were exposed to many of their technologies. For example, informal social networks supported participants' control over technology information and choices, in contrast to the more formal, clinical interactions that made it challenging to integrate those technologies into their everyday and work lives.

The themes derived from our interviews formed the basis for questions in the CEPS. Questions about technologies used at work included both assistive and mainstream technologies. Information about strategies to find work and technologies, and the financial resources used to purchase technologies reflected the range of work experiences described by participants. In addition to technologies, we also queried other accommodation practices, such as telework, service animals, and ASL interpreters.

It should also be noted that there were other, equally important factors and themes that emerged during the interviews that were not discussed in this paper, but which also provided the themes underlying items for the CEPS. For example: health considerations, especially pain and fatigue; type of contingent work (e.g., freelance or independent contractor); the role of medical insurance and Social Security Disability Insurance (SSDI) in shaping employment remuneration and benefits; access to health and information resources; social support systems; and negative experiences during work, such as stigma, and employer or coworker prejudices, contributed to how participants experienced work in general and contingent employment specifically. Together with the themes relating to technologies, the CEPS will generate important data about these evolving set of work practices.

CONCLUSION

The CEPS will be deployed later this year after reliability and validity testing is completed. It is the first self-report tool designed to capture the complex interrelationships between the technological, social, financial, health, type of disability, and environmental factors associated with the participation of individuals with disabilities in contingent employment practices.

It is hoped this new knowledge will aid vocational rehabilitation experts in better understanding and anticipating more of the complexities confronting individuals with disabilities in their search for employment. In addition, increased knowledge about the context and nature of contingent employment practices may aid policy makers and legislators to support individuals with disabilities as opportunities for contingent employment continue to grow.

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