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AI-enabled tools may help disabled workers close the wage gap

Researchers at UC Santa Barbara, University of Toronto and Zhejiang University have found that using artificial intelligence-based tools can help some disabled workers improve their performance and productivity, and potentially put them on par with their normally-abled counterparts.

“There are a lot of jobs where your disability wouldn’t really matter, except for one or two areas where it might matter a lot,” said UCSB economist Mitch Hoffman, co-author of [a working paper for the National Bureau of Economic Research](#). In these areas, according to the researchers, AI could be an effective tool for closing the gap.

Such has been the case for deaf and hard-of-hearing (DHH) workers in China working for a major food delivery platform. Using AI to better communicate with customers, DHH workers were able to measurably improve their outcomes, increasing their income while profiting the company — a win-win.

Improving communication, efficiency

People with disabilities tend to face challenges in the world of work. Built mainly around the able-bodied, the circumstances surrounding labor often present obstacles that are unfavorable to a person with a disability, and these obstacles often translate into less pay or opportunity to work. On a larger scale, workers with disabilities have lower rates of employment and face discrimination. Companies,

according to the researchers, may choose to hire fewer disabled workers, or hire them for lower-paying jobs, seeing the investment in workplace accommodations as an increased cost, and the hiring of disabled workers as a legal risk. In places like China, where social insurance, such as disability pay, worker's compensation, healthcare and retirement plans are less developed, the challenges, according to the paper, "are especially acute."

So it was with great interest that one of Hoffman's Chinese colleagues found themselves interacting on the phone with an AI tool on one of the country's major food delivery platforms. Not only did it spark questions about the effectiveness of the tool and its benefit to the worker, the size of the platform promised an ideal setting for the researchers' inquiry.

"It's a very large platform and it's exciting to do research that has the scope to benefit a lot of people," said Hoffman, whose research interests lie in the realm of personnel economics, which is the application of labor to issues inside of companies. "There's growing interest in personnel economics and understanding how different human resources policies affect workers with different levels of disadvantage," he said.

Additionally, according to the paper, the platform follows an open hiring policy, taking all who meet the basic requirements for the job, which in this case is food delivery. Wage is based on deliveries made and customer satisfaction, and this type of work has become a key source of employment for disabled workers in China. All these factors lent themselves well to a robust experiment to answer the researchers' questions with regard to how disabled and non-disabled workers compare when working the same job, and how AI tools can affect outcomes for workers with disabilities.

The researchers focused on DHH workers, who, like their non-disabled counterparts, were required to accept orders, pick up the food and deliver it to the customers, mediated by the platform.

"You'd think of food delivery as a job that doesn't seem like it has a lot of communication, and that's true, but it does involve communication often at some critical points on some orders," Hoffman said. In particular the delivery step of the task — the so-called "last mile" — could become fraught with confusion and delay as the drivers contend with finding the specific location to drop off the food. "For

example, if you're going into a giant high rise and you can't get in the door, it's really important to be able to contact your customer," he explained. "Or if someone says, 'leave it here'. What does 'here' mean?" The ability of the worker to solve those puzzles can be the difference between a good customer rating, or a bad rating for late, damaged or failed deliveries, and a subsequent monetary penalty.

Prior to the AI tool, which is a text-to-speech outbound phone calling system, the DHH workers were slightly slower than non-disabled workers, particularly during the crucial food drop-off phase. They were more likely to experience 9% late deliveries and 31% more bad customer ratings.

"But they do work more hours and they're less likely to quit," Hoffman added. "So in that sense they're actually profitable workers for the platform, pre-AI." Indeed, according to the paper, "the higher labor supply of DHH workers more than offsets their small efficiency gap, with DHH workers completing more orders per week and generating higher weekly profits for the platform than non-disabled workers." But because the DHH workers were slower and received more bad reviews, their wages are about 10% lower than non-disabled workers.

With the introduction of the AI tool that allowed the DHH workers to call customers and communicate with them with a realistic voice, there was significant improvement with their outcomes.

"We found that this AI tool substantially reduces some of the gaps we saw pre-AI," Hoffman said, eliminating a third of the hourly wage gap between DHH and non-disabled workers, and reducing the bad customer rating gap by about two-thirds.

Over the course of the study, the researchers also found that the tool benefits profoundly disabled workers (severely deaf) more than non-profoundly disabled (hard-of-hearing) workers, and that it had larger effects on hours, income and profits in stronger (lower unemployment) local labor markets than in weaker (higher unemployment) local labor markets.

The tool itself was also relatively inexpensive and straightforward, according to the paper, meaning both the cost and the effort spent to implement it was small relative to the benefit to both the workers and the company. Rather than being a large language model, it was a simpler tool that converted text to speech and allowed for automatic prompts, which saved time during delivery. It didn't solve all the

communication-related problems that could arise, but it handled the most common issues.

While the study concentrated on DHH workers, there are implications for workers with other disabilities as well, workers who may have the know-how of the job but could use a little assistance now and then.

“If you’re a low-vision person you might be able to do most of a knowledge work job just fine, but having an AI tool that could tell you what’s on the screen might be very useful,” Hoffman said. “Or if you have dyslexia, you might be totally fine for almost everything, but AI could be useful for reading, spelling and a few things like that.”

Given the current interest in the negative potential of AI and concerns over widespread job loss, environmental problems and other deleterious consequences, this research highlights something different: AI and its ability to help human workers perform better and get more out of their work.

“We thought that this was an interesting situation where AI was being used in a different way where it wasn’t replacing someone’s job but helping a type of worker who was traditionally disadvantaged, benefit,” said Hoffman.

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