

Goal-Setting Behavior of Workers on Crowdsourcing Platforms: An Exploratory Study on MTurk and Prolific

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Abstract

A wealth of evidence across several domains indicates that goal setting improves performance and learning by enabling individuals to commit their thoughts and actions to goal achievement. Recently, researchers have begun studying the effects of goal setting in paid crowdsourcing to improve the quality and quantity of contributions, increase learning gains, and hold participants accountable for contributing more effectively. However, there is a lack of research addressing crowd workers' goal-setting practices, how they are currently pursuing them, and the challenges that they face. This information is essential for researchers and developers to create tools that assist crowd workers in pursuing their goals more effectively, thereby improving the quality of their contributions. This paper addresses these gaps by conducting mixed-method research in which we surveyed 205 workers from two crowdsourcing platforms – Amazon Mechanical Turk (MTurk) and Prolific – about their goal-setting practices. Through a 14-item survey, we asked workers regarding the types of goals they create, their goal achievement strategies, potential barriers that impede goal attainment, and their use of software tools for effective goal management. We discovered that (a) workers actively create intrinsic and extrinsic goals; (b) use a combination of tools for goal management; (c) medical issues and a busy lifestyle are some obstacles to their goal achievement; and (d) we gathered novel features for future goal management tools. Our findings shed light on the broader implications of developing goal management tools to improve workers' well-being.

Introduction

Crowdsourcing platforms offer some advantages, such as flexible work hours and the ability to work remotely and provide full-time employment for many people worldwide (Gray and Suri 2019). Earning money, as with other jobs, is one of the primary incentives for crowd workers to pursue work on crowdsourcing platforms despite numerous obstacles, such as low pay (Martin et al. 2014) and difficulty in finding well-paid work (Kaplan et al. 2018). Prior work has revealed that other factors in addition to short-term financial needs motivate workers to perform microtasks. These incentives include workers' desire to apply their knowledge and

acquire new skills, task autonomy, contribute to the community and science, spend their leisure time productively, experience pleasure, and achieve a positive work value outcome (Deng and Joshi 2016; Cedefop 2021; Kaufmann, Schulze, and Veit 2011).

Regardless of different motives that retain workers and garner an influx of new workers on such crowdsourcing platforms, the quality of crowd-generated outcomes may be subpar, as crowdsourcing invariably relies on the anonymous contributions. Researchers have developed several methods to improve output quality, such as mentoring novice workers with experienced workers (Dow et al. 2011), increasing self-awareness of workers' competencies (Gadiraju et al. 2017), training workers (Abbas et al. 2020), variable monetary incentives (Bonner et al. 2000), dynamically assigning tasks (Kobren et al. 2015), workflow patterns (Bernstein et al. 2010), among others. However, despite their benefits, proposed methods have concentrated on the task itself and neglected to address how to "motivate" workers to perform better (Lim, Lee, and Kim 2021).

Given that goal-setting is essential in increasing people's motivation toward the task (Locke 1996), researchers from crowdsourcing have studied goal setting to improve task performance (Lim, Lee, and Kim 2021) and learning (Rechkemmer and Yin 2020) and increase the quantity and quality of contributions (Ling et al. 2005). In these studies, however, researchers used goal-setting as a control factor (by goal-setting or goal-setting messages) to see its effects on the performance. Given that crowd workers are a diverse and multifaceted population with various motives and experiences (Kittur et al. 2013), there is a lack of a comprehensive understanding of their goal-setting behaviors considering the diversity of motivations as stated above. In addition, existing qualitative research on workers' goals focuses on a single type of goal (e.g., careers (Rivera and Lee 2021) or learning goals (Cedefop 2021)), and does not delve specifically into workers' needs regarding goal-setting and the technological innovation required to support them.

Understanding the worker's needs regarding goal setting is essential for many reasons. First, the community now realizes that crowd workers are real people and should not be treated merely as computational machines (Barbosa and Chen 2019). Gaining a thorough understanding of their goals can inform the design of tasks and platforms to support

crowd workers, keeping them motivated and informed of their progress. Second, since goal setting is associated with well-being, happiness, and success (Grégoire, Bouffard, and Vezeau 2012; Jones and Drummond 2022), an in-depth understanding of workers' goals can aid in developing intelligent tools for goal attainment that promote workers' well-being and, consequently, improve the quality of their contributions. Finally, considering that global gig economy is expected to grow by 17% by 2023 (Mastercard and Associates 2019), it is important to examine the personal goals that motivate workers to join these platforms and technical support they need in achieving those goals, which, to the best of our knowledge, have not been comprehensively explored in the literature. This lack of comprehension prompted us to investigate the following overarching questions:

- **RQ1:** What type of goals do workers wish to create for themselves and why?
- **RQ2:** How often and for how long do workers set goals?
- **RQ3:** What do crowd workers do to achieve their goals, and what potential barriers prevent workers from reaching their goals?
- **RQ4:** How can we use technology to assist workers in achieving their goals?

To address these research questions, we recruited 205 workers from MTurk ($N = 105$) and Prolific ($N = 100$), two well-known platforms for crowdsourcing that host hundreds of thousands of on-demand workers around the clock. We designed a 14-item questionnaire based on prior literature on person-focused strategies that incorporate goal setting (Javadi et al. 2018), and workplace learning (Fontana et al. 2015a).

Related Work

Goal Setting Theory

Locke and Latham offer a well-developed goal-setting theory of motivation, which explains why some people perform better than others on tasks linked to their work (Locke and Latham 1990). In the notion of goal setting, a goal is the intended outcome of an action, which corresponds to the desired level of performance in the job. According to research, the degree of goal complexity and performance have a linear relationship (Locke 1967), that is, more performance is achieved with specific, challenging goals than with no goals or abstract goals like “do your best”. The issue with a do-best goal is its obscurity about performance effectiveness. A definite, lofty goal removes uncertainty around what constitutes high effective performance (Locke and Latham 2013). Goal-setting has resulted in favorable effects in various domains, including creativity (Carson and Carson 1993), leadership (Locke and Latham 1990), sports (Locke and Latham 1985), behavior change (Ammerman et al. 2002), among others.

Goal Setting in Crowdsourcing

Researchers have recently looked at how setting goals affects the performance and learning of crowd workers in the

crowdsourcing domain. For instance, Lim, Lee, and Kim (2021) discovered that motivating workers to perform the task better with different goal types, such as distal, proximal, and achievement goals, improved the output quality in a task requiring shortening a text. Reckemmer and Yin (2020) examined the impact of goal setting on worker training for complex crowdsourcing activities requiring in-depth nutritional knowledge. They discovered that setting multiple goals (performance, learning, or behavioral goals) affects how workers perceive their learning. For workers with an affinity for learning orientation, for instance, defining learning goals resulted in more significant learning gains.

Goal Setting in Online Communities

Goal-setting has also been applied to online production communities and citizen science to boost the crowd's quantity and quality of contributions. For instance, Ling et al. (2005) shown that workers with clear quantitative goals performed better on movie rating tasks than those with generic goals. In addition, participants with group-level goals rated more films than those with individual goals. Another study (Zhu, Kraut, and Kittur 2012) that examined the group goal setting in Collaborations of the Week (COTW) wiki-projects indicated comparable outcomes. The COTW initiatives nominate one or two articles for enhancement over a specified time frame. In general, people contributed more during collaboration periods, but the effect was significantly more significant for those who set group-level goals. In citizen science, Jackson et al. (2016) conducted a goal-setting experiment using goal-setting and anchoring to increase membership in an online citizen science community. They discovered that participants with goals contributed more annotations than those without goals. However, the existing research on goal-setting within the crowdsourcing domain has only looked into the effect that goal-setting has on task performance or learning. However, there is a lack of research that goes deeper into the needs of workers regarding goal-setting and the technical support they require to achieve their goals.

Qualitative Research on Goal Setting in Crowdsourcing

Few studies attempted to explore workers' goals concerning their careers and learning new skills. For instance, Rivera and Lee (2021) investigated the career goals of MTurk workers through qualitative research, the obstacles they face in achieving their goals, and the potential factors that support or impede workers' pursuit of their goals. They discovered that a lack of mentorship, tight finances, and limited-time force workers to continue working on MTurk despite their desire to pursue career goals and education elsewhere. In another study connected to this topic, Cedefop (2021) showed that workers who are better at managing their learning goals do more creative and complex work and learn more at work. Gray et al. (2016) conducted a large-scale study using a mixed methods approach on four crowdsourcing platforms, focusing on how crowd workers collaborate to fulfill their financial and technical needs in pursuit of their personal and work-related goals. For instance, they found that workers

collaborate to contribute to the family’s household income, buy commodities, create employment opportunities for each other, help each other to complete the crowd work via chat and in-person meetings, etc. Nonetheless, this article focused on how workers collaborate and what they collaborate on. Our work is distinct in that we also delved deeply into the elements that impede or promote goal attainment and studied technical solutions that may help workers achieve their goals more effectively.

Method

We administered surveys using Prolific¹ and MTurk² and recruited 205 participants (MTurk=105, Prolific=100). We chose MTurk because it is one of the oldest and most popular crowdsourcing platforms, and the number of published studies employing MTurk has increased steadily in recent years (Keith, Tay, and Harms 2017). As this platform is representative, it is essential to gain an in-depth understanding of the goal-setting strategies of its workers. We chose Prolific because it has recently gained popularity in the academic community due to its transparency, usability, high-quality outcomes, and population diversity (Peer et al. 2017; Palan and Schitter 2018). The survey was created with Qualtrics³, an online survey software and data analysis platform. We restricted the survey to only US and UK workers since our task required fluency in English. We predicted £2.25 (£9/hr) for a 15-minute survey on Prolific. The average hourly compensation was £10.92. We paid \$2.83 on MTurk, which was exactly identical to the £2.25 based on Google’s conversion rate.

We used ‘approval rating’ as an additional criterion on Prolific, which is the proportion of studies for which requesters have approved the participant’s assignments. We set the approval rate to be greater than or equal to 98. On the MTurk, we hired master workers. These workers have regularly exhibited a high level of success in completing a diverse array of Human Intelligent Tasks (HITs) for a large number of requesters. In addition, we set the following pre-qualification criteria: (1) Approval rate ≥ 98 ; (2) We select workers with 10,000 approved HITs, which is the number of HITs a worker has completed after registering for MTurk. Prior research has shown that acquiring high-quality results from MTurk is difficult without employing strict screening criteria (Eyal et al. 2021). While it is challenging to employ identical participant constraints across MTurk and Prolific due to the varying platform features and dynamics, and considering the susceptibility of surveys (Gadiraju et al. 2015), we aimed to control quality strictly to ensure reliable responses. We used the Cognitive Bias Checklist introduced by Draws et al. (2021) to inform our survey design and limit potential cognitive biases from seeping through.

Procedure

(1) Consent form On both platforms, after workers accept the task, they are redirected to a consent form where they

¹<https://www.prolific.co/>

²<https://www.mturk.com/>

³<https://www.qualtrics.com/uk/>

can read a detailed description of the study and general declarations regarding the protection and use of their data. We mainly inserted the phrase that this research is part of an ongoing project at a specific university, and as a result, we genuinely value your help with our research. We also stressed that this study’s outcome would improve the well-being and welfare of MTurk and Prolific workers.

(2) Worker Demographics After they accepted the consent form, they were taken to a new page where they were asked some basic questions about their gender, age, income, working hours/day, experience with crowdsourcing platforms, and level of education. Table 1 represents the detailed demographics of the participants.

(3) Questions in Relation to RQs We then posed specific open-ended questions to answer the research questions outlined in the Introduction. To answer RQ1, we asked two sets of questions to determine the goals workers desired to establish in their personal and professional lives (crowd work related). We have divided this question into two parts to allow for extensive responses to each question.

- Could you please list a few of the goals about your **crowd work (personal life)** that you intend to set for yourself?

To answer RQ2, we asked specific closed-ended questions about goals’ duration, consistency, and quantity.

- How often do you set goals? (usually, sometimes, often, rarely)
- What is the length or duration of the goals that you create? (daily, weekly, monthly, yearly)
- How many goals do you typically create at a time? (1, 2, 3, >3)

Next, we asked questions about how workers attain their goals and potential obstacles (both in terms of their personal lives and tools) that prevent workers from accomplishing their goals (RQ3). In this section, we asked a total of seven questions where; first three of them were closed-ended, and the last four were open-ended. We adopted three questions from the self-regulated learning scales (Fontana et al. 2015b) that include questions concerning goal setting and task strategies on a five point likert scales (1 = not at all true, 5 = very true). Thus we asked:

- I meet the goals that I set for myself in my job or personal life
- I write down a plan to describe how I hope to achieve my goals
- I organize my time to best accomplish my goals
- Please list any tools that help you plan and monitor your goals?
- How does the tool(s) you mentioned above assist you in planning and monitoring your goals?
- Think about the goal(s) you have achieved (or not achieved). Kindly describe the most significant factor(s) obstructing you from accomplishing your goal(s).
- Please describe any flaws in the current tool(s) you are using.

We then asked them two questions regarding a new tool and set of features that can aid them with goal planning and monitoring. The first question was a close-ended question with a 5-item scale (1: To a very small extent, 5: To a very large extent)

- To what extent are you interested in a new tool that can assist you in planning and monitoring your goals more effectively?
- What features would you like to see in the tool. Please be as elaborate as possible

Sex	M	P	Age	M	P	Income (\$)	M	P	Experience	M	P	WH.	M	P	Education	M	P
♀	55	83	18-24	3	17	0-24.9K	60	91	<=6 mos.	4	22	0-10	70	98	Technical Degree	13	10
♂	50	15	25-34	33	38	25-49.9K	18	7	7-12 mos.	8	23	21-30	9	0	Bachelor's Degree	51	41
♀	0	2	35-44	33	20	50-74.9K	12	1	1-2 yrs.	14	29	31-40	5	1	Professional Degree	19	13
			45-54	14	19	75-99.9K	10	0	2-3 yrs.	13	13	40+	3	0	High School Diploma	8	15
			55-64	15	3	>100K	5	1	3-10 yrs.	54	13				Some College	12	18
			65+	7	3				10+ yrs.	12	0				high school or less	2	3

Table 1: This table displays the demographic characteristics of MTurk and Prolific workers. Here, M stands for MTurk, P for Prolific, and WH for working hours.

Finally, we asked workers to share any additional comments/remarks that they might have.

Data Analysis

We used conventional qualitative content analysis (Hsieh and Shannon 2005), an inductive approach that is useful when describing a phenomenon for which there is limited existing research or theory, as opposed to deductive qualitative analysis, which builds on predetermined themes from previous literature. We conducted the analysis using the Dedoose software (Lieber, Salmons, and Kaczynski 2021) application. Authors read all of the responses to the open-ended questions to generate codes by highlighting the key phrases that seemed to capture the most significant ideas. As the analysis progressed, multiple core concepts emerged. These concepts served as the basis for the initial coding scheme. The codes are then merged or classified based on their inter-dependencies.

Results & Discussion

RQ1: Types of Goals

Workers reported different goals that they create for their crowd work (Fig. 1.A). The most important goal was to make more money or increase one's income (*money-driven*). Some workers simply state that they want to earn money as if it were their primary source of income, whereas others mention specific milestones they must achieve regarding money. Another category of workers appeared to consider crowdsourcing platforms as a means to supplement their current income. Given that monetary incentives are a significant motivator for crowd workers (Gray and Suri 2019; Martin et al. 2014), this type of goal was less surprising. Other studies have reached similar conclusions; for instance, making money online and being paid promptly and fairly were the primary motivations for joining this marketplace (Irani and Silberman 2013; Kaufmann, Schulze, and Veit 2011). Another aspect of using these platforms as a primary or secondary source of income was also reported in a previous study (Ipeirotis 2010). Below are excerpts from the workers' goals in which they specified earning a certain amount of money per day, week or month. MTurk workers mentioned more goals of this type than Prolific workers.

(ID.223, Prolific, ♀): Ideally I like to try and earn £100 a month if possible. I also think it really important to try and provide researchers good information and try your best at their studies as this could go to helping someone else in the future.

(ID.89, MTurk, ♀): I have a certain earning goal that I have each day and I try to meet that by making at least \$20 a day. The hours I work are tied to my earnings goal, so they vary depending on how much I make per job.

Another area in which workers set more goals was to perform tasks more diligently in order to avoid any mistakes or errors in the assignments, resulting in higher quality work (*quality-driven*). Lack of rules on expected time and payment (standardization) when posting tasks and a lack of measures to mitigate disputes and prevent scamming activities (risk mitigation) may contribute to these goals, particularly on MTurk (Deng and Joshi 2016). This lack of standards may compel workers to set goals for performing their tasks with diligence to receive fewer rejections and improve their overall reputations.

(ID.71, MTurk, ♀): To do the work right and to make sure to pay attention and answer all the questions to the best of my ability. Also that they end up paying fairly for the work that you do.

(ID.176, Prolific, ♀): I set out to try and perform to the best of my ability in any study, as I wish to give the most accurate results I can. I only take studies when I know I have the time and attention span for them, even if I might otherwise like to take the money—I won't sign up for the study if I feel my results will cause issues for the study because of other factors.

In addition to money-driven goals, workers also created *task-driven* (completing X surveys per day) and *time-driven* goals (working X hours per day). There were two types of goals within the time-driven category: some respondents specifically mentioned that they set goals to work X hours per day, while others only mentioned that they take their work time more seriously by putting in dedicated hours or staying efficient with their time. Below are two excerpts regarding time-driven and task-driven goals, respectively.

(ID.82, MTurk, ♀): Prioritizing time to devote solely to crowd work (3 hours per day minimum), balancing cost vs benefit (time per task vs pay)

(ID.207, Prolific, ♀): Complete five tasks a day, five days a week

Workers also established some intrinsic goals. For example, they set goals to contribute to science or assist researchers, as well as to have fun and learn new skills. MTurk workers were less interested in setting goals to boost their enjoyment than their Prolific counterparts. Both MTurk and Prolific workers were eager to acquire new skills and contribute to scientific research. Previous research also revealed that passing leisure time productively and experiencing pleasure contributed to the accomplishment and productivity of

		(A)																	
		Increase income	Do more work/hyts	Do tasks diligently	Get good value work	Avoid being scammed	Earn money	Earn X money per D/W/M	Efficient use of time	Filtering out bad surveys	Get more qualifications	Do X surveys or HITs /day	Learn new skills	Maintain high rating	Save money	Strive for stimulation	Contribute to science	Meet expenses	Work X hours/day
Mturk		10	2	16	8	5	8	26	6	3	7	5	6	8	4	1	4	2	6
Prolific		13	12	18	4	0	7	13	2	0	0	6	5	0	2	8	6	0	2

		(B)																		
		Eat balance diet	Be kind/supportive	Being able to pay bills	buy commodities	Earn extra income	Excell career	being financially successful	Improve (mental) health	Learn new skills	Pay debts	Live a peaceful life	Improve physical health	Raise kids well	Save money	Spare time for fun	taking a vacation	Take care/ renovate home	Take care family	Work-life balance
Mturk		4	6	4	7	5	5	2	9	6	0	8	8	9	3	3	3	2	43	3
Prolific		4	3	0	8	7	1	6	12	6	4	11	17	2	8	4	9	3	47	2

Figure 1: This figure depicts the **platform x code** count matrix. On top are codes representing crowd work goals, while on the bottom are personal goals. Similar colors in the codes (text) indicate themes that overlap.

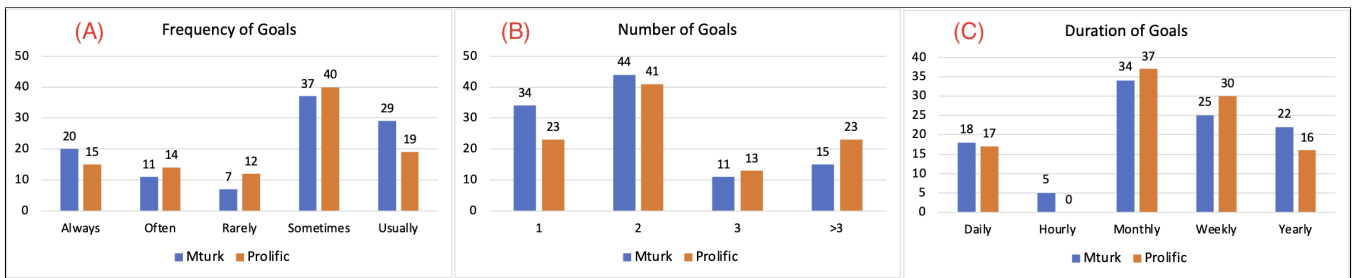


Figure 2: Frequency, number and duration of goals

workers on MTurk (Ipeirotis 2010; Deng and Joshi 2016). We present examples of intrinsic goals below.

(ID.222, Prolific, φ): That I find further platforms in which I can undertake crowd work, so I can maximise the amount of work I do that I find interesting and challenging to me

(ID.95, MTurk, σ): Making a positive impact for future generations. Contributing work so I may personally benefit from the project.

In addition, MTurk workers mentioned goals to perform the invisible work (see Toxtli, Suri, and Savage (2021)), such as avoiding being scammed by requesters, filtering out bad surveys, gaining more qualifications, maintaining a high rating or reputation, and covering their expenses. Evidently, these distinct goals have primarily emerged due to power imbalance on MTurk, where requesters are solely responsible for accepting and approving worker assignments and where unfair rejections are prevalent (McInnis et al. 2016; Gray and Suri 2019). Furthermore, gaining more qualifications as their primary goal is related to the fact that well-paid work is hard to come by on MTurk, and highly qualified workers can take the available one upon arrival (Rivera and Lee 2021).

A number of distinct themes emerged regarding personal goals (Fig. 1.B). For the sake of brevity, we only list three of them that were mentioned by the majority of workers. In this category, improving one’s health or caring for or spending time with family were the most prominent goals. There were two kinds of health-related goals: one focused on over-

all health, including mental health, and the other on physical health or overcoming disabilities. Another study also reflected similar outcomes: MTurk workers enjoyed being at-home parents and caring for their children (Deng and Joshi 2016). Furthermore, research has shown that some MTurk workers have psychological disorders like social anxiety and depression (Arditte et al. 2016), and some have a range of physical disabilities (Zyskowski et al. 2015). Therefore, designing interventions that support workers’ short- and long-term mental and physical health goals is essential. Excerpts from family-oriented, mental, and physical health goals are provided below.

(ID.157, Prolific, φ): Ensuring I give my friends and family plenty of time and attention and making sure I give them opportunities to ask for help if needed

(ID.179, Prolific, φ): To make sure that my mental health gets better and doesn’t deteriorate, to fix the relationship I have with my husband because of my mental health issues, and try and make my friends

(ID.73, MTurk, φ): I would like to lose weight, so making obtainable goals toward that means a lot to me.

RQ2: Frequency, Duration and Number of Goals

We also inquired as to how frequently workers set goals, how many goals they set or have made, and if the goals are short-term or long-term in nature. To determine the relationship between two categorical variables (platform vs. frequency, platform vs. number of goals, and platform vs. dura-

tion of goals), we conducted three chi-square tests for association (Fig. 2). The relation between these variables was not significant: **frequency**: $\chi^2(4, N = 204) = 4.514, p = .341$; **number of goals**: $\chi^2(3, N = 204) = 4.003, p = .261$; **duration**: $\chi^2(4, N = 204) = 6.481, p = .166$. However, it is obvious from the Fig. 2 that these workers tend to set goals infrequently, tend to generate no more than two goals, and typically set goals that are at least a month in duration. Next, we examined cases in which workers reported that they ‘always’ set goals to determine how this affected the number and duration of goals. The chi-square tests for association showed significant relation between **platform** and **duration of goals** ($\chi^2(4, N = 35) = 9.981, p < .041$). It reveals that MTurk workers 15% and 30% more likely than Prolific workers to set hourly and monthly goals, respectively. On the other hand, Prolific workers were 40% more likely than MTurk workers to set weekly goals.

RQ3 (A): Goal Attainment Strategies

As stated previously, in order to answer this question, we asked three closed-ended questions about goal achievement, goal planning, and time management. In addition, we asked two open-ended questions regarding the types of tools used for goal planning and monitoring, as well as how these tools are helpful.

To see the difference in the scores, we conducted independent samples T-test. The test indicated that goal attainment score for MTurk was greater than Prolific workers ($t(203) = 3.26, p = .001, d = 0.45$), goal planning scores were also higher for MTurk workers than Prolific workers ($t(203) = 2.19, p = .030, d = 0.30$) and MTurk workers also scored significantly higher in terms of time management ($t(203) = 4.16, p < .001, d = 0.58$) – Fig. 3. The reason that MTurk workers scored higher could be due to the hard-working conditions for MTurk workers (Martin et al. 2014; Lehdonvirta 2018), which allowed them to be better organized and well-planned to meet their targets.

Next, we examined the tools mentioned by crowdworkers for goal planning and tracking. As depicted in the Fig. 4 and Fig. 5, the most frequently mentioned applications by crowd workers were Spreadsheet ($N = 22$), Calendar ($N = 20$), To-do list ($N = 23$), Journal/diary ($N = 15$), Notepad ($N = 9$), Reminders ($N = 6$), Notes ($N = 7$), Notebook ($N = 6$) and other programs ($N = 29$).

Other applications mentioned by crowd workers can be classified into several categories; for example, some workers used fitness trackers ($N = 9$) and health apps ($N = 5$) to improve their overall health. Some workers ($N = 3$) overcame certain disorders or stress by engaging in therapy as a form of meditation and employing a variety of tool to improve their ability to handle their situation better. For instance, one worker reported:

(ID.176, Prolific, ♀): Therapy is an essential tool for me, as is medication for my ADHD. I also use Google Docs so frequently when it comes to planning and jotting down personal notes that I actually filled up the free allotted Google Drive space purely in text documents. Discord has been a surprisingly helpful tool, as well, perhaps more so than Google Docs in some ways.

	Calendar	Google docs	Journal	Notepad	Notes	Reminders	Spreadsheet	To-do list
Calendar	0	0	2	1	1	4	2	5
Google docs	0	0	0	0	1	0	2	1
Journal	2	0	0	2	0	1	1	1
Notepad	1	0	2	0	1	1	2	1
Notes	1	1	0	1	0	0	2	0
Reminders	4	0	1	1	0	0	1	2
Spreadsheet	2	2	1	2	2	1	0	2
To-do list	5	1	1	1	0	2	2	0

Table 2: Code co-occurrence matrix for the tools workers used in organizing their goals

Other workers utilized health apps to monitor their weight and calorie intake. For instance, three workers (MTurk = 1, Prolific = 2) used myfitnesspal (myfitnesspal.com) to manage their weight. Others (MTurk = 2, Prolific = 4) mentioned using fitness trackers like Fitbit (fitbit.com) to monitor their performance.

Intriguingly, crowd workers also mentioned tools (column four, Fig. 5), such as Teams and Whatsapp, Discord (discord.com), etc., that allow them to track their progress and share and discuss it with coworkers, friends, and family members (MTurk = 4, Prolific = 3). For instance, one worker reported:

(ID.82, MTurk, ♀): calendar, written lists and revisiting goals, **verbal discussion with coworkers to receive feedback and share progress**, apps on my phone

In addition to the standard tools for managing tasks, such as to-do lists, reminders, journals etc., workers also mentioned some tools they used explicitly for goal setting and tracking. These include Notion (notion.so), Coach.me (coach.me), GoalBuddy (goalbuddy.io), Goalscape (goalscape.com), Lifetick (lifetick.com), Trello (trello.com/home), Mint (mint.intuit.com), Clickup (clickup.com), SMART (Doran et al. 1981), and Discord (discord.com).

In addition, workers combined multiple tools for goal setting and tracking. The matrix in Table 2 displays the frequency with which all code pairs were applied to the same excerpt. This also pointed to the types of tools workers desire in a single application to better organize and track their goals. For the sake of brevity, we have simply listed the most common pairs.

Another question we posed was to know how different types of tools workers used to assist them in monitoring their goals. In Table 3, we have listed some commonly occurring themes along with excerpts from our corpus.

RQ3 (B): Potential Barriers

In this section, we examine the potential obstacles posed by the workers’ incentives and the software tools they use to manage their goals.

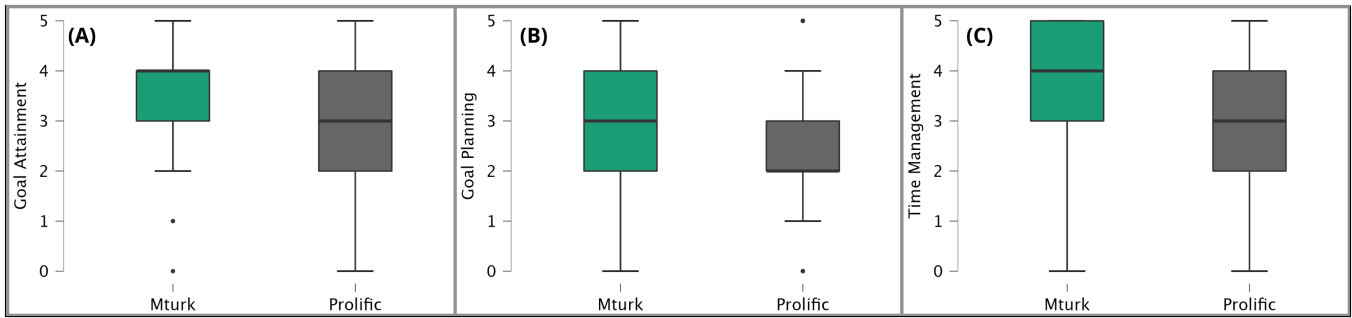


Figure 3: This figure depicts the mean scores for goal attainment, planning, and time management.

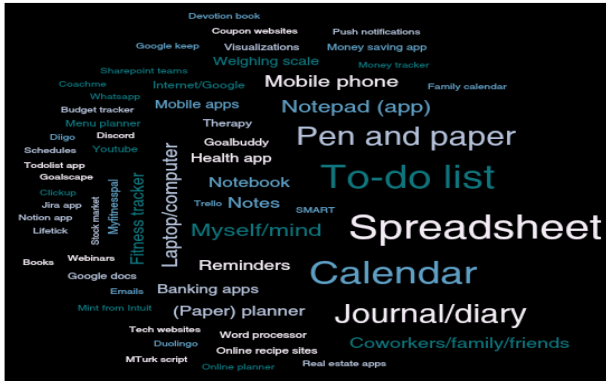


Figure 4: Word cloud of tools used by workers.

(1) Busy Lifestyle Most workers reported that despite having the best intentions to achieve goals, they never seem to have sufficient time to focus on them due to several uncontrollable factors. Family obligations, such as caring for a child at home, being busy with errands and chores, and poor time management, were the most prominent reasons cited by many workers for their inability to achieve their goals (MTurk=19, Prolific=40). For instance, one worker reported:

(ID.23, MTurk, ♂): The most significant factors obstructing me from accomplishing my goals is my schedule, I have a lot of things to do sometimes, that I do not have the time to work on my goals, family demands stands in the way sometimes.

This significant obstacle creates ethical concerns regarding providing employment benefits to these invisible laborers. In their book, Gray and Suri (2019) explains that while the MTurk API streamlines the recruitment and management of online labor, it shifts the risk to on-demand workers, such as health care, sick, and paid family leave. Thus developing a more sustainable crowdsourcing model can help workers have a better work-life balance.

(2) Lack of Motivation Another potential barrier reported by many workers was the lack of motivation/apathy (MTurk=14, Prolific=26) and procrastination (MTurk=3, Prolific=4). This lack of motivation may be attributable to the tedious, monotonous, and repetitive nature of the work on these platforms, and “motivating workers to complete

such tasks is difficult and may result in decreased engagement.” (Kittur et al. 2013). Since goal-setting is associated with increasing one’s motivation towards action, we argue that instituting goal-setting on these platforms can increase worker engagement (Locke and Latham 1990). Following are two examples from our corpus:

(ID.216, Prolific, ♀): My own distractions, procrastination, and feeling overwhelmed and not knowing what to do first or just being tired after work, etc

(ID.76, MTurk, ♀): The only thing that’s keeping me from my goals is the motivation I think. Lots of times I don’t feel like it or I have no energy to do it. That’s the biggest obstruction I have.

(3) Depression Another significant factor was mental illness or depression (MTurk=2, Prolific=7). We have already discussed mental health difficulties among crowd workers. Researchers can use various methods to reduce depression, such as playful engagement (Kasunic et al. 2019), micro-diversion (Dai et al. 2015), training them about emotional support (O’Leary et al. 2018; Abbas et al. 2020) or even letting them set goals (Psychiatry 2021).

(ID.89, MTurk, ♂): The most significant factors obstructing me right now are lack of money and lack of social skills. Having severe social anxiety limits the kinds of jobs I can do and makes it hard for me to really go out and network, etc. Having little to no money also makes it difficult to build up any kind of savings.

(ID.181, Prolific, ♂): Not enough money coming into the house and I can’t work due to mental health issues

(4) Medical Issues Numerous workers reported multiple medical issues that impede their ability to achieve their goals (MTurk=3, Prolific=8). This includes fitness issues, Attention Deficit Hyperactivity Disorder (ADHD), Autism, injuries, physical disability, chronic illness, and Traumatic Brain Injury (TBI). Researchers can implement various strategies to provide these workers with more flexible working conditions. Zyskowski et al. (2015) has suggested, for instance, that flexible task durations, micro-breaks, filtering out inaccessible tasks, building an online community, sub-contracting a portion of the job, and an adjudication process to improve workers’ ratings can assist gig workers in achieving their goals. Below are three examples:

(ID.160, Prolific, ♀): The biggest obstacle for me achieving my goals is that I have ADHD and autism and just doing things can be a struggle sometimes.

	Myfitnesspal	Banking apps	Calendar	Support from others	Fitness tracker	Goalbuddy	Google docs	Health app	Journal/diary	Planner	Myself/mind	Notebook	Notepad (app)	Notes	Pen and paper	Reminders	Spreadsheet	Therapy	To-do list	Other applications
Mturk	1	3	10	4	2	3	1	5	4	1	8	4	1	2	9	2	8	0	6	16
Prolific	2	2	10	3	4	0	3	0	11	5	2	2	8	5	6	4	14	3	17	13

Figure 5: Tools mentioned by workers for goal planning and tracking.

Theme	MTurk	Prolific	Descriptor	Excerpt
Tracking progress	31	48	ID.93, ♀, MTurk	It shows my how I am progressing in meeting my goals and helps to encourage me to try harder if I am not making as much progress as I would like.
			ID.112, ♀, MTurk	They will help me not miss things that are time sensitive and know what has to be done and by when. A menu planner will help me help my mom organize her eating better and I can use some of the things we come up with to help my immediate family.
Assist in recalling	11	17	ID.145, ♀, Prolific	Reminds me to stay on top of my tasks
Easy management	9	16	ID.105, ♀, MTurk	It's easy to go back to my notebook and remove or add items to do. I find it easier to plan goals using this method because it doesn't take a lot of time or energy to do it.
			ID.160, ♀, Prolific	It lets me break down my goals into smaller SMART parts, it tracks timelines and history, it automatically changes goal dates if things move.
Accountability	6	1	ID.110, ♂, MTurk	I have them to help me remain focused on my goals and generally accountable.
Expense Management	4	8	ID.181, ♂, Prolific	Keeps track of my in and out goings and my financial situation
			ID.89, ♂, MTurk	It just lets me see exactly how much money is coming in and whether there are any expenses I can trim.
Collaboration	0	6	ID.176, ♀, Prolific	The most 'odd' tool and thus the most worth explaining is likely Discord; with Discord, I can set up a personal 'server' that I can then use to send and leave messages for myself, categorized as I want them into as many channels or folders as I want. This has been one of the most useful tools for planning and goalsetting, especially for collaborative goals, because you can add others to such a server.
Consistency & Organization	4	7	ID.92, ♀, MTurk	Sometimes it's nice to see my goals that have been written down crossed off the list and completed. It makes me feel organized and accomplished.
			ID.34, ♂, MTurk	Keeping a checklist helps me stay organized and consistent.
Learning	1	1	ID.84, ♀, Prolific	Youtube provides free work outs and advice on fitness.

Table 3: This table shows how goal-setting and tracking tools assisted workers.

(ID.47, MTurk, ♀): The most significant factor obstructing many of my goals is my chronic illness. It keeps me from work goals and personal goals.

(ID.152, Prolific, ♀): My physical health is moderate and I am living with a physical disability, which forces limitations upon what I am able to achieve each day.

(5) Financial Constraints Many others reported that having a lack of finances effect them to achieve various personal goals that need finance, such as learning new skills and managing budget or savings (MTurk=8, Prolific=18). One worker reported:

(ID.93, MTurk, ♀): The biggest stumbling block in meeting goals is financial constraints where I may not be able to pay a chunk on a credit card as I had planned, often due to unexpected issues that required spending money that was not budgeted. On MTurk, I may not be able to meet my earnings goal(s) if work availability is low.

(6) Flaws in the Software Tools In addition, they also identified many flaws in the software they used to track their progress, which hindered their ability to meet their goals. The most prominent one was their inability to motivate (MTurk=1, Prolific=3) them toward achieving their goals and their lack of proactiveness (MTurk=7, Prolific=14).

(ID.72, MTurk, ♀): They don't help me track or give me motivation

(ID.47, MTurk, ♀): I tend to avoid it when I get even the slightest off track so that I don't have to hold myself accountable. It is up to me if I use the planner or not and if I visit it or not.

Others pointed out that these tools are clumsy and difficult to use (MTurk=1, Prolific=5), prone to error (MTurk=1, Prolific=1), lack data-sharing features (MTurk=1, Prolific=2), lack reminders (MTurk=1, Prolific=6), lack multiple features (MTurk=1, Prolific=1), require self-management (MTurk=3, Prolific=2), lack personalization (MTurk=2, Prolific=2), lack digitization (MTurk=1, Prolific=9) – men-

tioned by those who used pen and paper or paper planner, lack an offline mode (Prolific=3), and are time-consuming (MTurk=2, Prolific=1), slow (MTurk=2, Prolific=2) and costly (Prolific=1), among other issues.

(7) **Miscellaneous** Workers also cited a pandemic (MTurk=6), unanticipated events (MTurk=1, Prolific=1), fear of rejection (MTurk=1, Prolific=1), low work availability (MTurk=2), and over-commitment (MTurk=1, Prolific=1) as major obstacles to accomplishing their goals.

RQ4: Needs for Goal Management Tools

To answer this question, we asked two questions: the first was a closed-ended question asking if they intended to use such a software tool for goal setting, and the second specifically asked them to list the features they would like to see in the software tool. Overall, workers on both platforms were interested in utilizing such a tool. Even though the Chi-square test did not reveal a significant difference, MTurk workers were 10.7% more willing (“to a very large extent”) to use interventions than Prolific workers (4%). Only 23.5% of workers from MTurk choose ‘to some extent’, whereas 28% of workers from Prolific select this option.

(1) **Reminders/Notifications** Having intelligent reminders/notifications (MTurk=13, Prolific=16) was the most desired feature that workers wished to pursue their goals more effectively. Here, they hoped that the reminders were not merely “alerts” but could detect when someone is spending too much time on a microtask and alert them to transition to another task or remind them to complete all unfinished tasks. In addition, they sought a feature that would notify them when they had made substantial progress in accomplishing specified targets and constantly remind them of their goals/plans. Here is a sample of excerpt where workers wished an intelligent reminder:

(ID.36, MTurk, ♂): Something that alerts me when i am spending too much time on a task that will keep me from accomplishing another one.

(2) **Motivate in a Proactive Way** Workers indicated a desire for a tool that blends motivation and support to keep them on track (MTurk=10, Prolific=8). Some even sought inspirational quotes or the employment of specific words or advice-giving elements to keep them motivated (MTurk=3, Prolific=1).

(ID.18, MTurk, ♂): I suppose some kind of app that engages with you and is not passive. Something that has access to the goal and motivates you to continue down the correct path.

(ID.184, Prolific, ♀): Maybe rewards for hitting your goal, or making progress towards it. Motivational quotes and videos?

(3) **Visually Track Progress** Workers also desired a visual planning or tracking system that visually displays goal progress and enables them to modify goals as necessary (MTurk=11, Prolific=14).

(ID.112, MTurk, ♀): a good visual planning system so that it is easy to see what the goal is, what has to be done and what is already complete. Also need a way to prioritize what makes the biggest progress toward a goal.

(ID.21, MTurk, ♂): I would like to see a visualization of my progress on a day to day basis so it doesn't feel like I'm not making progress toward my goals.

(4) **Game-like Features** Workers also sought a tool with game-like characteristics, such as concrete rewards or points that can be won or attained if one stays on track (mTurk=6, Prolific=6).

(ID.31, MTurk, ♀): I want something that is sort of fun with game elements, but has better visuals than Habitica.

(5) **Fully Customizable** In addition, workers desired features that allow them to adapt or tailor the software to their tastes (MTurk=1, Prolific=6).

(ID.160, Prolific, ♀) Offline and quick. Has to-dos with deadlines and urgency, with custom fields, subtasks, can set milestones, can view tasks in different views - list, board, calendar, gantt, timeline, box, table. Can note tasks, add attachments to tasks, can have folders and different lists for different projects, can set overall goals.

(6) **Facilitates Hands-free, Multi-modal Interaction** Another intriguing feature only MTurk ($N = 5$) workers wanted was the software's capacity to allow hands-free engagement via voice input or multi-modal interaction, such as a touch screen and keyboard.

(ID.103, MTurk, ♂): Fast calculation of alternatives, graphical display, maybe touchscreen controls. Voice input as well as keyboard/touchscreen.

(ID.98, MTurk, ♂): I would like to see something like a spreadsheet go integration that's voice activated. It's kind of hard to explain here but the AI is just almost there for it and I'm not the one that likes to hover over spreadsheets on a computer.

(7) **User-friendly Interface** Workers also desired a simple and intuitive interface that provides easy access to their goal information, allows them to establish goals without effort, helps them organize their goals into folders/categories, and offers basic formatting options (MTurk=10, Prolific=11).

(ID.47, MTurk, ♀): has to be free, easy to use, and convenient. I don't want to have to pay to use it or spend a lot of time using it. If it is time consuming or frustrating to use, I'll quickly abandon it.

(8) **Integrated and Easily Accessible** Workers wanted a feature that enables them to take notes whenever possible effortlessly, is accessible on various devices, can operate offline, and also integrate other apps that workers are familiar with.

(7) **Miscellaneous** Other features that workers desired were accountability (MTurk=1, Prolific=2), budget management (MTurk=2, Prolific=1), a countdown timer (MTurk=1, Prolific=1), easy sharing of goals (Prolific=3), assistance in effectively managing time (MTurk=3, Prolific=3), facilitation of organization (MTurk=4, Prolific=2), help in setting both short (MTurk=1, Prolific=1)- and long-term goals (MTurk=1, Prolific=1), aid in breaking down goals into sub-goals (MTurk=3, Prolific=4) or combining multiple goals into a single goal (MTurk=3), personalized feedback (MTurk=2), and goal suggestions/ideas (MTurk=1, Prolific=1).

Conclusions & Future Work

In this exploratory study (and the first of its kind), we surveyed MTurk and Prolific workers, revealing important insights into the goal-setting practices of crowd workers. We consider multiple standpoints, including the nature of goals, goal attainment strategies, potential obstacles, and requirements for goal management tools. Concerning **RQ1**, we found that extrinsic goals (money-driven) were more prevalent, but workers also mentioned intrinsic goals that allowed them to find work for enjoyment and leisure, learning and contributing to science. We also observed that MTurk workers need computational tools and goal-setting to minimize “invisible labour” (Toxtli, Suri, and Savage 2021) such as screening out poor surveys to optimize their intended outcomes. Personal goals included viewing family life as vital as work, maintaining a balanced lifestyle, and supporting overall health. In response to **RQ2**, MTurk workers were more likely to have short-term (hourly) and long-term (monthly) goals, whereas Prolific workers were more likely to have medium-length (weekly) goals. Regarding **RQ3**, we found that MTurk workers were more organized and well-planned than Prolific workers. To meet their goals, workers usually used standard tools (e.g., spreadsheets, calendars) and other commercially accessible tools to monitor their progress, hold themselves accountable, cooperate, organize, and learn new skills. Potential impediments to their goal completion include a hectic lifestyle, a lack of motivation, depression, medical ailment, and financial restraints, as well as the incapacity of goal-setting tools to motivate in a proactive manner toward goal fulfillment. Concerning **RQ4**, workers expressed an interest in computational processes to manage their goals and requested that the tool intelligently assist them in recalling, proactively motivating, visually tracking progress, utilizing gamification, supporting hands-free and multimodal interaction, and being fully customizable.

Our current research has shed light on the dynamics of workers’ goal-setting behaviors, the obstacles they face, and the computing resources needed to better support goal-setting in crowd work. Platform developers and researchers can use this information to investigate how to translate the design requirements suggested in RQ4 into a functional goal-setting tool for goal management, and test this tool in longitudinal studies in the wild. In the current work, we did not analyze the differences between platforms demographics, which can yield important insights and warrant additional exploration.

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