

Evaluating the Impact of Artificial Intelligence Versus Human Management on Modifying Workplace Behavior

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Overview

This pilot study was a behavior change experiment, where a small sample of employees of a digital marketing company was asked to form new habits related to their work schedules.

Three groups of remote employees were studied over 14 weeks. One group was coached by a human manager, another group was coached by an AI system consisting of robotic process automation and a specially trained conversational chatbot. The final group was coached by both humans and AI.

All groups of employees had previously been in the habit of working whenever they felt like it, with no fixed schedule. Starting in November of 2023, without disclosing that they were to be part of a pilot study, employees were asked to change their behavior, specifically:

Plan their work schedule at least a few days in advance, start work each day at their planned start time and work during the hours that had been scheduled

The focus of the pilot was to create a study design that is capable of comparing human to AI management systems and to draw initial conclusions regarding the efficacy of the current state of AI management technology developed by Inspira AI Corp.

The results of the pilot study (starting on page 5) demonstrate that the AI management system, without any human involvement, created behavior change on par with the human manager. Readers should note that at least some of the data indicated that a combination of AI and human managers may deliver even better results, under certain circumstances, than AI or human managers on their own. Larger sample sizes are needed to verify this hypothesis and the conditions under which it may be true.

Introduction

Managers have often found it difficult to inspire, nudge, or coerce changes in the everyday working habits of employees (Li et al., 2023; Schoch et al., 2023)¹. These difficulties were compounded recently as many modifications to workplace processes were put into place because of the COVID pandemic. Employees who never used flextime before were given the opportunity to set their own schedules, often with little direction from managers. Now that concerns about the pandemic have lessened considerably, many employees who were recently utilizing flextime scheduling and freeform work habits are now often asked to conform to planned scheduling modalities, even if they are still working on a remote basis away from direct oversight of managers and colleagues. The research described in this paper was conducted in this challenging context of workplace flux to compare the efficacy of human, artificial intelligence (AI), and human-AI combination managerial systems in assisting employees to shift into more predictable work habits. This research is part of a larger set of studies in which the applicability of AI-enhanced management in various settings is being examined (Traub et al., 2023)². These studies are inspired by the potential for human managers to have an array of AI tools for the support of their employees in making shifts in work habits and becoming more in sync with the larger objectives of their organizations. The possibility that synthetic AI ‘management’ systems can offload some of the more intensive day-to-day support that employees could need, presents potential savings of managerial time and attention. Synergetic AI and human strategies may provide even more effective support for employee work habit change and thus stabilize and enhance future workplaces.

Literature Review

Introductions of AI technologies into workplace settings can be complicated, facing legal and human-resource related challenges (Arslan et al., 2022; Rodrigues, 2020)^{3,4}. These issues include employees’ concerns about fairness as well as managers’ uncertainties about their own future activities and statuses. The use of workplace AI systems for “coaching,” “co-piloting,” and other forms of mentoring was given considerable stimulus by the Covid pandemic but has continued as a managerial trend as remote work options have persisted in many organizations (Schoch et al., 2023)⁵. Among the various characterizations of these mentoring systems is the notion of “Digital Productivity Assistants” or DPAs (Cranefield et al., 2023)⁶, systems designed to enhance employee production through behavioral change efforts. A commonly accepted vocabulary for characterizing AI management systems has not yet emerged, however, so whether the systems are identified as AI coaches, co-pilots, mentors, or DBAs can vary in workplace and research efforts.

Behavioral change modification strategies in the workplace such as habit formation are often rooted in the notion of “nudging” (Thaler and Sunstein, 2009; Mele et al., 2021)^{7,8}, in which the choice architecture is designed in ways that can shape human behavior. Applications of AI to

behavioral change extend nudging in a “smart” manner through the individualization of choice architectures and customization of human-computer interaction. The positive and even “friendly” employee-AI interactions that are integral to the design of some AI management systems also play roles in their effectiveness in stimulating workplace habit formation (Traub et al., 2023)². Gkinko and Elbanna (2022)⁹ describe how desirable outcomes such as increased social connection and emotional dynamics among employees (such as “empathy, forgiveness, tolerance, fairness and closeness”) can be engendered by the use of AI management systems.

Background

Remote employees at a digital marketing company were accustomed to setting their own work hours.

The lack of structure often results in workers not working at all, working fewer hours than verbally promised, or working during hours that do not overlap with other team members’, producing lag times in communication with direct impact upon the production pipeline.

All employees use a semi-automated time tracker to indicate which project they are working on, which enabled the researchers to verify the actual hours worked.

Management (whether human or AI) can coach remote workers to construct well-considered schedules that take into account the obstacles the workers face in their work settings as well as fulfilling the obligations that are mapped out in those schedules. To this end, management must convey to the remote workers that their schedule-related choices and habits will affect the success of the entire operation.

This experiment evaluated the use of a ‘flex-planned’ program, where remote workers may set their own schedules, but must plan it in advance. In addition, they are expected to adhere to the schedule that they created.

Our primary objective is the formation of habits for the following behaviors:

1. Creating a carefully-considered work schedule in advance
2. Showing up on time, reasonably near the scheduled start time of their shift
3. Working the full shift as per the schedule by measuring the ratio of time worked within the start/end times of their planned schedule

Despite the priming, the change the remote employees were asked to make were significant, as the full-flex habits were well established. We expected a degree of failure, with the possibility of some team members not surviving the transition.

This experiment compared the resulting behavior change when the policy is managed entirely by Inspira’s autonomous ‘machine suite’, compared to a control group who were managed

solely by a human manager. A potential benefit of being managed with the help of an autonomous entity is its capability to inspire personal reflection in a non-judgmental setting and encourage openness and careful consideration.

Methods

Participants

Twenty-six remote employees working at a digital marketing company were asked to change their work habits by using a calendar app to plan their intended work schedules at least several days in advance, then adhere to those schedules. This was a single-blind study with the participants unaware that they would be participating in an experiment.

Design and Procedure

Prior to the experiment, all employees had been working 'full-flex' hours that gave them freedom to work any hour of the day/week as long as they completed their assigned workloads.

Participating employees were asked to adopt a 'flex-planned' program where they could set their own weekly schedules, but must plan it in advance. All team members had been informed of this policy change, first announced in September of 2022 and repeated numerous times since. The data presented in this paper covered all work days between and including November 6 of 2023, through February 11 of 2024.

Participating employees were asked to, 1) set their schedule for the following week by no later than Sunday of each preceding week, 2) check in for work on time, and 3) work during the planned hours. How well employees adhered to these goals served as our critical outcome variables. The employees fell into three groups. Eight were coached by a human manager, thirteen by an AI coaching system and five by both human and AI coaches.

Both the human and AI manager served to coach and assist the participating employees toward adhering to the new flex-planned program. All groups received weekly reminders to set their schedule, because past research has found reminders are particularly beneficial when an intended goal is complex (Peper et al., 2023)¹⁰.

When the human was triggering the reminders, they do so through a realtime chat interface, and included personalized encouragement to do better.

When the AI was triggering the reminders, they were either automated (email and push notifications), or they were by realtime chatbot with an encouragement to do better. The AI system could detect when the employee started work. Under these conditions, a chatbot would automatically launch on the user's computer and infrequently initiate a 'coaching' conversation when the employee was either ontime, early or late for work. The AI system personalized the conversations, praising when the employee was early or on time, and gently coaching those

where were late. The coaching bot referenced the employee's planned start times, actual start times, next shift date/time and their historical adherence to the new policies.

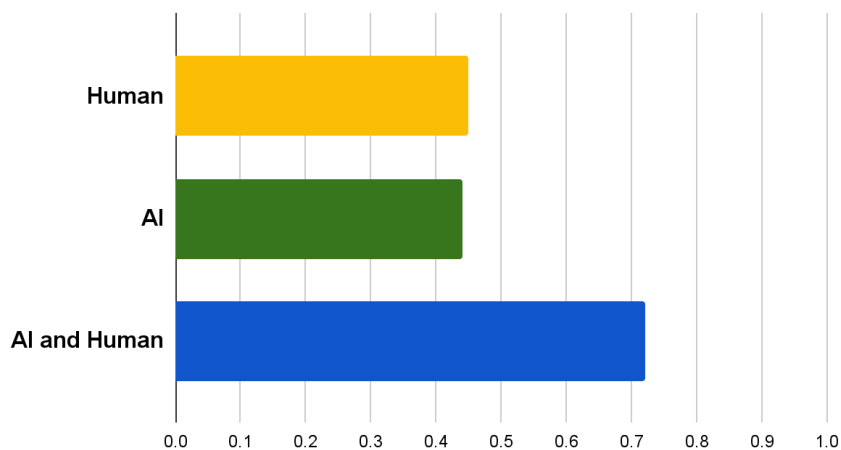
Participating employees successfully set their schedule if they planned each day of next week by Sunday of the current week. When a participating employee scheduled a day to work, they also specified a time window (e.g., 1pm - 6pm). Participating employees were deemed checked in for work on time if they signed in through a designated desktop software called TrueTime. All employees had used this software previously and were familiar with how it operated. Checking in for work was considered on-time if employees signed on to TrueTime within a 15-minute window of their scheduled start time (e.g., for a 1pm scheduled start time, a window of 12:50pm - 1:05pm would be considered on time). An employee who worked four of the scheduled five hours (e.g., 2pm - 6pm on Monday) would have worked 80% of the scheduled hours that day.

Results

Prior to the pilot study there was the expectation of high rates of failure due to anticipated challenges remote employees may face in changing their habits. The resulting changes in observed behavior were higher than anticipated across all three groups, with the exception of how well the employees were able to adhere to the planned hours of any given day.

Planning of Work Schedules

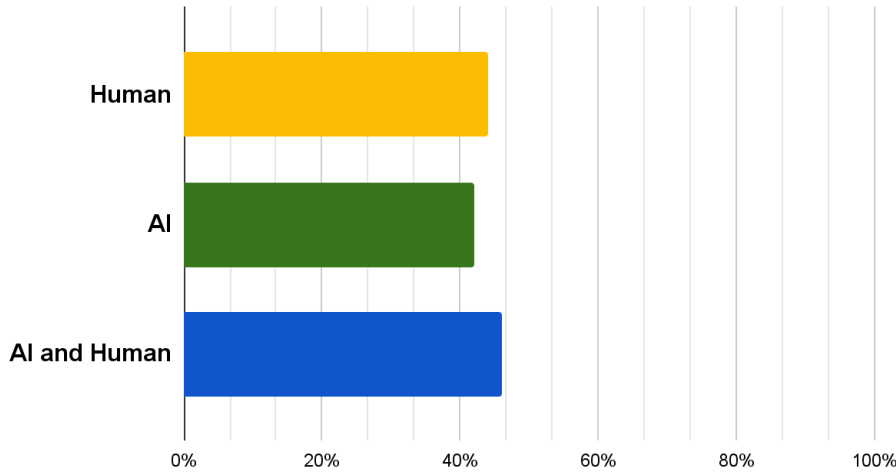
Not surprisingly, employees sometimes forgot or neglected to plan their work schedules in advance, and therefore ended up working more days than they had planned. The ratio of worked days that were planned to those that were unplanned was very similar between employees who were coached by Human or AI, with success ratios of 0.45 and 0.44 respectively. Those coached by both human and AI were more successful, obtaining an average planned to unplanned work days ratio of 0.72 (72%).



Planned days worked to unplanned days worked. Source: Inspira AI Corp.

Starting Work on Time

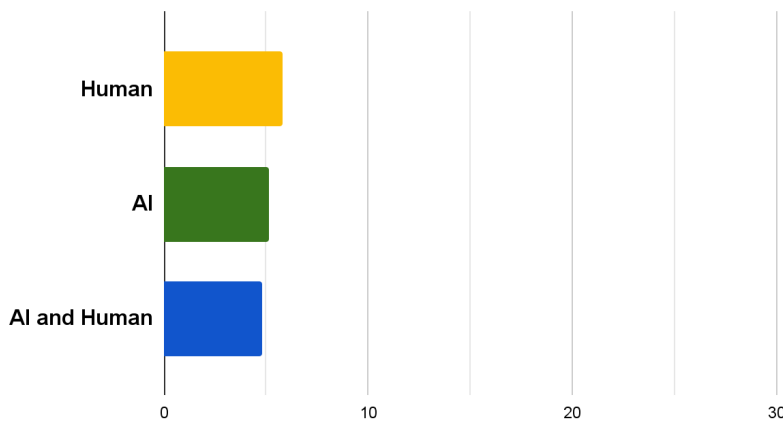
Employees in all three groups had similar success in starting work at the intended start time. Those coached by a human manager adhered to their plans 44% of the time, those within the AI group had an adherence of 42%, and those being coached by both human and AI showed up 46% of the time.



Adherence to planned start time. Source: Inspira AI Corp.

Advance Planning

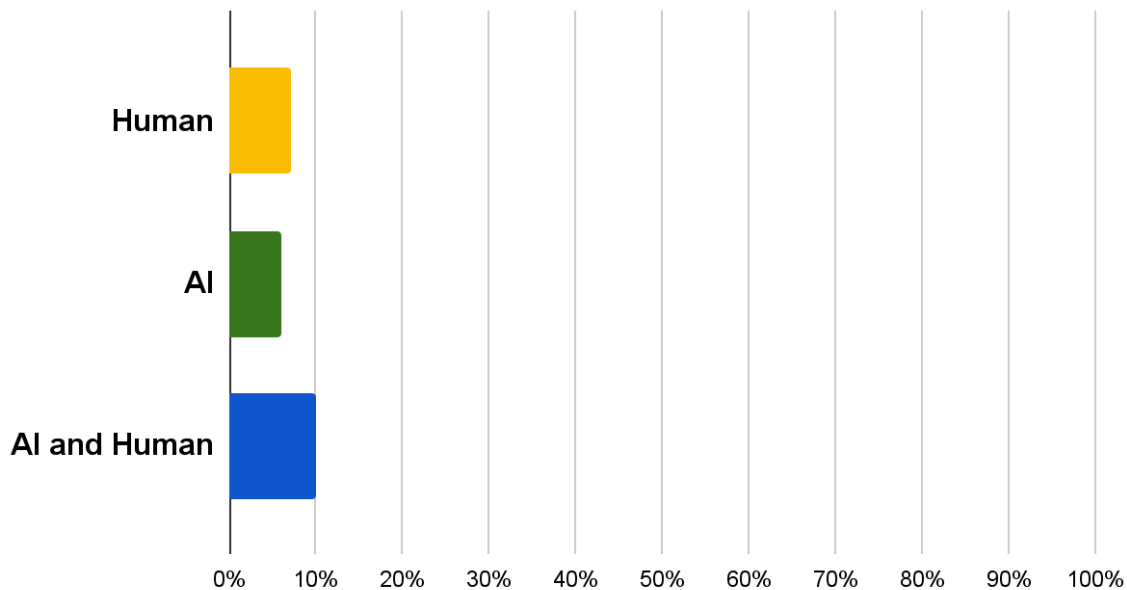
Employees in all three groups had insignificant differences with regards to how far in advance they planned their workdays. Those coached by a human manager planned 5.79 days in advance. Those within the AI group planned 5.13 days in advance, and those being coached by both human and AI came in 4.82 days in advance. The results were so similar across the three groups that any difference could easily be explained by statistical anomalies associated with the small sample sizes, as is the risk with any small-sample study such as this one.



Number of days in advance that work days were planned. Source: Inspira AI Corp.

Worked during scheduled hours

Employees also in all three groups had similar results in working during their planned shifts, with a high degree of failure across the board. Those coached by a human manager adhered to their planned hours only 7% of the time, those within the AI group had an adherence of 6%, and those being coached by both human and AI came in at 10%. The remote workers who participated in the study had been in the habit of breaking their work day up with frequent and long breaks. The interventions utilized in this pilot study were not sufficient to break these habits, illustrating the difficulties in changing behavior when entrenched habits exist, at least with remote workers.



Adherence to at least half of planned work hours. Source: Inspira AI Corp.

Summary

Although the results described below are preliminary and are based on a small sample, they present some interesting topics for further study.

Our findings suggest that AI-based management may indeed be able to influence changes in behavior at a pace comparable to that of human managers. Therefore, we continue to support the theory that certain usecases of AI management systems may currently be as effective as human management in improving reliability and modifying other workplace behaviors. Furthermore, under certain conditions a combination of AI and human managers may outperform either AI or human managers on their own.

Future Research

The findings in this pilot study substantiates the possibility that AI management systems may replace some of the duties traditionally performed by humans, specifically that of monitoring and analyzing behavior, then implementing constructive feedback loops designed to modify behavior or even improve the work experience. For example, by offering more consistent praise for work well-done, which would normally fall under the radar of a human manager. Or by coaching employees during early signals of poor performance, before the issue grows and results in a human confrontation. Essentially, this enables employees to outperform what would normally be possible. It sets them up for more favorable performance reviews, which may lead to higher job security or economic benefits such as raises or bonuses.

A synergy between AI and human management might offer organizations substantial benefits, serving as a compelling reason to develop a blend of both human and AI management instead of shifting entirely to AI solutions.

To confirm these hypotheses, further research involving larger and randomly selected samples is necessary.

The kind of research portrayed in this paper is highly sensitive to cultural, economic, and disciplinary differences in workplace settings (Lewis et al., 2021; Li et al., 2023)¹¹. Habit formation in complex environments involves an assortment of psychological and social dimensions (Rebar, Rhodes, & Verplanken, 2023)¹²; changes made in some arenas could have an impact on others. Some modifications of the content and style of AI management systems might be necessary for various audiences and contexts. Employees who are reasonably familiar with technology and comfortable with AI concepts may be more amenable to the interaction provided by the AI management system described in this paper. However, as knowledge about and comfort with AI capabilities increase on the part of many working-aged individuals, these kinds of concerns may decrease. The apparent ease-of-use of the system discussed in this paper (Inspira's autonomous Machine Suite) increases the prospects for successful implementation in a wide variety of workplace settings.

Future examination of the capabilities of chatbots for eliciting sensitive and revelatory information from human interactors could also extend the research described in this paper. This information could increase the effectiveness of chatbots in the support of workplace habit formation, possibly improving results over those of human managers' efforts in dramatic ways. For example, employee reflections about why they are having trouble changing their work habits can be used to create more specific and possibly effective human-AI interactions; in many contexts, the employees may not want to reveal such information to a human manager because of personal embarrassment or other kinds of reticence. Development and use of employee profiles in habit formation protocols could also enhance the capabilities of chatbots to foster behavioral change.

In a follow-up phase for those who struggle to adhere to their schedule, both human and autonomous system participants can identify obstacles to the fulfillment of their planned schedule (such as “my child started soccer practice last week” or “I needed to give my dad a ride to the clinic”). This investigation process can reveal whether the remote workers are more straightforward and open with their human bosses or with the autonomous entities. With increased self-reflection, the remote workers may submit more accurate schedules as well. A deliberate and careful approach to schedule development will produce better results.

Conclusion

For centuries, human managers have worked with employees to help create and reinforce appropriate work habits. The initiative described in this paper is an effort to ascertain how an AI management system compares with human managers in habit formation assistance and related forms of workplace mentoring. The remote context of these experiments provides additional obstacles and complications for behavioral modification, presenting settings in which employees have many distractions and competing obligations for their attention and energies. The results of the experiments conducted with HARRi versus human managers show that AI systems can indeed enhance efforts to improve work habits in remote work environments. The habit formation friction involved with remote work provides challenges to both modes of employee habit formation, AI-assisted as well as human-assisted. The results described in this paper present tantalizing prospects for future AI systems that are designed to have a wider set of behavior modification objectives and that draw from even more extensive informational profiles of employees.

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