



Perceptions and Preferences towards AI and Human Coaching in Fitness

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Abstract

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This dissertation investigates the perceptions and preferences of individuals towards AI-driven coaching as opposed to human coaching in the fitness sector. The primary objective of the study is to evaluate the potential impact of AI coaching on exercise motivation, perceived convenience, and concerns regarding injury prevention and posture. Furthermore, the paper explores the potential for AI to completely replace human coaches in the future, considering the advantages and constraints of AI.

A survey was conducted with 146 participants to assess participants' perceptions and preferences for both AI and human coaching approaches. The findings indicate that in spite of the perceived convenience and accessibility of AI-based coaching, participants continue to consider human coaches as more effective in motivating people to exercise and providing customized interactions.

Regarding the future of AI in the field of fitness, the results indicate that participants expect that AI will not entirely substitute human trainers. Although AI is considered a useful complement, the ability of human trainers to offer empathy, personalized instruction, and emotional support remains essential. The research findings indicate that artificial intelligence (AI) has the potential to improve fitness coaching, but it is unlikely that AI will completely replace human trainers in the years to come.

Keywords: Artificial intelligence, AI-based coaching, Human-based coaching, motivation, convenience, injury prevention

Sumário

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Esta dissertação investiga as percepções e preferências dos indivíduos em relação ao coaching baseado em inteligência artificial, em comparação com o coaching humano no setor do fitness. O principal objetivo do estudo é avaliar o impacto potencial do coaching por inteligência artificial na motivação para o exercício, na conveniência percebida e nas preocupações relacionadas com a prevenção de lesões e correção de postura. Além disso, o estudo explora a possibilidade da inteligência artificial substituir completamente os treinadores humanos no futuro, tendo em conta as vantagens e limitações da inteligência artificial.

Foi realizado um inquérito com 146 participantes para avaliar as percepções e preferências dos participantes em relação a ambas as abordagens de coaching, inteligência artificial e humano. Os resultados indicam que, apesar da conveniência e acessibilidade percebidas do coaching baseado em IA, os participantes continuam a considerar os treinadores humanos mais eficazes na motivação para o exercício e na prestação de interações personalizadas.

Relativamente ao futuro da inteligência artificial no ramo do fitness, os resultados indicam que os participantes esperam que a inteligência artificial não venha a substituir totalmente os treinadores humanos. Embora a inteligência artificial seja considerada um complemento útil, a capacidade dos treinadores humanos de oferecer empatia, instruções personalizadas e apoio emocional continua a ser essencial. Os resultados da pesquisa indicam que a inteligência artificial (IA) tem o potencial de melhorar o coaching em fitness, mas é improvável que substitua completamente os treinadores humanos nos próximos anos.

Palavras-chave: : Inteligência artificial, AI coach, coach humano, motivação, conveniência, prevenção de lesões

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Glossary

<i>a</i>	Cronbach's index of reliability (probability of Type I error)
<i>b</i>	Estimated value of regression coefficient
&	And
AI	Artificial Intelligence
ANOVA	Analysis of Variance
CI	Confidence Interval
df	Degrees of freedom
<i>F</i>	F distribution
M	Sample Mean
MD	Mean Difference
N	Number of cases per condition
N	Total number of cases
<i>p</i>	p-value
<i>r</i>	Spearman correlation coefficient
R ²	Multiple correlation squared
RQ	Research Question
SD	Standard Deviation
SE	Standard Error

1.Introduction

Year after year, technology is constantly being developed to improve the quality of people's lives. Nowadays, the implementation of automation methods, one of which is Artificial Intelligence (AI), is continuously being introduced in different working fields (Donepudi, 2018).

AI is a multidisciplinary field of computer science dedicated to creating systems capable of performing tasks that normally require human intelligence such as problem-solving, decision-making and language processing (Manaware, 2020). Recent technological advancements, such as the rise in computer power and the availability of vast quantities of data, have fostered substantial advancements in AI (Zhuang et al., 2017).

However, optimism must be balanced with caution. The spread of AI constitutes ethical and social issues that cannot be ignored. The introduction of automation technologies could result in massive employment losses, raising societal disruption risks (Au-Yong-Oliveira et al., 2019). Furthermore, as massive amounts of data are processed, privacy, data security, and even algorithmic discrimination become important considerations (Kantarcioglu & Ferrari, 2019). These problems necessitate collaborative efforts to examine, regulate, and define ethical frameworks for AI use.

In addition, the COVID-19 epidemic has been an unexpected stimulus for changes in daily activities and lifestyle patterns. One of the most compelling examples is in the domain of physical fitness. People needed to adapt when public gyms were forced to close for a prolonged period of time, which resulted in an increase in home-based training routines (Bagherian et al., 2021). Surprisingly, this situation also paved the way for the introduction and rapid adoption of AI-driven fitness coaching platforms, which were created as new solutions to assist people in maintaining their workout habits while confined to their homes (Bagherian et al., 2021).

Exercise on a regular basis has numerous advantages and benefits. In addition to promoting physical health by assisting in the prevention of numerous illnesses, such as diabetes and cardiovascular disorders, it helps to improve mental health by reducing the levels of anxiety and depression (Hu et al., 2020). Additionally, exercise can also improve overall life satisfaction, sleep quality, and cognitive function (Mandolesi et al., 2018) Moreover, exercise motivation varies significantly from person to person but is typically based on the desire for

better health and wellness, aesthetic goals, or stress relief (Mandolesi et al., 2018; Teixeira et al., 2012).

Therefore, the convergence of artificial AI and fitness underscores the growing importance of technology in facilitate the attainment of individuals' wellness objectives. Advanced fitness coaching systems powered by artificial intelligence have increased the availability of customized programs, accommodating various fitness levels, preferences, and health problems.

By examining people's perceptions and responses toward AI-based fitness coaching and conventional human-based coaching, the current thesis aims to investigate whether the type of coaching affects a person's desire to exercise regularly.

1.1. Academic and managerial relevance

Rapid growth in the use of AI-driven solutions for fitness and health is partly due to the convenience, scalability, and data-driven approaches that these technologies provide (Farrokhi et al., 2021a). There is, however, a concern among the people in the industry (Saadati, 2023). Could AI technologies, despite their promise, unintentionally result in inadequate training, possible accidents, or incorrect postures (Sharma, 2024; Bodhe, 2024)? Such problems may raise concerns on the possible benefits of AI in fitness and have actual consequences for consumer trust and acceptance. Looking at past literature no studies have compared AI coaching systems that can have the ability of preventing injuries with AI coaching systems with other features. It could be important in understanding this to create the most reliable AI coaching to promote people to exercise. Furthermore, despite de fact that researchers have already tested the likelihood of AI in replacing human trainers (Chi-Wai et al., 2011), their approach and sample differs from that of this study.

Leading fitness businesses that have adopted AI-driven technologies highlight how crucial it is to have visionary leadership that understands the proper balance between technology and human interaction (Chaurasiya et al., 2024). It is interesting, however, that a substantial number of fitness companies might not already have a clear plan in place for incorporating AI into their coaching programs (Everfit Team, 2024).

Two hypothetical scenarios are included in this paper, asking if an AI tool can the primary fitness coach for humans, guiding their daily routines either by providing real-time feedback and anticipating and preventing potential injuries or by providing personalized and recommending workouts based on fitness level and preferences. While this paper will not go

into great detail on the specific technicalities of creating such an AI system, the emphasis will be on understanding its acceptance and perceived utility. Given the current scenario in which personal trainers can offer a human touch, compassion, and empathy to their sessions, elements that AI finds difficult to replicate, it is critical to investigate the balance that customers demand between human and AI coaching. While users respect AI's convenience and data-driven approach, they also prefer the human connection, expertise, and customized touch that human trainers provide (Boratto et al., 2017).

To get the most out of AI, fitness businesses must be aware of their customers' interests and worries. Industry leaders must also acknowledge the inherent problems and opportunities associated with AI-coaching, be prepared to manage unexpected outcomes, and ensure that their plans align with consumer expectations. (Chaurasiya et al., 2024; Hamadeh, 2023).

1.2.Problem statement

To understand the impact of the coaching type (AI vs human) on individuals' willingness to do exercise, I analyzed potential consumers' preferences and attitudes towards AI coaches in four specific aspects. First, I investigated the perceived impact of AI-based fitness coaching and traditional human personal training on individuals' motivation to do exercise. Second, given the rapid technological advancements in AI systems and applications, it's vital to explore whether people find one coaching method more convenient than the other. Third, as concerns related to injuries and human posture are crucial in doing exercise, understanding these factors' role in coaching preference is essential. Fourth and lastly, with the rise in the implementation of AI in various sectors, it's important to identify the general opinion on whether AI-based coaching could completely overtake human trainers in the future.

Thus, the current research primarily seeks to answer the overarching question: “What are people's perceptions and preferences towards AI-based fitness coaching in comparison with human personal training?”. This can be subdivided into the following key research questions:

RQ1: Does coaching type (AI or human coaching) influence people's motivation to do exercise?

RQ2: Which coaching type is perceived as more convenient?

RQ3: Does the concern about injuries and human posture impact people's coaching type preference?

RQ4: Do people think AI coaching will eventually replace human coaching in the exercise domain?

1.3. Structure

The current work is organized in the following way: The next chapter will evaluate the pertinent literature in order to cover all the theoretical insights of the key concerns raised by the study's topics. This literature review will address several key areas: AI; the role of AI in fitness (benefits and limitations); the impact of AI on people's motivation to do exercise and convenience perceptions; the factors influencing the choice of AI-based coaching and, finally, the future of coaching in fitness. The next chapter will then outline the research strategy and methodology of the experimental study carried out. In the fourth chapter, the data collected will be examined. The discussion of all significant findings, as well as any limits and suggestions for further research, will be covered in the fifth chapter, which ends with a conclusion.

2. Literature review

2.1. Artificial intelligence

Artificial Intelligence (AI) has gained significant attention and made remarkable advancements in recent years (Zhang & Lu, 2021). AI refers to the development of intelligent machines that can perform tasks that typically require human intelligence such as perception, language understanding, reasoning, learning, planning, and problem solving. The field of AI has seen rapid growth and development in recent years, and it has already been implemented in various fields such as banking (Fares et al., 2023), agriculture (Liu Y, 2020), healthcare (Saraswat et al., 2022), and education (Zhai et al., 2021), among others. AI has also made significant contributions to the field of robotics (Torresen, 2018). Intelligent robots are being developed to perform complex tasks in various industries, including manufacturing (Pillai et al., 2021), healthcare (Kyrarini et al., 2021), and agriculture (Wakchaure et al., 2023). These

robots can autonomously navigate their environment, manipulate objects, and interact with humans.

One area of AI that has gained particular prominence is machine learning. Machine learning algorithms enable computers to learn from data and make predictions or decisions without being explicitly programmed (Raj, 2019). Another field of AI is deep learning, a subset field of machine learning that has revolutionized AI by utilizing artificial neural networks with multiple layers to process and learn from large amounts of data (Sarker, 2021). Finally, another important aspect of AI is natural language processing, which focuses on enabling computers to understand, interpret, and generate human language. Natural language processing techniques have been applied in chatbots, virtual assistants, and language translation systems, improving human-computer interaction and communication (Jurafsky & Martin, 2023).

Despite the promises and current achievements of AI, it can also lead to significant issues. For example, using AI in Transportation advanced autonomous vehicles depend on artificial intelligence algorithms to make decisions in complicated traffic situations. Programming autonomous vehicles to make split-second decisions, such as choosing between possible harm to the vehicle occupants or pedestrians, leads to ethical concerns (Olatunji Akinrinola et al., 2024). Secondly, in finance automated Credit Scoring Technology Credit scoring algorithms, driven by artificial intelligence, assess the creditworthiness of individuals by considering several criteria. There have been documented cases of prejudice, in which specific demographic groups are subjected to discriminatory credit evaluations. These biases can have significant consequences, restricting the ability of minority groups to access financial opportunities (Olatunji Akinrinola et al., 2024).

Consequently, ethical considerations are crucial in the development and deployment of AI systems. Issues such as privacy, bias, transparency, and accountability need to be addressed to ensure the responsible and ethical use of AI technologies. (Hagendorff, 2020).

One of the various area that AI is entering is fitness, which is the topic of the next section.

2.2 AI for fitness

AI is revolutionizing the fitness industry by providing personalized and engaging workout experiences (Fabrizio et al., 2023). First, with the use of machine learning algorithms, AI-based fitness technology can analyze data from wearable fitness devices and provide real-

time feedback on form and technique (Fabbrizio et al., 2023; Nahavandi et al., 2022). Additionally, it can create customized workout plans based on an individual's fitness level, goals, and physical characteristics (Fabbrizio et al., 2023). Second, another important application of AI in fitness is its use for injury prevention and rehabilitation (Van Eetvelde et al., 2021). This can include real-time feedback on the technique, which can help users avoid common mistakes that may lead to injury.

Third, AI can also be used in fitness in the field of rehabilitation, for example, for elderly individuals (Sardari et al., 2023). AI-based fitness technology can be used to create personalized workout plans for older adults which consider their specific needs and limitations. Additionally, it can also monitor, progress, and provide feedback to help older adults achieve their fitness goals in a safe and efficient manner (Görer et al., 2013). Fourth, AI in fitness has the ability to optimize sports performance by analyzing data from games and identify areas for improvement (Ghosh et al., 2023). This can be particularly beneficial for professional athletes and teams, but also for amateur and recreational sports players (Ghosh et al., 2023). This way, AI can assist coaches and trainers in making data-driven decisions and enhance the performance of the team or the individual.

Fifth, AI in fitness can also be integrated with natural language processing and conversational AI to create chatbots that can assist users with their fitness goals and answer their questions. These can help users with tracking their progress and provide them with additional resources and information to help them reach their goals (Chew, 2022; Rugved Lola et al., 2021).

AI-based fitness coaching is a growing trend that can offer a wide range of benefits to users. One of the main benefits of AI-powered fitness coaching is convenience (Chin et al., 2022). With the ability to access coaching through mobile apps, virtual personal trainers, and wearable devices, people can exercise at their own convenience and flexibility. This means that users can work out anytime, anywhere, making it easier to fit fitness workouts into their busy schedules as AI personal trainers are available 24/7 (Chin et al., 2022; Rugved Lola et al., 2021). AI fitness coaching can also offer advanced data tracking and analysis. By monitoring and analyzing data such as heart rate, sleep patterns, and activity levels, the technology can provide users with valuable insights on how to improve health and fitness (Mohammadi et al., 2020). Hence, human personal trainers may not have the same level of knowledge and expertise as AI-based systems. AI-powered fitness coaching can have access to vast amounts of data and research on fitness and nutrition, which can provide more accurate and up-to-date recommendations (de Moraes Lopes et al., 2020).

AI-based fitness coaching can provide several other potential advantages. First, it is often more affordable than conventional human personal training, thereby increasing the accessibility of fitness to a broader demographic, especially for individuals who do not have access to gyms or fitness facilities (Milioto M., 2024). Second, AI can effectively tackle the inconsistency commonly linked to human trainers, who may use diverse techniques and opinions, therefore interfering with clients' capacity to sustain a consistent exercise schedule. Third, AI addresses the issue of divided attention, which can be a challenge for human trainers to ensure the same focus on all customers, particularly when handling an extensive number of clients. This limitation can lead to a lack of improvement and frustration. Nevertheless, apart from these significant advantages, this thesis fundamentally emphasizes another substantial advantage: the convenience offered by AI-based coaching, particularly in terms of user accessibility and flexibility in promoting physical exercise. Finally, it is important to keep in mind that AI-powered fitness coaching is mostly viewed as a supplement to human trainers, rather than a replacement (Boratto et al., 2017; N. H. D. Terblanche et al., 2024).

However, using AI for fitness coaching can have drawbacks. One of the main concerns is bias. AI systems rely on the data they are trained on and if the data is biased, the model may not perform well for certain groups of people such as women or men, people of color, or those with disabilities (Ferrara, 2024). It can also have limitations in terms of computer vision in providing accurate motion tracking and detection issues in pose estimation (Garbett et al., 2021). This limitation has been found, for example, in AI-powered yoga instruction (Sharma, 2024b). Furthermore, AI-powered fitness coaching may not be able to provide the emotional support that people need to stick to their exercise routine (Čaić et al., 2020).

Because motivation is a crucial aspect of exercise, I turn to how AI may affect motivation, in contrast to human coaches, in the next section.

2.3 Motivation

The literature suggests that both AI fitness coaching and human personal trainers can influence people's motivation to exercise.

Kari & Rinne, 2018 conducted a study of 20 semi-structured interviews for participants who used a novel digital coaching solution with personalization and gamification features for one month. The study demonstrated that digital coaching positively increased physical activity on inactive individuals, suggesting an important role for technology in promoting exercise

motivation. The benefits of AI coaching fitness coaching were also supported by Singh et al., 2022 who created an AI fitness coaching solution that not only mimics the tasks performed by a human personal trainer but also provides real-time feedback on form and repetition counting increasing participants' motivation.

In addition, AI health coaches designed by Mohan et al., 2020 take this personalization one step further. These AI health coaches generate, track, and revise personalized exercise goals that evolve with the trainee, providing an incrementally challenging training program. The authors of the study note that this level of customization is something that might be challenging for human personal trainers, particularly if they are managing multiple clients. Mohan et al., 2020 conducted a 6-week observational study using these AI health coaches on a sedentary population. The results showed a significant increase in the weekly volume of exercise performed by participants, indicating the potential effectiveness of AI-based coaching. Furthermore, Oyibo et al., 2023 suggest that smart home technologies, especially digital personal assistants, coaches, and robots, are effective in promoting physical activity among the young population.

Moreover, Paay et al., 2022 found that digital personal assistants can effectively motivate people to increase their physical activity at home using suggestion, virtual reward, and praise principles. A study with 48 participants was conducted and verified the effect of a digital personal assistants who have the potential to persuade people to increase their physical activity at home, using suggestion to encourage physical effort, virtual reward to encourage endurance, and praise to create reassurance for beginners (Paay et al., 2022).

Finally, Ramgoolam et al., 2014 found no significant effect of coaching type (humanoid robot vs. human) on young adults' daily activity levels. In the paper, the authors describe a pilot study to compare the effects on young adults of coaching delivered by a social and mobile humanoid robot health coach versus a human health coach. Data analysis registered no significant statistical effect of coaching type on daily activity levels, suggesting further research with a larger sample size.

Hence, both human and digital coaching may effectively increase motivation to exercise, but in different ways. Human coaching often relies on personal interaction and psychological support (Reynders et al., 2019), while digital coaching harness technology to provide continuous feedback and guidance (Garbett et al., 2021). As the literature is not consistent in regard to the effect of coaching type on people's perceived motivation, the current study tries to assess this relationship to clarify previous results. Therefore, no differences are expected to see in regard to coaching type on motivation to exercise.

As mentioned in the AI for fitness section, I turn out to convenience in the next section as one of the main benefits of AI coaching devices.

2.4. Convenience

In the field of fitness, several studies highlight the benefits of AI coaching in people's convenience to use AI devices to exercise (Chew, 2022; Farrokhi et al., 2021; N. Terblanche et al., 2023), however none compare them to human personal trainers on this domain but rather as a supplement and tool to increase the user-human trainer experience (Chi-Wai et al., 2011; N. H. D. Terblanche et al., 2024).

Haoran et al., 2023 proposed an AI Fitness coach system that has multiple features such as: posture and pose recognition, fitness movement analysis and a feedback unit. It is an app that uses computer vision as the core technology and can be put into practice by a camera and at home turning it more convenient for the user. Furthermore, Lo et al., 2018 found out that the usage of other conventional interventions was reported to have been reduced with the use of the AI-embedded mobile app. The aim of the study was to investigate the perceived benefits of an AI-powered mobile app in therapeutic exercise. Moreover, Chin et al., 2022 hypothesized that perceived ease of use would positively influence attitudes towards AI services. There were recruited 410 participants who have an interest in using AI fitness services in their workouts. The study results concluded that the perceived ease of use was verified as predictor of positive attitudes that increase intention to use AI services. Finally, only Terblanche et al., 2022 compared both coaching types but on goal attainment efficacy. Results indicated that an AI chatbot coach was as effective as human coaches in facilitating clients in achieving their goals.

Although no studies directly compared AI based coaching and human based coaching on perceived convenience, as mentioned above, it is one of the greatest advantages of AI coaching in generating data-driven real time feedback and accessibility, so it is interesting to see to what extent this benefit mentioned in the literature is perceived by potential users. Therefore, I hypothesize that:

H1: People will perceive AI coaching systems as more convenient than human personal trainers.

2.5. Reasons to choose AI coaching

Real-time feedback and form correction are one of the reasons people could choose AI coaching systems to exercise. AI can provide real-time feedback on exercise form and technique improving workout effectiveness and reducing the risk of injury (Bodhe, 2024; Haoran et al., 2023; Singh et al., 2022; Wang et al., 2019; Ying et al., 2021). Consequently, (Wang et al., 2019) developed an AI coaching system that provides personalized experiences for sports activities that heavily rely on proper posture. This study underscores the potential of AI coaching in addressing posture concerns which may directly affect sports performance and injury risk.

Personalization and customization are another main reason why people would use AI coaching devices. AI can personalize training programs based on performance data and goals, and individual needs that can offer tailored interventions that optimize training outcomes (Fabrizio et al., 2023; Parashar et al., 2023; Schmidt et al., 2015; Singh et al., 2022).

In general, although the literature does not explicitly address this research question, it does indicate that factors such as pose analysis, injury prevention, and personalization and customization are relevant to include in the discussion of AI coaching capabilities and reasons for using AI coaching devices. Therefore, it is pertinent to examine whether pose analysis and injury prevention is considered more valued by prospective users when opting for coaching type to exercise in comparison to other features, such as customized exercise and diet plans, or incentive systems when choosing between AI and human coaching. Thus, a comparison analysis will be undertaken between these two benefits.

2.6. Future of coaching in Fitness

When considering the research question of whether AI-based coaching might completely substitute human-based fitness coaching in the future, the current body of literature largely indicates that this is unlikely.

(Terblanche et al., 2020) clarified the factors that influence the behavior intention to hire an AI coach. In addition to identifying age, gender, and level of goal achievement as moderating variables, their findings emphasized performance expectancy, social impact, and attitude as key elements. The findings mentioned above emphasize that the perceived usefulness and

acceptance of AI coaching might be greatly influenced by human differences, so potentially restricting its universal applicability. Additionally, (Čaić et al., 2020) found that elderly people perceived human coaches as warmer and more competent than robotic coaches.

Moreover, (Boratto et al., 2017) found that e-coaching systems should create their coaching protocols always taking into account the effectiveness of the support of qualified professionals over completely automated approaches. This suggests that the optimal use of AI-based coaching may be in a supplementary role, where a human personal trainer can monitor the client's progress and give feedback by harnessing the capabilities of AI-based devices (Boratto et al., 2017).

Complementing these insights, (Chi-Wai et al., 2011) found that, while mobile virtual fitness applications cannot substitute human fitness trainers, they can provide valuable support to both trainers and trainees.

In conclusion, while AI-based coaching systems have demonstrated some advantages, however, they have not yet managed to fully replicate the unique benefits provided by human coaching. Thus, I hypothesize that:

H2: People will consider that AI coaching will not be able to replace human coaching in the exercise domain in the future.

3. Methodology

This section covers, in detail, how the study was conducted to explore the research questions, including the research strategy and design, the characteristics of the sample that was obtained, the experimental process, and the measurement of the dependent and independent variables.

3.1. Research strategy and design

This current study had four predefined objectives. First, it was determined if either AI coaching or human-based coaching can influence people's motivation to do exercise. Second, it was determined which type of coaching is more convenient between an AI and a human trainer. Third, it was assessed whether injuries are the reason people tend to choose either AI

coaching systems or human trainers. Fourth, it was determined if participants perceived that AI could fully replace human trainers in the future.

Consequently, for the first two outlined objectives, participants were surveyed to evaluate their motivation and perceived convenience in doing exercise when monitored by AI devices and/or AI-based coaching systems, as opposed to human-based coaching by personal trainers.

For the third and fourth desired outcomes, an experimental vignette study was conducted to determine if injuries were the main reason why people tend to opt for either AI coaching systems or human trainers to do exercise. For this, participants were randomly assigned to two different scenarios. The first scenario explained that scientists were developing AI coach systems with the objective of analyzing human movements so that it can prevent injuries and detect bad human poses and posture when indulging in physical activities. Finally, it asked participants if they think that, based on the scenario mentioned before, an AI coach system could fully replace human personal trainers in the future. The second scenario asked the same question; however, it mentioned that scientists were mainly focused on developing AI coach systems to provide personalized training experiences, including workout routines and nutrition diets based to the athlete's objectives or preferences. Moreover, a reward system was available based on the athlete's performance and progression.

3.2. Participants

The participants were recruited as volunteers using several social media platforms including Instagram, Whatsapp, and Facebook, as well as two independent online recruiting services, SurveyCircle and SurveySwap. My colleagues and I operated on a mutually beneficial principle, where community members responded to each other's surveys in return for participants for our research. Participants were randomly distributed by the reward system group and the injuries and posture detection group using the Qualtrics randomization tool. Despite all the participants consenting in participating in this experiment, 42 were excluded for not answering all questionnaire questions. Therefore, the total valid sample for this study was 146 participants. Moreover, reversed scored items were recoded, such as the perception that AI will cause many job losses variable presented in the attitudes towards AI scale.

Among the participants in the sample, 62.2 % were female and 37.8 % were male. When classifying the gender variable, participants who identified as non-binary, other, or prefer not to disclose were classified as female due to the minority of these cases in the total sample. In the total sample, 37.7 % of participants were Portuguese and the other 62.3 % were from a diversity of different nationalities including English (10.3%) American (9.6%), Dutch (3.4%), and German (3.4%) as the most represented nationalities. Further demographic information can be found in Appendix 3.

3.3. Procedure

The study started with a concise introduction outlining the goals of the study, followed by the informed consent form. Afterwards, participants were asked about several demographic questions: age, gender, education level, nationality, and employment status. Then, other potential covariates were measured regarding participants' self-reported AI knowledge level, attitude towards AI, fitness knowledge, and exercise adherence. Moreover, people were asked how motivated they were towards doing exercise being monitored by AI-based coaching systems or by using smart fitness apps on their own (depending on condition) and subsequently how motivated they were by doing physical activities monitored by personal trainers. Then, participants proceeded with an experimental vignette study to explore whether injuries and posture detection can be an important reason why people would rather exercise by being monitored by personal trainers in contrast of doing exercise on their own with the assistance of AI coach systems or AI devices by asking how sure the participants were that AI could replace human trainers.

3.4. Measurement of Variables

3.4.1. Independent Variable

Coaching type: This variable represented whether participants were asked about AI coaching or human-based coaching on the motivation and convenience to engage in exercising activities.

AI benefit: This variable was represented in a vignette study by randomly assigning participants to two different AI coaching systems highlighting two different benefits: an AI

coaching system who could detect posture and help with injury prevention (measured as posture group for analysis and classified as 0) and another AI coaching system who could personalize trainings and nutrition recommendations based on fitness level and objectives and reward systems depending on athlete's progression and performance (measured as reward group for analysis and classified as 1) . In both scenarios the participants were asked from a 5-point Likert scale ranging from ranging from 1 (*Completely sure they cannot fully replace*) to 5 (*completely sure they can fully replace*) how sure were the participants that an AI coaching system or robot could fully replace human personal trainers in the future.

3.4.2. Dependent Variables

Motivation to exercise: Motivation was evaluated based on participants' self-reported level of enthusiasm in indulging in physical exercise. Survey respondents were queried about their motivation levels during physical activities monitored by personal trainers, as well as their motivation towards doing physical activities when utilizing smart fitness apps or being monitored by AI-based coaching systems (depending on condition). Responses were collected using a 7-point Likert scale ranging from 1 (*not motivated at all*) to 7 (*very motivated*).

Convenience to exercise: Convenience was assessed as the perceived ease and accessibility of integrating the coaching method into participants' daily routines. Survey responses were collected utilizing a 7-point Likert scale from 1 (*not convenient at all*) to 7 (*very convenient*) to determine how convenient it was to exercise utilizing AI fitness devices and/or AI coaching systems on their own_(in the AI coaching condition) or how convenient it was for the participants to do exercise monitored by personal trainers (in the human-based condition).

Prediction of human replacement: Prediction of human replacement was measured by participants' stated likelihood that AI coaching would replace human-based coaching in the future through a 5-point Likert scale ranging from 1 (*Completely sure they cannot fully replace*) to 5 (*completely sure they can fully replace*).

3.4.3. Demographics and covariates

Demographics: In this study, five demographic variables were measured. First, participants were asked to select their age. Second, gender was measured by using a multiple choice item using the following options: 1) “male”; 2) “female” 3) “other” 4) ”Prefer not to say”. For analysis purposes, “male” was classified as 1 and options “female”, “other” and “Prefer not to say” were classified as 0. Third, participants were asked to select their nationality. This variable was classified as 1 for Portuguese and 0 for others for analysis. Fourth, participants were asked about their education, and it was measured using a multiple-choice item ranging from “Less than 12th grade” to “Master’s degree” and “other” option was provided. Finally, employment status was measured using a multiple-choice item using the following items 1) “Employed”; 2) “Unemployed”; 3) “Student”; 4) “Retired; 5) “Student and worker”. Then, the variable was categorized as 1 for “Employed” and 0 for “Unemployed” for analysis.

Self-reported familiarity with AI: Self-reported familiarity with AI was evaluated as participants' understanding of the AI concept. This item was measured by assessing if participants were aware (“Yes” vs. “No”) with the term AI.

Attitude towards AI: Attitude towards AI was assessed as participants' general disposition towards AI, including their perceptions of trust and acceptance of AI technologies. It was measured by utilizing a modification of the attitude towards AI scale by (Sindermann et al., 2021). The scale consisted of responding, using a 7-point Likert Scale ranging from “Strongly disagree” to “Strongly agree”, to the following three statements: “I trust artificial intelligence”, “Artificial intelligence will benefit mankind”, and “Artificial intelligence will cause many job losses”.

Fitness knowledge and awareness: Fitness awareness was assessed as participants' consciousness and understanding of their own fitness level, health benefits of exercising, and knowledge about available fitness resources. It was measured by asking participants to assess how informed they were about fitness through a 5-point Likert scale ranging from “not well at all” all the way to “extremely well”.

Exercise Adherence: Exercise adherence was evaluated as participants' frequency of doing exercise. It was measured by asking the survey participants how often they exercise or play any sports through multiple-choice item ranging from “Never” to “Regularly”.

4. Results

This chapter will present this study's relevant results including the statistical methods used to analyse the tests that were conducted. The data was analysed using IBM SPSS Statistics (Version 29).

4.1. Scale Reliability

The current study included a single scale which aimed to measure attitudes towards AI. To test its reliability, a Cronbach's α was computed as a measure of internal consistency. This scale had an α coefficient equal to .54. Considering that the Cronbach's α coefficient is below .60, the items revealed to have a low internal consistency (Bland & Altman, 1997). Therefore, each of the items were used individually.

4.2. Data Analysis

4.2.1. Descriptive Statistics

The descriptive statistics indicates that in relation to the attitudes towards AI, AI Trust has a mean value of 4.56 ($SD = 1.48, p < .001$), representing a moderately high level of trust in AI. This score, being above the midpoint of the scale, suggests that participants generally view AI with a positive attitude in terms of trustworthiness. Similarly, the AI benefit to humankind variable has an even higher mean of 4.95 ($SD = 1.42, p < .001$), placing closer to the top of the scale. This reveals that participants strongly believe in the positive impact of AI on society, with this variable displaying to be the highest mean among all variables measured.

However, this optimism is moderated by significant concerns regarding AI's potential impact on employment. AI Job Loss is a reverse-coded item, where a lower score reflects greater concern about the fact that AI could lead to substantial job losses. This variable registered a mean score of 2.68 ($SD = 1.21, p < .002$), which is below the midpoint of the scale. This suggests that participants are quite concerned that AI might lead to job losses, indicating

a more cautious or pessimistic view of AI's impact on employment. The descriptive statistics are presented in table 1 in more detail in Appendix 3.

4.2.2. Bivariate correlations

In terms of the variables that more strongly correlated with the current study's dependent variables, perceived convenience with Human-based coaching and perceived motivation with AI-based coaching were found to have a strong positive association ($r = 0.70, p < .01$). This significant correlation suggests that individuals who find human-based coaching more convenient are also more likely to be motivated when using AI-based coaching systems. Additionally, the correlation between the perceived motivation to exercise with an AI coach and perceived convenience with AI coaching systems is also strong, with a coefficient of $r = 0.61, p < .01$. This suggests that individuals who are motivated to exercise with AI coaching systems also find AI coaching more convenient.

When comparing the coaching type on perceived convenience to exercise, a significant correlation was observed between perceived convenience with AI coaching and perceived convenience with Human-based coaching to do physical activities, with $r = 0.43, p < .01$. This result implies that those who find exercising with AI coaching devices convenient are also likely to find doing exercise with human trainers convenient, indicating a strong link between the perception of AI coaching and human coaching in convenience to exercise.

Considering the covariates, the correlation between Fitness Knowledge and Exercise Frequency variables was also found to be significant $r = 0.49, p < .01$. This moderate ($r > .30$) positive relationship suggests that individuals with greater knowledge of fitness are more likely to engage in regular physical activities, demonstrating the impact of fitness knowledge on behavior. Finally, with a correlation coefficient of $r = 0.74, p < .01$, the relationship between AI Trust and the belief that AI will benefit humankind is the strongest seen in this study. With a statistically significant and strong ($r > .50$) positive correlation, it is possible that those who trust AI will also see more benefits from its application.

Bivariate correlations are presented in more detail in the Appendices' section Tables 2 and 3, respectively.

4.3. Main analysis

4.3.1. Exercise Motivation

As the literature is not consistent in regard to the effect of coaching type on people's perceived motivation, no differences are expected to see between AI-based coaching and human-based coaching.

To test this effect, I conducted a paired-samples *t*-test to determine whether there is a significant difference between the means of the two groups. Results showed that participants report, statistically, more motivation to do exercise when monitored by personal trainers ($M = 4.58$, $SD = 1.62$) rather than on their own by using smart fitness apps or AI coaching systems ($M = 4.08$, $SD = 1.75$), $t(145) = -2.87$, $p = .005$. Furthermore, the correlation coefficient of 0.22 indicates a positive, though weak, correlation between the two types of motivation scores, which is statistically significant with $p = .007$.

Then, a repeated-measures ANOVA was conducted to control for certain covariates. According to the test of within-subjects effects, none of the covariates used significantly impacted how participants' perceptions of motivation changed across the two coaching types. For more detailed information see Appendix 6.

4.3.2. Exercise Convenience

H1 predicted that participants would perceive a difference in convenience between personal trainers and AI coaching systems favoring the latter. To test this effect, I again conducted a paired-samples *t*-test to determine whether there is a significant difference between the means of the two groups. Results showed that, statistically, participants consider doing exercise on their own by using smart fitness apps or AI coaching systems more convenient ($M = 4.58$, $SD = 1.62$) rather than doing exercise monitored by personal trainers ($M = 4.08$, $SD = 1.75$), $t(145) = 2.80$, $p = .006$. The paired samples correlation analysis revealed the relationship between convenience scores for the two conditions. The correlation coefficient ($r = 0.22$)

indicated a positive, but weak, correlation between the two types of convenience scores. This correlation was found to be statistically significant ($p = .008$).

Then, a repeated measured ANOVA was again conducted to test the interactions and effects of the different covariates on the convenience variable. Both the tests for within-subjects effects and between-subjects effects showed that none of the covariates used significantly impacted how participants' perceptions of convenience changed across the two coaching types. For more detailed information see Appendix 7

4.3.3. AI replacement prediction

Finally, it was explored whether injuries and posture detection could be an important reason why people would rather exercise by being monitored by personal trainers or by doing exercise on their own with the assistance of AI coach systems. It was expected that participants would not perceive any difference when the ability of AI to correct and suggest proper posture is highlighted in comparison to when other features (workout routine creation, nutrition, and reward system) are highlighted on predicting that AI could fully replace personal trainers in the future. To test this effect, an independent t-test was conducted. Results showed that there was no significant difference between participants who were presented with the scenario of AI coaching systems that suggest proper posture to believe AI will replace personal trainers in the future ($M = 2.89$, $SD = 1.08$) in comparison to when other features are highlighted ($M = 2.81$, $SD = 1.05$), $t(145) = .468$, $p = .641$.

Then, univariate ANOVA was conducted to control for certain covariates. Considering the between-subjects effects, when comparing the two groups on the participants' prediction that AI could fully replace personal trainers in the future, the results shows that there was no significant difference between them, $F(1, 141) = .29$, $p = .606$. Additionally, covariates were tested to see the effects on the dependent variable. Results showed that none of the covariate tested had a significant effect on the dependent variable.

Lastly, H2 predicted that people would perceive that AI coaching systems would not be able to fully replace human personal trainers in the future. To test this hypothesis a one-sample t-test was conducted against the value of 3 in a 5-point Likert-scale. The results suggest that, on average, participants tend to consider that AI coaching systems cannot not fully replace human personal trainers ($M = 2.85$, $SD = 1.06$), however, this belief is not strong due to the

proximity to the mean of the scale and due to the fact that is only significant using a one-tailed t-test , $t(145) = -1.72, p = .044$.

Then, ANOVA was conducted again to control for certain covariates.

Considering the test of between-subjects, the results suggests that AI perceived trust by the participants $F(1, 141) = 6.29, p = .016$ and perception that AI will cause job losses in the future $F(1, 141) = 5.58, p = .024$, interactions were significant on the dependent variable. This result suggests that participants who perceive AI as a trustworthy technology are more likely to believe that AI could potentially fully replace human trainers in the future, $b = .141, SE = .058, p = .016$. In addition, participants who perceive that AI would cause many job losses are also more likely to believe that AI could potentially fully replace human trainers in the future, $b = -.164, SE = .072, p = .024$. For more detailed information see Appendix 8.

5. Discussion

5.1. Research findings and main conclusions

Part of this study's objectives was to evaluate the impact of AI-based coaching versus human personal trainers on individuals' motivation to exercise and perceived convenience. In individuals' motivation to exercise the literature is not consistent in regard to the effect of coaching type on people's perceived motivation, however, the current study tried to assess this relationship to clarify previous results. Therefore, I expected that there would be no difference between the coaching type on people's motivation to do exercise.

The findings revealed a statistically significant higher motivation to engage in physical exercise when monitored by human personal trainers compared to AI-based systems. This result matches the literature that suggests that the personalized touch and empathy provided by human trainers still play a crucial role in motivation (Čaić et al., 2020). However, the correlation coefficient from the two coaching types indicated a positive, though weak, correlation between the two types of motivation scores, which was statistically significant. Hence, it can suggest that people could be naturally motivated to exercise in general regardless of the coaching type. Therefore, the results did not meet the expectations that there would be no difference between the coaching type on people's motivation to do exercise.

H1 predicted that participants would perceive a difference in convenience between personal trainers and AI coaching systems favouring the latter. Results were significant indicating that statistically participants considered doing exercise on their own by using smart fitness apps or AI coaching systems more convenient rather than doing exercise monitored by personal trainers. The correlation coefficient indicated a positive, but weak, correlation between the two types of convenience scores. This correlation was found to be statistically significant ($p = .008$). Consequently, it can suggest that individuals who find it convenient to exercise using AI fitness devices also tend to find it somewhat convenient to exercise with personal trainers. Therefore, the results confirm H1 that participants would perceive AI coaching systems as more convenient to do exercise rather than human personal trainers.

Then, I wanted to explore whether injuries and posture detection can be an important reason why people would rather exercise by being monitored by personal trainers or by doing exercise on their own with the assistance of AI coach systems. Based on previous literature, I expect that there will be no difference in prediction of the potential of AI to replace personal trainers when the ability of AI to correct and suggest proper posture is highlighted in comparison to when other features (workout routine creation, nutrition, and reward system) are highlighted. An independent samples t-test was conducted. It indicated that when comparing both AI benefit scenarios on the participants' prediction that AI could fully replace personal trainers in the future, the results shows that there was no significant difference between them. It suggests that participants did not find injury prevention as a reason to prefer either AI coaching or human trainers to indulge in physical activities. Therefore, this result is according to what was expected in the literature review since there were no previous studies directly correlating these two AI coaching benefits.

Moreover, H2 predicted that people would perceive that AI coaching systems would not be able to fully replace human personal trainers in the future. Results showed some evidence for this hypothesis, as the average was found to be below the middle of the scale in a one-tailed t-test. Hence, the study partially supports H2 that AI coaching systems could not fully replace human personal trainers in the future. This result supports the literature that AI coaching systems will not be able to fully replace human trainers (N. Terblanche et al., 2022).

5.2. Academic and managerial relevance

This dissertation contributes to the growing collection of scientific literature on the incorporation of AI in fitness coaching, specifically examining its influence on motivation and convenience for physical activity, whether injuries impact coaching type preferences and if they could potentially replace human trainers in the future. Through a comparison of AI-based coaching and conventional human personal training, this study presents empirical data that emphasizes the clear benefits and possible constraints of AI-driven fitness solutions. These observations deepen our comprehension of the intricate function AI has in fitness, indicating that, although AI can improve convenience and accessibility, it still faces challenges in reproducing the profound influence of human connection on motivation.

From a managerial standpoint, the findings of this study have important implications for fitness enterprises and developers of technology. The proven convenience of AI coaching systems implies that these technologies have the potential to significantly contribute to the expansion of fitness services, especially for clients who appreciate adaptable and readily available solutions. Integrating AI into fitness businesses might enable the provision of scalable and customized workout experiences, hence potentially decreasing expenses related to human trainers while maintaining an exceptional level of service. Nevertheless, the results equally emphasize the need of preserving human aspects in fitness coaching to augment motivation and customer involvement. Managers should approach the integration of AI as a supplementary tool rather than a complete substitute for human trainers, also in line with previous literature (Boratto et al., 2017; N. H. D. Terblanche et al., 2024). This strategy has the potential to successfully address a wide range of customer requirements by integrating the effectiveness and user-friendliness of AI with the compassionate and tailored assistance of human coaches. Furthermore, it is essential to comprehend the apprehensions regarding AI, such as the displacement of jobs and trust. This understanding is vital for formulating tactics that effectively tackle these worries, thereby enhancing client confidence and acceptance of AI technologies in the physical fitness industry.

5.3. Limitations and future research

Several limitations of this study must be acknowledged. First, the use of self-reported data may induce bias since participants might overestimate the degree of convenience or motivation. Although acceptable, the sample size might not accurately reflect the larger population, which could limit the extent to which the results can be generalized. Second,

another limitation is related to the measurement of variables. The scale used showed some limitations in reliability (Cronbach's $\alpha = .54$ for the attitudes towards AI scale). Third, specification of the AI device used could have had a different impact on people's perceived motivation and convenience and whether the same technology can replace human trainers in the future. Fourth, this study is only a snapshot in a particular time and thus may not capture the dynamics of motivation and convenience which typically fluctuate over time. Hence future research could address these limitations by 1) employing longitudinal designs to examine how motivation and convenience perceptions evolve over time with consistent use of AI or human coaching, 2) refining the attitude towards AI scale to ensure greater reliability, 3) exploring a larger and more diverse sample to enhance the generalizability of the findings, 4) investigating the specific features of AI coaching and AI devices that most significantly impact user motivation and convenience. Lastly, 5) exploring the integration of AI with human trainers in a hybrid model could reveal optimal strategies for combining the strengths of both approaches (Dergaa et al., 2024).

6. Conclusion

AI-based fitness coaching is still in its early stages, and there are still a lot of unanswered questions on how it will affect exercise convenience and motivation in the long run and if it will eventually replace human trainers in the future. This research represents one of the initial steps toward understanding how AI can be integrated into fitness coaching, reasons for use or not use this technology and how it compares to human trainers. While AI coaching shows promise, especially in terms of convenience, it still cannot match the motivational elements offered by human trainers. It is my hope that this study contributes to the ongoing conversation about the role of AI in fitness and encourages further research to refine these technologies for a better and more supportive fitness environment for all.

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8. Appendix

Appendix 1: Study questions

Welcome and thank you for participating in this experiment on AI (Artificial Intelligence). I, Francisco Meneses, am conducting this experiment as part of my Master Thesis at Católica Lisbon School of Business and Economics, under the supervision of Professor Cristina Mendonça.

The study consists of answering several questions regarding AI-based coaching and Human-based coaching in Fitness and how they impact people`s willingness to do exercise.

This study will take no longer than 5 minutes to complete.

Please answer as honestly as possible. All answers will be kept strictly confidential and are anonymous. This means that there will be no way to link your responses to your identity. The data collected will be used for research purposes only. Your participation will contribute to research on the effects of AI in Fitness.

There are no expected side effects of participating in this study. You may drop out at any point.

If you have any questions about this study, please email Francisco Meneses (s-fmmeneses@ucp.pt). By continuing you agree to participate.

Thank you!

PS: This survey contains completion codes for SurveyCircle and SurveySwap.io.

Demographics

Q1 Age

Q2 Gender

Male (1)

Female (2)

Other (3) _____

Prefer not to say (4)

Q3 Education Level

Less than 12th grade (1)

12th grade (2)

Bachelor's degree (3)

Master's degree (4)

Other (5) _____

Q4 Nationality

Q5 Employment Status

- Employed (1)
- Unemployed (2)
- Student (3)
- Retired (4)
- Student & Worker (5)

Q6 AI Knowledge Are you familiar with the term AI?

- Yes (1)
- No (2)

Q7 If yes, do you use AI based fitness devices to do exercise?

- Yes, smart fitness apps and websites (1)
- Yes, wearable trackers (smart watches and wrist bands) (2)
- Yes, Other (3) _____
- No (4)

Q8 Please indicate how much do you agree with the following sentences regarding Artificial Intelligence (AI):

	Strongly Disagree (1)	Disagree (2)	Slightly disagree (3)	Neither agree nor disagree (4)	Slightly agree (5)	Agree (6)	Strongly agree (7)
I trust Artificial Intelligence (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Artificial Intelligence will benefit Humankind (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Artificial Intelligence will cause many job losses (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 How often do you exercise or play sports?

- Never (1)
- Seldom (2)
- With some regularity (3)
- Regularly (4)

Q10 How informed are you regarding fitness?

- Not well at all (1)
- Slightly well (2)
- Moderately well (3)
- Very well (4)
- Extremely well (5)

Q11 Please indicate from a 1 (**not motivated at all**) to 7 (**very motivated**) scale how motivated are you towards doing exercise by using smart fitness apps and/or being monitored by AI based coaching systems on your own.

1

2

3

4

5

6

7

Q12 Please indicate from a 1 (**not motivated at all**) to 7 (**very motivated**) scale how motivated are you towards doing exercise monitored by personal trainers.

1

2

3

4

5

6

7

Q13 Please indicate from a 1 (**not convenient at all**) to 7 (**very convenient**) scale how convenient it is for you to do exercise using AI fitness devices on your own.

1

2

3

4

5

6

7

Q14 Please indicate from a 1 (**not convenient at all**) to 7 (**very convenient**) scale how convenient it is for you to do exercise monitored by personal trainers.

1

2

3

4

5

6

7

Q15 Scientists are currently developing AI coach systems to provide personalized athletic training experiences. This AI system would be capable of estimating and analyzing human

movements in order to prevent injuries and detect bad human poses and posture in fitness exercises. At the same time, the AI system would suggest the right poses and movements for the athlete to do.

From a 1 to 5 scale (**1-Completely sure they cannot fully replace** to **5-Completely sure they can fully replace**) please indicate how sure are you that an AI coach system or a robot could fully replace human personal trainers in the future?

1

2

3

4

5

Q16 Scientists are currently developing AI coach systems to provide personalized athletic training experiences. This AI system would be capable of tracking and developing workout routines for the athletes and also recommend the best nutrition diet based on their fitness objective. Additionally, a reward system would be available depending on the athletes' performance and progression.

From a 1 to 5 scale (**1-Completely sure they cannot fully replace** to **5-Completely sure**

they can fully replace) please indicate how sure are you that an AI coach system or a robot could fully replace human personal trainers in the future?

1

2

3

4

5

Appendix 2: Study Overview

Table 1

Study Sample Size

	Valid		Invalid		Total	
	N	%	N	%	N	%
Answers	146	89.4	42	10.6	188	100

Table 2

Scenarios frequency

	N	%
Posture Prediction	73	50
Reward Prediction	73	50

Appendix 3: Study demographics

Table 3

Sample Demographic characteristics of study

	Participants total #	Scenario		Total
		Posture 73	Reward 73	
Gender	Male	33,8 %	41,7 %	37,8 %
	Female	66,2 %	58,3 %	62,2 %
Age	17-39	90,4 %	90,4 %	90,4 %
	40-59	9,6 %	8,2 %	8,9 %
	60-79	-	1,4 %	0,7 %
Nationality	Portuguese	38,4 %	63,0 %	37,7 %
	Other	61,6 %	37,0 %	62,3 %
Employment Status	Employed	39,7 %	32,9 %	36,3 %
	Unemployed	1,4 %	5,5 %	3,4 %
	Student	41,1 %	50,6 %	45,9 %
	Retired	1,4 %	1,4 %	1,4 %
	Student & Worker	16,4 %	9,6 %	13,0 %
Education	Less than 12th grade	-	1,4 %	0,7 %
	12th grade	21,9 %	19,2 %	20,5 %
	Bachelor's degree	43,9 %	49,3 %	46,6 %
	Master's degree	30,1 %	27,4 %	28,8 %
	Other	4,1 %	2,7 %	3,4 %

Appendix 4: Descriptive Statistics

Table 4

Age – Descriptive Statistics

Variable	N	Min	Max	M	SD
Age	146	17.00	71.00	25.98	9.02

Table 5.

Descriptive statistics for the variables tested in this study.

Variable	M	SD
AI Trust	4.56	1.48
AI Benefit Human Kind	4.94	1.42
AI Job Loss	2.69	1.21
Exercise Frequency	2.97	0.84
Self Assessed Fitness Knowledge	3.05	1.00
AI Motivation	4.08	1.62
Human Motivation	4.58	1.75
AI Convenience	4.72	1.72
Human Convenience	4.20	1.88
Posture Prediction	2.89	1.07
Reward Prediction	2.81	1.05

Appendix 5: Bivariate Correlations

Table 6

Bivariate correlations list for all variables.

Variable	1	2	3	4	5	6	7	8
1. Age	1	-.053	.197*	.059	.114	.066	-.120	-.160
2. Male	-.053	1	-.071	.333**	.081	-.093	.269**	.230**
3. Education	.197*	-.071	1	.167*	.259**	.054	-.036	-.060
4. Portuguese	.059	.333**	.167*	1	.336**	.030	.394**	.240**
5. Employed	.114	.081	.259**	.336**	1	.002	.265**	.155
6. AI Familiarity	.066	-.093	.054	.030	.002	1	-.085	-.079
7. AI Trust	-.120	.269**	-.036	.394**	.265**	-.085	1	.737**
8. AI Benefit	-.160	.230**	-.060	.240**	.155	-.079	.737**	1
9. AI Job Loss	.052	-.033	.202*	-.027	.036	.129	-.014	.030
10. Exercise Frequency	-.019	.202*	-.003	.015	-.123	-.065	-.007	-.082
11. Fitness Knowledge	.094	.201*	.104	.076	.021	.054	.047	.055
12. Motivation AI	-.054	-.089	-.119	.173*	.106	.104	.304**	.206*
13. Motivation Human	-.067	-.037	.057	.076	.154	-.039	.205*	.266**
14. Convenience AI	-.148	-.001	-.067	.136	.130	-.050	.288**	.300**
15. Convenience Human	-.086	.058	.087	.242**	.181*	-.013	.270**	.248**
16. Prediction Posture	-.134	-.171	-.044	.151	.081	.105	.363**	.192
17. Prediction Reward	-.038	.177	.212	-.036	-.042	-.281*	.062	.039

Note: *** p <.001, ** p<.01, * p<.05

Table 7

Bivariate correlations list for all variables (continuation).

Variables	9	10	11	12	13	14	15	16	17
1. Age	.052	-.019	.094	-.054	-.067	-.148	-.086	-.134	-.038
2. Male	-.033	.202*	.201*	-.089	-.037	-.001	.058	-.171	.177
3. Education	.202*	-.003	.104	-.119	.057	-.067	.087	-.044	.212
4. Portuguese	-.027	.015	.076	.173*	.076	.136	.242**	.151	-.036
5. Employed	.036	-.123	.021	.106	.154	.130	.181*	.081	-.042
6. AI Familiarity	.129	-.065	.054	.104	-.039	-.050	-.013	.105	-.281*
7. AI Trust	-.014	-.007	.047	.304**	.205*	.288**	.270**	.363**	.062
8. AI Benefit	.030	-.082	.055	.206*	.266**	.300**	.248**	.192	.039
9. AI Job Loss	1	.037	.041	.093	.020	-.011	-.002	-.033	-.263*
10. Exercise Frequency	.037	1	.486**	.027	.126	-.031	.109	-.187	.029
11. Fitness Knowledge	.041	.486**	1	-.006	.115	.032	.094	-.207	.087
12. Motivation AI	.093	.027	-.006	1	.221**	.606**	.350**	.557**	.083
13. Motivation Human	.020	.126	.115	.221**	1	.206*	.701**	.151	-.091
14. Convenience AI	-.011	-.031	.032	.606**	.206*	1	.218**	.424**	.065
15. Convenience Human	-.002	.109	.094	.350**	.701**	.218**	1	.217	.072
16. Prediction Posture	-.033	-.187	-.207	.557**	.151	.424**	.217	1	. ^c
17. Prediction Reward	-.263*	.029	.087	.083	-.091	.065	.072	. ^c	1

Note: *** p < .001, ** p < .01, * p < .05

Appendix 6: Motivation

Table 7

Motivation - Paired samples statistics

Paired Samples Statistics					
Motivation		M	N	SE	SE Mean
		AI	4.08	146	1.62
	Human	4.58	146	1.75	.14

Table 8

Motivation - Paired samples t-test

Paired Samples Test

Paired Differences

	M	SE	SE Mean	95% Confidence Interval of the Difference		t	df	Significance	
				Lower	Upper			One-sided p	Two-sided p
				Motivation AI - Motivation Human	-.50			2.11	.17

Table 9

Motivation - ANOVA - Test of within-subjects

Variables	Type III Sum of Squares	df	Mean Square	F	p
Motivation	.40	1	.40	.18	.671
Motivation * Portuguese	.43	1	.43	.20	.659
Motivation * AI_Trust	6.47	1	6.47	2.95	.088
Motivation * AI_Benefit_Humankind	8.11	1	8.11	3.70	.056
Error(Motivation)	311.03	142	2.19		

Table 10

Motivation - ANOVA - Test of between-subjects

Variables	Type III Sum of Squares	df	Mean Square	F	p
Intercept	164.886	1	164.886	52.659	<.001
Portuguese	.833	1	.833	.266	.607
AI_Trust	7.912	1	7.912	2.527	.114
AI_Benefit_Humankind	4.961	1	4.961	1.584	.210
Error	444.631	142	3.131		

Table 11

Motivation - ANOVA - Parameter estimates

Dependent variable	Parameter	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Motivation AI	Intercept	2.667	.482	5.54	<.001
	Portuguese	.207	.291	.71	.479
	AI_Trust	.333	.137	2.43	.016
	AI_Benefit_Humankind	-.038	.136	-.28	.779
Motivation Human	Intercept	2.942	.525	5.60	<.001
	Portuguese	.034	.317	.11	.914
	AI_Trust	.017	.150	.11	.911
	AI_Benefit_Humankind	.312	.148	2.11	.036

Appendix 7: Convenience

Table 12

Convenience -Paired samples descriptive statistics

Paired Samples Statistics					
		M	N	SE	SE Mean
Convenience	AI	4.72	146	1.72	.14
	Human	4.20	146	1.88	.16

Table 13

Paired samples t-test for the convenience variable

Paired Samples Test

Paired Differences

	M	SD	SE Mean	95% Confidence Interval of the Difference		t	df	Significance	
				Lower	Upper			One-sided p	Two-sided p
Convenience AI - ConvenienceHuman	-.52	2.25	.19	.15	.89	2.80	145	.003	.006

Table 14

Convenience – repeated measures ANOVA - Parameter estimates

		Parameter Estimates			
Dependent variable	Parameter	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Convenience AI	Intercept	2.667	.482	5.54	<.001
	Portuguese	.207	.291	.71	.479
	AI_Trust	.333	.137	2.43	.016
	AI_Benefit_Humankind	-.038	.136	-.28	.779
Convenience Human	Intercept	2.942	.525	5.60	<.001
	Portuguese	.034	.317	.11	.914
	AI_Trust	.017	.150	.11	.911
	AI_Benefit_Humankind	.312	.148	2.11	.036

Appendix 8: AI Replacement prediction

Table 15

AI replacement prediction between the two groups.

Descriptive Statistics						
AI replacement prediction	N	M	SD	SE	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Posture Group	73	2.89	1.07	.13	2.64	3.14
Reward Group	73	2.81	1.05	.12	2.56	3.05
Total	146	2.85	1.06	.088	2.68	3.02

Table 16

AI replacement prediction - Independent samples t-test

Independent samples t-test

	F	Sig	t	df	Significance		M diff	SE diff	95% Confidence Interval of difference	
					One sided p	Two sided p			Lower	Upper
AI Replacement Prediction	.006	.938	.468	144	.320	.641	.08	.18	-.27	.43

Table 17

AI replacement prediction - Univariate ANOVA - Test of between-subjects

Test of between-subjects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	12.396 ^a	4	3.099	2.908	.024
Intercept	10.817	1	10.817	10.148	.002
AI_Familiarity	.001	1	.001	.001	.982
AI_Trust	6.292	1	6.292	5.903	.016
JoblossR	5.576	1	5.576	5.231	.024
Group	.285	1	.285	.267	.606
Error	150.288	141	1.066		
Total	1348.000	146			
Corrected Total	162.685	145			

Table 18

AI replacement prediction - Parameter estimates

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	2.582	.829	3.114	.002	.94	4.22
AI_Familiarity	.017	.744	.023	.982	-1.45	1.49
AI_Trust	.141	.058	2.430	.016	.03	.26
JoblossR	-.164	.072	-2.287	.024	-.31	-.02
[Group=.00]	.088	.171	.517	.606	-.25	.43
[Group=1.00]	0 ^a

Table 18

AI replacement prediction - Descriptive statistics

One-Sample Statistics				
	N	M	SD	SE Mean
AI replacement prediction	146	2.85	1.06	.088

Table 19

AI replacement prediction - One-sample t-test

One-Sample Test							
Test Value = 3							
	t	df	Significance		Mean Diff	95% Confidence Interval of the Difference	
			One-Sided p	Two-Sided p		Lower	Upper
AI replacement prediction	-1.72	145	.044	.088	-.16	-.32	.02

