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Personalized Coaching for Lifestyle Behavior Change through Large Language Models: A Qualitative Study

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Abstract

This paper investigates the impact of large language model (LLM)-based coaching interventions on enhancing physical activity and nutritional habits, following motivational interviewing guidelines. By exploring user perceptions through qualitative research involving eight interviews, five key themes emerged: the tension between the need for authenticity and reservations about AI humanization, the desire for personalized coaching and autonomy, the necessity of simplifying daily tasks, the aspiration for self-development, and the need for perceived privacy and trust. The findings reveal that perceptions of LLM-based coaching are multifaceted and cannot be easily classified as purely beneficial or concerning; they vary based on the specific implementation. This complexity indicates that certain aspects can simultaneously present both benefits and risks. The paper discusses theoretical implications and offers practical recommendations to enhance the advantages and mitigate the risks associated with LLM-based coaching interventions.

Keywords: Large Language Models, Behavioral Change, Digital Health, Artificial Intelligence

1. Introduction

In today's fast-paced society, maintaining a healthy lifestyle through regular exercise and a balanced diet is crucial. These habits not only prevent chronic diseases such as diabetes and cardiovascular conditions but also enhance mental well-being (Franz et al., 2015; Warburton et al., 2006). However, the prevalence of sedentary office jobs and the allure of convenient, processed foods have led to rising rates of overweight and obesity, along with their associated health risks (WHO, 2021).

The struggle to maintain fitness and a healthy diet is particularly evident during the annual New Year period when many set resolutions for weight loss and improved well-being (Davis, 2023). Despite good intentions, these resolutions often fizzle out within weeks, highlighting a critical question: Why is it so challenging to adopt and maintain a healthy lifestyle? Understanding this challenge is the first step toward developing effective strategies for long-term health and well-being.

Resolutions often fail because individuals may not be fully ready for change. The transtheoretical model of health behavior change, developed by Prochaska and Velicer (1997), outlines six stages: precontemplation, contemplation, preparation, action, maintenance, and termination. This model suggests that motivation and preparation are crucial before active behavior change can occur. However, people frequently have mixed feelings about change, leading to hesitation (Hettinga et al., 2005). For example, someone might want to lose weight but resist giving up favorite foods or be advised to exercise more but prefer to relax after work. These scenarios illustrate the ambivalence individuals experience when considering behavior change.

Motivational Interviewing (MI; Miller, 1983) is a goal-directed counseling technique designed to overcome this ambivalence and promote positive behavior change (Channon et al., 2003). Typically delivered face-to-face, MI involves "change talk" to help clients express their motivations, thereby increasing the likelihood of behavioral shifts (Hettinga et al., 2005). However, traditional MI services often face long waiting periods and high costs. Advances in large language models (LLMs) present an opportunity to deliver MI digitally through chat-based interfaces. This innovation could enhance MI's accessibility and effectiveness (Patel et al., 2019; Pedamallu et al., 2022).

Despite its benefits, MI has been criticized for not fully considering clients' unique life circumstances (Stelter & Andersen, 2018). LLMs can be prompted to deliver varying personalities (Deshpande et al., 2023), allowing for personalized health coaching that aligns with individual experiences. This personalization, combined with LLMs' cost-effectiveness and scalability, holds promise for improving MI-based coaching in areas like physical activity and nutrition. The novelty of LLM technology requires careful evaluation of its benefits, risks, and user perceptions. Early user involvement is crucial for addressing ethical concerns and developing effective solutions. Demszky et al. (2023) emphasize the importance of a nuanced understanding of LLM technology to maximize its benefits and minimize potential harms in behavioral healthcare.

In line with this perspective, we conducted exploratory qualitative interviews with potential users to understand their views on LLMs in psychological practice. By centering on the experiences and expectations of potential users, this user-centric approach ensures that the application of LLMs is both relevant and effective, setting the stage for more sophisticated and advantageous uses of LLM technology in the field. Our research question is:

RQ: How do potential users perceive the benefits, risks, and embodied personality traits of large language model-based motivational interviewing in coaching interventions aimed at enhancing physical activity and nutritional habits?

Given the exploratory nature of our study, we aimed to comprehensively understand the perceived benefits, risks, and characteristics of LLM-based coaching aligned with MI principles. To achieve this, we conducted eight semi-structured interviews with potential users, collecting empirical data. Utilizing an inductive methodology appropriate for qualitative analysis as outlined by Gioia et al. (2013), our analysis revealed 48 first-order categories that encapsulated user perceptions of LLM-based coaching. Subsequently, these categories were organized into eleven second-order themes. We further synthesized these themes into five aggregate dimensions. These dimensions provide a detailed insight into user perceptions, highlighting significant themes and their implications for IS research and practice.

2. Related Work

2.1 Motivational Interviewing

MI is a psychotherapeutic approach first developed by Miller in 1983. The primary goal of MI is to enhance a client's motivation for change by addressing and resolving their uncertainties. MI has been found to be effective in various areas, such as substance abuse issues, smoking cessation, managing HIV, promoting physical activity, and encouraging healthy eating habits (Hettema et al., 2005). MI sets itself apart from other counseling methods due to its focus on goal-direction and its action-oriented approach (Channon et al., 2003).

In MI, the counselor concentrates on evoking the client's "change talk," which refers to the client's statements expressing their desire, ability, reasons, and need for change (Hettema et al., 2005; Miller & Rollnick, 2013). These conversations allow clients to vocalize their own motivations for change, which are then echoed and summarized by the counselor, encapsulating the client's self-driven motivational statements. Several studies have investigated the delivery of MI interventions through technological tools. In their systematic review, Patel et al. (2019) identified three different technologies used to deliver an MI intervention for weight loss: telephone-based counseling (n=12), email and phone (n=2), and online chats (n=1). They concluded that remotely delivered MI interventions demonstrated significant outcomes for weight loss and performed similarly to other behavioral interventions.

2.2 Large Language Models

Recently, the development of artificial intelligence systems has significantly advanced due to foundation models. These models are described by Bommasani et al. (2022, p. 3) as "any model that is trained on broad data (generally using self-supervision at scale) that can be adapted (e.g., fine-tuned) to a wide range of downstream tasks." One important application of foundational models is in LLMs like Google's Bard, OpenAI's GPT-4, and Meta's LLaMa. LLMs use statistical models to predict upcoming text elements based on input. Leveraging extensive training data, language models demonstrate proficiency in context-based comprehension and generating text that resembles human writing. (Bommasani et al., 2022; McCoy et al., 2023) They exhibit versatility in

linguistic styles and natural dialogue. (Demszky et al., 2023) LLMs have the potential to benefit various sectors, such as healthcare, law, and education (Bommasani et al., 2022). Tools like ChatGPT illustrate how language models can boost productivity (Dwivedi et al., 2023) and surpass human performance in numerous fields, such as law (Choi et al., 2021). In the field of psychological research and practice, LLMs could help improve access to mental healthcare, provide personalized treatment to a larger population and also adapt to different theoretical orientations (Stade et al., 2024). However, delivering psychotherapy with language models is very complex, requiring a nuanced understanding of context and addressing unpredictable human behavior. Additionally, the stakes are high, as poor outcomes could harm individuals. Therefore, language models for clinical care must be developed with caution. In this sense, behavioral health experts must guide the development. (Stade et al., 2024)

The persona of LLMs can be effectively manipulated through various prompting techniques. These techniques include prompting based on personality traits such as attitude, authority, and reasoning; imitating public figures like Muhammad Ali; and adopting persona categories like journalists (Deshpande et al., 2023; Gu et al., 2023). Research by Serapio-García et al. (2023) demonstrates that brief persona descriptions and the adaptation of Big Five personality traits can successfully shape LLMs' synthetic personalities. These personalities, reflected in the language used by LLM-based conversational agents, influence user perception, trust, engagement, and acceptance. Customized LLM personalities can enhance user experience and task-specific performance, making agents more persuasive and supportive (Serapio-García et al., 2023). However, the potential for undesirable personalities raises safety and fairness concerns, as adapted personalities can increase toxicity (Deshpande et al., 2023). Thus, it is crucial to develop scientific methods for measuring, analyzing, and modifying LLM personalities to ensure ethical and responsible AI deployment.

3. Methodology

3.1 Data Collection

We conducted eight semi-structured interviews to collect the empirical data, reaching a point of theoretical saturation through a rigorous process of iterative coding, ensuring no new themes emerged in

later interviews. We followed a purposive sampling strategy and recruited participants from our widened professional and personal network. We only included participants in our sample who stated that they were interested in using LLMs to improve their fitness or eating habits. Participants were purposively selected to ensure a diversity of perspectives, varying in occupations (including students, one unemployed individual, researchers, and professionals such as a sociologist, software developer, medical doctor) and levels of experience with LLMs (ranging from no experience to advanced experience). Additionally, we ensured that the participants faced different barriers to incorporating more physical activity and healthy nutrition into their daily lives, such as time constraints due to busy schedules, limited knowledge about proper nutrition or exercise routines, and a lack of motivation or consistency. The participants were within a similar age bracket, ranging from 25 to 34 years old. This purposive selection allowed us to cover various perspectives toward LLM-based MI.

Prior to the interviews, we informed the participants about the subject-specific and institutional context of the study. We provided assurance regarding the ethical principles of maintaining anonymity and confidentiality. Following this procedure, as suggested by Gill et al. (2008), is essential for the informed consent process and will increase the likelihood of honesty during the interviews.

During the study, participants were encouraged to discuss specific topics using their own terminology to promote the discovery of new concepts (Gioia et al., 2013). The interviews were conducted following a priorly established interview guideline, which was developed based on the theoretical foundations of MI, current research on LLMs for behavioral healthcare, and personality adoption in LLMs. The guideline also included questions about participants' struggles to improve their lifestyle behavior, their previous use of digital applications for fitness coaching and nutrition, and previous experience with LLMs. It was clustered into the following sections: 1) Prior Experience with Fitness Apps and LLMs, 2) LLMs for Coaching and Motivational Interviewing, 3) Personality Adoption of LLM-based Coaches, 4) Additional Features and Design Requirements.

To ground the discussions in practical examples, all participants were presented with an exemplary dialogue that was created using ChatGPT. We instructed ChatGPT (GPT 4.0) to act as a fitness and nutrition coach following MI principles and core skills. The prompt specified that the dialogue should simulate a first-session consultation between the coach and a

client, focusing on exploring the client's motivations, addressing ambivalence, and collaboratively setting goals for behavior change.

One interview was conducted in person, and all other interviews were conducted via video calls. The interviews were between 20 and 30 minutes long and conducted individually. All interviews were recorded after consent was granted and afterward transcribed. All interviews were conducted in German. The quotes presented in the results section (Section 4) have been translated for this purpose. We utilized DeepL for these translations and made manual adjustments as necessary to ensure accuracy and appropriateness of the language.

3.2 Data Analysis

To systematically retrieve information regarding the perceived benefits, risks, and embodied personality traits of LLM-based coaching that follows the guidelines of MI, we transcribed and coded all interviews. We followed an inductive approach following the guidelines of Gioia et al. (2013). This methodology is suitable since it provides a systematic structure for analyzing and coding the data, and it allows for visually showing the established data structure.

Gioia et al. (2013) propose a multi-step methodology for coding empirical data. Throughout our analysis, we utilized MAXQDA software to support the coding process. The first step involved identifying and coding first-order categories representing themes directly emerging from the participants' statements. At this stage, it is crucial to develop categories that closely align with the language used by the participants. In the second step, we grouped these first-order categories to identify second-order themes. Finally, we consolidated the second-order themes into overarching aggregate dimensions.

4. Results

Figure 1 shows the data structure that was received by analyzing the interviews following the guidelines by Gioia et al. (2013). We identified 48 first-order categories, which were grouped into eleven second-order themes, which we, in turn, aggregated into five dimensions. The emerging dimensions that could be derived from the interview were "Tension between Authenticity and Reservations about the Humanization of AI", "Desire to Personalize Coach

and Feel Autonomy towards Coach", "Desire for Self-Development", and "Need for Perceived Privacy and Trust".

4.1 Authenticity and Humanization of LLM-based Coach

The interviews showed a spectrum of differing perspectives regarding the humanization of AI, some conflicting. Some participants prefer to temporarily forget the artificial nature of their coach to optimize their interaction, as highlighted by this statement of a participant: *"because then you'd forget that it's nothing human. You might feel a bit more empathy and take a bit more care of your diet and everything, because then you know that there's a person at the end of the line, so to speak"* (Interview 5, P5) In fact, some participants even envisioned their coach as a *"buddy"* (Interview 3, P3) with whom they could discuss a range of topics, including emotional struggles. Some participants even said that they view the LLM-based coach as someone they feel the need to justify their actions to. On the other hand, others maintain a pragmatic stance, emphasizing the need to be aware that they are conversing with an LLM-generated entity. Nevertheless, a prevailing sentiment emerges, labeling conversations with AI about personal topics as unusual and something one must get used to: *"It's a bit strange to talk to an AI and especially about such personal things"* (Interview 1, P1)

The interviews also revealed that participants critically evaluated the LLM-based conversation regarding its human-like qualities. The coach presented to the interviewees employed MI core skills, one of which was summarizing the client's statements. One participant viewed this behavior by the LLM as not human-like and evaluated it as a lack of advanced technology: *"Also, what might be missing is, I believe, this bit of emotional and, uh, well, I'd say, human conversation management, rather than just improving what was just said, not to improve, but to repeat it."* (Interview 3, P3). Additionally, some participants said they would find listening to anecdotes from AI odd and viewed it as less genuine, as this example highlights: *"So, I would find anecdotes about oneself quite difficult. I believe I would be out then, because I would think, okay, this is all made up. This person doesn't really exist."* (Interview 2, P2).

The diversity of the user responses highlights the tension between desiring authenticity in interactions with LLM-based coaches and apprehension about technology closely mimicking human behaviors.

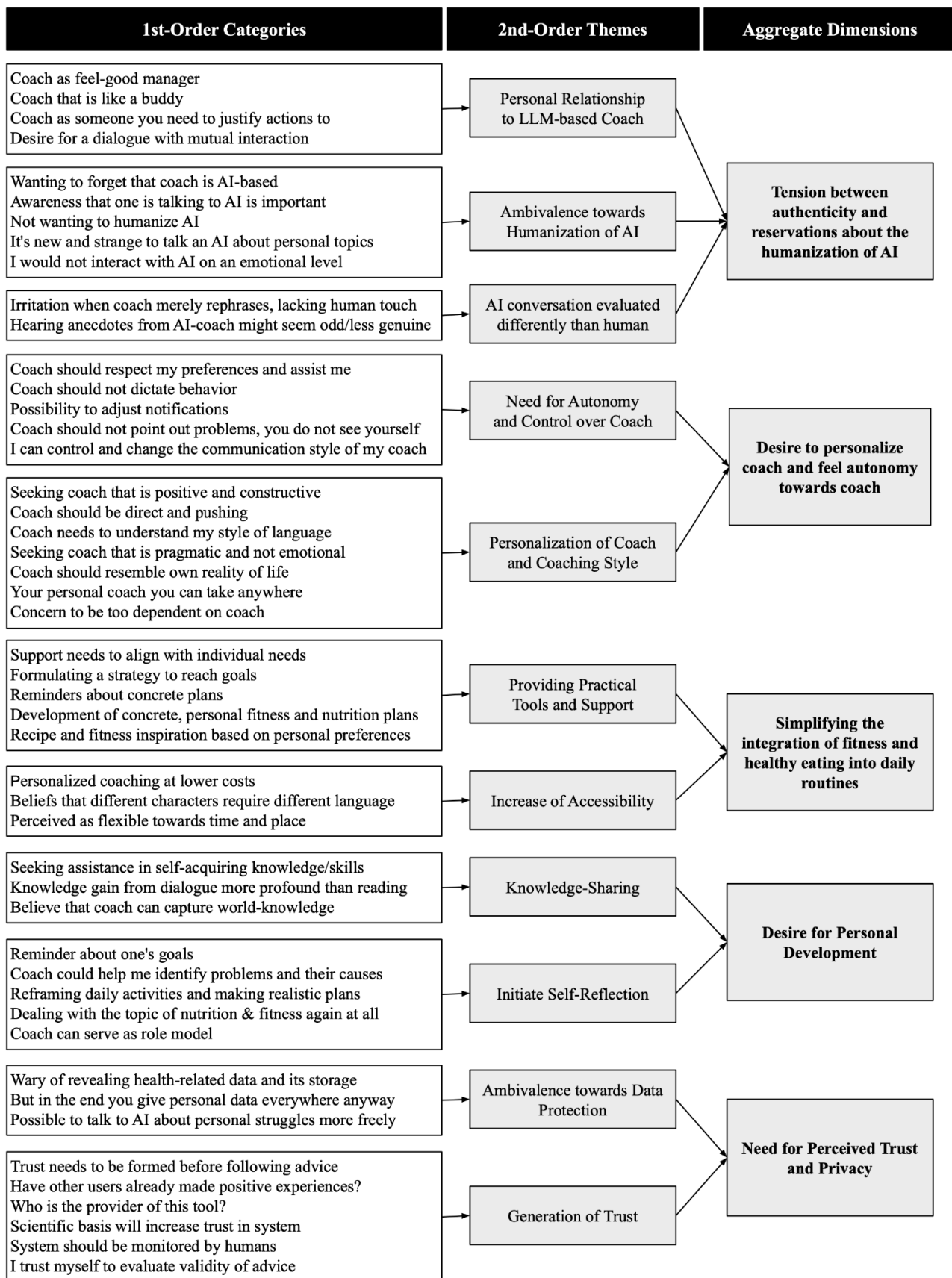


Figure 1. Data structure.

4.2 Personalization and Autonomy of Coaching Relationship

The interview participants showed that the preferred coaching style differs greatly from person to person. Thereby emphasizing the benefit of personalized coaching solutions. While some participants said that they would prefer a positive and constructive coach, other participants said that they would prefer to be coached by a person who is not too considerate but instead *“very strict. Because I need someone who also pushes me a bit”* (Interview 4, P4). Other participants stated that they seek a coach who is not emotional but pragmatic: *“So, for me, emotionality would not be so important, but rather, um, really very dry instructions. And, for me, it would be more about something pragmatic.”* (Interview 8, P8). Even though the language style differs, there was agreement that there is an immense benefit if the coach is personalized in a way that aligns with their language style, both in understanding and speaking. Additionally, participants stated that they are interested in using a coach that resembles their reality of life regarding gender, age, or circumstances, such as motherhood: *“Yeah, haha. Is that narcissistic? A little. Actually, I just want. Myself. No, no, no. No. But similar to me in the sense that this life reality is understood.”* (Interview 4, P4).

Some interviewees highlighted that they view it beneficial to develop a personal relationship with the LLM-based coach through mutual dialogue. One mentioned that he would consider the LLM-based coach as *“[his] personal coach, whom [he] can take with [him] everywhere”* (Interview 1, P1). However, the potential users also reported concerns about dependency on their LLM-based coach, highlighting a delicate balance between reliance and apprehension.

Even though some participants wanted to be pushed by their coach, all participants underlined the importance of autonomy. The coach should respect the user’s wishes and not dictate behavior or point to problems that are not relevant to the user, as this example shows: *“But with minor things like soft drinks, where I see no problem at all, I don’t need a paternalistic attitude. Where someone says that one soft drink per week is enough or something like that.”* (Interview 1, P1). Participants viewed it as positive that an LLM-based coach allows for easy switching of language styles or coaches, either long-term or on a daily basis: *“if the tone is not appropriate for one, there is the possibility to somehow get a different tone of voice”* (Interview 7, P7). Additionally, participants

said that they wish to be able to adjust or turn off notifications.

4.3 Simplifying Integration of Healthy Habits into Daily Lives

During interviews, participants expressed that a significant advantage of LLM-based coaching is the support that the coach can provide in their daily lives. They expect the coach to offer strategies that can help them achieve their goals and concrete plans for workout routines and meals, as this example emphasized: *“And if you have a kind of plan that tells you how you can get back into it more easily, then I can imagine that it could really help me.”* (Interview 4, P4). In addition, participants hope the coach would provide them with recipes and inspiration for meals and activities: *“Also with recipes, because I don’t like being in the kitchen very often, and if it had some simple recipes included, like a range of them, that would be fantastic, I think.”* (Interview 5, P5).

It is important that these recommendations align with their individual needs and preferences. For example, one participant highlighted the importance of personalized advice, saying, *“and, for example, [the system should not] suggest, ‘Hey, if you need protein, then have some cottage cheese,’ because I can’t eat that due to being lactose intolerant.”* (Interview 6, P6). This highlights the need for personalized dietary recommendations for conditions like lactose intolerance. Furthermore, the interviewees would appreciate receiving reminders from their coach regarding planned workouts or meals.

Additionally, participants pointed out that using LLM-based personal coaching could increase the flexibility of such a program as it becomes independent of time and place. Furthermore, the lower costs expected from digital coaching were mentioned positively. One participant further mentioned that *“people are different and different people need to be spoken to differently”* (Interview 1, P1), pointing to the need for different coaching styles. Hence, emphasizing that LLM-based coaching would increase the accessibility of suitable coaches.

Overall, LLM-based coaching is largely seen as a possibility for everyone to receive help in integrating fitness and healthy nutrition into their daily lives.

4.4 Desire for Personal Development

A participant highlighted a key benefit of an LLM-based coach, emphasizing its ability to

encapsulate “*world knowledge*” (Interview 6, P6). This view was shared with others, who expressed a desire for the LLM-based coach to actively support them in acquiring knowledge and skills autonomously, such as the development of meal plans. One participant also emphasized his belief that engaging in dialogue with the coach yields a more profound understanding compared to simply reading an article.

Moreover, participants perceive the use of an LLM-based coach as a catalyst for self-reflection and provide examples of how an LLM-based coach could initiate self-reflection: “*he helps me somehow to clarify things that are not yet quite clear to myself*” (Interview 1, P1), “*it could also [...] provoke cognitive dissonance in me and say ‘Hey, did you eat this and that today, and what was the reason for it?’*” (Interview 6, P6). This potential is also seen in the coach's ability to remind users of their goals and motivations: “*that my goals, which I may have originally stated, are repeatedly and perhaps even subtly brought to my attention*” (Interview 7, P7). Additionally, participants envision the coach serving as a role model in guiding their personal development. Furthermore, one participant pointed out that using an LLM-based coach means dealing with the topic of fitness and nutrition again after all, resulting in more exposure to the topic. Participants further said that the coach could help them reframe certain activities, such as running after their kids, to do more mindfully.

4.5 Need for Trust and Privacy

Interviewees express concerns regarding data protection, particularly when dealing with sensitive health-related information. The pivotal question of where this data is stored and how it is processed adds another layer of worry: “*My concerns would definitely be about data, where it goes or how it is stored, or how it is, yes, how it is processed, whether I am giving out very personal data.*” (Interview 4, P4). However, interestingly, participants recognize that, in the grand scheme, data protection might not be as critical after all, drawing parallels to the ubiquity of personal information shared online: “*But I mean, we use the internet and all these apps so often and click on agree even though we don't read it, that it has actually already become normality*” (Interview 5, P5). Notably, some participants recognize that they might be able to discuss personal struggles with an LLM-based coach more freely than with a friend or professional: “*And I believe I would be more honest than with a person I know well, where you might still have concerns about how you come across*” (Interview 4, P4). This suggests

that even though data protection concerns exist, potential participants might be more willing to disclose private information to an AI.

Nevertheless, they emphasize that trust is indispensable when implementing advice from a coaching application, as this participant points out: “*If you are working on a sports plan or something, then you somehow also have to believe that it really leads to the goal*” (Interview 1, P1). The issue of trust hinges significantly on the credibility of the application's provider. Participants view the provider's trustworthiness as a critical factor in establishing a foundation of trust: “*It then somewhat depends on who is offering this coaching system. If it's something like a fast-food chain, then I would probably have more reservations about believing that it is a serious offer*” (Interview 3, P3). Positive experiences shared by other users can significantly enhance this trust: “*[if] a lot of your friends use it, and they've had positive experiences with it, saying it helped them here and there. I think that's a strong argument to give it a try as well.*” (Interview 1, P1) However, users assert their capability to discern the validity of nutrition and fitness tips, indicating that trust can be organically built over time through the consistent delivery of beneficial advice: “*I will evaluate them myself and then, in a way, build trust in them*” (Interview 6, P6).

One participant advocates for increased security through human monitoring of the system. She underscores the importance of human oversight, citing its necessity in detecting potentially harmful behaviors such as disordered eating habits: “*I believe that it should, you know, remain somewhat human-monitored. [...] Especially when it comes to things like nutrition. And, above all, that one can somehow assess whether a person might have an eating disorder or tendencies, for example.*” (Interview 8, P8).

5. Discussion and Conclusion

5.1 Discussion of Findings

Our research endeavor began with the notion that LLMs provide a unique and promising approach to delivering MI interventions. Additionally, it allows for a broader representation of different life realities thanks to the possibility of adjusting the tone of voice and personality adoption of the LLM-based coach. During our qualitative study, we discovered that potential users anticipate functionalities from this application surpassing the MI scope. Using LLMs to coach and assist users in structuring their plans and finding

recipes offers a broader range of possibilities compared to humans. Limiting the use of LLM-based coaching solely to delivering MI does not align with users' expectations of LLM capabilities. Additionally, some individuals desire a coaching style that diverges from MI principles, such as a more assertive and pushing approach. The communication style required in MI may seem peculiar to users when implemented by technology, and their perception of it might differ from human interactions. Further investigations are needed to explore this observation, thus contributing to the body of knowledge related to conversational styles (e.g. Janson, 2023).

Interestingly, while users expressed a preference for different coaching styles, all emphasized the importance of autonomy in the coaching relationship. They felt that coaches should avoid focusing on behaviors the users are not motivated to change. This observation aligns with Self-Determination Theory (Ryan & Deci, 2017), which highlights the critical link between autonomy and intrinsic motivation.

Nevertheless, users are interested in personal development and find reflecting on their behavior with an LLM-based coach intriguing. It is worth noting that users' expectations for an LLM-based coach go beyond the scope of MI, influenced by their prior experiences with fitness apps or other LLMs that have provided practical life assistance. Furthermore, users desire to build a long-term connection with their coach. MI, however, is typically conducted over a few sessions, which may not meet this need. In summary, users expect more from an LLM-based coach, drawing on their familiarity with other fitness apps and LLMs that have proven to offer practical guidance in various aspects of life.

As stated by Demszky et al. (2023) and Stadel et al. (2024), it is crucial to involve psychological expertise in evaluating such systems to ensure the development of safe and ethical LLM-based applications in behavioral healthcare. The feedback from our interview participants further emphasizes that the credibility of the application provider plays a significant role in building trust. Furthermore, citing scientific sources for the advice provided can enhance the application's trustworthiness. Serapio-García et al. (2023) pointed out that such systems can become toxic when adopting personalities. Considering that some potential users said that they want a coach who pushes them and should not be particularly considerate, special attention should be paid to make sure that users' wish for challenging coaches aligns with the development of responsible AI. LLM-based personalities should, therefore, be evaluated for toxicity.

Our research underscores the complex nature of LLM-based coaching characteristics, which can yield benefits and concerns surrounding these systems. This indicates a dual nature of the characteristics surrounding LLM-based coaching interventions. From our analysis, we derived propositions for theoretical considerations and recommendations for practice.

5.2 Implications

Notably, the humanization of AI emerged as a pivotal aspect. Individuals' perceptions of such systems are deeply influenced by their personal viewpoints. In this regard, it is important to note that our research suggests that authenticity for LLM-based personas might be evaluated differently than with humans. For example, one interview participant said that she would perceive the sharing of anecdotes, which is common in human conversation, as inauthentic from a technological entity. This offers interesting insights into users' perceptions and evaluations of interactions with AI entities, pointing to the importance of scientific markers for authenticity.

Proposition 1: Authenticity is a pivotal element in shaping users' perception of the humanization of AI. Authenticity in LLM-based communication may be assessed through different criteria compared to human conversation.

Recommendation 1: Communication styles common in human conversation should be evaluated with LLMs to ensure authenticity.

Perceived privacy and trust emerge as foundational components influencing the perception of LLM-based coaching interventions. The technical aspects of the system show complexities that contribute to both advantages and concerns, forming a multifaceted scenario. Regarding privacy, users express apprehensions about sharing personal data and its secure storage. Yet, intriguingly, they highlight the absence of social constraints when engaging with an algorithm, enabling more open conversations. This freedom fosters a sense of comfort in sharing personal issues. Regarding trust, users emphasize its necessity, particularly when relying on advice and recommendations from such systems. The credibility of the intervention provider influences the establishment of trust. Users also assert their ability to build trust autonomously by engaging with the system and evaluating its efficacy firsthand.

Proposition 2: Perceived privacy and trust form a paradox in LLM-based coaching interventions, where concerns about data security coexist with the freedom for open, unreserved conversations.

Recommendation 2: LLM-based coaching interventions must prioritize transparency and security regarding data protection while fostering an environment that encourages open and secure communication.

LLM-based coaching interventions exhibit a dual role in supporting users. Firstly, they provide practical aid by offering concrete plans, reminders, and recipes, assisting individuals in their daily activities. Secondly, they facilitate self-reflection and the acquisition of knowledge and skills, encouraging personal growth. Even as users desire challenges and reminders from their LLM-based coach, they express a reluctance toward a paternalistic approach where the coach dictates behavior or highlights unseen problems. This presents a complex challenge in designing a coach that effectively motivates individuals while respecting their autonomy.

Proposition 3: LLM-based coaching interventions face the complex task of providing practical assistance and encouraging self-reflection without overstepping into paternalism, highlighting the importance of designing these systems to support autonomy and personal growth effectively.

Recommendation 3: Designing motivational coaching systems that foster self-development while valuing and preserving user autonomy is crucial.

5.3 Limitations and Future Research

This study has limitations due to its exploratory nature and small sample size of eight participants within similar age brackets. Future research should explore how older adults perceive LLM-based coaching for promoting healthy nutrition and physical activity. To enhance the generalizability of our findings, further qualitative or quantitative studies should validate and expand upon our results. Additionally, investigating the interconnectedness of these factors is essential. Specifically, our findings suggest that AI using a conversational style similar to MI may be perceived as inauthentic, and verifying this through diverse examples or experimental setups is crucial. Future research should explore the generation of perceived authenticity of LLM-based personas and their alignment with MI principles and core skills.

Another potential limitation is the varying levels of preexisting knowledge about LLMs, fitness, and nutrition among participants, which might have influenced their responses. Although we purposively selected participants with different levels of interest and experience to capture a range of perspectives, future research could focus exclusively on individuals

without prior experience to better understand the effect of baseline knowledge on their perceptions.

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