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The Human Touch: The Impact of Anthropomorphism in Chatbots on the Perceived Success of Solution Focused Coaching**

Abstract

This study explores how a chatbot can be used to support coachees to define and implement goals. It examines how the chatbot has to be designed to ensure that its coaching is successful. In this context anthropomorphism – the transmission of human qualities to non-human objects – should increase the acceptance of the chatbot and the perceived effectiveness of the coaching. While there are several studies on the perceived humanity of chatbots, no research has investigated the effects of anthropomorphic chatbots on the success of coaching. In an online experiment, participants (n = 44) performed randomised coaching with either a high or low anthropomorphic chatbot. Operationalizing a model of the effects of solution-focused individual coaching, the coachees were surveyed. The analysis shows that they were significantly more satisfied with the highly anthropomorphic chatbot, and rated the relationship building as well as the effectiveness of the coaching higher than by the less anthropomorphic chatbot. Therefore, the anthropomorphic representation of a chatbot in an online coaching session has a strong impact on its success.

Keywords: Keywords: coaching, anthropomorphism, e-coaching, effectiveness of coaching, chatbot
(JEL: J24, O14, O32, O33, M53)

Introduction

Digitalization and artificial intelligence are prevalent in daily life, transforming communication and business models (Janssen et al., 2020). Skyping, chatting and e-mailing have long been socially established and accepted. However, the next online interaction we have may not necessarily be with another human being. Instead, we could be interacting with a chatbot. A chatbot is a dialogue system that uses pattern recognition and rules to analyse the user's text or voice to generate an automated answer. They are increasingly managed by intelligent systems, many of

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which have been developed with human identities and even personalities (Radziwill & Benton, 2017).

These chatbots are often used in customer communication processes along the customer journey (Adam et al., 2020; Kusber, 2017). However, chatbots have also found their way into other disciplines, which were believed to be less suitable, because they heavily rely on human interaction. For example, significant growth rates can be observed in areas such as e-health and e-mental health (Bredl et al., 2012). The coaching sector is also subject to digital transformation. According to Rauen (2018), only highly individualized concerns of coachees will be processed by a person in the future. Less complex and more common coaching concerns dealt with in decision coaching or goal achievement coaching can be standardized and automated. The chatbot examined in this study supports goal attainment coaching. It helps coachees define an ideal state for their concern, create action goals, and implement them. This study examines the design of a chatbot to achieve the greatest possible coaching success: how must a chatbot in e-coaching be designed so that coachees perceive the coaching as successful?

To measure the success of coaching, this study is based on the model of the effects of solution-focused individual coaching (Greif, 2008). It measures success with three dependent variables: (a) coachees' satisfaction with the coaching, (b) trust between coachee and coach, and (c) perceived effectiveness of the coaching. We manipulated the anthropomorphism of the chatbot to measure its impact on the perceived success of the coaching. Anthropomorphism is the transfer of human characteristics to non-human characteristics, in this case the chatbot which is equipped with human cues (Nass & Moon, 2000).

Human-looking chatbots have an effect on users. This has already been researched in numerous publications (Araujo, 2018; Braun, 2003; Go & Sundar, 2019; Kasap & Magnenat-Thalmann, 2008; Shevat, 2017; Sieber, 2019). However, no research has investigated the design requirements and the effects of an anthropomorphic chatbot on the success of a coaching process. Specifically, the focus and objective of this work are to explore *how* a chatbot in coaching should be designed to positively influence (1) the coachee's satisfaction with the coaching, (2) trust between coach (chatbot) and coachee, and (3) the perceived effectiveness of the coaching. The present study aims to contribute to closing this research gap.

Success Factors in Coaching

The model of effects in solution-focused individual coaching developed by Greif (2008) reflects the coaching research of recent years (see Table 1). The components of the model in bold have been proven empirically by several studies (Greif, 2008).

Table 1: Structural Model of the Effects of Results-Oriented Individual Coaching

Requirements of the coach	Success factors	Specific results	Generally applicable results
Professional credibility of the coach	Appreciation & emotional support	Increase in focused outcome-oriented problem or self-reflection (State)	Degree of goal attainment
Clarification of goals & expectations	Affect reflection & calibration	Clarity of problem & concretization of the goal	Satisfaction of the person seeking advice
	Promotion of results-oriented problem and self-reflection	Rating of social competences, team behaviour	Improvement of the affect
Requirements of the coachee	Clarification of objectives	Improvement of performance	General well-being
Motivation for change	Updating of resources and support for implementation	Self-control: systematic management of problems, specific self-efficacy	Potential and self-development
Result oriented reflexivity (as a trait)	Evaluation during the intervention		
Persistence	Individual analysis & adaptation		

Note. Adapted from Greif, 2008, p. 277

According to Greif (2015), appreciation, emotional support, promotion of self-reflection, activation of resources, and clarification of goals are the coach's most important behaviours influencing coaching success. The coach's appreciation and emotional support promote a good working relationship with the coachee (Lindart, 2016). Without this trusting relationship, the coaching process cannot be successful. Coachees, for their part, should consider coaching as a beneficial tool for achieving their goals, and, at the same time, feel obliged to fulfil the objectives resulting from the coaching (Boyce et al., 2010). The motivation of coachees also increases by clarifying the objectives and making the degree of goal attainment

tangible (Greif, 2015). The dependent variables in this study (coachee's satisfaction with the coaching, trust and its perceived effectiveness) have been extracted from Greif's model as factors for successful coaching.

Coachees' Satisfaction with Coaching

Coaching participants should assess to what extent they perceive their coaching as beneficial, motivating, and relevant (Dewhurst et al., 2015). The coachee's satisfaction with the coaching's content and results is a significant criterion in any coaching evaluation (Greif, 2008; Offermanns, 2004). The coachee's satisfaction is additionally influenced by other factors such as the setting of goals and subsequent achievement of these objectives (Greif, 2016; Mäthner et al., 2005) as well as satisfaction with the coach (Hofmans, 2018). A trusting relationship is associated with greater satisfaction of the coachee (Bozer et al., 2014; Stober, 2006). There is a strong positive correlation between the coachee's satisfaction with the relationship (relationship perception) and the effectiveness of the coaching (de Haan et al., 2013).

Relationship Building and Trust

The relationship between the coach and coachee is one of the most important factors in coaching (International Coaching Federation, n.d.). Many studies prove significant effects of the quality of the working relationship between coach and coachee on the effectiveness of coaching (Baron & Morin, 2009; Flückiger et al., 2015; Grant, 2014; Greif et al., 2012; Kelley et al., 2014). The quality of the coaching relationship is a significant mediator between inputs (i.e., self-efficacy) and the desired results (Baron et al. 2011; de Haan et al., 2013). Therefore, the relationship between coach and coachee has a direct influence on the self-efficacy and thus on the coaching outcome.

Trust is identified in many studies as the most important influence for successful working relationships in coaching (Boyce et al., 2010; Ely et al., 2010; Greif et al., 2018; Gyllensten & Palmer, 2007). The coaching setting should be like a shelter where the coachee can open up, where self-reflection can take place, and where a consistent trial and error is possible (Heß & Roth, 2001). To gain and maintain this trust, coaches should treat coachees with empathy and appreciation (Bluckert, 2005; Kilburg, 2001; Stober, 2006). Trust is the precondition to share any sensitive information (Gyllensten & Palmer, 2007).

Effectiveness of Coaching

The number of studies measuring the effectiveness of coaching is limited (Künzli, 2016). These studies are characterized by a high degree of heterogeneity due to different coaching definitions and research designs (Künzli, 2016). However, the studies show that the perceived effectiveness of coaching is a central component of

coaching evaluation (Greif, 2016; Kotte et al., 2016; Künzli, 2009, 2016; Lindart, 2016). Return on investment rates of the coaching processes, as an ideal response to Kirkpatrick and Kirkpatrick's (2006) level four evaluation, are problematic since many economic effects cannot be attributed directly to a single intervention like coaching (Greif, 2016; Theeboom et al., 2014). Therefore, the coachee's perceived achievement of objectives can be a good indicator of the coaching effectiveness (Greif, 2008; Künzli, 2016).

This is supported by the view that coaching increases business effectiveness through its potentially beneficial effect on the goal-oriented self-management of the workforce (Grant, 2003). Several studies prove that coaching can have a positive impact on goal attainment expectations (Evers et al., 2006; Moen & Skaalvik, 2009) as well as on goal attainment and commitment (Green et al., 2006). Additionally, Locke and Latham (2002) have proved the correlation between goal setting, motivation, and performance. Overall, coaching can be beneficial for companies by improving employee performance and skills, well-being, coping, work attitude, and goal-oriented self-regulation.

E-Coaching

In recent years, numerous electronic tools specific to coaching have been developed (Armutat et al., 2015; Kanatouri & Geißler, 2016). According to Heller et al. (2018), e-coaching can be classified into the following categories:

1) Machine vs. human: does the coachee communicate with a human or is the coaching response generated entirely by a machine?
2) Synchronous vs. asynchronous: does the communication take place directly, for example, in a virtual coaching room? Does the coach ask questions in writing, to be answered by coachees at their discretion?
3) Written or oral communication between coach and coachee.
4) Use of avatars or not.

The chatbot examined in the study is a machine that uses weak artificial intelligence to generate answers. The communication takes place synchronously and in writing. The coachee is in direct conversation with the coach (chatbot) and does not have to wait for the answers as in communication via e-mail. Furthermore, no avatars are used because the chatbot only uses the medium of writing for communication.

Advantages

According to Bredl et al. (2012), e-coaching offers numerous advantages. By using e-coaching tools, the costs for office space, travel, and the coaches' salaries can be reduced if not eliminated. In addition, coaching is available at any time and does not require much effort. E-coaching is particularly helpful when dealing with urgent matters. Thematically, e-coaching is suitable for any topic (Heller et al.,

2018). According to Berninger-Schäfer (2018), e-coaching even promotes greater self-revelation of the coachees. Tabooed and potentially shameful topics can be addressed more easily, and closeness through distance may arise (Berninger-Schäfer, 2018; Knatz, 2012). If coachees deal with very sensitive topics and are afraid of losing face, the experienced distance of the virtual coaching can help coachees find a way to get the support they need (Geißler & Metz, 2012). The protected setting of one's own home may also help to address sensitive issues, and chatbots are neutral listeners without any personal judgement. Another advantage is the automated documentation of the coaching process. By taking notes, coachees can reflect on the session afterwards. According to Lippmann (2013), archiving the communication may ensure that the coachee does not forget any part of the instructions in the case of more complex interventions and tasks.

Another advantage of e-coaching is on-the-job support for the coachee (Berninger-Schäfer, 2018). The coachee can receive immediate feedback and use it to make quick corrections to goals and action steps. This increases the probability of success. Furthermore, shorter and timely coaching units can help coachees cope with various demands and increase motivation, as success becomes visible more quickly. The coach's positive, focused feedback helps to achieve the desired solution-focused behaviour in a timely manner. It is up to the coachees to decide when to send a message, how much time they spend on reflecting and framing an answer, and when to take breaks. As a result, coachees have more control over the coaching process. This type of coaching thus strengthens the autonomy and self-efficacy of coachees (Heller et al., 2018).

Disadvantages

The coachee's reading and writing skills might be a possible disadvantage of online coaching (Bredl et al., 2012) since texts and intentions must be decoded and understood. Furthermore, coachees need access to reliable internet connectivity as well as internet-enabled devices. This is a given in most cases nowadays, but must be mentioned as a possible limitation as it still cannot be guaranteed. The loss of direct contact with the coachee and thus the potential loss of 'rich' communication is the greatest weakness of e-coaching (Berninger-Schäfer, 2018). If coaching is limited to text form only, as in e-mails or in a chat, non-verbal signals like facial expressions and linguistic intonation are lost. These non-verbal signals reflect the coachee's mood, and emotions might provide important information for coaches. They enable coaches to provide emotional support for the coachee, and by doing so promote a good working relationship (Lindart, 2016). Further, the loss of 'rich' communication makes it more difficult to build up necessary trust between coach and coachee (Lipmann, 2013). How can these disadvantages of e-coaching be mitigated? Anthropomorphism might offer some options.

Anthropomorphism

Increasingly, chatbots are anthropomorphized (Mathur & Reichling, 2016). In a meta-analysis, Schaefer, Chen, Szalma, and Hancock (2016) prove that users trust and are more willing to cooperate with human-like chatbots. The human design of a chatbot can evoke a strong emotional attachment to its user (Bartneck et al., 2009). Studies show that social responses to computers generally tend to increase with social cues or when a system exhibits human-like behaviour (von der Pütten et al., 2010). Furthermore, the design of chatbots with human-like cues can have a positive impact on relationship building and emotional connection (Bălan, 2018). Qiu and Benbasat (2009) proved a significant influence of chatbots‘ anthropomorphic representation on how they are perceived, trusted, and used. The humanoid design significantly influenced the perception of chatbots' social presence. As a result, the humanoid design increased the user's confidence in the chatbot, the perceived fun in communicating with the chatbot, and the intention to use it as decision support.

Research has identified two relevant motivational factors that explain why people respond to non-human influences with anthropomorphism. Firstly, the anthropomorphic perception of non-human actors meets the basic human need to be socially connected with other people. Thus, more and more humanoid robots are currently being developed as alternatives to loneliness. Secondly, anthropomorphization satisfies the basic human need for control and understanding of the environment. Examples of this are the tendency to see human-like figures in star constellations and weather formations (Epley et al., 2007).

Kaiser et al. (2019) argue that users of chatbots no longer feel recognized and valued as human beings due to the loss of human contact. Therefore, it is important to compensate for the lack of human contact by an anthropomorphic representation of the chatbot. These human-like characteristics are also relevant when chatbots have no avatar and are disembodied (Araujo, 2018). Accordingly, the form of execution (physical chatbot/disembodied chatbot) is not a prerequisite for a chatbot to be perceived as human-like. Only the strength of the *perception of humanity* differs between the two forms. Therefore, the challenge of anthropomorphization is to provide sufficient impulses so that users have the feeling of having a human experience. How can a chatbot be designed to appear human?

Personality

Several studies highlighted the importance of personality development for speech-dialogue systems. Primarily, the user should experience the chatbot as pleasant as possible. An assumed personality arouses users' curiosity and encourages them to trust the machine and be sympathetic towards it. The users' acceptance increases if chatbots show personality traits (Braun, 2003; Kasap & Magnenat-Thalmann, 2008; Shevat, 2017). Chatbots with the same content will be perceived as more

intelligent, helpful, and useful if they have personality traits that match those of the user (Braun, 2003). A consistent personality also serves to set the user's expectations for the conversation and can even create an emotional bond (Sieber, 2019). Personality traits comprise the chatbot's age, gender, language style, general attitude, and level of knowledge (Shum et al., 2018).

Name

The name of a chatbot (e.g., human vs. machine-like name) can support anthropomorphic perception (Araujo, 2018; Go & Sundar, 2019; Waytz et al., 2014; Xu & Lombard, 2017). For this reason, many assistant chatbots have been given names. Not only the chatbot's name is important, but also the coachee's. Mentioning the name of the coachee plays an important role. Carmody and Lewis (2006) and Nakane et al. (2016) have shown that there are several regions in the left hemisphere of the brain that are more strongly activated when hearing one's own name instead of somebody else's. Using functional magnetic resonance imaging, Nakane et al. (2016) proved that conscious and unconscious hearing of one's own name attracts attention. Researching the perception of social agents, Holtgraves et al. (2007) proved that participants rated the chatbot as more competent when it used their name in a chat.

Language

Users should have the feeling of having a normal conversation with a fellow human being to perceive the chatbot as human. Natural language processing (NLP) supports this process. Natural language is any language that humans learn from their environment and use to communicate with each other. It is used to express our knowledge and emotions and to communicate our answers to other people and to our environment.

The chatbot's language style should be appropriate for the target group (Kaiser et al., 2019). A chatbot used in the insurance industry, for example, requires a more serious and formal appearance with sophisticated vocabulary. If teenagers are the chatbot's target group, it may be more appropriate to integrate colloquial expressions into the communication. Yet the open nature of natural language still poses a challenge to the conversational capabilities of chatbots (Diederich et al., 2020). According to Webers (2015), the inability to detect irony in human statements is a limitation of artificial intelligence in language processing. However, due to the continuous development of natural language processing and artificial intelligence, chatbots are increasingly developing new conversational capabilities (Shah et al., 2016). It seems only a matter of time when these last hurdles of language or intention recognition can be overcome.

Emotions

Human video and computer gamers perceived compliments, emotions, and empathy of virtual persons as if they came from real people (Brave et al., 2005; Fogg & Nass, 1997; Jo et al., 2013; Nass et al., 2001). Similarly, people perceive polite chatbots more positively than those that are less polite or machine-like. Yet, excessive politeness can be counterproductive since it tends to have a negative effect on users (Holtgraves et al., 2007; Inbar & Meyer, 2015).

People like receiving compliments, and it is irrelevant whether they are made by a computer and occur randomly (Braun, 2003). Hakim et al. (2019) examined two compliment strategies that a chatbot can use in dialogue. One is the initiative strategy which can be used to open a dialogue. The communicative purpose of the compliment is to reinforce the greeting. In this case, the compliment serves as a contact-making expression. The other is the reactive strategy which reacts to users' statements. This serves to cultivate interpersonal relationships. Both forms have the purpose to create positive emotions for users.

Contrary to popular belief, chatbots are as good as a human chat partner when it comes to showing empathy and helping a person dealing with emotional situations (Xu et al., 2017). Empathic text-based chatbots can be perceived as emotional support in case of illness (Liu & Sundar, 2018). Emotions are central for credibility and trustworthiness. A chatbot is considered more credible if it expresses appropriate emotions in the conversation (Zumstein & Hundertmark, 2017).

Humor and Small Talk

Humor is a predictor of social bonding in computer-mediated communication (Aragon, 2003). Participants who appreciate the jokes told by chatbots feel a higher degree of social connection (Tay et al., 2016). Jain et al. (2018) identified humour, sarcasm and playfulness as positive characteristics in a study on personality requirements for chatbots. Participants who received humourous comments while interacting with the chatbot found the chatbot to be more human-like, funny, and likable (Dybala et al., 2009; Niculescu et al., 2013). A chatbot's humour can help reduce boredom during long and tedious tasks (McTear et al., 2016). This enables long-term interaction with the user.

Furthermore, chatbots should be prepared for small talk, as the users want to test the limits of new technologies. Small talk using greetings and fillers (e.g., "Hello", "How are you?", "Goodbye") builds trust in the chatbot and creates a relaxed atmosphere (Braun, 2003; Krämer, 2008; Sharma, 2018). Small talk can range from banal to offensive questions. According to Kaiser et al. (2019), the inhibition threshold is very low, as users think they are "only" communicating with a chatbot. Because of their social connectedness, people treat robots as social actors (Lee, Jung, Kim, & Kim, 2006; Lee, Peng, Jin, & Yan, 2006).

Weakness

Weaknesses make people human, so chatbots should also not be perfect. They should occasionally include humourous weaknesses which should nonetheless not hinder the efficiency of the chatbot (Kaiser et al., 2019). According to Braun (2003), the precision of a chatbot can be perceived as rude and impolite. For example, if you ask a chatbot a complex mathematical question like 'What is the square root of nine?', the preferred answer could be 'Math is not really my cup of tea' (Virtual Identity, n.d.). Systems may also contain specific imperfections such as filler words 'um' and 'well'. By using these superfluous fillers, chatbots appear even more human in the conversations (Leviathan & Matias, 2018). The key to perfection could therefore be imperfection.

Writing Indicators

Gnewuch et al. (2018) investigated the extent to which the response behaviour of chatbots has an influence on their perception as human. They show that interaction with the chatbot appears more human by using writing indicators. The chatbot appears more credible if it does not react immediately but integrates response delays into the chat (Zumstein & Hundertmark, 2017). The greatest social presence can be created with three animated dots simulating 'thinking' (Gnewuch et al., 2018). Through these animated dots, users feel more like communicating with a human than with a machine. Fadhil et al. (2018) examined the use of emojis in chatbot conversations. Participants are more likely to share information on their mental well-being with the chatbot if the dialogue contains emojis. However, if the dialogue refers to the physical well-being of the subjects, the use of plain text without emojis would be preferable.

Hypotheses

In this study, we investigated to what extent the anthropomorphic representation of a chatbot has an impact on the coachee's satisfaction with the coaching, the relationship between coach and coachee, and the effectiveness of the coaching.

H1. A high anthropomorphism chatbot leads to higher satisfaction of the coachee with the coaching than a low anthropomorphism chatbot.

H2. A high anthropomorphism chatbot leads to higher trust between chatbot and coachee than a low anthropomorphism chatbot.

H3. A high anthropomorphism chatbot leads to higher perceived effectiveness of the coaching than a low anthropomorphism chatbot.

Design

An online experiment was conducted with a 1x2 between-subjects design with anthropomorphism as independent variable (high vs. low). Satisfaction, trust, and effectiveness were measured as dependent variables. The participants were assigned to one of the two representations on an alternating basis and 'talked' with the chatbot for 5 to 10 minutes. As a cover story, the participants were informed that the goal of our study was to validate the functionality of the chatbot for further improvement.

Material

The chatbot under investigation is a virtual coach that has been designed to help achieve goals, encourage reflection of obstacles and stimulate further thinking by asking questions. The chatbot is currently available in the beta test phase. Via a text input field, users can communicate with the chatbot and are guided through the coaching process by the chatbot's questions. The goal is to define an ideal state for the topic and to set action goals. For this study, the chatbot was available in two versions. Based on the features presented above, a high anthropomorphism and a low anthropomorphism version of the chatbot were programmed. Thus, we instructed the participants to choose a topic or issue they would like to 'talk' about with the chatbot (see Table 2).

Table 2: Presentation of the Differences Between the Chatbots

Version	high anthropomorphism	low anthropomorphism
Name	James	Goaltastic
Compliments	Yes "That's a nice name. You seem really motivated."	No
Humor	Yes ("Or do you live like me everywhere? 🌍 "; "...if you need me, you know where to find me 😊 ")	No
Weaknesses	Yes ("It's best to take notes, that always helps me to visualize important things")	No
Emoji use	Yes (👏; 😊; 😃; 🌍; 💭; 🎓)	No
Writing indicators	Yes	No

Version	high anthropomorphism	low anthropomorphism
Reference to errors	Yes ("But every now and then there can still be problems, just think how young I still am and forgive me")	No
Background info	"I am James, a chatbot who is born in 2019. I've learned a lot since then and hope I can help you too."	"I am a chatbot. I was trained to counsel you."
Mention of the coachee's name	7 x	1 x

Manipulation Check and Control Variables

As manipulation check, we used a semantic differential with a six-point scale to measure how human the participants perceived the chatbot to be. The items were chosen based on Bartneck et al. (2009) and Powers and Kiesler (2006). For example, the participants should evaluate whether the chatbot was realistic vs. artificial, human-like vs. machine-like, or rude vs. polite. As control variables, we measured authenticity and perceived sympathy with two five-point Likert scales with four items each. The internal consistencies of the scales in this study are between .83 and .93. We asked participants whether they had previously participated in virtual coaching in this form, to control for habituation or experiential effects.

Dependent Variable

We measured satisfaction with five items based on the 'Check-the-Coach' questionnaire by Bachmann et al. (2004). The coachee should rate five statements on a 5-point Likert scale from 'do not agree at all' to 'agree completely'. The scale in this study shows excellent internal consistency with Cronbach's Alpha = .91.

To measure trust, participants rated nine items (e.g., 'The chat was characterized by appreciation') about their relationship with the chatbot, based on the study by Reinhard et al. (2006) and Runde (2018), as well as on trustworthiness. We based the rating on a 6-point scale from 'very much agree' to 'not at all agree'. The scale also shows excellent internal consistency in this study with Cronbach's Alpha = .97.

We measured the effectiveness of the coaching with nine items (e.g., 'When I think of my topic, I feel pleasantly challenged') based on the questionnaire by Künzli and Toggweiler (2014). The evaluation was based on a 6-point scale from 'do not agree at all' to 'agree completely'. The efficacy in this study shows excellent internal consistency with a Cronbach's Alpha = .93.

Sample

The survey took place in May 2019 and lasted 10 days with an invitation issued via social media. A total of 24 females and 20 males participated (n = 44). The average age was approximately 32 years (M = 31.64, SD = 9.82). Only two (4.5 %) of the interviewees had previously taken part in coaching with a chatbot. The majority of the participants had no experience with this form of coaching and therefore started the coaching process completely free of bias.

Results

Manipulation check and control variables

The chatbot with low anthropomorphism (M = 24.59, SD = 9.53) was perceived less human-like than the chatbot with high anthropomorphism (M = 49.41, SD = 9.00), $F(1, 42) = 78.99$, p <.001, d = *2*.68. The chatbot with low anthropomorphism (M = 5.00, SD = 2.02) was perceived less natural than the chatbot with high anthropomorphism (M = 10.82, SD = 2.44), $F(1, 42) = 74.02$, p <.001, d = *2*.59. The chatbot with low anthropomorphism (M = 7.05, SD = 2.38) was perceived less sympathetic than the chatbot with high anthropomorphism (M = 13.86, SD = 2.75), $F(1, 42) = 77.38$, p <.001, d = *2*.66.

Dependent Variables

The participants who interacted with the highly anthropomorphic chatbot (M = 3.23, SD = 0.84) were more satisfied with the coaching than the participants who interacted with the low anthropomorphic chatbot (M = 1.96, SD = 0.60), $F(1, 42) = 32.94$, p <.001, d = 1.73. This confirms hypothesis 1.
The participants who interacted with the highly anthropomorphic chatbot (M = 4.11, SD = 0.55) perceived higher trust than the participants who interacted with the low anthropomorphic chatbot (M = 1.92, SD = 0.87), $F(1, 42) = 100.54$, p <.001, d = 3.02. This confirms hypothesis 2.

The participants who interacted with the highly anthropomorphic chatbot (M = 3.26, SD = 0.96) described a higher effectiveness than the participants who interacted with the low anthropomorphic chatbot (M = 1.96, SD = 0.67), $F(1, 42) = 38.66$, p <.001, d = 1.88. This confirms hypothesis 3.

Discussion

In this study, we examined the influence of the anthropomorphic representation of a chatbot in e-coaching. The focus was on the analysis of the extent to which high vs. low anthropomorphic representation of the chatbot influences the coaching success. We measured the success of the coaching with three variables: (a) satisfaction of the coachee with the coaching, (b) trust between coach and coachee and (c) perceived effectiveness of the coaching.

The first three hypotheses were confirmed. A human chatbot increases the satisfaction of the coachee with the coaching. High anthropomorphism leads to higher satisfaction of the coachee with the coaching compared to low anthropomorphism. A human chatbot improves trust between chatbot and coachee. High anthropomorphism leads to improved relationship building compared to low anthropomorphism. The perceived effectiveness of the coaching increases through a human chatbot. High anthropomorphism increases the perceived effectiveness of coaching compared to low anthropomorphism.

In this study, we could confirm the influence of anthropomorphic cues on the perception of a chatbot using the manipulation check. The cues were extracted from previous research and were intended to distinguish between the high anthropomorphism and the low anthropomorphism chatbot version. They led to statistically significant differences in the evaluation of chatbots. Thus, the high anthropomorphism chatbot was perceived to be more human-like, and the authenticity and sympathy towards the human bot were rated higher. The implementation of the hint stimuli in both versions led to good manipulation results. The results of the conducted survey showed that coaching with the high anthropomorphism chatbot led to higher satisfaction with the coaching, to higher trust, and to higher perceived effectiveness of the coaching than with the low anthropomorphism chatbot. In this research, the influence of an anthropomorphism chatbot on coaching success in e-coaching could be proven: A chatbot with a human touch leads to a higher satisfaction and perceived effectiveness of the coachee with the coaching process.

So far, chatbots in coaching are generally viewed with scepticism. Coaches still prefer communication via classic media such as e-mail or telephone (Middendorf, 2018). The study by Das (2017) shows that those users who reject communication via chatbots consider this form of communication to be very impersonal. The anthropomorphic design of the chatbot 'James' attempts to provide a better communication experience for the user. Following Triebel, Heller, Hauser, and Koch (2016), it is, however, not *what* happens between two people in communication that matters, but *how* it happens. This principle can be applied to HRI (human-robot interaction) because the results of this research show that the *how* of the communication has significant effects on the variables.

The research supports the advance of chatbots into disciplines that were believed to be less suitable for artificial intelligence because they heavily rely on human interaction, like coaching. It shows that human chatbots are a good option for decision and goal attainment coaching. The biggest obstacle for this transformation of coaching does not seem to be the technology nor the acceptance by the coachee, but possibly the coaches' fear of lost business opportunities. However, the chatbot-supported coaching could be embraced as an opportunity to make decision-coaching and goal-attainment coaching more available to many people who considered it too complicated, not timely enough, too personal, or too costly.

Therefore, chatbot-coaching increases the coaching offerings and leaves the highly individualized demands of coaching (Rauen, 2018) to humans. With the help of anthropomorphic goal-attainment chatbots, the coaching world becomes more diverse and coaching can become ubiquitous.

Limitations and Further Research

The reliability analysis showed that an item on the perceived effectiveness scale has a significantly lower discriminatory power than all other items on this scale. This item can be exchanged in further research so that the internal reliability of the scale is increased. Enlargement of the sample and a different type of sampling is also recommended for a better generalization of results. It should also be examined whether the increasing anthropomorphization of chatbots becomes counterproductive at some point through unfulfillable expectations (de Visser et al., 2016; Diederich et al., 2020). The question of the optimal level of anthropomorphism has not been clearly clarified in current research (Lucas, Gratch, King, & Morency, 2014; Złotowski, Proudfoot, Yogeeswaran, & Bartneck, 2015).

Further research should also explore which exact cues are responsible for an anthropomorphic representation. The differences between the two chatbots had an effect, but the question of which cues were decisive to which degree has not been explored. Future research could examine the exact effect of these cues and help developers of future coaching chatbots to design the communication even more successfully. Despite the many positive effects of the coachees' satisfaction with the coaching and its importance on the coaching's perceived effectiveness, it would be too brief to list it as the sole criterion for the effectiveness of coaching. The relative importance of the success factors in Greif's model (2008) should be explored by conjoint analysis.

Because of the options of artificial intelligence supported anthropomorphic chatbots, coaching is in a very exciting transformation with many changes to come.

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