Putting AI into Coaching:
Can a Chatbot be a Coach?
Analysing the effectiveness of a career coaching intervention conducted by a conversational agent

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Combining Artifical Intelligence and Career Coaching:

Use of **chatbots in psychological contexts is a new and growing area of research** with primarily pilot studies (Bending et al., 2019). Current research focuses on depression and anxiety disorders (e.g., Fulmer et al., 2018) and psychological well-being (e.g., Ly et al., 2017).

Use of chatbots in coaching with scientific background is not very wide spread; accordingly, publications are mostly theoretical (e.g., Grassmann & Schermuly, 2020). Exception: PEACH Personality Coach (Stieger et al., 2021).

Artificial intelligence in career coaching seems promising: 21% of surveyed coaches in *Coaching-Umfrage Deutschland* considered digitally supported coaching more suitable for career coaching compared to other kinds of coaching (Middendorf, 2016).

"Does it work?" is a fundamental, yet unanswered question. Specifically, can a conversation with a career coaching-chatbot help achieve goals, drive problem solving, make clients more optimistic and confident?

Research Design and sample:

	Time 1	Time 2	Time 3	Time 4
Treatment Group	n = 41		n = 23 Retention Rate: 56%	n = 19 Retention Rate: 46%	-
Wait List Control Group	n = 34	-	n = 23 Retention Rate: 68%	n = 10 Retention Rate: 29%
Full Sample	N = 75		N = 42 Retention Rate: 56%	N = 33 Retention Rate: 44%

Wait list control group design with 3 measurement points
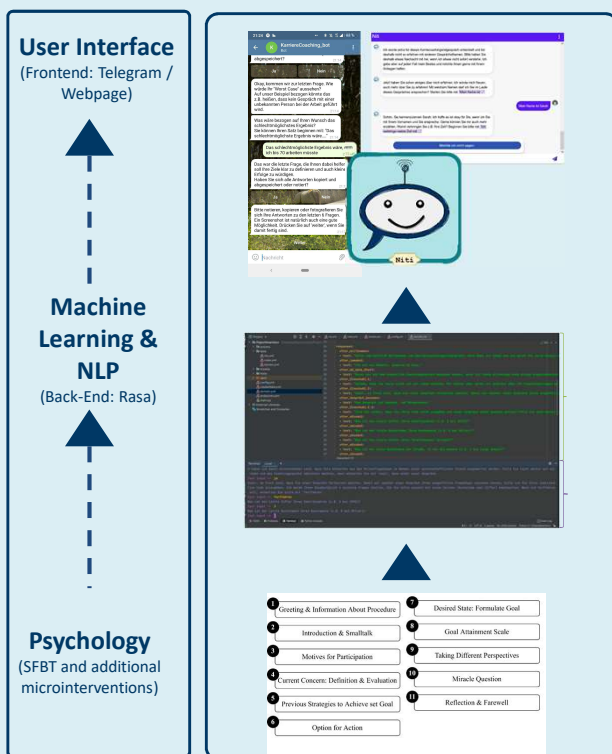
Dependent variables:

Goal Attainment: Solution-focused brief therapy scaling questions (e.g., de Shazer et al., 2021) at T1, T2, and T3: and "How close are you to resolving this current concern today?"
Problem Perception: Solution-focused brief therapy scaling questions (e.g., de Shazer et al., 2021) at T1, T2, and T3: and "How problematic do you perceive the issue just described?"
Career Optimism: 10-item German version of the Career Future Inventory (Spurk & Volmer, 2013); e.g., "I am eager to pursue my career dreams", on a 6-point Likert scale at T1 and T3; α_{T1} = .91; α_{T3} = .87
Career Insecurity: Höge et al.'s career insecurity with 4 items (2012); e.g., "It is difficult for me to plan my professional future "on a 6-point Likert scale at T1 and T3; α_{T1} = .63; α_{T3} = .63
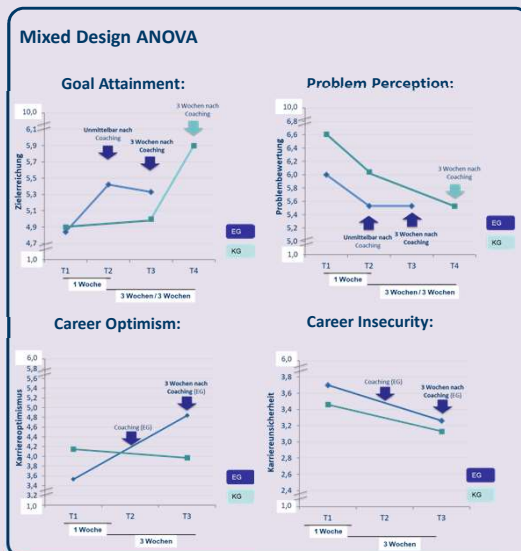
Niti – the Chatbot-Coach:

User Interface
(Frontend: Telegram / Webpage)

Machine Learning & NLP
(Back-End: Rasa)

Psychology
(SFBT and additional microinterventions)

1 Greeting & Information About Procedure	7 Desired State: Formulate Goal
2 Introduction & Smalltalk	8 Goal Attainment Scale
3 Motives for Participation	9 Taking Different Perspectives
4 Current Concern: Definition & Evaluation	10 Miracle Question
5 Previous Strategies to Achieve set Goal	11 Reflection & Farewell
6 Option for Action	

Results:

Sample Statistics (*N* = 29)

Descriptive Statistics (*N* = 29)

Mixed Design ANOVA

Goal Attainment:

Problem Perception:

Career Optimism:

Career Insecurity:

- Approximation of desired Goal Attainment Score remains stable 3 weeks post-coaching.
- Stable decrease over time for Problem Perception Scores.
- Career Optimism ratings improve over time for the treatment group, while they decrease for the control group, $F(1,40)$ = 0,34, p = .063, η^2 = .08
- Overall decrease in career insecurity over time, $F(1,40)$ = 6.63, p = .014, η^2 = .14

Conclusion and Outlook:

What our clients say: "Despite problems in small talk, a helpful tool," "Clarity is created through the architecture of the conversation, which worked excellently," and "The questions were asked very stringently [...]. The writing sharpened my thoughts and I became more aware of some things."

What we say:
Challenging, exciting interdisciplinary project (including the Schöller Endowed Chair for Business Information Systems) with promising development opportunities. Once the available data has been fully analyzed, it is planned to transfer it to collaborations for further development and publication.