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Can (A)I do this for you? – Exploring the Impact of Psychological Distance and AI-Attitude on Task Delegation

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Completed Research

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Abstract

Artificial intelligence (AI) creates a new frontier of information systems, ready to be utilized by organizations. However, AI is yet to be implemented across workplaces to automate tasks and to save costs. A crucial success factor to achieve this, is the correct delegation of tasks to AI by considering the individual fit of humans, tasks, and AI. Previous literature focused on tasks' characteristics that influence the delegation decision. We argue that the effect of personal factors, such as the own involvement in the task (psychological distance) and a person's attitude towards AI affect the delegation as well. We examined these effects during an experiment (n=211). Our results indicate both factors strongly affect the predictors of AI task delegation. Our findings underline the importance of underlying personal factors for the decision and imply that the persons deciding whether a task shall be delegated to AI or not should be carefully chosen.

Keywords

Artificial Intelligence, Organizational Context, Psychological Distance, Outsourcing

Introduction

The continuing rise of artificial intelligence (AI) vastly improves the capabilities of information technology (McCorduck and Cfe, 2004; Berente et al., 2021). At the core of AI are mostly machine learning algorithms that are outstanding in their ability to detect patterns in large amounts of data, enabling the technology to 'understand' textual, visual and auditive data (Amershi et al., 2019). The potentials of AI have been demonstrated in nearly all sectors (Stone et al., 2016), such as healthcare (Hamet and Tremblay, 2017; Davenport et al., 2020), supply-chain (Nissen and Sengupta, 2006) or finance (Bahrammirzaee, 2010). In general, AI takes over tasks that could previously only be executed by the human workforce (Brynjolfsson and Mitchell, 2017).

However, AI comes with its own set of challenges that needs to be addressed to properly manage the technology and implement it in an organizational setting (Berente et al., 2021). Numerous authors suggest that both humans and AI should be employed according to their strengths and ultimately can build a team to solve a task and reach the best performance (Dellermann et al., 2019; Bittner et al., 2021). One socio-technical challenge is properly allocating tasks for AI (AI task delegation) (Lubars and Tan, 2019). Recent works investigated how individuals would allocate tasks towards humans and AI in different contexts (Lubars and Tan, 2019; Cvetkovic and Bittner, 2022) adding valuable insights.

These works mainly focused on different domains of tasks and tasks characteristics. We argue that the human factor, i.e., underlying perceptions that shape one's opinions about the task and the AI, needs to be investigated as well. As pointed out by Berente et al. (2021), "It is the managers that make all key decisions about AI" (p. 3). Hence, we focus on factors that could possibly influence the managerial perspective on AI task delegation, because ultimately, decision making regarding AI will be rather conducted by managers

than executing personnel (i.e. personnel that will in the end work with the AI-based system). We choose two constructs that possibly distinguishes managers from executing personnel. First, we adapt the construct of psychological distance. Psychological distance generally assesses how invested someone is in an object (Trope and Liberman, 2010), i.e., how close or distant a person feels towards an object on a temporal, social, spatial and hypotheticality level. The effect of psychological distance on managerial decisions was investigated before (e.g., export markets (Dow, 2000)). Research of psychological distance points suggests that people who conduct tasks themselves perceive those as more difficult and complex (Thomas and Tsai, 2012) and reduces motivation to engage (Trope and Liberman, 2010), thus, we consider the construct of psychological distance as useful in this context. Second, we explore the effect of the general attitude towards AI on the delegation decision. While we use the psychological distance to investigate the relationship towards the task, we use the attitude towards AI to explore the relationship between human and AI and its effect on the final decision. Building upon these two considerations, the following research question summarizes the research endeavor:

> ***RQ:*** *How does a person's psychological distance to a task and a person's attitude towards AI influence AI task delegation?*

The work is structured as follows to answer the research question. In section 2, we describe the current state of AI task delegation and the foundations of psychological distance. Next, we derive hypotheses about the potential effect of psychological distance and attitude towards AI on AI task delegation in section 3. Drawing on hypotheses, we derive a research model to investigate possible effects in section 4. Moreover, we describe the experimental setting of our experiment to test the research model in this section. Next, we describe the results of our findings in section 5. We discuss our findings and show the limitations and future research avenues in section 6. Last, we summarize our findings, show the limitations of our work, and describe future research avenues in section 7.

Theoretical Background

AI Task Delegation in Organizations

Organizations can be described as a decision network, aiming to reach their organizational goals. With the rise of AI, previously fixed hierarchies and structures of this organizational network are changing (Shrestha et al., 2019). Due to the new tier of information systems (IS) that AI introduces, new capabilities and challenges for organizations are emerging (Shrestha et al., 2019; Berente et al., 2021). One of these challenges is the correct allocation of tasks to either human, AI, or both (Shrestha et al., 2019). Humans excel at their ability to adapt flexibly to tasks, have empathy, and can be creative. In contrast, AI can recognize patterns that are not visible to humans, it is probabilistic, works consistently, and achieves higher speed and efficiency than humans (Dellermann et al., 2019). Current research advises combining the strengths of humans and AI in organizations, which can be realized in different forms of human-AI teams (e.g., human is supported sequentially by AI during decision making) (Shrestha et al., 2019). The potentials of human-AI teams have been demonstrated for example in medicine (Kieseberg et al., 2016), service contexts (Poser et al., 2021), and manufacturing use-cases (Cimini et al., 2020). To realize these advantages for real-world organizations, the individual strengths of both entities need to be employed accordingly. If human and (AI-based) IS capabilities are misjudged, task performance can also strongly decrease (Price, 1985; Dellermann et al., 2019). Moreover, this AI task allocation can be a pitfall for managers, because they can be held accountable if AI fails in the decision-making process (Shrestha et al., 2019).

Lubars and Tan (2019) present a framework that conceptualizes factors influencing the decision of delegating a task towards AI or humans (see Fig. 1). We argue that this framework can be of interest for organizations to be aware of factors that can influence the AI task delegation.

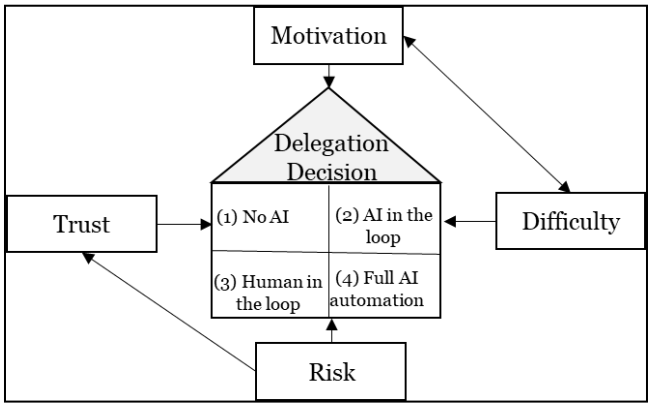

Figure 1. AI Task Delegation Framework. Based on Lubars and Tan (2019)

The model considers four influencing factors of delegation decisions: motivation, difficulty, risk, and trust. These four factors strongly influence a person's decision to decide for a specific level of AI task delegation. *Motivation* measures the person's intrinsic will to conduct a task. *Difficulty* measures the person's subjective perception of the effort needed to perform the task. *Risk* measures the probability of successfully conducting the task versus the costs needed to conduct the task. The last factor, *trust*, measures the trust in the successful support provided by the AI to the human during task performance. Moreover, the framework distinguishes between four levels of delegations: (1) no AI assistance, (2) AI in the loop (AI supports the human), (3) human in the loop (human supports AI) and (3) full AI automation (Lubars and Tan, 2019).

Psychological Distance

The concept of psychological distance is based on the Construal-Level theory from Liberman and Trope (2010) and describes the experience of "something or someone being close to or far from the self, here, and now" (p. 1). This distance can be measured on multiple dimensions: spatial, temporal, social, and hypotheticality (Liberman and Trope, 2014). The starting point of psychological distance is always the present situation (e.g., including factors like the current time, location). Psychological distance is a highly subjective factor for the experiencing person, although the psychological distance can be measured objectively (e.g., the temporal distance could be measured with time intervals such as weeks, months, or years) (Trope and Liberman, 2010). In past research, psychological distance has been measured through different scales, because there is no standard measurement method (Wakita et al., 2012). We adapt our approach from Spence et al. (Spence et al., 2012) who investigated the effect of psychological distance on the perceived threat of climate change and adapted the scale to their individual topic.

Previous works demonstrated the effect of psychological distance on the perception of positive and negative effects. Depending on the psychological distance, events are perceived differently strong, i.e., positive or negative events that have close psychological distance tend to be perceived stronger (Bilgin and Leboeuf, 2010; Han and Gershoff, 2018). In the context of tasks, Thomas and Tsai (2012) point out that the perceived difficulty of a task is influenced by the psychological distance of a person towards it (Thomas and Tsai, 2012). Apart from that, psychological distance also affects our relationships with others (Aggarwal and McGill, 2007); humans are more likely to make different decisions for themselves than for others, due to the higher psychological distance (Pronin et al., 2008). In general, it was found that when making choices for other people, humans tend to be less risk-averse, i.e., more willing to make risky decisions, in comparison to making choices for themselves (Polman and Emich, 2011; Polman, 2012). In summary, we note that psychological distance does have an impact on perceived characteristics of the task itself (e.g., its difficulty) and one's commitment and perceiving of positive and negative events related to it.

Hypotheses Development

We develop our hypotheses by drawing on the presented AI task delegation framework of Lubars and Tan (2019) and the research corpus of psychological distance and trust in AI. We adapted the constructs of task

motivation, task difficulty, and trust in the AI agent from the framework. Consequently, we derive several hypotheses for the possible impact of psychological distance and a person's attitude towards AI, using the corpus of literature. Moreover, we combine our hypotheses in a research model (see Fig. 2).

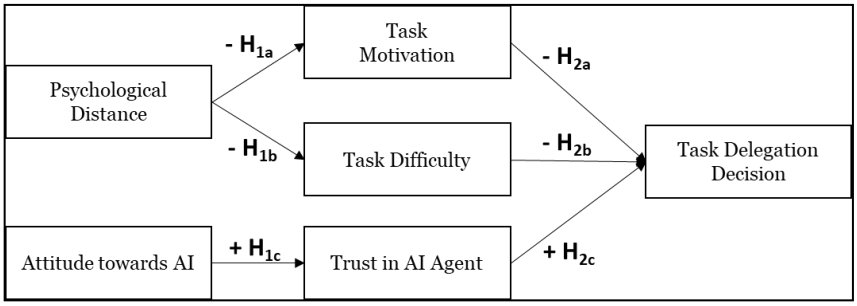

Figure 2. Research Model

Impacts of Psychological Distance

In our work, we focus on the impact of psychological distance on the decision to delegate a task to AI. We specifically want to investigate the effect of psychological distance on the constructs of motivation and difficulty. According to the Construal Level Theory, greater psychological distance introduces less motivation to engage in an action due to the decreased dependence on the specific outcome of this action (Trope and Liberman, 2010). Moreover, the authors state that motivation to do an action influences the perceived value of this action. Therefore, we hypothesize that:

> **H1a:** The **higher** the psychological distance of a person towards a task, the **lower** the person's motivation of the person to conduct the task is.

Another study investigated the effect of psychological distance on perceived task difficulty (Thomas and Tsai, 2012). The main finding of that work is that psychological distance influences the perceived difficulty of a task. The closer someone is to a task (i.e., low psychological distance) the higher is the perceived difficulty. Alternatively, vice versa, people tend to perceive tasks as less difficult if they have a high psychological distance. Thus, we hypothesize that:

> **H1b:** The higher the psychological distance of a person towards a task, the **lower** the perceived difficulty of a task is.

In a second step, we want to confirm the impact of motivation and difficulty on the AI task delegation decision. This effect was already investigated by several authors (Lubars and Tan, 2019; Cvetkovic and Bittner, 2022). Thus, we derive the following two hypotheses:

> **H2a**: The higher the motivation of a person to conduct a task, the **lower** the desired AI support on this task is.
>
> **H2b:** The higher the perceived difficulty of a task, the **lower** the desired AI support on this task is.

Impact of general AI beliefs on Trust

For the trust factor, we hypothesize, that the general attitude towards AI needs to be positive to trust the AI to conduct a task successfully. Trust is a construct where experiences in one area (e.g., distrust of the government handling banking data) can influence other areas (distrust of the government handling medical data), even if they are not necessarily connected (Gille et al., 2020). We adapted the Attitude Towards Artificial Intelligence (ATAI) scale which has been validated across Germany, China, and the United Kingdom and is designed to be used in specific contexts involving AI (Sindermann et al., 2021). While the construct of trust assesses a person's estimation of an AI agent to conduct a task successfully, it does not consider underlying beliefs about AI. Thus, we hypothesize that:

> **H1c:** The higher the attitude towards AI, the **higher** the trust in the AI agent to successfully conduct a task is.

H2c: The higher the trust in the AI agent to conduct a task successfully, the **higher** the desired AI support on this task is.

Method

Task and Procedure

An online experiment with a quantitative questionnaire was conducted to examine the hypotheses in the presented research model. The experiment scenario was two-fold and set in a fictional business context. This fictional setting was selected to fit the context of the participants (mostly undergraduate and graduate students in economics). First, participants were asked to select their most favorite department and their least favorite department to work in after graduating. The six departments (purchasing, research and development, information technology, human resources, finance, and sales) were chosen because they cover relevant aspects along the typical value chain of an industrial company. We used this binary metric to measure the (social) psychological distance of the participants towards these departments, where the favored department indicates a minimal psychological distance, and the least favored department indicates a high psychological distance. We adapted this approach of an individual scale for psychological distance from similar works that used context-specific items to measure people's tendency in the domains of climate change (Spence et al., 2012) and export market selection (Dow, 2000).

Next, participants were asked to imagine they were in charge of deciding whether tasks in their fictional company should be delegated to AI or not. Consequently, six tasks (one of each department) were presented to the participants. Similar to Cvetkovic and Bittner (2022), we used the International Standard Classification of Occupations to formulate a real-world task. We formulated a standard task, which was slightly adapted to fit each department's context but did not vary in its basic activity. In general, all activities involved operational and administrative tasks (e.g., processing sales documents or processing applicants documents), adapted to the department. This was done to not bias the participants by showing them different tasks since our focus was on the psychological distance and not on the task's characteristics. At the end of every task, participants had to select the mode of outsourcing (i.e., no outsourcing, AI assists human, human assists AI or full AI automation).

Utilizing the AI task delegation framework, the constructs of motivation, difficulty and trust had to be answered for each task. We dropped the initial construct of risk because Cvetkovic and Bittner (2022) showed that the construct does not fit into the model. We adapted the constructs of our questionnaire mainly from the AI task delegation framework of Lubars and Tan (2019). The AITA was adapted from Sindermann et al. (2021). Last, the participants had to decide whether to delegate a task to AI or not (on a scale from 1-4). Moreover, the questionnaire included several attention checks and control variables (age and gender).

Validity of the Research Model

To ensure the reliability and validity of the constructs, we conducted a confirmatory factor analysis (CFA) in lavaan 0.6-9 in R (R-Project, 2022) (see Table 1). The loadings of items of a few constructs were overall low (e.g., difficulty). These low loadings are explained by the high diversity of items included in the AI task delegation framework, because every construct covers multiple dimensions. We removed items to increase the factor loadings and defined .4 as the borderline threshold (Stevens 2002). This resulted in two dropped items for difficulty, one dropped item for trust, and two dropped items for the AITA construct. These findings are similar to those of another study (Cvetkovic and Bittner 2022), which also experienced problems with the framework's constructs. After recalculating the CFA, the loadings of all our items were above our set threshold. Moreover, the CFA showed acceptable measures of fit ($\chi 2 = 174.549$, $df = 59$, $\chi 2/df = 2.958$, RMSEA = .068, CFI = .926, TLI = .902). The composite reliability (CR) and average variance extracted (AVE) are above the thresholds of .6 (CR) and .5 (AVE) for all constructs (thresholds proposed by Fornell and Larcker 1981), except the construct difficulty, which has an AVE of .335 (and a CR of .6). We accepted this limitation due to the acceptable CR and since it is a unique framework that has not been tested very often.

Construct	Factor Loadings	
	Initial	**Adjusted**
Motivation (*M* = 3.185, SD = .992) (Lubars and Tan 2019)		
1. I would feel motivated to perform this task, even without needing to; for example, it is fun, interesting, or meaningful to me		**.506**
2. I am interested in learning how to master this task, not just in the completion of the task		**.837**
3. I consider this task especially valuable or important; I would feel committed to completing this task because of the value it adds to my life or the lives of others		**.782**
Difficulty (*M* = 3.767, SD = .743) (Lubars and Tan 2019)		
~~1. This task requires social skills to complete~~	.353	
2. This task requires creativity to complete	.451	**.648**
3. This task requires a great deal of time or effort to complete	.352	**.551**
4. It takes significant training or expertise to be qualified for this task	.339	**.531**
~~5. I am confident in my abilities to complete this task~~	.530	
Trust (*M* = 3.393, SD = .924) (Lubars and Tan 2019)		
1. I trust the AI agent's ability to reliably complete the task	.806	**.840**
~~2. Understanding the reasons behind the AI agent's actions is important for me to trust the AI agent on this task (e.g., explanations are necessary)~~	~~.031~~	
3. I trust the AI agent's actions to protect my interests and align with my values for this task	.666	**.625**
Attitude towards AI (*M* = 2.464, SD = 1.125) (Sindermann et al., 2021)		
1. I fear artificial intelligence	.802	**.815**
2. Artificial intelligence will destroy humankind	.860	**.920**
3. Artificial intelligence will benefit humankind	.583	**.582**
~~4. Artificial intelligence will cause many job losses~~	~~.464~~	
~~5. I trust artificial intelligence~~	~~.331~~	

Table 1. Validation of Constructs

Data Analysis

In total, 223 participants took part in the experiment. Through a scenario check (M = 8.53, SD = 1.61), 5 participants were discarded from the sample, because their answer was less than 5 on a scale from 1 to 10 (where a 10 indicates that they can fully put themselves in the described scenario). Moreover, 7 participants were removed from the sample because they did not pass an attention check during the experiment. Thus, the final number of participants is 211. The age of the participants ranged from 20 to 38 years (M = 24.88 years, SD = 2.54) and 37.68% of the participants were female.

Moreover, we evaluated our control variables, age and gender. Both variables were included to assure that our findings are not limited to a specific subgroup. Age (F = 3.148, p = .077) and gender (F = 0.017, p=.897), show no significant effect on the final AI task delegation decision.

Results

We applied a structural equation model to test our derived research model and the underlying hypotheses. The analysis was carried out with lavaan 0.6-9 in R. We used the Weighted Least Square Mean and Variance (WLSMV) estimator for the analysis, because of our endogenous ordinal variable (task delegation decision) and the binary exogenous variable of psychological distance. WLSMV is a robust estimator suited especially for categorical, ordinal, and not equally distributed variables (Edwards, 2010; Proitsi et al., 2011). The results of our research, including path coefficients, R^2 values, and the significance levels of our results are presented in figure 3.

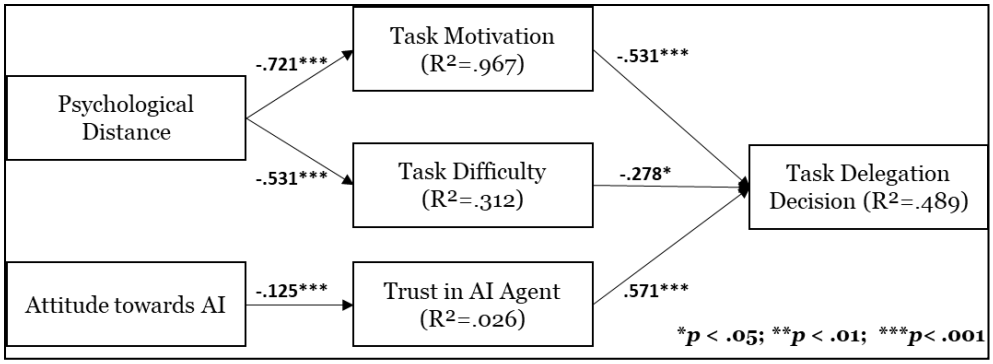

Figure 3. Results of the Experiment

The measured psychological distance has a significant effect on the participant's motivation towards a task (psychological distance → motivation, β = .-721, *p* <.001). Our hypothesis H1a about the negative effect of psychological distance on motivation is supported. Similar to this finding, it could be shown that psychological distance also influences the perceived difficulty of a task (psychological distance → difficulty, β = .-531, *p* <.001). Thus, hypothesis H1b that states that psychological distance negatively influences the perceived difficulty of a task, is also supported. Following the path of these two influencing factors, we can confirm the negative effects of motivation (motivation → task delegation decision, β = .-531, *p* <.001) and difficulty (difficulty → task delegation decision, β = .-278, *p* = .010). Hence, hypotheses H2a and H2b are supported by our experiment as well. Next, we investigated the effect of the general attitude towards AI on the context-dependent trust of the participant in the AI agent (attitude towards AI → trust, β = -.125, *p* = .005). Our experiment supports this hypothesis as well (H1c). Last, we can confirm the effect of trust on the task delegation decision (trust → task delegation decision, β = .571, *p* = <.001), which confirms hypothesis H2c. Our findings are summarized in Table 2.

Hypotheses	Relationship	β-value	z-value	p-value	Support
H1a	Psychological Distance → Motivation	-.721	-4.970	<.001	yes
H1b	Psychological Distance → Difficulty	-.531	-6.314	<.001	yes
H1c	Attitude towards AI → Trust	-.125	-2.829	.005	yes
H2a	Motivation → Task Delegation Decision	-.531	-3.984	<.001	yes
H2b	Difficulty → Task Delegation Decision	-.278	-2.562	.010	yes
H2c	Trust → Task Delegation Decision	.571	7.362	<.001	yes

Table 2. Results of the Hypotheses Tests

Discussion

Our study explores underlying factors that influence humans' decision to delegate tasks to AI. Since AI as technology reached a tipping point where its capabilities have been proven in many areas, research is needed on how to effectively implement this technology in organizations (Berente et al., 2021). This study contributes to this by investigating underlying factors that can influence humans' decisions regarding AI task allocation. To the best of our knowledge, we are the first to investigate the effect of psychological distance and attitude towards AI on the AI task delegation decision. Our findings point towards the importance of the relationship between the deciding person, AI and the task (psychological distance to the task and attitude towards AI). Moreover, we add knowledge to the growing corpus of studies investigating human-AI task delegation (Lubars and Tan, 2019; Jiang et al., 2021; Cvetkovic and Bittner, 2022).

Our findings add to the ongoing discourse in literature by providing three contributions: First, we found that the psychological distance of a human towards the organizational department a task is set in negatively influences the perceived difficulty of a task. The negative influence of psychological distance on the perceived difficulty of a task is in line with previous research that investigated this effect in a non-AI-related setting (Thomas and Tsai, 2012). Our explanation for this is that people conducting a task themselves instead rate the task's difficulty higher, due to their involvement in it. Second, our results support our hypothesis that motivation is decreased if the psychological distance is high. We explain this with the corpus of research indicating that psychological distance affects a person's commitment towards another subject because the outcome does not affect the person itself (Trope and Liberman, 2010); hence, the person is not motivated to conduct the task. Moreover, the experiment also confirmed the effects of motivation and difficulty on the decision to delegate a task to AI. This finding adds up to the AI task delegation framework of Lubars and Tan (2019) and the empirical work of Cvetkovic and Bittner (2022) who had similar findings. Third, as pointed out by literature, one domain's trust levels can spread to other domains unrelated to the first domain (Gille et al., 2020). We found that the general attitude towards AI influences the context-specific trust of humans in an AI agent to conduct a task. The attitude towards AI positively influences the factor of trust, which has a significant positive impact on the task delegation decision. Last, we could confirm the effect of trust on the decision to delegate a task (like motivation and difficulty), which also adds up to the previously mentioned findings.

We also derive practical implications from the results of our study, aiming at the successful management of AI in organizations as an emerging topic (Berente et al., 2021). Organizations that want to utilize the advantages of AI need to be aware, of which factors influence the decision to delegate tasks to AI. Our findings indicate that psychological distance plays a crucial role in this decision. We argue that decision-makers of AI task delegation need to be cautious of the role of their psychological distance towards tasks because it can persuade their final decision. Our findings imply for organizations that single persons should not make decisions about AI task delegation, but rather multiple persons that have different psychological distances to the tasks (e.g., persons from within the department where AI shall be used and persons from other departments) because they will likely have different motivations themselves to conduct the task and perceive the difficulty of the task differently. Moreover, deciding persons within an organization should be aware of their attitude towards AI and be able to conclude if this impacts their managerial decision on AI. As people interact with different applications and providers of AI during everyday lives (e.g., by getting recommendations based on their purchases), we argue that trust is often not rationally transferrable because the different encounters with AI do not relate to each other. However, our results indicate that the general belief about AI impacts the trust in a context-specific AI agent.

Concluding Remarks

In this study, we exploratively investigated underlying factors that can influence the decision of AI task delegation. Our online experiment included 211 participants who evaluated tasks from different business departments and ultimately had to decide whether to delegate a task to AI or not. We determined their initial psychological distance towards these tasks by asking the participants in advance which business department they would most (and least) like to work in. Moreover, we formulated the tasks in a very similar way, all involving the same activities but with different entities (e.g., documents and personnel). We could show that the psychological distance and the general attitude towards AI are important factors in perceiving factors that ultimately decide whether a person or an algorithm shall conduct a task.

However, our work is not free of limitations. First, the majority of our participants were students who have little to no managerial experience. Despite, samples consisting of students can often be generalized (Compeau et al., 2012). While we acknowledge this limitation, this work points toward the effect of psychological distance on managerial decisions. This experiment could be conducted again with managers to prove the contribution of this work. Second, our study was set in the fictional setting of a company that includes typical business departments and our tasks were framed to fit into this context. We did not cover other areas with special working conditions such as healthcare or investigated different types of AI that shall be implemented (i.e., different types of algorithms and application areas such as visual or auditive). Third, we measured psychological distance by implying that people who want to work most at a specific department have a less psychological distance to this department than to one they do not want to work in. Nevertheless, this approach was adapted from authors that adapted the measure of psychological distance

to their individual contexts (Dow, 2000; Spence et al., 2012). Keeping these limitations in mind, we would like to call to further research on decision-making about human-AI interaction due to the large possible impact of this technology on socio-technical organizations and the ongoing adaption of AI in our lives.

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