Employers’ and applicants’ fairness perceptions in job interviews: using a teleoperated robot as fair proxy

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1. Introduction

The employment interview is “a social interaction where the interviewer and applicant exchange and process the information gathered from each other” (Macan, 2009, p. 215). It is one of the most commonly used methods to assess job applicants and a critical organizational activity that helps firms secure the necessary workforce to remain competitive over time (Macan, 2009, p. 215). Despite its importance, the employment interview has been found to lack objectivity, often caused by implicit biases (Dane and Pratt, 2007; Gore and Sadler-Smith, 2011). Implicit associations an interviewer may have related to, for instance, physical appearance, obesity, race, and gender, are also some of the factors known to unintentionally influence the way applicants are perceived and evaluated (e.g., Grant and Mizzi, 2014; Heilman and Saruwatari, 1979; Johnson et al., 2010; Ruffle and Shitdiner, 2015). Indeed, research has documented that interviewers’ intuition, affective processes and subjective impressions during job interviews prevail over applicants’ qualifications and skills (Garcia et al., 2008; Graves and Powell, 1996; Huffcutt, 2012). Implicit biases are very difficult to control and change (Dobbie and Kalver, 2016; Lai et al., 2016). They involve the unconscious, rapid and automatic processing of information and can be in direct contradiction to consciously held values and beliefs of individuals (Hinton, 2017). Personnel selection may be biased due to well-known non-job-related factors such as the halo effect, homophily, homosociality, etc. (Holgersson, 2013; Rivera, 2015). Implicit associations an interviewer may have related to, for instance, physical appearance, obesity, race, and gender, are also some of the factors known to unintentionally influence the way applicants are perceived and evaluated (e.g., Grant and Mizzi, 2014; Heilman and Saruwatari, 1979; Johnson et al., 2010; Ruffle and Shitdiner, 2015). Indeed, research has documented that interviewers’ intuition, affective processes and subjective impressions during job interviews prevail over applicants’ qualifications and skills (Garcia et al., 2008; Graves and Powell, 1996; Huffcutt, 2011). As opposed to the rational, conscious, and somewhat slower cognitive operations of analytical thinking, selection based on intuitive thinking is nonconscious, affectively charged and based on rapid cognition and thus unavoidably relies on implicit biases (Dane and Pratt, 2007; Gore and Sadler-Smith, 2011).

Implicit biases are problematic on both ethical and pragmatic
ethically, biases of this sort violate basic rights to equal
treatment, respect, and opportunity—i.e., rights that are regarded
as foundational in Western democratic societies (Arneson, 2015).
Pragmatically, when the assessment and selection during the job interview
process are under the influence of subjective impressions, the interview
process may be perceived as less fair by applicants, thus generating
negative reactions toward the hiring organization (McLarty and Whitman,
2016). Applicants’ fairness perceptions of the job interview process
may therefore affect how such stakeholders perceive the hiring
organization and whether they are likely to recommend it to other
jobseekers or potential collaborators with associated effects on the
organization’s reputation. The perceived fairness of the process may also
affect their decision to accept or reject the job (if offered) and even their
job performance and work attitudes if they accept the job (McLarty and
Whitman, 2016; Ryan and Huth, 2008). A biased personnel selection
process may lead to losing out on candidates who are more skilled than
those to whom the bias is in favor, as well as to less employee diversity
(Rivera, 2012), which in turn may affect company performance and
innovation as well as workforce creativity and effectiveness (Hewlett
et al., 2013; Homan et al., 2007; Wang et al., 2019).

Fairness perceptions are related not only to freedom from bias but also
to compatibility with ethical standards, consistency of the procedure
across candidates and time, representation of the interests of the
affected parties, accuracy of the information that the selection procedure
is based on and availability of mechanisms that are able to correct
inaccurate decisions (Colquitt et al., 2001; Leventhal, 1980). To increase
the fairness perceptions of job interviews, it is relevant to understand
how personnel selection can deal with implicit biases. One approach
relies on training (Dobbin et al., 2015) and aims at increasing
individuals’ cognitive control of behavior (Amodio, 2014). However,
training often has a short-term effect, as implicit biases are very resilient
to change (Dobbin and Kalev, 2016). For instance, even individuals who
are strongly motivated and determined to act without prejudice have
been found to exhibit racial biases at the level of preconscious
decision-making (Amodio, 2014). A second approach involves altering
structural conditions in which biases emerge. In personnel selection,
studies show that structural changes in selection procedures can affect
employer biases. For instance, research has documented that relying on
structured rather than unstructured job interviews can reduce biases
toward candidates (Bragger et al., 2002; Katcher and Bragger, 2004),
and Gilliland (1993) proposed that structured interviews indicate
greater consistency, which leads to higher fairness perceptions.
Nonetheless, structured interviews are only able to reduce interviewer bias
rather than eradicate it (Aamodt et al., 2006). This means that biases related
to, for instance, overweight (Katcher and Bragger, 2004), race
(de Kock and Hauptfleisch, 2018), pregnancy (Bragger et al., 2002), etc.,
may decrease but will remain present in structured interviews to a
certain extent. An important reason for this is visual cues that have been
documented to affect interviewers’ judgments (DeGroot and Moto-
widlo, 1999). In addition to introducing more structure to job
interviews, another option is to reduce biases by relying on joint rather
than individual evaluations of candidates (Bohnet et al., 2016). A study
on the audition procedures of symphony orchestras further showed that
an intervention at the interface, i.e., using a curtain between the selection
committee and the candidates, increased the impartiality of the
committee and led to significantly more female musicians being selected
(Goldin and Rouse, 2000). The latter study in particular indicates the
potential in directly modifying the job interview setup, as it manipulates
the traditional face-to-face interaction to make it less conducive to
discrimination. When a selection procedure is perceived as neutral, i.e.,
as being “based on a full and open accurate assessment of the facts” (p.
768), it improves fairness perceptions related to that situation (Lind
et al., 1997). A neutral procedure may create more focus on objective
criteria and knowledge about candidates, which can be used to achieve
dispersing hiring decisions (Goldin and Rouse, 2000).

These considerations motivated us to test a novel structural approach
aimed at increasing applicant fairness perceptions in job interviews. As
reported in this paper, we examined what happens when the traditional,
face-to-face employment interview setup is replaced by a robot-
mediated setup. In recent years, employment interviews have
involved, to various degrees, the use of technology-mediated techniques
such as phone, video conference, or recorded digital interviews (Langer
et al., 2017) as alternatives or supplements to face-to-face interviews.
The present study taps into this line of research by assessing the use of
robot-mediated technology for possible effects on perceived fairness in
employment interviews. A previous study examined how a robot-mediated job interview affects fairness perceptions (Nørskov
et al., 2020, p. 1). The study, however, investigated a setup in which both the interviewer and the applicant were visually anonymous, i.e., a
type of a double-blind interview based on “symmetrical visual anonymity”, in which both parties are represented by a teleoperated robotic
proxy (Nørskov et al., 2020, p. 1). In contrast, in this study, we examine
a setup based on asymmetrical visual anonymity, or what could be
termed a single-blind interview, in which only the applicant is repre-
sented by a teleoperated robotic proxy, while the interviewer is visible to
the applicant via a computer screen. This is in line with recent research
on “fair proxy communication”, i.e., a setup for interpersonal commu-
nicator where the perceptual biases of the decision-maker ‘cannot get
off the ground’ because the conversation partner is present only by a
proxy (Seibt and Vestergaard, 2018). Asymmetric telepresence for
the purpose of reducing the biases of decision-makers has been shown to be
effective in the context of conflict facilitation (Druckman et al., 2021).
Since a job interview is a situation where decisional power is asym-
netric, it thus requires an asymmetric setup (Seibt and Vestergaard,
2018). The decisional power of employers also entails their legal and
moral duty to ensure proper treatment of candidates. There may, how-
ever, be modifications to this power imbalance between employers and
candidates, for instance, in times of labor and skills shortage. Another
difference between our study and prior research is that Nørskov et al.
(2020) based their work on respondents who were bachelor’s students
with limited job interview and job search experience, while our study
relies on HR professionals (recruiters, consultants, HR partners, etc.,
and current jobseekers. Finally, we examine both the employers’ and
applicants’ perspectives, while Nørskov et al. (2020) only investigated
the latter.

More specifically, our study examines (i) the use of a “fair proxy”
representing the job applicant (in the shape of a teleoperated social
robot) and (ii) its impact on applicants’ and employers’ fairness percep-
tions of the employment interview process. Our overall research
question is therefore whether replacing a face-to-face job interview with
a robot-mediated job interview affects the perceived fairness of the job
interview from the perspectives of the applicant and the employer and in
what ways.

The paper extends prior research on job interviews and technology
mediation by demonstrating the converging views of HR professionals and
applicants on robot mediation in job interviews, which suggest that HR
professionals’ focus on the ‘business case’ for diversity, i.e., that more
employee diversity will lead to better financial outcomes, undermines
the ‘social case’ for diversity, i.e., increasing diversity because it is a
socially responsible thing to do. The paper further demonstrates the
potential of a new technology-based perspective on how to deal with
biases in hiring, namely, through robot mediation in job interviews. In
the following, we first review the relevant literature and present our
arguments for how robot mediation could impact fairness perceptions in
job interviews. Next, we report the results of two studies and discuss the
findings and their implications.

2. Theoretical background

2.1. Applicants’ fairness perceptions and job interviews

Research on applicant reactions to selection processes investigates
“attitudes, affect, or cognitions an individual might have about the hiring process” (Ryan and Ployhart, 2000, p. 566). As noted by Gilliland (1993), fair selection procedures are relevant from a business, ethical, and legal perspective. First, reactions to personnel selection procedures can negatively affect the corporate brand of the hiring organization and thus the organization’s ability to attract and hire well-qualified applicants. Applicants’ perceived fairness of job interviews also holds potential to affect the hiring organization’s reputation, its ability to attract qualified job candidates, its collaboration partners, and its capacity to secure high work performance and positive organizational citizenship behavior (Bauer et al., 1998; Gilliland, 1993; McCarthy et al., 2017). Second, hiring organizations should, from an ethical perspective, be concerned with applicants’ well-being during the interview. Increasing fairness perceptions, for example, promotes applicants’ self-esteem, self-efficacy, and well-being (Gilliland, 1993; Schuler, 1993). Third, perceived unfairness caused by discrimination during the selection procedure may lead to applicants’ decisions to pursue legal discrimination cases. While research has generated several recommendations on how to improve applicant reactions to the selection process—e.g., job relatedness, giving feedback, providing selection information (for a recent review, see McCarthy et al., 2017)—and thereby also applicant fairness perceptions, implicit biases in the employment interview remain an important but unresolved issue.

The employment interview is an inherently interpersonal process (Rivera, 2012). This is a situation where subjective impressions and affective processes, e.g., similarities and liking, gain more significance in hiring decisions than candidates’ qualifications and cognitive skills (García et al., 2008; Graves and Powell, 1996; Huffcutt, 2011). Assessment and selection processes are influenced by mechanisms such as halo effects and first impressions (Howard and Ferris, 1996). Positive as well as negative affective reactions are thus likely to be at play during the formation of a first impression. Moreover, it may often be felt immediately and by both parties. Such affective reactions to unplanned stimuli trigger an automatic first reaction, which in turn may influence how individuals process and judge information (Zajonc, 1980). Thus, challenging the validity of the traditional employment interview as a selection method.

For instance, employers have been found to be more likely to choose candidates who possess a better cultural fit (Rivera, 2012, 2015) and whose backgrounds seem similar to their own (Bertrand and Mullainathan, 2004; Cotton et al., 2008; Kang et al., 2016). Similar mechanisms apply to gender. Homosociality—the preference for relations with the same gender—and discrimination are therefore two sides of the same coin (Holgersson, 2013). Behaviors such as laughing, the use of humor, and engagement with the interviewer during a job interview have also been documented to affect hireability (Paulhus et al., 2013). Rivera (2015), for example, found that interviewers’ emotional responses to candidates played a key role in their assessment and selection decisions, leading to biased hiring outcomes. In fact, emotion and homophily (i.e., the tendency to have ties with people who share similar sociodemographic, behavioral, and personal characteristics) were the most prevalent factors affecting the assessment of candidates in job interviews (Rivera, 2015). Complementing this line of research, a recent study found that the way job candidates display emotions during job interviews affects the likelihood of them being hired (Benchait et al., 2018). This effect is positive if there is a match between the emotions (i.e., calm or excited) displayed by candidates with the interviewer’s cultural preferences for conveying emotions in job interviews (Benchait et al., 2018).

Physical attractiveness has also been documented to affect hiring decisions. It has been found that being an attractive man (versus a plain-looking man) provides a significant advantage when applying for a job. Surprisingly, however, being an attractive woman (versus a plain-looking woman) has the opposite effect on the applicant’s chances of being selected for further consideration in the hiring process (Ruffle and Shustediner, 2015). With particular relevance to gender, physical attractiveness has been found to be capable of exerting an adverse effect (the “beauty-is-beastly” effect). Physical attractiveness can, for example, be a disadvantage for women applying for masculine jobs traditionally filled by male employees (Heilman and Saruwatari, 1979; Johnson et al., 2010). Research on other potentially stigmatizing aspects of applicants’ physical appearance has shown that obese applicants tend to be discriminated against during the selection process (Grant and Mizzi, 2014). These findings suggest that implicit biases can lead to unintentional discrimination regarding appearance (race, gender, body size, etc.) and behavioral cues (e.g., displays of emotion). Access to the labor market is thus not necessarily equally available for certain groups of candidates despite their having the required or even higher qualifications (Gaddis, 2015; Villadsen and Wulf, 2018). These issues may affect applicants’ reactions to personnel selection in general and to face-to-face job interviews in particular and point to the need to reconsider the interview setup. In addition to considering the setup itself, in Study 2, we further include two individual-level factors that may influence applicant fairness perceptions, namely, core self-evaluations (CSEs) and personal innovativeness. Indeed, research has shown that CSEs affect applicants’ reactions to selection procedures (McLarty and Whitman, 2016). CSEs refer to “fundamental appraisals that people make of their own self-worth, competence, and capabilities” (Chang et al., 2012, p. 82) and have been found to be positively related to fairness perceptions (McLarty and Whitman, 2016). Due to the novelty of the use of robots in job interviews, we also consider personal innovativeness within the domain of interactive technologies (to which robotics belong), as domain-specific personal innovativeness has been shown to affect innovation adoption within the domain (Roehrich, 2004), which may influence how robots are perceived in job interviews.

2.2. Employers’ fairness perceptions and job interviews

While research on fairness perceptions has rightfully focused on the applicant perspective, examining the employer perspective on the fairness of new selection methods is important to understand the factors that promote and/or prevent their adoption. The employer perspective is especially relevant because extant research documents that HR professionals are aware of unintended biases related to face-to-face interviews, and yet they still prefer to rely on intuition during this process (Highhouse, 2008). The chemistry and emotional connection with candidates thus remain key factors in applicant selection (Rivera, 2012, 2015; Rynes et al., 2002), although alternative and potentially fairer interview methods are available, which have been documented to generate more accurate judgments (Highhouse, 2008; Kuncel et al., 2013). Indeed, the failure to adopt more effective selection practices has been widely documented (Rynes et al., 2002). This rejection of more effective methods may stem from personal preference, practitioners’ beliefs, convenience, reluctance to change, and costs related to switching to alternative methods (Dana et al., 2013; Rynes et al., 2002). In regard to fairness perceptions of different selection methods, practitioners may have unique views in this respect. A method that is perceived as fair by applicants may not necessarily be considered as such from an employer’s perspective. However, to our knowledge, research has not yet examined such differences.

The use of robots to mediate job interviews toward more objective outcomes may be rejected for similar reasons as other assessment and selection methods (e.g., tests, structured interviews, mechanical combination of applicant information). This is namely because practitioners’ preference for relying on intuition and experience to make selection decisions may be perceived as being obstructed and thus as less fair from their perspective. On the other hand, robot-mediated interviews may offer a chance to limit applicants’ impression management tactics, which are intended to create a misleading impression of the applicant (Cuddy et al., 2015) and instead fully focus on their knowledge and skills. This possibility could be perceived as attractive from the employer perspective and positively affect their perception of the fairness of the
Furthermore, similar to other professions, human resource management is confronted with ethical dilemmas as practitioners try to meet profit goals (Schumann, 2001). For example, pressures to reduce costs or urgently fill a job position might lead practitioners to choose selection procedures that speed up the selection process in ways that are perceived as less fair by applicants but are convenient for practitioners. On the other hand, with respect to the robot-mediated job interview, HR professionals may find that it could offer a chance for their organizations to signal high standards of ethical business conduct. Such standards are not only ethically justified per se; they may also help to enhance the reputation of the company or enterprise and thereby contribute to maximizing profits. Moreover, the robot-mediated interview may be viewed as a way of living up to the moral responsibility entailed in personnel selection by potentially making the process fairer and reducing discrimination. On the other hand, employers may perceive the robot-mediated job interview as unfair because it does not lead to a fair distribution of benefits (e.g., hiring the best candidate) and costs (e.g., having to hire and work with males when one prefers female coworkers, even though this preference is based on prejudice) from the company perspective (Schumann, 2001). We explore these perspectives in Study 1.

2.3. Technology-mediated job interviews

A few attempts have previously been made to test various technology-mediated interviews’ effects on fairness perceptions and biases. The previously mentioned study that compared a face-to-face job interview with a robot-mediated interview found that the face-to-face interview was perceived as fairer (Norkov et al., 2020). Nonetheless, as the authors also noted, since their respondents were bachelor’s students with limited job interview experience, they did “not reflect a representative sample of job applicants and the associated probabilities of experiencing discrimination” (Norkov et al., 2020, p. 15), thus calling for further research in the area of robot mediation in job interviews.

In a technology-mediated interview of 416 undergraduates based on the use of avatars, Behrend et al. (2012), for example, identified a similar “beauty effect” known from face-to-face interviews. They examined the impact of the avatars’ attractiveness on online employment interview ratings and found that applicants with more attractive avatars received more favorable interview ratings. Technology is thus not immune to biases, and research confirms that people respond to social behaviors and features displayed by both human-like and non-human-like robots and technologies in similar ways as they respond to other people (e.g., Breazeal, 2002; Reeves and Nass, 1996), thus transferring social norms as well as gender and racial stereotypes and same-ethnicity favoritism to their interaction with robots (Eyssel and Hegel, 2012; Gong, 2008). For this reason, the current study utilized a teleoperated robot, the Telenoid, which is based on a minimal design approach (Ishiguro, 2016). The Telenoid’s appearance and behavior are based on minimal human embodiment, and it thus “appears as both male and female, as both old and young” (Seibt and Vestergaard, 2018, p. 9).

Prior experimental studies show that the robot was perceived as “a generic human being” (p. 9) and that a lack of visual cues and social identities (gender, age, etc.) made it easier for the participants to focus on the conversation (Seibt and Vestergaard, 2018). For this reason, the Telenoid was found to be suitable for testing in the job interview context.

2.4. Fair proxy communication in the employment interview

To increase fairness perceptions of the job interview, we examine the use of robots as a fair proxy communication (FPC) technology during the employment interview. FPC is defined as “a specific communicational setting in which a teleoperated robot is used to remove perceptual cues of implicit biases in order to increase the perceived fairness of decision-related communications” (Seibt and Vestergaard, 2018, p. 1). In a robot-mediated job interview, during which the Telenoid functions as a possible fair proxy for the applicant, the applicant and the interviewer are seated in two different rooms (Fig. 1). The interviewer sits opposite the robotic proxy that represents the applicant. The applicant sits in front of a computer screen via which she can see the interviewer. The robot is teleoperated by the applicant, and it has a built-in camera on its forehead, which is used to transmit the visual image of the interviewer on the computer screen.

A robot-mediated interview is capable of eliminating visual cues associated with the applicant’s individual physical appearance, thus holding the potential for reducing some of the existing biases associated with a person’s body size, gender, ethnicity, age, etc. This provides a situation in which both job interviewers and applicants can focus more on the applicant’s knowledge, skills, and abilities (Gilliland, 1993). Indeed, Chapman and Rowe (2001) found that applicant competency ratings received a higher grading in video conference-based interviews than in face-to-face interviews. The authors speculated that having a technology-based communication medium might have reduced applicant anxiety, resulting in higher performance (Chapman and Rowe, 2001).

Other studies have found that job interviews conducted via video conferences or telephone score lower on fairness perceptions than face-to-face interviews (Sears et al., 2013). On the one hand, this finding may suggest that, regardless of the type of technology used in job interviews, job interviews relying on any technology will always be perceived as being less fair. On the other hand, one could imagine that different technologies may have different effects on fairness perceptions in job interviews. Using a teleoperated robot as a fair proxy may be a more effective communication technology for job interviews than video conferences, telephone, etc. The reason is that embodied agents have a physical body and are physically present in a job interview situation. These characteristics are expected to make a robot more engaging and to elicit more favorable psychological responses, e.g., empathy and trust, and a greater sense of social presence compared to communication via a screen or a telephone (Li, 2015; Seo et al., 2015). If, in addition to these advantages, a teleoperated robot as a fair proxy is able to reduce or eliminate biases from the job interview, it is plausible that this type of interview could yield higher perceptions of fairness than a face-to-face job interview. Our main proposition is therefore that fairness perceptions will be higher in the robot-mediated job interview.

3. Study 1: mini-public

Study 1 was designed to explore in-depth how the robot-mediated job interview is perceived and what factors influence the fairness perceptions of such interviews. The study employed a deliberative mini-public design. A mini-public is a method of engaging citizens and promoting deliberation around a certain topic or issue of relevance to the public (Smith and Setälä, 2018). A mini-public was found to be particularly suitable for three main reasons. First, it promotes deliberation and discussion around complex and/or controversial topics (Smith and Setälä, 2018). Second, because discussions are facilitated, it incites participants to explain and substantiate their views and to respectfully pay attention to those of others (Roberts et al., 2020). Third, and most importantly, during a mini-public, participants’ knowledge about the issue should increase (Roberts et al., 2020). This third reason is particularly relevant because of the novelty of the robot-mediated job interviews. By promoting information sharing and learning about this new job interview approach, a mini-public assists in exposing an extensive range of reasons and arguments for and against the proposed concept.

3.1. Participants

Seventy-six individuals accepted an open invitation to participate in a mini-public entitled “Robots in recruitment and hiring processes”.

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However, 23 participants cancelled their participation at the last minute for various reasons (illness, conflicting work appointments, etc.). Thus, the mini-public was attended by 53 participants (26 males). Participants were not compensated for their participation. Information on work title or work area was not obtained to ensure participant anonymity. However, during the roundtable discussions, the participants introduced themselves to each other, and it became clear that only 11 percent of the participants were unemployed jobseekers and that the majority of the employed participants (76 percent), regardless of sector, held jobs that were related to human resource management, i.e., HR managers, HR consultants, owners of small and medium-sized recruitment agencies and similar. In the rest of the paper, we refer to those participants as HR professionals. Due to noise in the sound recordings, it was not possible to identify the background information of six participants, so the actual number of HR professionals may be slightly higher, as several statements of some of these unidentified participants during the roundtable discussions indicated professional experience in recruitment and selection.

3.2. Procedure

The invitation to the mini-public was published on Aarhus University’s website and shared through the university’s official online communication channels, i.e., LinkedIn, Twitter, and Facebook. The research team members also shared the invitation through their LinkedIn, Twitter, and Facebook accounts. Both the invitation and the mini-public were in Danish. The mini-public event was organized as a setup where interested stakeholders could form, express, and explain their opinions about robotics in recruitment and selection through presentations from experts, roundtable debates, and short polls. When the participants arrived, they received further information about the study, and verbal and written consent was obtained. They were then assigned a unique ID number and randomly allocated to a seat at one of eight roundtables (each table holding approximately seven participants).

The mini-public lasted three hours. The structure of the mini-public consisted of four main elements, some of which were repeated several times: i) an on-stage robot-mediated job interview, ii) expert presentations, iii) roundtable discussions, and iv) a poll. While Table 1 shows the schedule, Fig. 1 illustrates the robot-mediated job interview and the interaction.

![Fig. 1. The robot-mediated job interview, from the perspective of the interviewer (a) and the job candidate (b).](image)

<table>
<thead>
<tr>
<th>Table 1</th>
<th>The Mini-Public Program.</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.00-14.20</td>
<td>Check-in, coffee and introduction to Mentimeter</td>
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<tr>
<td>14.20-14.30</td>
<td>Welcome and the first Mentimeter poll (T1)</td>
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<tr>
<td>14.30-14.40</td>
<td>Demonstration of a robot-mediated job interview</td>
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<tr>
<td>14.40-14.50</td>
<td>Presentation of the research group by one of its members</td>
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<tr>
<td>14.50-15.15</td>
<td>Roundtable discussions and the Mentimeter poll (T2)</td>
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<tr>
<td>15.15-15.25</td>
<td>Expert presentation #1</td>
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<tr>
<td>15.25-15.35</td>
<td>Expert presentation #2</td>
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<tr>
<td>15.35-16.00</td>
<td>Roundtable discussions and the Mentimeter poll (T3)</td>
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<tr>
<td>16.00-16.10</td>
<td>Expert presentation #3</td>
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<td>16.10-16.20</td>
<td>Expert presentation #4</td>
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<tr>
<td>16.20-16.35</td>
<td>Roundtable discussions and the Mentimeter poll (T4)</td>
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<tr>
<td>16.35-16.50</td>
<td>Q&amp;A</td>
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<tr>
<td>16.50-17.00</td>
<td>Wrap-up</td>
</tr>
</tbody>
</table>
shows the mini-public program and the exact sequence of the activities, here we focus on explaining the logic behind these activities. The first element, a short robot-mediated job interview, was performed on stage. It lasted approximately two minutes. It showcased a job interview via a robotic proxy (resembling the setup in Fig. 1a). We used a teleoperated android robot, Telenoid R1, developed by the Japanese robotics lab ATR Hiroshi Ishiguro Laboratories. The Telenoid is designed to display minimal human embodiment.

Second, during the mini-public, four experts gave 10-minute presentations on how new technologies are used or could be used in the recruitment and selection processes. The first expert was an entrepreneur who runs a large network for female entrepreneurs and who is experienced within the domain of technology and biases. The second expert was a career advisor at a professional association for technical, IT, and natural sciences professionals who talked about technology in general and robotics in particular in recruitment, assessment, and selection processes. The third expert worked with digital transformation and digital business development in a consultancy firm and discussed robotics and biases. Finally, the fourth expert was a local politician whose political party was the first to try out anonymizing parts of the job application process. He discussed their experiences with this process. The overall purpose of the presentations was to show different and contrasting perspectives on technology in the recruitment, selection, and assessment processes. The presentations were expected to stimulate roundtable discussions.

Third, in between the expert presentations, roundtable discussions took place. The discussions at each table were facilitated by either one of the researchers involved in the project or one of the four experts. The facilitators were expected to remain neutral in the discussion and merely ensure that the discussion continued and that everyone at the table got a chance to express their opinion. An audio recorder was placed at each table, and it remained on during the entire event. Unfortunately, due to a human error, a recorder at one of the tables was turned off after 25 minutes, which meant that the rest of the debate at that table was not part of the analysis. The recordings summed to a total of 18 hours and 21 minutes. All the debates were transcribed and subsequently analyzed.

Finally, the participants were asked to fill out a poll, which consisted of five items (Table 2). Four of those items assessed attitudes toward robots in job interviews and the effects of technology on equality and diversity in the job market. These items were measured on a five-point Likert scale ranging from “strongly agree” to “strongly disagree.” The final item was open-ended. The poll was conducted via Mentimeter and repeated four times throughout the event (marked as T1-T4 in Table 1) to detect changes in attitudes toward robots in recruitment. Responses were anonymous and logged on the participants’ ID numbers.

### Table 2
The Mini-Public Survey Items.

<table>
<thead>
<tr>
<th>Items</th>
<th>Scale</th>
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</thead>
<tbody>
<tr>
<td>I would prefer to be interviewed by a robot at my next job interview</td>
<td>5-point Likert scale (Strongly disagree... Strongly agree)</td>
</tr>
<tr>
<td>I think that robots in job interviews would have a positive effect on my chances of being offered a job</td>
<td>5-point Likert scale (Strongly disagree... Strongly agree)</td>
</tr>
<tr>
<td>I prefer to show my entire personality during a job interview</td>
<td>5-point Likert scale (Strongly disagree... Strongly agree)</td>
</tr>
<tr>
<td>I think that technology can help improve equality and diversity in the labor market</td>
<td>5-point Likert scale (Strongly disagree... Strongly agree)</td>
</tr>
<tr>
<td>Please add any additional comments regarding the mini-public program, the presentations, your experiences as a participant, or anything else you would like to share</td>
<td>Open-ended</td>
</tr>
</tbody>
</table>
The good match

Removing personality (-)

P2: That it gets completely cleaned of personality; I think that is, oh well… (sighs). […] [Roundtable #4]

P5: It’s just that you remove that human factor, I simply don’t believe in that. (Roundtable #3)

P: And then it’s this thing about, when the put feeling tells you this is right, I think that’s where the challenge will be, so that it’s not only about the competences. (Roundtable #2)

Removing intuition and emotions (-)

P7: But there is that part of the match that goes the other way, because one thing is the selection related to the applicant, but equally as much it is about the selection as applicant. And by putting a robot in that first meeting with the company, you miss out on impressions such as values and culture.

P2: Yes, you can end up feeling… how to put it? Cheated.

P3: Yeah, a little. Because you did not get any idea of what the culture is like.

P2: Yes, or at least you need to remember that a selection process actually goes both ways. (Table #8)

The match between a candidate’s personality and the interview setup (+/-)

I would think that it would be far more awkward for me to sit and talk to a robot than to a human being. Even though I have actually seen and experienced quite many robots, I think it’s actually harder for me to communicate with something – even though the Telenoid has facial features and stuff like that, it’s just different. (Table #3)

The match between the job type and the job interview setup (+/-)

But I think it also depends to a great extent on what field we are talking about. I work in an unemployment insurance fund that is 75 percent in the humanistic field and 25 in the scientific field. And there are perhaps some of the areas where you tend to say, well if they only go for a person whose programming or other qualities are within something more measurable versus hiring a new high school teacher, for example, where one can say that there are some other parameters that may be in play, where one will be defensive in advance against a robot, because it only tells half of the story. (Roundtable #7)

False objectivity

Postponing rejection and biases (-)

But exactly that part related to objectivity is what we are struggling with daily. And anything but equal, it is still the company that decides whom they want to hire. […] And there, I think, […] it may well be that the person gets to the last step, but it’ll be a waste of time anyways. I don’t think that’s respect for the individual either. (Roundtable #2)

Imagining (-)

[…] and I don’t think you can prevent people from letting their imagination run wild in the situation. (Roundtable #3)

Symptomatic treatment

Creating awareness of biases (+)

[…] that it may perhaps make biases visible rather than thinking that you can remove biases by using robots (Roundtable #1)

Indirectly accepting discrimination in the labor market (-)

It may be that you can anonymize in the selection situation itself, but if you really don’t want to have women or immigrants at the workplace, then you still have the problem. […] I would rather see that the labor market got adapted and arranged in a different way. (Roundtable #2)

* (-) and (+) indicate a positive or negative effect on fairness perceptions of the robot-mediated job interview.

lower priority to the interview, ii) it removes a candidate’s personality from the interaction, and iii) it removes intuition and emotions, which are seen as central to the selection process.

3.4.1.1.2. Removing personality. Another related perceived disadvantage of the robot-mediated setup is that it removes personality:

P2: In a way, I think that it removes personality.

P1: Yes, exactly.

>P5: Yes, that’s it. And if you remove personality, then you make us into robots as well. (Roundtable #1)

Removing personality from the robot-mediated job interview seems to lead to technological dehumanization of the job interview, which is expected to be of a deeply interpersonal character. The participants stressed personality as an essential parameter in the applicant selection process because it is easier to develop a candidate’s lacking competences than it is to develop or change the incompatible personality of the candidate:

P6: We always try to turn it upside down and pressure our clients […] and say: but he or she has the perfect personality to be able to create a new perspective on those tasks. [She or he] lacks 20 percent at the competence level, but we can build upon that. (Roundtable #2)

3.4.1.1.3. Removing intuition and emotions. Furthermore, objectivity as the ultimate goal of the job interview was disputed. The participants argued that selection decisions should be made both by intellect and intuition, but especially the latter. Intuition and emotions were viewed as essential to personnel selection, emphasizing the importance of the “human factor” (Roundtable #3) and the need to connect to a candidate at a personal level: “[…] on LinkedIn, for instance, we look and say ‘that skill, that skill, those skills’. There’s nothing human about that.” (Roundtable #5). Not being able to use one’s intuition and emotions in the selection process is compared to “giving up on what makes us human”:

P3: I think we can find and build many systems that can help us become more objective, but when all comes to all, I don’t mind either if the final decision is made both with sense and with heart and with intuition [snaps fingers] or what you would call it, right. That I think is good. And I think that robots will have difficulties with that.

P6: I think so, too.

P2: Otherwise it would be equal to letting go of your entire humanity, right. We can’t do that. (Roundtable #2)

3.4.1.2. Securing “the good match”. The second factor highlights that to achieve “the good match” in the selection process, three aspects need to be considered: i) personnel selection is a reciprocal process, i.e., both parties are selecting, ii) the interview setup needs to match a candidate’s
of HR Professionals Related to the Robot-Mediated Job Interview.

<table>
<thead>
<tr>
<th>Second-order categories</th>
<th>First-order categories</th>
<th>Representative quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role morality</td>
<td>The right to be biased</td>
<td>Because of course it is biased when you are hiring. It is a whole person who you have to hire in your company. (Roundtable #7)</td>
</tr>
<tr>
<td></td>
<td>Obligation to the client</td>
<td>But it is precisely that objectivity that we fight against daily. And all things being equal, it is still the company that decides whom they want to hire. And then you can challenge [them], but I think that the output is not going to be better than the input. So, if there is a person who wants the job description to mirror him, then it’s easy to say: ‘I don’t want a female who is pregnant’. No, okay. We are not allowed to say that (out loud)... (Roundtable #2)</td>
</tr>
<tr>
<td>Business case</td>
<td>Time and cost</td>
<td>The robot-mediated job interview only postpones biases and rejection and ii) triggers the ‘imagining’ of the candidate due to the absence of visual cues, which may result in false expectations.</td>
</tr>
<tr>
<td></td>
<td>effectiveness of the robot-mediated job interview</td>
<td>But if you get to the stage where you have a real robot that interviews, where I don’t have to sit and spend time, because it is about the time aspect as well. You have to hire someone, you have made the investment [...] and then the [applicant] sits there, and you are here still doing the work and asking questions based on what she responds. (Roundtable #3) […] And the same goes for the headscarf. There could be some situations, where it wouldn’t be wise, but there could be other situations in which it wouldn’t matter. (Roundtable #4)</td>
</tr>
<tr>
<td>Social case</td>
<td>Society hinders unbiased selection</td>
<td>The third factor, false objectivity, reduces fairness perceptions and arises from the perception that i) the robot-mediated job interview only postpones biases and rejection and ii) triggers the ‘imagining’ of the candidate due to the absence of visual cues, which may result in false expectations.</td>
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</table>

Personality, and iii) the job type and the interview setup need to match. The first aspect was found to have a negative effect on fairness perceptions of the robot-mediated job interview, while the effects of the two remaining aspects are context dependent.

3.4.1.2.1. Reciprocal selection. There was a general agreement that an effective selection process needs to ensure that both the hiring organization and the applicant are able to identify a good match in each other. Differently put, the selection process and outcome have to benefit both parties. While the concepts of fair proxy and the robot-mediated interview emphasize reducing or eliminating biases and hence discrimination against applicants, many participants pointed out that the needs of hiring organizations should also be considered. The reason for this is that the applicants are not the only ones being assessed; the company is being evaluated by the candidates as well. Applicants can decide to either accept or reject a job offer. Creating a good match is therefore seen as a “two-way street”, and the robot-mediated setup is viewed as less fair than the face-to-face setup because it reduces the chance for reciprocal selection:

P1: And I think that somehow the premise for this is that companies are the ones deciding whom to hire, but in reality it is just as much the candidate, the talented candidates, that can equally choose to accept or decline. And I think that is an important aspect to include and say: well, it’s the mutual match that’s important. (Roundtable #2)

3.4.1.2.2. The match between a candidate’s personality and the interview setup. In addition to achieving a good match between a hiring organization and a candidate, the participants generally acknowledged that there are other factors that need to suit a particular job interview setup in order for the selection process to succeed. One aspect is a candidate’s personality. Depending on candidates’ personality traits, some are more comfortable with a face-to-face job interview, while others would prefer a robot-mediated interview:

P6: [...] that there may be some who will have a more positive experience of...that it may be more pleasant to sit and talk to a robot, where you don’t get so nervous. But there will be equally many who would think it would be a loss, or how to put it, or that would think it would be annoying. (Roundtable #7)

3.4.1.2.3. The match between the job type and the interview setup. Participants seemed to agree that those job types that, for instance, require more technical problem solving and little interpersonal communication would also be likely to place less emphasis on personality and more on qualifications. They therefore thought that a robot-mediated job interview could be suitable here:

P3: And I think that it is fine if we are talking about a salesman or a performer or a teacher or something. But if it is “TT-Joe” that will have to sit and nerd out with something in the basement, how good he is at selling himself does not have anything to do with how good he is at his job. (Roundtable #2)

3.4.1.3. False objectivity. The third factor, false objectivity, reduces fairness perceptions and arises from the perception that i) the robot-mediated job interview only postpones biases and rejection and ii) triggers the ‘imagining’ of the candidate due to the absence of visual cues, which may result in false expectations.

3.4.1.3.1. Postponing rejection and biases. The robot-mediated job interview, as conceptualized in this paper, aims to maximize objectivity by removing visual cues that may trigger implicit biases and discrimination. However, many participants were not convinced that this objectivity was achievable because at the end of the selection process, a candidate would need to show his or her entire person in any case. Therefore, they argued that using a robot-mediated interview would only postpone the rejection and biases until the very end, which is why the process may be experienced as falsely objective:

P1: [...] But what you also do is, as you mentioned, it’s just that you kind of postpone it until you show up at work or at the final round [of the selection process].

P3: Yes, that’s right. The moment of surprise. [several participants laugh]

P1: So you just postpone the thing where you say “Oh, that’s what you look like!” until later in the process.

P3: Yes, that’s correct. (Roundtable #4)

Some participants reasoned that the delayed rejection may feel as an even greater defeat and that applicants would therefore experience the process as being less fair than a face-to-face interview:

P7: [...] but in the end, you would never get hired without having stood forward and showing who you are. And ideally the way it should be is that you show your true self... and not only on the first day, where you come into the office and then there are some that look at you and say: “You there, you can just go back home” [laugh around the table]. Then I think it would be an even greater defeat. (Roundtable #4)

3.4.1.3.2. Imagining. The participants argued that if the visual cues were removed, the interviewer would compensate by filling in the gaps herself. This ‘imagining’ could build up unrealistic expectations for the applicants and bias the selection process and outcome in unintended ways:

P6: [...] you build up a person that’s a bit neutral, that you have some good impressions of. And then the person walks in through the door, and it may perhaps be an entirely different person than the one you had in mind. [...] I could be worried that [...] maybe that reveal will therefore become even greater: This was exactly what I had expected, or this was not at all what I had expected. (Roundtable #8)

3.4.1.4. Symptomatic treatment. The fourth factor, symptomatic treatment, is related to the role played by the robot-mediated interview to treat discrimination. The participants reasoned that the robot-mediated interview treats the symptoms rather than the causes of discrimination.
While unable to treat the root causes of discrimination, the robot-mediated setup’s symptomatic treatment of discrimination was perceived as both having a positive and negative effect on fairness perceptions. On the one hand, the robot-mediated setup may improve fairness perceptions, as it may create awareness of biases at the individual level in personnel selection, which may reduce discrimination. On the other hand, it may signal the acceptance of discrimination in the labor market because the robot-mediated interview is unlikely to have an effect beyond the interview situation and thus have a negative effect on the fairness perceptions of the setup.

### 3.4.1.4.1. Creating awareness of biases

Even if the robot-mediated interview only addresses the symptoms of discrimination, some participants argued that it could create an awareness of bias during the selection process and that such awareness could over time positively impact selection practices:

P3: But again, you should of course be able to hire someone, if you [pause]... But that consciousness about those biases, that you are choosing that person because they are from western Jutland, and not because the person is sharp at something. That you get that awareness back to the person who is hiring. That I think may be a more sustainable way of viewing recruitment. (Roundtable #7)

### 3.4.1.4.2. Indirectly accepting discrimination in the labor market

Some participants reasoned that by treating symptoms of discrimination via solutions such as a robot-mediated interview, employers would actually be giving indirect and unintentional consent to the discrimination that is present in the labor market:

P3: We say that we have equal rights. We don’t. We don’t have equal pay either. Maybe that’s the task that should be solved instead of anonymizing ourselves.

P1: But that’s what they are trying to achieve here, namely, equal rights.

P2: Yes, [...] but by doing something like this [refers to the robot-mediated interview], you accept racism and you accept...

P1: You accept everything.

P5: Well, yes, discrimination.

P2: Discrimination, right. Then we say: Okay, let’s make some [...] technology there instead of removing the issue at its core. (Roundtable #1)

### 3.4.2. Moral pragmatism

The second aggregate theoretical dimension is related to the moral pragmatism of HR professionals (Table 4). It is evident from our data that the introduction of robots in job interviews raises the defenses of HR professionals related to morality, which results in moral pragmatism. The notion of “moral pragmatism” as such is ambiguous, since there are many different varieties of “pragmatism” in philosophy. What is common to a pragmatist approach is the resistance to a realist conception of values and norms as mind-independent entities, the insight that human decision-making is not guided by one and the same system of normative ethics (e.g., deontology, utilitarianism, virtue ethics), and/or the insight that moral decision-making is not guided, across situations, by one and the same value hierarchy (Oracek et al., 2021; Heney, 2016; Marchetti, 2021). Here, we follow a conception of pragmatism that emphasizes “that all knowledge and experience are infused with interpretive aspects, funded with past experience, and stem from a perspective, i.e., a point of view” (Rosenthal and Buchholz, 1999, p. 115). Accordingly, moral decision-making takes place in a perspectival understanding of a situation—each perspective comes with its own set of moral obligations and, in particular, with its own instantiation of morally guiding values and its own ranking of these values. Moral pragmatism of this kind is very close to moral relativism, but unlike the latter, holds on to the idea that perspectival moral decisions are neither arbitrary nor ‘locked in’, but are justifiable by and revisable in the situation. In the case of our study, we found evidence for this understanding of morality and for perspectival conceptions of fairness and associated norms. The HR professionals showed a certain degree of unwillingness to revise current procedures for the sake of the flourishing of the company. As long as the protection of the company is undertaken for moral reasons (e.g., to protect the livelihood of the company and its employees), resistance against changing selection procedures displays not amoral attitudes but moral pragmatism in the sense defined. Our analysis shows that it results from a combination of i) role morality that is related to being an HR professional and ii) the business case (i.e., the bottom-line effects) of the robot-mediated interview taking precedence over the social case for the robot-mediated interview (increasing fairness, reducing bias and increasing diversity). Moral pragmatism demonstrates that fairness from a company perspective is differently perceived than fairness from an applicant perspective. From the company perspective, fairness includes the right to choose according to the company’s own preferences for the best match, even if it means being biased.

### 3.4.2.1. Role morality

A majority of HR professionals expressed that their job entails acting on behalf of their client or company, which sometimes may involve acting in ways that they would otherwise consider morally wrong. Their acceptance of this role-based morality was anchored in two arguments: i) biases are permissible because the hiring organization has the right to choose according to its own preferences, to the extent that this can be morally justified (e.g., along utilitarian lines of protecting the jobs of extant employees), and ii) HR professionals have an obligation to the client/company regardless of how they personally feel about the nature of the selection process. Role morality refers to “claim(ing) a moral permission to harm others in ways that, if not for the role, would be wrong” (Applbaum, 1999, p. 3).

#### 3.4.2.1.1. The right to be biased

The participants, including HR professionals, acknowledged that “there are clearly some inappropriate biases that can be removed” (Roundtable #4). This acknowledgment was generally present among the participants at each roundtable, and they were positive about the idea of removing visual cues that trigger biases:

P1: If we could remove everything about who you are and what your background is, and this and that, so only pure competences remain, and that you are good at your work, and this and that, I think that would be great. (Roundable #6)

Despite clear moral awareness, the HR professionals argued that it is unfair to remove the hiring organizations’ right to be biased:

P7: [...] Because we have some clients, who are business owners, and he bloody does not, sorry, but he won’t hire Muhammed. He bloody doesn’t want that in his “shop.” He doesn’t want a Muhammed there.

P1: And he shouldn’t have to.

P7: And he shouldn’t have to.

P1: Then it’s really not cool for Muhammed to be there either. (Roundable #2)

Importantly, the ‘should’ that appears in this line of argument is not a piece of instrumental reasoning but a normative ‘should’ that relates to rights, obligations, and entitlements. In other words, Participants P1 and P7 ultimately express a moral point of view relating to emotional discomfort and human flourishing; they do not argue from an exclusively instrumental perspective.

It was thus argued that the hiring organizations should be able to recruit based on their own (subjective) attitudes and preferences toward the types of applicants they want to hire, regardless of those preferences being unrelated to qualifications or work performance. Some decision-makers are, for instance, more emotionally invested in their businesses than others and as such, are entitled to their own way of selecting candidates:

P7: Well, there are some decision-makers out there in the Danish companies... If you have your own business that you have built over the course of 30 years, Mr. Knudsen will have his stance on whom he would like to hire. There are lots of feelings involved in it from his perspective. And he will not hire [women]—his experience says that male engineers are better. You cannot take that away from him. (Roundable #2)

#### 3.4.2.1.2. Obligation to the client

The participants further explained
that discrimination may be acceptable if it serves the purpose of satisfying the client. Generally, the HR professionals who participated in the mini-public were of the opinion that a fair selection method allows for a trade-off between accommodating the company needs and wants and the goal of eliminating discrimination:

P1: Well, it is also fair enough that there are some criteria that an employer wants for this to work. If you hire a person who is so far away from the rest of the employee group, it will also cause a lot of disagreement, because how will the person adjust, and will it work at all, and will she become isolated or something. Nobody wants that. [...] So, we do it just as much to protect the person as the company, right.

P2: So, there can be good reasons for discrimination?

P1: Well... well... yes. But I wouldn’t call it discrimination. (Roundtable #3)

Moreover, the HR professionals reasoned that the robot-mediated interview setup would be unable to yield benefits for both parties because it is not based on ‘win-win’ principles (Roundtable #8). They argued that the benefits of this interview setup for candidates entail a disadvantage for companies, branding the robot mediation as less fair and emphasizing their duty to the client:

P2: But again, whom are we, ehh, giving preference to here? Is it the company that may not get the full benefit from this taking a turn [...] Really, to whom are we giving priority here? (Roundtable #5)

3.4.2.2. The business case overrides the social case. There was an underlying perception among the HR professionals that the business case behind the robot-mediated interview outweighs the social case. This perception was grounded in two arguments: i) even in the presence of the many objections against the robot-mediated job interview (cf. dehumanization, a good match, false objectivity, etc.), the HR professionals argued that if the robot-mediated interview involved an autonomous robot (unlike the teleoperated one), it could be a cost- and time-efficient solution and therefore attractive, and ii) because stereotypes and biases are so prevalent in society (including clients and customers that companies work with and sell to), society needs to change before companies can embrace unbiased selection. Both of these arguments reflect the participants’ view of financial performance not as a ‘good in itself’ but as something that is directly connected to companies’ and employees’ well-being, thus reflecting moral pragmatism. They are anchored in a business logic favoring financial performance over the good of social justice and show that a business argument is necessary to justify acting in a socially responsible way.

3.4.2.2.1. Time and cost effectiveness of the robot-mediated interview. Despite insisting on the importance of relying on intuition in selection as an argument against the robot-mediated interview, the HR professionals had an exception:

P3: So it would be very time-saving if you could find a robot that could actually interview, and that could also think on its own...that could ask follow-up questions if the candidate was off on a tangent etc., and collect that data. (Roundtable #2)

If the robot were autonomous, they argued that it would be a cost- and time-effective solution, which would free the HR professionals to focus on other work tasks:

P1: (interrupts) Yes, then you could hand over the work, right? Now you are doing it yourself anyway. (Roundtable #8)

This suggests that the HR professionals’ opposition to the robot-mediated job interview is not necessarily about resistance to change, i.e., replacing something known, something that “works” (intuition-based selection), with something new (robot-mediated selection). Rather, the above examples indicate that their resistance is related to their strong focus on the business rationale behind the new technology (i.e., time and cost effectiveness). Since the ultimate motivation for the business logic was not financial gain in itself but the livelihood or thriving of the company and employees, this line of reasoning appeared morally justified to the participants, even though they understood that it conflicted with the perspectival moral reasoning in favor of the robot-mediated interview (i.e., in order to reduce discrimination, increase perceptions of fairness).

3.4.2.2.2. Society hinders unbiased selection. Some participants argued that society needs to change before companies can make selection and hiring decisions that are nondiscriminatory, thus placing the responsibility for the “necessity” to discriminate on society while using financial performance to justify this stance. For instance, a participant recounted a situation involving an applicant who was going through a gender change:

P2: We had a very peculiar case, well, a few years back, where I was looking for a managing director for a job, but who would also be able to sell. And I received a number of applications. [...] There were really many men that applied, and then there was only one woman, who applied. And she did everything right, and had a good background, and wrote both a good application and a good CV. And my first thought was, it was like, errr, that CV, you did not write that yourself.

P5: Okay?! [sounds surprised]

P2: And the explanation is that men and women use different words. And very much emphasize results, and what you have achieved, and what you have done, and things like that. And women write differently.

P5: Yes.

P2: And this CV was very much like: I have done, I have created, I have achieved, I have. So, it was a typical male-CV. Uhm, and then I invite the person in question to an interview, and it turns out that this is a woman, with a female name, but it is in fact a man, because it’s someone who is changing gender. So, this person comes from being a man and is in the process of becoming a woman, in female clothes and high heels, but still a male voice and a male appearance etc. And uhm, well, had the right competences, but if the person were to go out and sell the company, it would create a lot of confusing signals to customers. So, that person was actually discriminated against in the process, even if the competences were appropriate and all those things. But it would create such strange signals if the person was to meet clients, and if one needed to decode: What is this? What is going on here? Well, a man in women’s clothes. So, uhm, [...] it was really not easy. (Roundtable #3)

Examples similar to this were used to argue that a company cannot afford to be inclusive and hire an “atypical” type of applicant to be the face of the company, to represent it, to meet clients, partners, etc., because it would risk its performance and profitability. They reasoned that society needs to change and become more open-minded before companies can be more inclusive and unbiased in hiring a diversity of applicants:

P4: I can see that there is a certain point with this technology, but it’s not the same if you need to go out to customers. But if the society could move, then recruitment could [move] as well. (Roundtable #3)

That the arguments of the HR professionals are best construed as reflecting a stance of moral pragmatism and not a rejection of moral principles is supported by the fact that participants talked about the “rights” of companies to proceed with biased selection procedures, partly in order to cater to the biases of their clients—they did not qualify their own standpoint as being immoral or amoral, but justified it along the lines of moral principles that largely follow utilitarian ethics.

3.4.3. Results of the mini-public poll

As seen in Table 5, statistically significant effects of time were only observed for the preference for being interviewed by a robot. Here, participants rated their preference for being interviewed by a robot significantly higher at T4 compared to T1 (t(47)=-2.83, p=.009), while there were no statistically significant differences between any of the other time points or any of the other questionnaire items (questionnaire items 2, 3, or 4; at any time T1, T2, T3, T4; see Table 5).
3.5. Discussion

Based on a deliberative mini-public, Study 1 explored fairness perceptions of the robot-mediated interview. Despite the HR professionals’ awareness of the shortcomings of the face-to-face job interview and ethical reasons for using the robot-mediated interview, the findings suggest that face-to-face job interviews are perceived as preferable for mainly pragmatic reasons, i.e., they entail several well-known positive benefits, such as the opportunity to directly observe personality, social and other skills, ask complex questions, use probing mechanisms, etc. Being practically preferable, however, does not necessarily imply that they are ethically preferable; rather, as we have shown in our theoretical background, there is extensive and consistent evidence that face-to-face interviews are inevitably interwoven with numerous biases that undercut basic rights to equality, respect, and equality of opportunity. Several statements that were made during the mini-public event exemplify this point.

The HR professionals argued that robot mediation would prevent their reliance on intuition, which they insisted was essential for successful selection. Research has shown that analytical methods are better at predicting human behaviors than intuition-based methods (Grove et al., 2006; Kuncel et al., 2013). Similarly, intuitive expertise in applicant selection is a poor predictor of a candidate’s future job performance (Highhouse, 2008). In fact, it has been found that unstructured interviews have low predictive validity and that they may even harm applicant selection decisions (Kausel et al., 2016). In light of the observed strong preference for intuition-based selection decisions, the goal of reducing discriminative biases in selection remains pivotal and motivates further investigation of robot-mediated job interviews.

Moreover, the finding that the mini-public participants showed a positive change in their attitudes toward being interviewed by a robot during the event indicates that the tested interview method may stand a chance with HR practitioners, but the causes of this change remain unclear.

Table 5

The Mini-Public Poll Results.

<table>
<thead>
<tr>
<th></th>
<th>T1(M, SD)</th>
<th>T2(M, SD)</th>
<th>T3(M, SD)</th>
<th>T4(M, SD)</th>
<th>One-way repeated ANOVA</th>
</tr>
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<tbody>
<tr>
<td>Prefer being interviewed by a robot</td>
<td>1.14 (.90)</td>
<td>1.41 (.95)</td>
<td>1.30 (.93)</td>
<td>1.60 (.87)</td>
<td>F(3, 129) = 3.33, p&lt;.022, n²=.072</td>
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<td>Post hoc analysis, T1&lt;T4, p=.009</td>
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<td>T1–T2, p=.096</td>
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<td>T1–T3, p=.227</td>
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<td>T2–T4, p=.430</td>
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<td>T3–T4, p=.063</td>
</tr>
</tbody>
</table>

Believe that robots will have a positive influence on securing a job (n=45)†

|                                          | 1.04 (1.11)| 1.35 (1.12)| 1.22 (1.19)| 1.46 (1.15)| F(3, 132) = 2.141, p=.098 n²=.046 |
|                                          |           |           |           |           | Post hoc analysis, T1<T4, p=.016 |
|                                          |           |           |           |           | T1–T2, p=.026 |
|                                          |           |           |           |           | T1–T3, p=.131 |
|                                          |           |           |           |           | T2–T3, p=.232 |

Believe showing one’s whole person at interview (n=44)†

|                                          | 2.79 (1.27)| 2.74 (1.43)| 2.78 (1.25)| 2.96 (1.25)| F(2, 17.93) = 0.715, n²=.003 |
|                                          |           |           |           |           | Post hoc analysis, T1<T2, p=.096 |

Believe technology will help increase equality (n=44)†

|                                          | 2.26 (1.50)| 2.45 (1.33)| 2.04 (1.50)| 2.11 (1.47)| F(2, 31, 99.54) = 2.45, n²=.083 |

† Mauchly’s test indicated that the assumption of sphericity had been violated. The model was corrected using the Greenhouse-Geisser estimates of sphericity.

Although the study revealed rich insights into fairness perceptions of the robot-mediated interview, it suffered from one important limitation. The predominance of HR professionals at the event generated a valuable understanding of how the decision-makers and organizational representatives perceive the robot-mediated interview. However, the applicant perspective was not uncovered in equal depth. While the insights into applicant perceptions suggested a different and more positive perception of the robot-mediated interview, these insights were based on relatively scarce data. This motivated us to pursue further investigation of the applicant fairness perceptions in Study 2.

4. Study 2: experimental survey

Study 2 was designed to explore the effects of the type of job interview (face-to-face vs. robot-mediated) on applicant fairness perceptions. The main purpose was to investigate whether the mean value of the interactional fairness construct is the same for the robot-mediated interview and for the face-to-face interview. The study was based on an experimental survey design.

4.1. Method

The study was conducted at an unemployment center in Denmark. Jobseekers were enrolled in the present survey as they are the target group for robot-mediated interviews, and going through job search and unemployment. A total of 242 valid responses were obtained. For demographics and employment-related characteristics, please see Table 6.

4.1.1. Procedure

The respondents were approached at the unemployment center and informed about the study. When oral consent to participate was obtained, they completed the survey delivered online on tablets. The survey was delivered through the Qualtrics survey system. The survey included questionnaires (described below) and two video segments displaying a conventional face-to-face interview and a robot-mediated job interview. As the technology represents a break with previous technologies used in this context, we found it critical to ensure that this context was clearly displayed in the survey. To ensure that the respondents all had the same understanding of the two job interview situations (robot-mediated vs. face-to-face), the survey included two scripted videos displaying the two interview conditions (as shown in Fig. 1).

In the face-to-face job interview, the interviewer and the applicant are physically seated across from each other. In the robot-mediated job interview, the Telenoid functioned as a possible fair proxy for the applicant. In the latter situation, the applicant and the interviewer are seated in two different rooms. The interviewer sits across from the robotic proxy that represents the applicant. The applicant sits in front of a computer screen via which the applicant can see the interviewer. The robot is teleoperated by the applicant, and it has a built-in camera on its forehead, which is used to transmit the visual image of the interviewer on the computer screen. Both interviews were based on the same script and involved the same two individuals. Each condition was thus shown in a separate video. Each survey respondent watched both videos, and each video was followed by a set of questions. The sequence of the videos was randomized.

4.1.2. Measures

As the mini-public results emphasized that the robot-mediated interview limits the interaction between interviewers and applicants in undesired ways, we focused on perceived interactional fairness (IF). We used a well-validated scale to assess interactional fairness perceptions in the two conditions consisting of four items, e.g., “The interviewer treated the applicant with dignity” (Bauer et al., 2001).

We also assessed personal innovativeness (PI) within the domain of interactive technologies (to which social robotics belong). For this
literature as a basis for assessing the quality of a confirmatory factor analysis model. We used six indicators from the original instrument to measure CSE (items 1, 3, 5, 8, 10, 11); see Table 7 for the wording and correspondence between the original numbering and our numbering. This formulation only uses positively worded items (since the original negatively worded items 8 and 10 were included in a positive wording form) and satisfies the usual global goodness-of-fit measures.

Given the objective of comparing the latent means of interactional fairness in the robot-mediated and face-to-face interviews, we applied structural equation modeling (SEM) to compare groups on latent means. Specifically, structured means modeling (SMM) is the recommended choice of analysis, as it allows for a highly flexible specification of the entire model and simultaneously addresses the unreliability of measures. Ignoring the uncertainty associated with the latent means of interactional fairness by using, for instance, summed scales and a standard ANOVA approach for analyzing experimental data might thwart the detection of important differences. We follow the suggestions in Steenkamp and Baumgartner (1998) as well as Thompson and Green (2013) and introduce a series of models with an increasing set of restrictions with the purpose of ultimately determining whether the mean of the latent construct interactional fairness is identical in the two groups (robot-mediated vs. face-to-face interview), accounting for the potential influence of CSE and personal innovativeness.

The point of departure is a model of configural invariance. Here, the same factor structure applies; that is, the same set of indicators for our construct applies in each group. There are no restrictions in terms of the loadings for these indicators or for any of the remaining parameters in the model. We allow for correlated errors associated with the indicators of the interactional fairness construct to reflect potential method effects (Brown, 2015). The second step is to identify which loadings, if any, are identical across the two groups. In step three, we identify which indicator means, among those with identical loadings, are identical across groups, where for identification, we restrict the mean of interactional fairness for the robot-mediated group and estimate the mean for the face-to-face group. In our final model, we also restrict the path coefficients between CSE and robot-mediated as well as face-to-face interactional fairness to be the same. The model in the first step (configural invariance) must be a well-fitting model to carry out the subsequent testing of additional restrictions. We base our assessment of the initial model, as is standard in the literature, on the chi-square statistic and introduce a series of models with an increasing set of restrictions with the purpose of ultimately determining whether the mean of the latent construct interactional fairness is identical in the two groups (robot-mediated vs. face-to-face interview), accounting for the potential influence of CSE and personal innovativeness.

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Table 8
Results from the SMM Analysis.

<table>
<thead>
<tr>
<th>Model</th>
<th>Characteristics</th>
<th>Goodness-of-fit</th>
<th>Incremental test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Same model form for both groups, the mean for the interactional fairness construct is set equal to zero for both groups, no restrictions on indicator intercepts across groups</td>
<td>$\chi^2$(109) = 173.879</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CFI = 0.964</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TLI = 0.956</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SRMR = 0.052</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>RMSEA = 0.050</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Same as Model 1 but with equivalent loadings for indicators IF$_1$, IF$_2$, and IF$_3$, the mean for the interactional fairness construct is set equal to zero for both groups, no restrictions on indicator intercepts across groups</td>
<td>$\chi^2$(111) = 178.658</td>
<td>$\Delta \chi^2$(2) = 4.822</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CFI = 0.963</td>
<td>p value = 0.089</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TLI = 0.954</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SRMR = 0.058</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>RMSEA = 0.050</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Same as Model 2 but with the mean for the interactional fairness construct set equal to zero for the robot-mediated group and estimated for the face-to-face group, indicator intercepts equivalent for IF$_1$ and IF$_3$ across groups</td>
<td>$\chi^2$(112) = 179.739</td>
<td>$\Delta \chi^2$(1) = 0.964</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CFI = 0.963</td>
<td>p value = 0.326</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TLI = 0.955</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SRMR = 0.058</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>RMSEA = 0.050</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Same as Model 3 but with equal path coefficients between core self-evaluations and robot-mediated plus face-to-face interactional fairness</td>
<td>$\chi^2$(112) = 179.809</td>
<td>$\Delta \chi^2$(1) = 0.027</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CFI = 0.963</td>
<td>p value = 0.870</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TLI = 0.956</td>
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<tr>
<td></td>
<td></td>
<td>SRMR = 0.058</td>
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<tr>
<td></td>
<td></td>
<td>RMSEA = 0.049</td>
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Muthén, 2012); hence, the incremental chi-square test uses the correction factor as described on the Mplus website. Table 8 summarizes the results.

Fig. 2 displays our final structural equation model (Model 4) that we use to investigate whether the average value of the latent interactional fairness construct is identical in the robot-mediated and face-to-face interviews. Factor loadings (single-headed arrows from a circle to a square) for CSE and PI have been omitted for brevity.

*We use the established model diagram symbols: squares signify observed variables, circles signify latent variables, a triangle is the mean or intercept, curved lines with two arrowheads signify correlations/covariances, and straight lines with a single arrowhead signify a direct effect. Dashed lines represent insignificant relationships between constructs. Single arrowhead lines with a 1 on top are marker indicators and are thus fixed to the value of 1. Single arrowhead lines with identical numbers on top are fixed to be equal.

The single-headed arrow from the triangle to the circle associated with the “interactional fairness, face-to-face” is the relevant effect. Based on the results from Model 4, we find the unstandardized mean difference between the robot-mediated interactional fairness factor and the face-to-face fairness factor to be -0.315 with a standard error of 0.050. Thus, the factor mean of the interactional fairness factor is highest for the robot-mediated group. The effect size according to Hancock (2001) is calculated as the interactional fairness factor intercept (which is equal to the above difference due to the identification restrictions) divided by the square root of the variance of the disturbance for that factor:

$$ES_{\text{fairness}} = \frac{-0.315}{0.050} = 0.645$$

The mean for the interactional fairness factor is 0.49 standard deviations smaller for the face-to-face group compared with the robot-mediated group. Using Cohen’s (1988) classification, this is a medium effect size.

We find the common unstandardized effect of CSE on interactional fairness to be 0.348 with a standard error of 0.099. Thus, the higher the CSE is, the higher the expected interactional fairness. The effect of PI on interactional fairness is insignificant, with parameter estimates and standard errors of 0.023 and 0.052 for the robot-mediated group and 0.006 and 0.062 for the face-to-face group.

4.3. Discussion

The findings of the survey show that jobseekers perceive robot-mediated job interviews as fairer than face-to-face interviews. From the jobseeker perspective, this suggests that there is room for improvement of the traditional job interview and indicates the potential of using robotic proxies for this purpose. Furthermore, only CSE was associated with fairness perceptions, and there were no differences between the two conditions (i.e., face-to-face and robot-mediated). We used CSE as a proxy for the appraisal of the job interview setup. However, in the present study, only six items of the scale were included in the final model. These six items especially relate to generalized self-efficacy (e.g., “when I try, I generally succeed,” and “I complete tasks successfully”) rather than to all four trait domains that the scale claims to assess. Additionally, all of these items were worded positively, which may in part explain the fit between them. Research suggests that it may be better to directly measure moderating processes attributed to CSE (Chang et al., 2012), e.g., factors that motivate jobseekers to prefer one interview setup over the other. Finally, the lack of effect of personal innovativeness on fairness perceptions may indicate that alleviating disadvantages related to the traditional face-to-face job interview is so fundamental to jobseekers that the high novelty of the alternative setup and the related technology are not perceived as a challenge. This result indicates that jobseekers may be ready to embrace radically new solutions that aim to improve job interviews as a selection method, regardless of their tendencies to adopt new interactive technologies.

5. General discussions and implications

This empirical paper is, to our knowledge, the first of its kind to thoroughly examine employers’ and applicants’ fairness perceptions of robot-mediated employment interviews. We explored whether a robot-mediated employment interview may be able to improve fairness perceptions by eliminating visual cues that are present in face-to-face communication. The paper offers three main contributions. First, it identifies key factors that affect fairness perceptions of the robot-mediated interview. Second, it reveals the diverging perceptions of the HR professionals and applicants on robot mediation in job interviews. These diverging perceptions are related to the HR professionals’ moral pragmatism that arises from their role morality and their focus on the
business case for the robot-mediated interview (financial aspects), which undermines its social case (reducing discrimination). Third, it examines an emerging technology as a future tactic to reduce potential biases, namely, through robot mediation in personnel selection. We discuss these three contributions below.

5.1. Employer vs. applicant fairness perceptions

Study 1 exposed different, but mainly negative, fairness perceptions of the robot-mediated interview that are held by HR professionals. These perceptions stand in contrast to the positive applicant fairness perceptions of the robot-mediated interview found in Study 2. In Study 1, the four identified factors can be categorized according to two types of fairness: procedural, i.e., whether the interview process is consistent, bias-free, correctable, etc., and interactional, i.e., whether the interview process is conducted in a respectful and informative manner (Bauer et al., 2001). While procedural fairness from the applicant perspective is related to consistency and neutrality of the interview (Bauer et al., 2001), our results show that the employer perspective views an interview procedure as fair only if it allows subjectivity and intuition. This is particularly evident with respect to the first factor, dehumanization of the interview process. The second factor, the good match, addresses procedural fairness by suggesting that fairness from the employer perspective is compromised if the interview setup does not secure the circumstances under which both employers and applicants can identify a suitable match in each other. This factor is also anchored in the subjective impressions of reciprocal fit between candidates and the hiring organization. The third factor, false objectivity, decreases both procedural and interpersonal fairness because the robot-mediated interview is perceived as postponing rejection and discrimination until the very end of the selection process, which the employer perspective interprets as disrespectful and unfair to the applicants. The final factor, symptomatic treatment, was related to the perception that the robot-mediated interview treats the symptoms rather than the causes of discrimination, which was assessed both positively and negatively. On the one hand, robot mediation was viewed as having an instrumental value in creating awareness around the issue of discrimination in the selection process itself and thus as improving procedural fairness. On the other hand, it was perceived as giving consent to the discrimination present in the labor market because it fails to treat the root cause of discrimination and consequently, as diminishing procedural fairness.

While the robot-mediated interview was thus not perceived as particularly fair from the employer perspective, the experimental survey in Study 2 showed that unemployed people perceived the robot-mediated employment interview as fairer than the face-to-face job interview. This difference may be attributed to the moral pragmatism of HR professionals. The HR professionals recognized the issue of implicit biases in job interviews, but from their perspective, the pragmatic reasons for face-to-face job interviews, e.g., relying on intuition, securing the “best” candidate-organization fit, have their own moral justification in terms of their obligations to the flourishing of the company and its extant employees, and thus outweigh the reasons for the robot-mediated interview, such as fair treatment and equality of rights, which they recognize as equally moral, from the perspective of the job applicant. This understanding of moral justification, which we characterized as a stance of moral pragmatism, has implications for research on employee selection because it offers an additional explanation as to why employers resist selection methods and/or technologies that are designed to improve the objectivity of selection decisions. In addition to contextual factors, such as organizational culture, habits and politics, the pervasive but flawed beliefs among employers are that a candidate’s character is too complex to be evaluated by structured and mechanical methods and that intuitive expertise can better predict a candidate’s work performance (Highhouse, 2008). Moral pragmatism is another reason for resistance to selection technologies, which shows that employers insist on particular selection methods due to i) their role morality, which obliges them to meet their clients’ needs and wants even if those entail biases, and ii) their focus on the business case for relying on a particular
method. This results in employers viewing fairness very differently than applicants, namely, as being fair to the hiring company by letting them decide on any given selection criteria (including, e.g., gender and race) they deem relevant, even if those are at odds with equality of opportunity.

5.2. Overcoming the opposing views of employers and applicants

Our two studies thus point to some of the challenges related to resolving discrimination in hiring. By taking the morally pragmatic stance on job interview discrimination, hiring organizations are, for instance, not only disregarding the effects on applicants’ psychological health (Friedman et al., 2005) but also the adverse effects of their selection practices on people’s careers over the long run (Hofstra et al., 2020). By letting discrimination creep into personnel selection, organizations are likewise making themselves vulnerable because discrimi-

nation may in fact lead to not hiring the best candidates (Quillian et al., 2017), and it may damage the hiring organization’s reputation (McLarty and Whitman, 2016).

While asserting the importance of intuition and gut feeling to argue against the robot-mediated job interview, the HR professionals in Study 1 pointed toward a potential exception: If the teleoperated robot were autonomous, it would be preferable because it would be a cost- and time-effective solution. Interestingly, this stance seems to contradict the importance of intuition in job interviews that was claimed by HR professionals. It also emphasizes their focus on financial performance (the business case). The HR professionals did not believe that autonomous, AI-driven robots could be unbiased considering the current state of AI development. Nonetheless, they found that particular option more appealing than the teleoperated robot mediation due to its potential to save money and resources. These findings suggest that focusing on business cases, i.e., the financial effects of a personnel selection method, undermines the social case, i.e., doing what is socially responsible. This is in line with emerging research that shows that having a strong business case for social action often does not lead to social action by organizations (Williams, 2017). This is because the principles of the business case for social action are based on an instrumental logic that prioritizes financial performance over social action, even in the face of a win–win situation (Kaplan, 2020). Adhering to this logic, the goal is to balance stakeholder trade-offs and shared value. However, research shows that “even shared value” approaches insist that the win-win formula always meets the needs of the bottom line first” (Kaplan, 2020, p. 1). As our study shows, the instrumental logic is masked by justificatory vocabulary that belongs to the domain of moral reasoning—HR professionals talked of “rights” and used “should” in the normative sense, not in the sense of furthering instrumental goals but in the sense of realizing obligations and entitlements. In Study 1, the HR professionals expressed that diversity can benefit the bottom line; however, their moral pragmatism meant that even if the robot-mediated job interview setup can be a win–win, financial performance beats social action. In the face of a potential win–win situation, HR professionals’ moral pragmatism seems unwarranted. One plausible reason for their moral pragmatism is that moral judgments are usually weaker for acts that are frequent or typical (Bigman et al., 2020). Indeed, research has documented that there is a pervasive and persistent belief among HR professionals that intuition is essential in personnel assessment and selection, even though they are aware of the disadvantages of such an approach (Highhouse, 2006). Furthermore, discrimination in hiring is common and institutionalized (Quillian et al., 2017). All of this limits the feelings of moral outrage that are usually necessary to trigger moral judgment and motivate social action (Kaplan, 2020; Martin et al., 1984).

Another explanation for the moral pragmatism of HR professionals is related to their focus on financial performance. Research in psychology links exposure to the construct of money directly to unethical behavior (Koschaki et al., 2013). In fact, this research suggests that this is why business decisions are sometimes unethical. The HR professionals’ focus on financial performance thus makes them more likely to make immoral business decisions.

Therefore, while jobseekers in Study 2 perceive the robot-mediated job interview as fairer, HR professionals in Study 1 feel the opposite way. As both groups are key stakeholders in the job interview, it seems reasonable to consider if and/or how this difference can be overcome. A study by Williams (2017) suggests that making a legal case rather than a business case is more likely to prompt organizations to act equitably because the legal case has a greater normative influence on individual values, beliefs and behaviors that are related to inequality. The legal case works, inter alia, because it has a deep moral grounding (Williams, 2017). Similar to the social case, the legal case fosters the belief that diversity and inclusiveness are morally correct. Thus, legal and social cases may be used in concert to stimulate moral beliefs that can help hiring organizations keep their biases in check and act in support of equality and diversity. Technologies such as robot-mediated job interviews may thus stand a better chance if presented as legal and social cases. While the robot-mediated job interview may not be able to solve the root causes of discrimination, as our mini-public findings suggest, they may be able to act as moral primers and help install the “values first principles” (Seibt and Vestergaard, 2018; Van den Hoven, 2005) in the selection process to achieve fair treatment and equal opportunities—the high-ranking moral values that seem to be difficult to live up to in personnel selection due to implicit biases present in human–human interaction and institutionalized discrimination in hiring.

5.3. Future research

While our results in the mini-public poll showed a positive change in attitude toward robot mediation in job interviews, our data did not reveal the underlying reasons for this change. During the mini-public, the participants had a chance to reflect on the benefits and drawbacks of the robot-mediated interview, and they also considered variations to the proposed robot-mediated setup. It is possible that these deliberations changed the participants’ perception of, for instance, ease of use, usefulness, and/or novelty, all of which are known to determine the attitudes toward and acceptance of new technologies (e.g., Rogers, 1995; Venkatesh and Davis, 2000; Wells et al., 2010). Social robots necessarily entail a novel experience since most people have had no or very limited interactions with them. In addition, the very nature of social robots makes them particularly novel. The contradictory combination of animate and inanimate features that characterize social robots intensifies the novelty experience because it makes social robots difficult to categorize ontologically and because our prior knowledge is inadequate to make sense of the experience when we engage in interactions with them (Smidts, 2019). Further studies are indeed necessary to better understand the first reactions of people to social robots in job interviews and to examine whether these reactions change as the novelty decreases.

In a recent study comparing asynchronous digital interviews (involving no live interaction) to video conference interviews, the lack of direct interaction was perceived as a little “creepy” (Langer et al., 2017). The authors explained this by referring to the novelty of the technology. Similarly, the robot-mediated interview is a fundamentally novel concept that can be perceived as somewhat outlandish the first time a person encounters it. The digital interview, which involves recording (and storing videos and information), also challenged the applicants’ perceptions of privacy and negatively affected the applicants’ perceptions of procedural justice (Langer et al., 2017). These two last shortcomings of the digital interview, however, are not present in the robot-mediated interview since the same robot-mediated setup is used for all (consistency), the robot’s appearance is neutral (bias suppression), it seeks to transmit objective information (accuracy), information can be modified in situ (correctability), both parties are present during the interview (representativeness) and it has decency as a goal (as it instantiates existing ethical principles). With all these potential
advantages of the robot-mediated employment interview, future research should examine whether fairness perceptions of such interviews increase as the novelty effect wears off.

Along with the potential for improving applicants’ perceived fairness, undesirable effects of robot-mediated interviews may also emerge. Among such effects may be a sense of greater distance and social disconnection, as well as reduced naturalness of the interaction, all of which may impact the interaction and communication quality between interviewers and candidates. Relatedly, maximizing applicant fairness perceptions by relying on robot-mediated job interviews may entail trade-offs, as our mini-public also indicated. Future research should seek to identify potential trade-offs and understand them in terms of, e.g., their ethical, psychological, business and social effects.

Additionally, it could be possible that different groups (e.g., minorities, mature jobseekers) may respond differently to using fair proxy communication in personnel selection and thus have different experiences in the organizations that hire them. Further research is needed to shed light on how being hired in this way affects an applicant’s later experiences in the new organization, for instance, in relation to the person’s career development, work relationships, psychological well-being, and work performance. Additional research into (a) whether formalizing such selection procedures is, for example, able to create more workplace satisfaction, inclusion and engagement in organizations and (b) whether such effects are of a short-term or a long-term character is also needed.

Last but not least, our findings also give rise to considerations related to the design of social robots for job interviews. To successfully extend HRI to a vital business function such as personnel selection, the robot’s design should be reconsidered. Our results suggest that the HR professionals are likely to adopt robots provided they are autonomous (and not teleoperated), as such robots were perceived to offer potential for cost-saving and freeing time for the HR personnel to do other important tasks. Our data indicated that robotics could help HR professionals rethink and reconceptualize the interview situation, and an autonomous robot could be a way of bridging the issues related to moral pragmatism. Nonetheless, from the perspective of applicants, a telepresence robot means that applicants communicate with a human interviewer via a robot rather than with “just” a robot. This may result in different applicant perceptions, conversational dynamics and communication quality. Future research should therefore investigate HR professionals’ and applicants’ reactions to different types of robots in job interviews.

5.4. Limitations

This study is not without limitations. First, although mini-publics (Study 1) are not expected to be a statistically representative sample of the entire population, they are aimed at representing different viewpoints on the issue at hand (Brown, 2006). In our mini-public, we observed a predominance of HR professionals, which thus limited the variety of viewpoints but provided strong insights into the HR perspective on the robot-mediated interview. While our open invitation to the mini-public did not restrict access to anyone and gave everyone an equal chance to be included (Goodin and Dryzek, 2006), such open invitations are subject to a self-selection bias, which was the likely cause of the overrepresentation of HR professionals. Second, the mini-public poll was designed to track any changes in attitudes (a key feature of this method) rather than measure personality traits and affinities. Nonetheless, including such measures in Study 1 may have helped explain the reasons behind the documented attitude change. Even so, the trait of personal innovativeness was not found to have an effect in Study 2. Third, several scales were translated and adapted into Danish in Study 2. Such culturally adapted scales need to be validated. Fourth, the external validity of Study 2 may be lower than it would have been if the respondents had experienced the robot-mediated interview first-hand. To further address the external validity of this study, future studies based on real-life job interviews and subsequent applicant evaluations might allow for comparison with these findings for possible deviations. Fifth, even if we accept that the Telenoid is gender and age neutral, the Telenoid may not be perceived as ethnically or voice neutral. Finally, witnessing an interaction with a robot is likely a new experience for the majority of respondents, which may predispose them to react with surprise or indecision—reactions that may be intensified when taking the third-person perspective (Kahn et al., 2013; Turkle, 2011). The exact nature and impact of these issues on the present study cannot be determined.

6. Conclusion

By relying on a mixed-method approach, this paper examined how the use of new technology during employment interviews affects employers’ and applicants’ fairness perceptions. Using a robot as a fair proxy in the employment interview is a novel approach for conducting interviews and has not yet been experienced by employers and applicants. Study 1 revealed four factors that influence their attitudes toward and perceptions of the robot-mediated interview. The study further suggested that the HR professionals’ focus on the business case rationale related to robot mediation in interviews triggers moral pragmatism—in the sense of a pragmatically justified prioritization of perspective moral evaluations—and undermines the social case related to this type of interview. Although the mini-public showed predominantly negative perceptions of the robot-mediated job interview, considering the participant composition (the majority of whom were HR professionals), we have argued that it was important to test the technique with active jobseekers. Indeed, our experimental survey findings show that the robot-mediated interview is perceived as fairer than the face-to-face interview. As such, this job interview method deserves more attention and further investigation.

Our research relates to this Special Issue in three ways. First, it examines an important form of social interaction in business settings, namely, the job interview, in which a robot acts as a new technology-based mediator. It thus reveals a future area of application for social robots by uncovering possible gains and/or limitations associated with extending HRI to a core business function such as recruitment and serves to inform and open up further research and product development in recruitment and selection. Second, this paper shows how the social function of a robot as a mediator in job interviews exposes the clashing expectations and perceptions held by applicants and HR practitioners toward the interview itself and discusses how employee selection may benefit from robotics to align these opposing views and potentially improve fairness perceptions of job interviews. Third, this work is further related to the consequences for HHI, as it addresses how the use of social robots in job interviews may affect the existing human understanding (recruiters) of that social activity (job interview) by triggering an opportunity for the recruiters to rethink this important social and professional activity.

CRediT authorship contribution statement

Sladjan Nørskov: Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft, Writing – review & editing, Visualization. Malene F. Damholdt: Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft, Writing – review & editing, Visualization. John P. Ulhøi: Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing. Morten Berg Jensen: Formal analysis, Writing – original draft, Writing – review & editing, Visualization. Mia Krogher Mathiasen: Investigation, Formal analysis. Charles M. Ess: Writing – original draft, Writing – review & editing. Johanna Seibt: Conceptualization, Writing – review & editing, Funding acquisition.
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