Received: 1 August 2023 | Accepted: 7 August 2024

DOI: 10.1111/joop.12545

RESEARCH ARTICLE

Conquering knowledge exchange barriers with age differences: A stress appraisal perspective on the consequences of upward social comparisons

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Funding information
Deutsche Forschungsgemeinschaft, Grant/Award Number: 438083224

Abstract

Knowledge exchange is crucial for organizations, but interpersonal dynamics can entail stress, affecting whether and how knowledge flows. Integrating social comparison and stress appraisal research, we propose that upward social comparison can be appraised as challenging or hindering. We suggest a dual pathway model involving an approach pathway via challenge appraisal and an avoidance pathway via hindrance appraisal with consequences on three knowledge exchange behaviours (i.e., knowledge sharing, knowledge seeking and knowledge hiding). Additionally, we examine age differences (vs. no age differences) to the comparison target as a buffer. We conducted two preregistered experimental online studies with employees ($N_{\text{Study 1}} = 206$, $N_{\text{Study 2}} = 414$), utilizing a 2 (social comparison; upward, lateral) × 3 (target age; younger, same-age, older) between-subject design. Participants received bogus task performance feedback (Study 1: cognitive ability test; Study 2: typing ability test). Both studies show that upward social comparison (but not other social comparison directions) fosters knowledge hiding via hindrance appraisal. This effect is weakened by an age difference (vs. no age difference) to the comparison target. However, our results do not support the approach pathway via challenge appraisal. Our research highlights social pitfalls in knowledge exchange and emphasizes the benefits of age differences between colleagues.

KEYWORDS

age difference, challenge-hindrance stress appraisal theory, knowledge exchange, social comparison theory, upward social comparison

Practitioner points

- Our study highlights the potential negative influence of upward social comparison on knowledge exchange from a stress appraisal perspective. By acknowledging the prevalence of upward social comparison and its potential hindrance to knowledge exchange, organizations can develop strategies to mitigate its detrimental consequences.
- Specifically, our research emphasizes the role of age difference as a mitigating factor in the relationship between upward social comparison and knowledge exchange. Pairing colleagues with age differences for collaborative activities can reduce the impact of perceived performance disparities, thereby fostering a conducive environment for knowledge exchange.

BACKGROUND

In today's knowledge economy, organizations' competitiveness relies on the wealth of knowledge within their workforce (Pereira & Bamel, 2021). To prevail against competitors, organizations must retain their employees' unique knowledge and foster the acquisition or creation of novel knowledge (Garcia-Perez et al., 2018). Typically, older employees are seen as the spearheads of organizational knowledge retention, while younger employees offer up-to-date knowledge from education and training (Burmeister, Fasbender, & Deller, 2018; Dietz et al., 2022). To harness the benefits of this diverse, age-based knowledge reservoir, employees of all ages must engage in knowledge exchange (i.e., sharing and seeking knowledge without hiding knowledge from others; Wang & Noe, 2010). Understanding the antecedents of knowledge exchange, while taking into account age differences (vs. no age difference) between employees, thus deserves our scholarly attention.

Although knowledge exchange benefits organizations (Ahmad & Karim, 2019; Reychav & Weisberg, 2009), preceding social processes can be stressful for employees, and occupational stress may hinder knowledge exchange (Marques et al., 2019). Knowledge exchange places several demands on employees. It requires employees to identify the right coworkers at the right time to exchange knowledge (Andrews & Delahaye, 2000; Burmeister et al., 2015; Ho & Wong, 2009). Knowledge exchange further demands that employees invest resources such as time, which they may perceive as scarce in a stressful day-to-day work environment (Burmeister et al., 2024; Connelly et al., 2014). Finally, it challenges employees to navigate potential threats to their self and competence when exchanging knowledge with coworkers, who might be seen as rivals (He et al., 2014; Menon et al., 2006). In particular, perceiving potentially rivalling colleagues as superior to oneself can lead to counterproductive work behaviour (Reh et al., 2018) and interpersonal competition at work may obstruct knowledge exchange (Anand et al., 2020). How employees relate to each other thus seems to be a decisive factor for (de-)motivating employees to engage in knowledge exchange.

Research identified multiple social factors (e.g., team cohesiveness, interpersonal trust; Wang & Noe, 2010) that may affect how challenging or stressful the knowledge exchange process is for employees. For example, trust can mitigate perceived risks associated with sharing and seeking knowledge (Wilkesmann et al., 2009). However, research has thus far neglected *social comparisons* (i.e., self-evaluation in relation to others by which individuals gain information about their relative standing; Wood, 1996) as a social factor. This is surprising given that social comparisons at work occur frequently and can cause stress (Greenberg et al., 2007), which may reduce the amount of high-quality work-related information transferred between colleagues (Fischer et al., 2009). Understanding the influence of social comparisons on knowledge exchange can thus provide insights into how a frequent, situational, and automatically occurring social process influences the flow of knowledge resources between employees.

Investigating the effects of social comparison on knowledge exchange behaviour is particularly relevant among age-diverse employees. Although research has established that social comparison shapes employees'

workplace behaviour (Sterling, 2013) and evidence indicates that age affects how individuals cope with social comparison (Zell et al., 2020), scholars have addressed these aspects separately. This is startling considering the emerging debate about intergenerational conflict and competition (Lytle & Apriceno, 2022; North & Fiske, 2012), which are intertwined with social comparisons (Gerpott & Fasbender, 2020). Based on Festinger's (1954) social comparison theory, we argue that age-dissimilar others are seen as less relevant comparison standards than age-similar others. This is due to their dissimilarity, which may reduce the impact of such social comparisons. Empirical findings indeed indicate that people prefer to receive comparison information from same-aged others when assessing their relative competence (Suls et al., 1978). Adding to the research on social comparison theory, we, therefore, consider it important to empirically probe the theoretical assumption drawn from social comparison theory that age differences should buffer the effects of social comparison in knowledge exchange processes (Fasbender & Gerpott, 2022a).

In this paper, we adopt an interpersonal stress appraisal perspective to examine the links between social comparison with others perceived to be better than oneself (i.e., *upward* social comparison), age differences, and knowledge exchange. We conceptualize upward social comparison as a work-related stressor (Greenberg et al., 2007) and propose that its stress appraisal shapes whether and how employees engage in knowledge exchange behaviours. We thereby aim to identify the mechanisms linking employees' upward social comparison with knowledge exchange behaviours towards the social comparison target (i.e., the person one compares to). At the same time, we consider how age differences to a social comparison target shape these relationships.

Specifically, we utilize the challenge–hindrance stress model (Cavanaugh et al., 2000) to distinguish two ways in which upward social comparison can be appraised: as a demand involving potential gains (i.e., *challenge appraisal*) or as a demand obstructing one's goal achievement (i.e., *hindrance appraisal*). We propose that appraising upward social comparison as a challenge prompts an approach response through which employees are encouraged to request knowledge from (i.e., *knowledge seeking*; Burmeister et al., 2022) or provide knowledge to (i.e., *knowledge sharing*; Wang & Noe, 2010) the social comparison target. In contrast, appraisal as a hindrance triggers an avoidance response inhibiting employees' knowledge sharing and driving them to intentionally withhold knowledge from the social comparison target (i.e., *knowledge hiding*; Connelly et al., 2012). Considering both appraisals are not mutually exclusive (Horan et al., 2020; Webster et al., 2011), we anticipate both pathways to operate simultaneously.

Integrating these arguments with Festinger's (1954) social comparison theory, we additionally suggest that the appraisal of upward social comparison is shaped by the similarity between the focal employee and the comparison target. People tend to prefer similar comparison targets (Conner, 2003) and such comparisons have a greater impact (Pomery et al., 2012). Thus, we argue that *age differences* (i.e., dissimilarity in age) between comparison partners weaken the links between upward social comparison and stress appraisals as well as downstream consequences on knowledge exchange compared to the absence of such differences. Figure 1 depicts our conceptual model.

Our research aims to contribute to the literature in three ways. First, we provide a novel theoretical perspective grounded in social comparison theory to investigate the social antecedents of knowledge exchange. Although past research has explored how relatively stable social factors such as relationship quality and group identity affect knowledge exchange at work (Szulanski & Lee, 2020), we have yet to understand how social comparisons as situational phenomena shape knowledge exchange processes. Furthering our understanding in this area is important given that scholars have recognized that social comparison is 'embedded deeply into the fabric of organizational life' (Greenberg et al., 2007, p. 23) and can disrupt information flow between colleagues (Fischer et al., 2009), thereby threatening organizational effectiveness.

Second, we add to the literature on knowledge flows in organizations by utilizing a stress appraisal perspective to decipher the mechanisms connecting upward social comparison and knowledge exchange. Specifically, we draw on the challenge-hindrance stress model (Cavanaugh et al., 2000) to introduce upward social comparison as an occupational social stressor that informs knowledge exchange through its appraisal. In doing so, we also extend stress appraisal and social comparison research, which traditionally framed social comparison as a means to evaluate stressors at work (rather than a stressor itself; Greenberg et al., 2007).

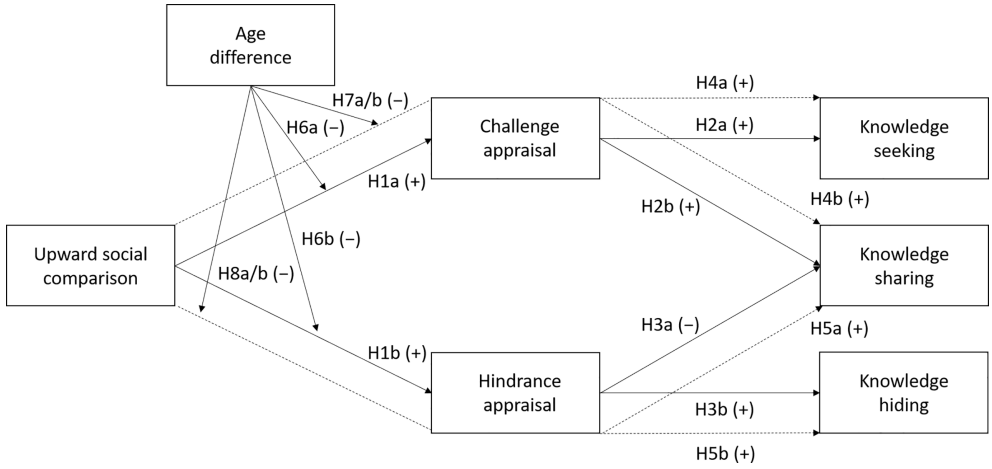

FIGURE 1 Conceptual model of study hypotheses. The dotted lines represent indirect effects.

Third, by introducing age differences as a boundary condition to the occupational social comparison process, we extend the literature to incorporate the conditions under which social comparison may promote or hinder knowledge exchange. Our investigation proves timely, given that research has highlighted the difficulties that may arise between employees of different ages in general (Urick et al., 2016) and specifically regarding their knowledge exchange (Schmidt & Muehlfeld, 2017). In contrast to the challenges associated with age dissimilarity emphasized in the literature (Kunze et al., 2013; North & Fiske, 2012; Rudolph & Zacher, 2015), we explore how age differences (vs. no age differences) between coworkers may contribute to overcoming tensions arising from upward comparison processes, thereby enhancing knowledge exchange. In sum, understanding how age differences shape knowledge-related social processes is a pressing concern we seek to address with this study.

THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

Social comparison as an occupational stressor

At its core, Festinger's (1954) social comparison theory states that people compare themselves to others to gain the most realistic self-evaluation possible when objective criteria are lacking. Social comparison can occur in three directions (i.e., upward, lateral and downward); yet, empirical evidence emphasizes upward social comparison as particularly relevant for knowledge exchange in contrast to downward social comparison (i.e., with others perceived to be worse than oneself) or lateral social comparison (i.e., with others perceived to be equal to oneself) due to its contradictory effects on employees' behaviour. Specifically, upward social comparison can prompt employees to either avoid or approach the upward comparison target (Yip & Kelly, 2013; Zhu et al., 2024), turning upward social comparisons into a double-edged sword for knowledge exchange. Furthermore, research shows a robust selection preference for upward social comparison, both generally for social comparisons in non-threatening contexts (Gerber et al., 2018) and specifically for work-related social comparisons (Buunk, 2022). Against this empirical background, which illustrates the complexity and relevance of upward social comparisons for knowledge exchange, we centred our investigation on this type of social comparison.

In their review of social comparison research, Buunk and Gibbons (2007) outline how most research on stress and social comparison focused on the role of comparisons as a potential coping mechanism in stressful situations. Accordingly, upward social comparison can help individuals

detect those who may be more knowledgeable about potential stressors. In this context, upward social comparison targets are expected to hold more information to share with a focal person than downward and lateral targets. However, Greenberg et al. (2007) offer a contrasting view, describing upward social comparison in an occupational context as 'likely to be stress-inducing' (p. 33). Supporting this view of upward social comparison as an occupational stressor (i.e., a stress-inducing stimulus), scholars have emphasized that upward social comparison targets may be perceived as threatening, triggering a protective stress reaction (Reh et al., 2018; Zhou et al., 2023). The stressful effects of social comparison also manifest on a cardiovascular level: the mere anticipation of social comparison leads to an increased heart rate while completing a task and slower recovery afterward (Jamieson & Kaszor, 1986).

According to the challenge-hindrance stress model, stressors can take two forms (Cavanaugh et al., 2000). On the one hand, challenge stressors are demands associated with the opportunity to prove oneself and gain a sense of accomplishment. Appraising work stressors as challenges generally leads to favourable outcomes, such as increased organizational citizenship behaviour (Webster et al., 2010), improved work performance (González-Morales & Neves, 2015), and learning (LePine et al., 2004; Prem et al., 2017). In the case of social comparisons, perceiving someone as superior can be motivating, with upward social comparisons triggering a desire to emulate the comparison target as a role model. This controllable perception, anticipating the possibility of overcoming the discrepancy through effort and potential growth, aligns with viewing upward social comparison as a challenge stressor (Zhou et al., 2023).

On the other hand, hindrance stressors correspond with demands that impede progress and hinder the achievement of personal goals. Appraising certain working conditions as hindrances is generally associated with unfavourable outcomes, such as increased exhaustion and decreased work engagement (Crawford et al., 2010; Sawhney & Michel, 2022). Similarly, upward social comparison can lead to frustration and threat if it is perceived as limiting personal development without offering positive consequences in return. This perception aligns with viewing upward social comparison as a hindrance stressor (Kern et al., 2021).

The original version of the challenge–hindrance stress model focuses on the dichotomous categorization of stressors into challenge or hindrance based on how a stressor is commonly perceived (e.g., time pressure as a classic challenge stressor and red tape as a classic hindrance stressor; Cavanaugh et al., 2000). However, current research emphasizes the need to consider individual appraisal of stressors (Li, Taris, & Peeters, 2022), not least because most stressors are ambiguous, combining challenging and hindering elements (Mazzola & Disselhorst, 2019). Accordingly, individuals can simultaneously perceive a stressor as a challenge and a hindrance (Webster et al., 2011). In light of the challenging and hindering elements characterizing upward social comparison (Zhou et al., 2023), we hypothesize that upward social comparisons will elicit both challenge and hindrance stress appraisal:

> **Hypothesis 1.** Upward social comparison (vs. lateral social comparison) has positive effects on (a) challenge appraisal and (b) hindrance appraisal.

The differential effects of stress appraisals in knowledge exchange

The perception of stressors shapes employees' behaviour, including their participation in knowledge exchange activities (Cai et al., 2022; Marques et al., 2019), such as knowledge seeking, knowledge sharing and knowledge hiding. Knowledge seeking refers to behaviours related to detecting the knowledge of others and making proactive efforts to obtain that knowledge (Burmeister et al., 2022). Complementing the acquisition of knowledge, knowledge sharing involves a knowledge sender providing knowledge to one or more knowledge receivers (Wang & Noe, 2010). In contrast to these behaviours promoting knowledge flows between employees, knowledge hiding is generally regarded as undesirable (Andreeva & Zappa, 2023; Burmeister et al., 2019). Connelly et al. (2012) define it as 'an intentional attempt by an individual to withhold or conceal knowledge that has been requested by

another person' (p. 65). As opposed to the lack of knowledge sharing, knowledge hiding thus involves the deliberate and deceptive refusal to share knowledge even when requested (Arain et al., 2024; Connelly et al., 2012).

We argue that these three knowledge-related behaviours differ in their underlying orientation, which pertains to whether the behaviour is primarily directed at affecting oneself (self-oriented) or others (other-oriented). Knowledge seeking is primarily self-oriented, focusing on acquiring information or expertise from others to enhance one's capabilities (He & Wei, 2009). In contrast, knowledge sharing has a dual orientation: it aims to simultaneously enhance one's knowledge by getting feedback from disclosing knowledge (self-oriented) and benefit others by providing knowledge (other-oriented; Gerpott & Fasbender, 2020). Knowledge hiding is predominantly other-oriented, as it is directed at preventing another person from acquiring the knowledge they seek (Lee, 2022; Weng et al., 2020; Zhu et al., 2019).

Based on their different orientations, we propose that challenge and hindrance appraisals exert distinct effects on these knowledge exchange behaviours. On the one hand, challenge appraisal is associated with the perception that one can effectively cope with demands, leading to learning and self-improvement (Cavanaugh et al., 2000). It is linked to approach behaviours, which involve actively engaging with the stressor to achieve positive outcomes (Calvo & Gutiérrez-García, 2016; LePine, 2022). This type of appraisal encourages an outward focus on the gains to be achieved, aligning with the self-oriented motives of knowledge seeking and knowledge sharing. On the other hand, hindrance appraisal is characterized by a perception of stress without the prospect of personal growth or other benefits (Horan et al., 2020). Hindrance demands are perceived as disproportionate barriers to achieving goals (Cavanaugh et al., 2000), which may lead to disengagement from the stressful upward social comparison through avoidance behaviours (LePine, 2022; Yip & Kelly, 2013). The threatening nature of hindrance appraisal tends to steer the focus on ways to reduce the threat posed by the comparison target in line with the other-orientation of knowledge sharing and knowledge hiding.

The impact of challenge appraisal on knowledge seeking and knowledge sharing

When work demands are perceived as challenging, individuals are motivated to invest resources to reap the expected rewards after overcoming the demands (Zhang & Parker, 2022). Applied to upward social comparisons, employees experiencing challenge appraisal are likely to engage in behaviours aimed at learning from the comparison target and closing the gap between themselves and the target, which may manifest as knowledge seeking.

Empirical evidence suggests that challenge appraisal encourages individuals to seek knowledge-based resources from others to cope with stressors (Cai et al., 2022). Similarly, challenge appraisal enhances motivation to learn in training settings (LePine et al., 2004), and it promotes proactivity in employees (Liu & Ren, 2022; Ohly & Fritz, 2010). Knowledge seeking (as opposed to merely receiving knowledge) is a proactive and effortful behaviour, requiring the knowledge seeker to identify and approach potential knowledge senders (Burmeister et al., 2022; Gubbins & Dooley, 2021). Given its proactive nature, it is therefore likely that perceiving stressors as challenging stimulates knowledge seeking in employees. Thus, we hypothesize:

Hypothesis 2a. Challenge appraisal is positively linked to knowledge seeking.

Similar to knowledge seeking, knowledge sharing is often regarded as a proactive behaviour (Liu & Ren, 2022; Ohly & Fritz, 2010), as it can involve approaching others. We anticipate that challenge appraisal will encourage knowledge sharing because challenge appraisals, as opportunities for self-improvement, are associated with expectations of personal growth (Choi et al., 2020). In particular, knowledge sharing can help employees progress through the feedback they receive from knowledge

recipients (Gerpott & Fasbender, 2020). When individuals share knowledge, recipients often engage with the shared information, ask questions, and provide feedback on its quality and relevance. Through this process, individuals can identify areas for improvement, refine their understanding, and enhance their expertise in the subject matter, ultimately contributing to their ongoing self-improvement efforts.

Moreover, well-managed challenge stressors can positively influence extra-role behaviours, including knowledge sharing (Kwok & Gao, 2005), due to increased perceived responsibility and work ownership (Montani & Dagenais-Desmarais, 2018). Physiologically, challenge reactions trigger approach behaviours, such as sharing one's perspective and engaging in social interactions (de Wit et al., 2020), supporting the notion that challenge appraisal may foster knowledge sharing. Therefore, we hypothesize:

Hypothesis 2b. Challenge appraisal is positively linked to knowledge sharing.

The impact of hindrance appraisal on knowledge sharing and knowledge hiding

In contrast to challenge appraisal, we expect hindrance appraisals to discourage knowledge sharing among employees due to disengagement from the stressor (LePine, 2022), which, in the case of social comparisons, stems from the comparison target. In this scenario, the upward social comparison does not induce motivation to reduce the difference between oneself and the comparison target. Instead, it may prompt an individual to avoid the perceived obstacle by reducing contact with the comparison target. Moreover, as perceived relative inferiority to a colleague is often considered unsatisfactory (Buunk, 2022), employees are likely reluctant to extend the perceived gap by providing the upward social comparison target with additional resources such as knowledge.

Empirically supporting a negative relationship between hindrance appraisal and knowledge sharing, Kang et al. (2022) demonstrated that hindrance stressors are negatively related to knowledge sharing due to resource depletion. Furthermore, in contrast to challenge appraisal, hindrance appraisal has been linked to reduced proactive behaviour (Yao et al., 2021) and inhibited display of prosocial behaviour (Parker et al., 2019), which may translate to disengagement from knowledge sharing activities. Similarly, Gao and Zhang (2022) show that hindrance appraisal of colleagues' dedication at work is associated with decreased proactive behaviour and organizational citizenship behaviour (i.e., workplace behaviour that serves organizational functioning but goes beyond the expected work performance), which is closely related to knowledge sharing (Amin et al., 2011). In sum, we hypothesize:

Hypothesis 3a. Hindrance appraisal is negatively linked to knowledge sharing.

Based on our interpersonal stress perspective, we argue that the avoidance response triggered by appraising social comparison as a hindrance stressor not only reduces knowledge sharing but goes beyond, manifesting in knowledge hiding. Like the lack of knowledge sharing, deliberately withholding knowledge represents proactive avoidance of the comparison target, as it inhibits knowledge-based interactions. In line with this, knowledge hiding echoes employees' desire not to exacerbate the disparity between themselves and the upward social comparison target.

Supporting this reasoning, meta-analytic evidence suggests that hindrance stress fosters counterproductive work behaviours (Mazzola & Disselhorst, 2019), which conceptually overlap with knowledge hiding (Connelly et al., 2012). Congruously, Zhang, Yao, et al. (2022) found that task-related hindrance stressors lead to knowledge hiding. Furthermore, Venz and Nesher Shoshan (2022) frame knowledge hiding as a coping mechanism to deal with interpersonal conflict at work, a typical occupational hindrance stressor. Taken together, current research suggests a positive relationship between hindrance appraisal and knowledge hiding. Thus, we hypothesize:

Hypothesis 3b. Hindrance appraisal is positively linked to knowledge hiding.

The mediating effect of stress appraisal

Integrating our arguments, we anticipate that both challenge appraisal and hindrance appraisal mediate the relationship between upward social comparison and knowledge exchange behaviours. First, upward social comparisons are perceived as stressful, and employees appraise them as either challenging or hindering, or both, based on perceived demands and potential for growth. Second, these appraisals have differential effects on knowledge exchange behaviours: challenge appraisal encourages approaching the comparison target and engaging in knowledge exchange interactions, while hindrance appraisal prompts disengagement and avoidance of knowledge exchange interactions. In wider support of the proposed mediating mechanisms, research has demonstrated that comparison with high-performers shapes employees' behaviour towards the superior comparison target (Campbell et al., 2017). Summarizing the above arguments, we hypothesize:

Hypothesis 4. Challenge appraisal mediates the positive effects of upward social comparison (vs. lateral social comparison) on (a) knowledge seeking and (b) knowledge sharing.

Hypothesis 5. Hindrance appraisal mediates (a) the negative effect of upward social comparison (vs. lateral social comparison) on knowledge sharing as well as (b) the positive effect of upward social comparison (vs. lateral social comparison) on knowledge hiding.

The moderating role of age difference

Age difference, which exists when two colleagues do not share the same age (Burmeister, van der Heijden, et al., 2018), can buffer the impact of a social comparison as such a difference indicates a lack of similarity (Jiang et al., 2017). Festinger's (1954) social comparison theory postulates that comparisons with similar others are more informative than comparisons with dissimilar others. This is because similar (vs. dissimilar) others' social information is perceived as more diagnostic of one's true standing on the comparison dimension (Callan et al., 2015), and individuals prefer comparison targets who are similar to them, even in attributes unrelated to the focal comparison dimension (Luk et al., 2000; Miller et al., 1988; Zanna et al., 1975). Likewise, the effect of social comparison increases with the degree of identification and similarity to the target (Pomery et al., 2012) which can stem from various surface-level (e.g., age, gender and ethnicity) and deep-level-attributes (e.g., attitudes, personality and values; Jansen & Searle, 2021). For instance, comparisons with individuals of the same gender or race (vs. different gender or race) show stronger effects on employees' voluntary turnover (Cobb et al., 2022).

Considering the growing demographic diversification of the workforce, different research streams (e.g., workforce aging, Zacher & Rudolph, 2022; workplace learning, Mulvie, 2021; diversity management, Gordon, 2018) have highlighted age differences as a crucial factor defining the social landscape of workplaces as a context for knowledge exchange. Research has established same-age comparisons (vs. comparison to younger or older targets) as more impactful (Grund & Westergaard-Nielsen, 2008; Wood, 1989). This can be attributed to the association of age similarity with a perceived commonality of performance indicators, which may intensify the salience and impact of same-age comparisons (Suls et al., 1978). Research on envy (i.e., feeling dissatisfied and hostile in response to an upward comparison; Smith, 2000) supports the notion that age similarity may enhance the relevance of upward social comparisons. Specifically, individuals often look to other age groups they perceive as superior as reference points in personal development (Heckhausen & Krueger, 1993), suggesting that upward social comparison targets typically fall into older or younger age categories. However, individuals across the lifespan tend to feel envy towards and report being envied by similarly aged individuals (Henniger &

Harris, 2015). These findings indicate that age differences between individuals and upward social comparison targets may mitigate the intensity of reactions sparked by such comparisons.

We thus propose that a higher (vs. lower) age difference among knowledge exchange partners buffers the effect of upward social comparison on subsequent stress appraisal (i.e., challenge and hindrance) and knowledge exchange behaviours (i.e., knowledge seeking, knowledge sharing and knowledge hiding).

Hypothesis 6. Age difference moderates the positive effects of upward social comparison (vs. lateral social comparison) on (a) challenge appraisal and (b) hindrance appraisal such that they are weaker when there is a higher (vs. lower) age difference.

Hypothesis 7. Age difference moderates the positive indirect effects of upward social comparison (vs. lateral social comparison) on (a) knowledge seeking and (b) knowledge sharing via challenge appraisal such that they are weaker when there is a higher (vs. lower) age difference.

Hypothesis 8. Age difference moderates (a) the negative indirect effect of upward social comparison (vs. lateral social comparison) on knowledge sharing and (b) the positive indirect effect of upward social comparison (vs. lateral social comparison) on knowledge hiding via hindrance appraisal such that they are weaker when there is a higher (vs. lower) age difference.

OVERVIEW OF STUDIES

To test our hypotheses, we conducted two experimental studies. We received ethical approval from the Justus-Liebig-University, Giessen (the first and second authors' former employer; IRB No. 2018-0048), obtaining informed consent from all study participants. In Study 1, we manipulated social comparison and the social comparison target age to establish the rationale that social comparison can lead to stress appraisal depending on the age difference to the comparison target, which subsequently shapes employees' knowledge exchange behaviours. To achieve this, we provided participants with social comparison feedback in the form of bogus performance feedback on a cognitive ability test (i.e., solving matrices). Afterward, participants reported their challenge and hindrance stress appraisal following the social comparison feedback and indicated their intentions to engage in different knowledge exchange behaviours towards the comparison target. In Study 2, we aimed to constructively replicate our findings from Study 1 and to increase the ecological validity of the social comparison manipulation for the work context by giving participants bogus performance feedback on a typing ability test.

Transparency and openness

We will provide all materials, data, analyses, and code used in this study on the website of the Open Science Framework (https://osf.io/cyf3b) in line with recommendations on experimental vignette research (Aguinis & Bradley, 2014). We preregistered our study design, hypotheses and analysis plan at the Open Science Framework (Study 1: https://osf.io/26qxc; Study 2: https://osf.io/uhnvw).

Adherence to best-practice guidelines for experimental vignette studies

To ensure the rigour of our studies, we followed the best-practice guidelines outlined by Aguinis and Bradley (2014). Specifically, we chose an experimental approach because we wanted to investigate the causal relationships between the study variables. Tying in with previous research (Reh et al., 2018), we opted for an experimental vignette method (paper people EVM; Aguinis & Bradley, 2014) to measure

participants' explicit appraisal and behavioural preferences following social comparisons. Furthermore, we ensured a high immersion of manipulation through interactive elements (i.e., taking a test) and excluded all participants who reported that they did not believe that the comparison target was a real person. Although participants reported their appraisal of the comparison manipulation, we recorded their hypothetical knowledge exchange behaviour as our experimental set-up did not allow us to measure actual behaviour. In addition, opting for a between-person research design allowed us to establish clear connections with previous research (Briker & Walter, 2021; Reh et al., 2018) and mitigate demand effects (cf. Eckerd et al., 2021), which could have hindered our investigation of knowledge hiding as it may be seen as socially inappropriate behaviour. We provided explanatory texts relating to each cover story to ensure participants of both studies had enough information to answer the questionnaires following the manipulation.

STUDY 1

Method

Procedure

We used a 2 (social comparison: upward vs. lateral) × 3 (target age: younger vs. same-age vs. older) factorial between-subject design. The data collection took place from May to September 2022. We collected data through an established online recruitment platform (i.e., Prolific). Compared to other platforms and panels for online behavioural research, Peer et al. (2022) concluded that Prolific has the highest data quality. Furthermore, along with the numerous benefits of online studies, the quality of data collected in online experiments is mostly equivalent to that collected in laboratory experiments (Clifford & Jerit, 2014).

As a cover story, we told participants that the study would be about examining a shortened version of a cognitive ability test in the work context as well as improving how we provided feedback for the cognitive ability test. After obtaining their informed consent, participants were instructed to provide some demographic information before taking the short cognitive ability test that involved solving matrices. Afterward, we provided them with manipulated performance feedback on their cognitive performance. Participants received their performance feedback alongside that of another random participant anonymized as 'P43' following Reh et al.'s (2018) experimental procedure. We additionally provided participants with the demographic information (i.e., age and gender) of 'P43'. To prevent effects due to gender differences, we always indicated that 'P43' had the same gender as the participant had previously self-reported. We informed participants that they received this information about 'P43' so that they could better assess their own performance in light of the lack of average scores on such a new cognitive ability test. Afterward, the subjects answered several questions before being debriefed about the real purpose of the study. As compensation for their participation, they received a small incentive (£2.25). We only considered individuals who completed the full study as participants, ensuring that there were no missing data.

Manipulations

Social comparison

Based on prior research (Campbell et al., 2017; Reh et al., 2018), we manipulated social comparison (upward vs. lateral) as a between-subject factor by giving participants bogus performance feedback on a cognitive ability test (i.e., solving matrices) relative to a supposed other participant 'P43'. We chose lateral social comparisons as a control condition in line with social comparison research to establish a 'neutral' control condition that still included a social comparison process (Mussweiler et al., 2004). Using lateral social comparisons as a control also helped mitigate the potential for erroneous contrast effects that may occur when contrasting upward and downward comparisons as social comparison information related to these directions is not used equally (Bruchmann, 2017). The participants were led

to believe that this matching partner had been randomly chosen from a sample of other participants, meaning that 'P43' stood for the participant number of the randomly drawn matching partner. The test result was represented visually by a bar graph (see https://osf.io/cyf3b for examples of the visual feedback). In the upward social comparison condition, 'P43' had a higher score than that of the participant. In the lateral social comparison condition, 'P43' scored one point above the participant to increase the believability of such a similar test result and to preserve the coherence of the measured variables. We also manipulated the scaling of the *y*-axis to emphasize the performance discrepancy in the upward condition and to stress the performance equivalence in the lateral condition.

To check whether the social comparison manipulation worked for participants, we used the three highest-loading items from Allan and Gilbert's (1995) social comparison scale as a manipulation check. Participants rated how they felt about the test feedback compared to 'P43'. We used a five-point Likert scale ranging from 1 (*inferior*, *incompetent*, *untalented*) to 5 (*superior*, *competent*, *talented*). The mean of the three items (Cronbach's $\alpha = .89$) was compared to participants' randomized comparison condition to assess their inclusion or exclusion from the final sample in line with our preregistered exclusion criteria.

Age difference

We manipulated the age difference to the social comparison target by providing participants with the age of 'P43' before the performance feedback as well as in connection with it. For reasons of logic, the age manipulation differed between two age groups. For all individuals over 27 years of age, 'P43' was randomized to be either 10 years younger, the same age, or 10 years older than the participants. For individuals between the ages of 18 and including the age of 27, 'P43' was randomized to be either as old as the participant or 10 years older. The reason for this distinction was that participants were informed that the minimum age to participate in our study was 18 years and therefore, it would have been unrealistic if 'P43' had been younger than 18 years.[1] To check whether the manipulation of the comparison person's age was successful, we asked participants to indicate before the debriefing whether 'P43' was younger, the same age, or older than them.

Sample

To investigate social comparisons among employees, the study was open to individuals who were between 18 and 69 years of age and were currently employed working for at least 20 hours per week. Because the study was administered in German, participants also had to speak German fluently. We targeted a final sample size of $N = 206$, which we determined using a power analysis (see pre-registration for details; Aguinis & Bradley, 2014). We collected data from a total of $N = 319$ to account for the exclusions based on the criteria we defined a priori in the pre-registration (i.e., manipulation checks and attention check items). Specifically, we excluded $n = 113$ participants who failed the manipulation checks for at least one of the manipulations (i.e., the social comparison manipulation and the target age manipulation).[2] We did not have to exclude any participants due to failed attention check items.

The final sample thus consisted of $N = 206$ participants (56.31% male, 42.23% female, 1.46% diverse; 19–62 years, $M = 31.50$, $SD = 8.48$). More than half of the participants reported having a university degree (54.37%). The largest share of participants reported working in 'Information and

[1]Since this procedure impacted randomization, we performed additional data analyses for participants over the age of 27 who could be randomly assigned to all comparison target age conditions. We present the results of these subsample analyses in Appendix S1: A for Study 1 (Tables A1–A4) and Study 2 (Tables A5–A8). The overall pattern of results remains consistent, as detailed in Table A9. However, there are some deviations concerning the support or rejection of hypotheses between the full sample and subsample analyses, which may be attributed to the sample size differences.

[2]A comparison of the included and excluded participants using an independent samples *t*-test showed that the groups did not differ in the variables used in the study model or in the demographic variables age and gender. Of the excluded participants, $n = 56$ had been randomly assigned to the lateral social comparison condition and $n = 57$ had been randomly assigned to the upward social comparison condition.

TABLE 1 Distribution of participants to the experimental conditions for Study 1.

	Social comparison direction	
Social comparison target age	**Upward**	**Lateral (control)**
Participant age < 28		
Same-age	21	21
Older	22	15
Participant age ≥ 28		
Younger	24	18
Same-age	18	29
Older	16	22

Note: $N = 206$.

Communication' (16.99%), while 'Human Health and Social Work Activities' represented the second-largest share (16.50%). Another 12.14% categorized their jobs as 'Professional, Scientific and Technical Activities', while the remaining participants were spread across different industries in smaller proportions. The distribution of participants to the experimental conditions can be found in Table 1.

Measures

All of the following measurement scales originally designed in English were translated to German in line with the back-translation method (Brislin, 1970). Specifically, we involved two native German speakers who were proficient in English at the C1 level. Disagreements were resolved by consulting a native English speaker as a third party. If not indicated otherwise, we used a 5-point Likert scale, ranging from 1 (*do not agree at all*) to 5 (*fully agree*). For all knowledge exchange behaviour scales, we replaced the recipients in the original scales (i.e., 'colleagues' for knowledge seeking and knowledge sharing, 'him/her' for knowledge hiding) with 'P43'.

Challenge appraisal

We measured challenge appraisal with the 4-item scale on challenge appraisal developed by Searle and Auton (2015). An example item is 'The performance feedback will help me learn a lot' (Cronbach's $\alpha = .92$).

Hindrance appraisal

To measure hindrance appraisal, we used the 4-item hindrance appraisal scale by Searle and Auton (2015). An example item is 'The performance feedback will limit how well I can do' (Cronbach's $\alpha = .96$).

Knowledge seeking

Knowledge seeking was measured using a modified 4-item scale by Wilkesmann et al. (2009). An example item is 'I would learn a lot by asking P43' (Cronbach's $\alpha = .89$).

Knowledge sharing

We measured knowledge sharing with a modified 3-item scale from Wilkesmann et al. (2009). An example item is 'I would show P43 special procedures so that they can learn them' (Cronbach's $\alpha = .78$).

Knowledge hiding

To measure knowledge hiding, we used Connelly et al.'s (2012) 4-item subscale for the knowledge hiding dimension 'playing dumb'. An example item is 'If P43 asked me for help or information, I would pretend that I did not know the information' (Cronbach's $\alpha = .87$).

Age difference

The experimentally manipulated age difference of 10 years can be perceived differently depending on participants' own ages. To illustrate, comparing an 18-year old and a 69-year old, a difference of 10 years represents a relatively larger share of the 18-year old's present lifetime than it does for the 69-year old. Following methodological recommendations to account for such dependencies (Kotter-Grühn et al., 2015), we calculated a proportional age difference score by subtracting participants' chronological age from their social comparison targets' age and dividing these difference scores by participants' chronological age (cf. Kotter-Grühn & Hess, 2012, for an application of proportional difference scores in the field of subjective age). Since we were not interested in the direction of the proportional age difference but only in its relative magnitude, we used the absolute value of this calculated parameter as the moderating variable. This way, a value of zero means that the social comparison target was the same age as the participant. A value above zero represents an age difference (either younger or older).[3]

Control variables

We controlled for participants' interest in solving related tasks with the modified 5-item interest scale by Vollmeyer and Rheinberg (2006) to exclude the possibility that the investigated effects stemmed from an interest in solving related tasks instead of the social comparison manipulation. An example item is 'For tasks like this I don't need a reward, they are lots of fun anyhow' (Cronbach's $\alpha = .90$). Moreover, we controlled for gender to rule out the possibility that the investigated effects came from gender differences in stress appraisal, particularly given that men are more likely to appraise events as a challenge than women (Ptacek et al., 1992). In addition, we controlled for participants' relative response speed (i.e., their deviation from the 'typical' median respondent; Leiner, 2019) as a proxy for their commitment (Hibben et al., 2022), which may have affected their appraisal of the comparison feedback.

Analytical strategy

First, we conducted confirmatory factor analyses (CFA) to estimate the construct validity of the measures. Second, we ran a path analysis in Mplus 8.4 to investigate the direct relationships between upward social comparison, challenge appraisal, hindrance appraisal, knowledge seeking, knowledge sharing and knowledge hiding as well as the moderation of the relationship between upward social comparison and the two types of appraisals by the proportional age difference score. In addition to the hypothesized relations, we incorporated the direct effect of upward social comparison on the outcome variables, as its omission could lead to an overestimation of indirect effects (Preacher & Hayes, 2008). Moreover, we regressed the control variables (participants' gender, interest in solving related tasks and relative response speed) on both the mediator (challenge appraisal and hindrance appraisal) and the outcome variables (knowledge seeking, knowledge sharing and knowledge hiding).[4] We tested the conceptual model by including all hypothesized effects simultaneously in the model. Third, we simulated Monte Carlo confidence intervals to investigate the indirect and conditional indirect paths in RStudio, version 2022.07.1+554.

[3]Because our data also allowed the directional analysis of the directional age difference, we conducted a post hoc analysis in which we included a directional version of the proportional age difference score as a moderator. The results of this analysis can be found in Appendix S1: B.

[4]The pattern of results remain unchanged when excluding gender and interest in solving related tasks as control variables from the analysis. However, the addition of participants' relative response speed as a control variable for commitment results in a significant *R*-square for the outcome variable knowledge sharing (as compared to a non-significant *R*-square without this control variable). The results for the path analysis without any control variables can be seen in Appendix S1: C (Tables C1–C4).

TABLE 2 Means, standard deviations and correlations of study variables for Study 1.

Variable	*M*	*SD*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Social comparison[a]	.49	.50	–										
2. Challenge appraisal	2.63	1.09	.09	–									
3. Hindrance appraisal	1.60	.90	.30*	.15*	–								
4. Age difference[b]	.19	.18	.13	.03	−.11	–							
5. Knowledge seeking	3.80	.70	.20*	.31*	.01	.02	–						
6. Knowledge sharing	3.65	.80	−.06	.07	−.17*	.04	.57*	–					
7. Knowledge hiding	1.35	.62	.09	.08	.36*	−.21*	−.24*	−.29*	–				
8. Age	31.50	8.48	−.15*	−.03	−.05	−.14*	−.001	.03	−.09	–			
9. Gender[c]	.59	.52	−.11	.02	−.04	−.004	−.07	−.03	.14*	−.01	–		
10. Interest in solving related tasks	3.16	.90	.03	.17*	.05	.10	.16*	.13	−.03	.09	.05	–	
11. Relative response speed	1.08	.25	−.003	.12	.06	.05	−.18*	−.14*	.23*	−.15*	−.01	−.01	–

Note: $N = 206$. Significant correlations are highlighted with an asterisk at $p < .05$.

[a]0 = lateral social comparison and 1 = upward social comparison.

[b]Refers to the proportional age difference score.

[c]0 = female and 1 = male and diverse.

TABLE 3 Confirmatory factor analysis fit indices for measurement model for Study 1.

Model	χ^2	*df*	$\Delta\chi^2$ (Δdf)	*p*-Value $\Delta\chi^2$ (Δdf)	CFI	RMSEA	SRMR
Five-factor model	271.89	142	–	–	.957	.067	.046
Four-factor model[a]	1201.66	146	929.77 (4)	<.001	.651	.187	.167
Three-factor model[b]	937.84	149	665.95 (7)	<.001	.740	.160	.150
Two-factor model[c]	1840.49	151	1568.60 (9)	<.001	.442	.233	.209
One-factor model[d]	2492.82	152	2220.93 (10)	<.001	.227	.273	.265

Note: $N = 206$. The difference of chi-square values ($\Delta\chi^2$) was estimated to compare to the five-factor model.

Abbreviations: CFI, Confirmatory Fit Index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual.

[a]Challenge appraisal and hindrance appraisal loading on one factor.

[b]Knowledge seeking, knowledge sharing and knowledge hiding loading on one factor.

[c]Challenge appraisal and hindrance appraisal loading on one factor. Knowledge seeking, knowledge sharing and knowledge hiding loading on one factor.

[d]All items loading on one common factor.

Results

Preliminary analysis

In Table 2, we present the means, standard deviations, and correlations of the study variables. Fit indices for the CFAs can be seen in Table 3. The analysis indicated a good model fit for the five-factor structure. Additionally, the CFAs showed that the hypothesized model was advanced to the alternative four-, three-, two- and one-factor models. Thus, the construct validity of the present measures is supported.

TABLE 4 Results of path analysis (direct effects) for Study 1.

	Challenge appraisal			Hindrance appraisal		
	Coeff	***SE***	***p*-Value**	**Coeff**	***SE***	***p*-Value**
Social comparison[a] (A)	.63	.67	.343	1.86**	.53	<.001
Age difference[b] (B)	.43	.30	.156	−.47	.24	.052
Interaction A × B	−.42	.61	.491	−1.24*	.48	.010
Interest in solving related tasks	.21*	.08	.011	.07	.07	.301
Gender[c]	.05	.14	.730	−.02	.11	.858
Relative response speed	.54	.30	.074	.23	.24	.334
R^2 (standardized)	.06	.03	.054	.15**	.05	.001
	Knowledge seeking			**Knowledge sharing**			**Knowledge hiding**		
	Coeff	***SE***	***p*-Value**	**Coeff**	***SE***	***p*-Value**	**Coeff**	***SE***	***p*-Value**
Social comparison[a]	.23*	.09	.010	−.07	.11	.547	.01	.08	.878
Challenge appraisal	.20**	.04	<.001	.06	.05	.202	–	–	–
Hindrance appraisal	–	–	–	−.11*	.05	.038	.23**	.04	<.001
Interest in solving-related tasks	.08	.05	.103	.11	.06	.062	−.03	.04	.428
Gender[c]	−.09	.09	.315	−.07	.10	.491	.19*	.07	.010
Relative response speed	−.61**	.03	.001	−.46*	.22	.038	.52**	.16	.001
R^2 (standardized)	.19**	.05	<.001	.06*	.03	.049	.19**	.05	<.001

Note: $N = 206$.

Abbreviations: Coeff, unstandardized coefficient; *SE*, standard error of unstandardized coefficient.

[a]0 = lateral social comparison and 1 = upward social comparison.

[b]Refers to the proportional age difference score.

[c]0 = female and 1 = male or diverse.

*$p < .05$. **$p < .01$.

TABLE 5 Indirect effects of upward social comparison on knowledge seeking, knowledge sharing and knowledge hiding for Study 1.

	Test of mediation		
	Coeff	**CI LL**	**CI UL**
H4a: Upward social comparison → challenge appraisal → knowledge seeking	.13	−.13	.41
H4b: Upward social comparison → challenge appraisal → knowledge sharing	.04	−.06	.19
H5a: Upward social comparison → hindrance appraisal → knowledge sharing	−.20*	−.45	−.01
H5b: Upward social comparison → hindrance appraisal → knowledge hiding	.43*	.17	.75

Note: $N = 206$. Significant coefficients are highlighted with an asterisk.

Abbreviations: CI LL, lower level of bias-corrected 95% confidence interval; CI UL, upper level of bias-corrected 95% confidence interval; Coeff, unstandardized coefficient.

Hypotheses testing

Table 4 shows the direct effects, whereas Table 5 contains the indirect effects of the path analysis. Overall, our hypothesized model showed a good model fit, $\chi^2(9) = 15.33$, $p = .082$, CFI = .97, RMSEA = .06, SRMR = .03.

Regarding the approach pathway linking upward social comparison to knowledge seeking and knowledge sharing via challenge appraisal, the path coefficients showed that upward social comparison did not have a significant positive effect on challenge appraisal ($\gamma = .63$, $SE = .67$, $p = .343$),

TABLE 6 Conditional indirect effects of upward social comparison on knowledge seeking and knowledge sharing via challenge appraisal upon age difference for Study 1.

	Test of moderated mediation		
	Coeff	**CI LL**	**CI UL**
Upward social comparison → challenge appraisal → knowledge seeking			
At higher (+1*SD*) levels of age difference	.11	−.17	.40
At lower (−1*SD*) levels of age difference	.15	−.11	.45
Difference between higher and lower levels of age difference	−.04	−.11	.02
Index of moderated mediation	−.08	−.22	.03
Upward social comparison → challenge appraisal → knowledge sharing			
At higher (+1*SD*) levels of age difference	.03	−.07	.18
At lower (−1*SD*) levels of age difference	.05	−.05	.20
Difference between higher and lower levels of age difference	−.01	−.05	.01
Index of moderated mediation	−.03	−.11	.02

Note: $N = 206$. Age difference refers to the proportional age difference score. Significant coefficients are highlighted with an asterisk.
Abbreviations: CI LL, lower level of bias-corrected 95% confidence interval; CI UL, upper level of bias-corrected 95% confidence interval; Coeff, unstandardized coefficient.

thereby not supporting Hypothesis 1a. We further found that challenge appraisal had a positive effect on knowledge seeking ($\gamma = .20$, $SE = .04$, $p < .001$), supporting Hypothesis 2a. However, challenge appraisal had no significant positive effect on knowledge sharing ($\gamma = .06$, $SE = .05$, $p = .202$). Therefore, we rejected Hypothesis 2b. Regarding the indirect effects, upward social comparison had neither a significant positive indirect effect on knowledge seeking (*indirect effect* = .13, 95% CI [−.13, .41]) nor on knowledge sharing (*indirect effect* = .04, 95% CI [−.06, .19]) via challenge appraisal, thereby not supporting Hypotheses 4a and 4b. Furthermore, concerning the moderation of these effects by age difference, we found no significant moderation of the direct effect of upward social comparison on challenge appraisal ($\gamma = -.42$, $SE = .61$, $p = .491$), thus rejecting Hypothesis 6a. Table 6 displays the conditional indirect effects of social comparison on knowledge seeking and knowledge sharing via challenge appraisal conditional upon age difference. Both Hypotheses 7a and 7b were not supported as the conditional indirect effects on knowledge seeking (*compound effect* = −.08, 95% CI [−.22, .03]) and knowledge sharing (*compound effect* = −.03, 95% CI [−.11, .02]) were not significant.

Regarding the avoidance pathway linking upward social comparison to knowledge sharing and knowledge hiding via hindrance appraisal, the path coefficients showed that upward social comparison had a significant positive effect on hindrance appraisal ($\gamma = 1.86$, $SE = .53$, $p < .001$), supporting Hypothesis 1b. We further found that hindrance appraisal had a significant negative effect on knowledge sharing ($\gamma = -.11$, $SE = .05$, $p = .038$) and a significant positive effect on knowledge hiding ($\gamma = .23$, $SE = .04$, $p < .001$), supporting Hypotheses 3a and 3b. Regarding the indirect effects, we found that upward social comparison had a significant negative indirect effect on knowledge sharing via hindrance appraisal (*indirect effect* = −.20, 95% CI [−.45, −.01]) as well as a significant positive indirect effect on knowledge hiding via hindrance appraisal (*indirect effect* = .43, 95% CI [.17, .75]), supporting Hypotheses 5a and 5b.

Furthermore, concerning the moderation of these effects by age difference, we found a significant moderation of the direct effect of upward social comparison on hindrance appraisal ($\gamma = -1.24$, $SE = .48$, $p = .010$), thus supporting Hypothesis 6b. We plotted this moderation effect in Figure 2. Table 7 displays the conditional indirect effects of social comparison on knowledge sharing and knowledge hiding via hindrance appraisal conditional upon age difference. First, the indirect negative effect on knowledge sharing via hindrance appraisal was significantly weaker at higher levels of age difference (*indirect effect* = −.17, 95% CI [−.41, −.01]) as compared to lower levels of age difference (*indirect effect* = −.23, 95% CI [−.52, −.02]; *difference* = .07, 95% CI [.004, .14]). The moderated

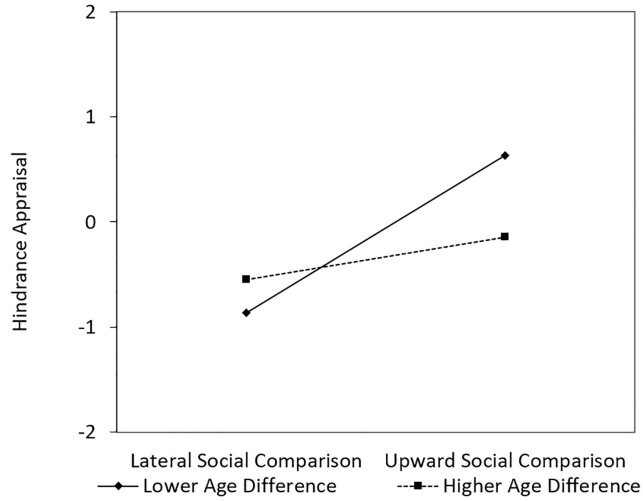

FIGURE 2 Age difference moderates the effect of social comparison on hindrance appraisal for Study 1. Hindrance appraisal ratings are shown for lower and higher levels of proportional age difference to the social comparison target in the lateral and upward social comparison conditions.

TABLE 7 Conditional indirect effects of upward social comparison on knowledge sharing and knowledge hiding via hindrance appraisal upon age difference for Study 1.

	Test of moderated mediation		
	Coeff	**CI LL**	**CI UL**
Upward social comparison → hindrance appraisal → knowledge sharing			
At higher (+1*SD*) levels of age difference	−.17*	−.41	−.01
At lower (−1*SD*) levels of age difference	−.23*	−.52	−.02
Difference between higher and lower levels of age difference	.07*	.004	.14
Index of moderated mediation	.13*	.01	.28
Upward social comparison → hindrance appraisal → knowledge hiding			
At higher (+1*SD*) levels of age difference	.36*	.10	.67
At lower (−1*SD*) levels of age difference	.50*	.23	.82
Difference between higher and lower levels of age difference	−.14*	−.22	−.07
Index of moderated mediation	−.29*	−.45	−.15

Note: $N = 206$. Age difference refers to the proportional age difference score. Significant coefficients are highlighted with an asterisk.
Abbreviations: CI LL, lower level of bias-corrected 95% confidence interval; CI UL, upper level of bias-corrected 95% confidence interval; Coeff, unstandardized coefficient.

mediation index was also significant (*compound effect* = .13, 95% CI [.01, .28]). These results support Hypothesis 8a. Second, the indirect negative effect on knowledge hiding via hindrance appraisal was significantly weaker at higher levels of age difference (*indirect effect* = .36, 95% CI [.10, .67]) as compared to lower levels of age difference (*indirect effect* = .50, 95% CI [.23, .82]; *difference* = −.14, 95% CI [−.22, −.07]). The moderated mediation index was also significant (*compound effect* = −.29, 95% CI [−.45, −.15]). These results support Hypothesis 8b.

As to the total effects of the predictor on the outcome variables, upward social comparison had a significant positive total effect on knowledge seeking ($\gamma = .36$, $SE = .16$, $p = .028$) and knowledge hiding ($\gamma = .44$, $SE = .16$, $p = .005$), but no significant total effect on knowledge sharing ($\gamma = -.23$, $SE = .15$, $p = .123$).

STUDY 2

We conducted a second study to replicate the results of Study 1 using a manipulation for social comparisons that is more ecologically valid for employees and less prone to be affected by age-related biases. In contrast to the more general comparison dimension in Study 1 (i.e., cognitive ability), we selected a more specific, work-related ability (i.e., typing ability) for Study 2. Three main reasons guided this decision: First, typing ability is a central daily work task for most office jobs that can significantly influence employees' productivity: both directly regarding the efficiency of creating written texts (e.g., documentation and email correspondence), but also indirectly, as more time spent typing reduces employees' availability to perform other tasks (Kalava et al., 2014). Second, comparisons of one's cognitive ability may be influenced by biases stemming from actual age-related cognitive decline (Salthouse, 2010) and negative age stereotypes about cognitive aging (Hummert, 2011). In contrast, real-life typing ability performance does not differ significantly between younger and older employees (Salthouse, 1984). Additionally, typing tasks offer potential compensatory mechanisms for age-related declines, such as planning further ahead to offset reduced perceptual-motor efficiency (Salthouse, 1984). Third, it is an easily measurable and manipulable metric for an experimental context, allowing us to replicate Study 1 as closely as possible.

Method

Procedure

For Study 2, we used a 3 (social comparison; upward, lateral, downward) × 3 (target age; younger, same age, older) factorial between-subject design, with the primary focus on the 2 (social comparison; upward vs. lateral) × 3 (target age; younger, same age, older) factorial structure also used in Study 1.[5] The data collection took place from February to March 2024 during the revision of this manuscript. As for Study 1, we recruited our participants via Prolific.

The fundamental experimental procedure remained the same as in Study 1. However, there were some deviations due to the adaptation of the experiment to a more ecologically valid context, which we will describe in the following. Specifically, we adapted the cover story, informing participants that they would be part of an early test of features we wanted to include in a programme to improve employees' typing ability. In line with this, participants took a short typing ability test in which they had to accurately type as much of a provided text as possible within 2 minutes. The test result formed the basis for the social comparison feedback, the presentation of which was analogous to Study 1. The only exception to this was the name of the comparison target ('Charlie' instead of 'P43') to reduce the abstraction of the target. We explained that we were testing such comparative feedback as one feature of the programme. To preserve deception, the survey contained scales on usability and user-friendliness (Brooke, 1996) in addition to the study variables. Participants received £ 3.00 as compensation for their participation.

Manipulations

Social comparison

The manipulation of the social comparison was the same as in Study 1, except for changing the name from 'P43' to 'Charlie' and adding a third social comparison condition (downward) in which 'Charlie'

[5]This allowed us to conduct exploratory analyses on the downward social comparison context (see Appendix S1: D). In sum, we found that downward social comparison had significant direct effects on knowledge seeking and knowledge sharing, but no significant indirect or conditional indirect effects. All results for Study 2 reported in this paper refer to participants in the upward and lateral social comparison conditions.

TABLE 8 Distribution of participants to the experimental conditions for Study 2.

	Social comparison direction	
Social comparison target age	**Upward**	**Lateral (control)**
Participant age < 28		
Same-age	4	10
Older	16	9
Participant age ≥ 28		
Younger	53	39
Same-age	85	49
Older	58	91

Note: $N = 414$.

scored lower than the participant. We used the same manipulation check and exclusion criteria as in Study 1 (Cronbach's $\alpha = .83$).

Age difference

The manipulation of the age difference to the comparison target and the associated manipulation check were identical to Study 1.

Sample

The criteria for participation in Study 2 were the same as in Study 1, except for the language requirement. As there were not enough suitable German-speaking employees registered on Prolific, we conducted the study with English-speaking employees instead. Additionally, to ensure the relevance of the experimental task for participants, they had to rate typing on a manual keyboard as at least 'important' for their job and complete the study on a device with a manual keyboard. The total sample size was $N = 1000$, which corresponded to the target sample size we calculated using Monte Carlo simulation based on the estimates obtained in Study 1 and a preliminary study.[6] Of these, $n = 331$ were in the downward comparison condition and were therefore not included in the main analysis. We applied the same exclusion criteria as in Study 1. Of the $N = 669$ participants in the focal sample (i.e., lateral and upward social comparison conditions), we excluded $n = 255$ because they did not pass at least one of the manipulation checks.[7] Nobody was excluded due to failed attention checks.

In sum, the final sample consisted of $N = 414$ participants (49.30% male, 50.48% female, .24% diverse; 19–69 years, $M = 40.22$, $SD = 10.54$). More than two-thirds of the participants reported having a university degree (69.81%). The largest share of participants reported working in 'Education and Teaching' (13.77%), while 'Information and Communication' represented the second-largest share (11.84%). Another 10.63% categorized their jobs as 'Professional, Scientific and Technical Activities', while the remaining participants were spread across different industries in smaller proportions. The distribution of participants to the experimental conditions can be found in Table 8.

[6]We conducted a preliminary study with $N = 42$ participants on Prolific to test the effectiveness of the manipulation of the modified experiment. We used the resulting estimators and the estimators from Study 1 as the basis for a Monte Carlo Simulation to calculate the necessary sample size (including three experimental conditions) in Mplus (Giner-Sorolla et al., 2024).

[7]A comparison of the included and excluded participants using an independent samples *t*-test showed that the groups did not differ in the variables used in the study model or in the demographic variables age and gender. Of the excluded participants, $n = 143$ had been randomly assigned to the lateral social comparison condition and $n = 112$ had been randomly assigned to the upward social comparison condition.

Measures

We assessed all variables using the same measures described in Study 1, though in their original English version. For all knowledge exchange behaviour scales, we replaced the recipients of the original scales with 'Charlie' and the pronoun corresponding to participants' self-reported gender.

Results

Our analytical strategy mirrored that of Study 1.[8]

TABLE 9 Means, standard deviations and correlations of study variables for Study 2.

Variable	*M*	*SD*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Social comparison[a]	.52	.50	–										
2. Challenge appraisal	3.36	.86	.14*	(.90)									
3. Hindrance appraisal	2.00	.81	.18*	−.16*	(.96)								
4. Age difference[b]	.18	.14	−.10*	.10*	−.02	–							
5. Knowledge seeking	3.67	.66	.23*	.57*	−.09	.05	(.87)						
6. Knowledge sharing	3.39	.70	−.25*	.23*	−.12*	.000	.29*	(.75)					
7. Knowledge hiding	1.61	.62	.14*	.04	.27*	−.08	−.09	−.19*	(.88)				
8. Age	40.22	10.54	−.08	.04	−.08	−.11*	−.03	.13*	−.04	–			
9. Gender[c]	.50	.50	.0004	−.02	−.003	.004	−.07	.08	.04	.09	–		
10. Interest in solving related tasks	3.50	.69	.02	.31*	−.07	.04	.30*	.18*	−.05	−.04	−.20*	(.81)	
11. Relative response speed	1.08	.29	−.01	−.16*	.17*	.04	−.01	−.11*	.15*	−.39*	.0002	−.11*	–

Note: $N = 414$. Significant correlations are highlighted with an asterisk at $p < .05$. Cronbach's alpha is indicated in brackets on the diagonal.

[a]0 = lateral social comparison and 1 = upward social comparison.

[b]Refers to the proportional age difference score.

[c]0 = female and 1 = male and diverse.

TABLE 10 Confirmatory factor analysis fit indices for measurement model for Study 2.

Model	χ^2	*df*	$\Delta\chi^2$ (Δdf)	*p*-Value $\Delta\chi^2$ (Δdf)	CFI	RMSEA	SRMR
Five-factor model	399.40	142	–	–	.957	.066	.059
Four-factor model[a]	2440.62	146	2041.22 (4)	<.001	.613	.195	.165
Three-factor model[b]	1954.10	149	1554.70 (7)	<.001	.696	.171	.155
Two-factor model[c]	3954.24	151	3554.84 (9)	<.001	.359	.247	.208
One-factor model[d]	4416.82	152	4017.42 (10)	<.001	.281	.260	.215

Note: $N = 414$. The difference of chi-square values ($\Delta\chi^2$) was estimated to compare to the five-factor model.

Abbreviations: CFI, Confirmatory Fit Index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual.

[a]Challenge appraisal and hindrance appraisal loading on one factor.

[b]Knowledge seeking, knowledge sharing and knowledge hiding loading on one factor.

[c]Challenge appraisal and hindrance appraisal loading on one factor. Knowledge seeking, knowledge sharing and knowledge hiding loading on one factor.

[d]All items loading on one common factor.

[8]The pattern of results remain unchanged when excluding gender, interest in solving related tasks, and relative response speed as control variables from the analysis. The results for the path analysis without any control variables can be seen in Appendix S1: C (Tables C5–C8).

TABLE 11 Results of path analysis (direct effects) for Study 2.

	Challenge appraisal			Hindrance appraisal		
	Coeff	***SE***	***p*-Value**	**Coeff**	***SE***	***p*-Value**
Social comparison[a] (A)	.69	.41	.087	1.06**	.40	.007
Age difference[b] (B)	.46*	.19	.014	.01	.18	.980
Interaction A × B	−.42	.38	.268	−.73*	.37	.046
Interest in solving related tasks	.37**	.06	<.001	−.07	.06	.220
Gender[c]	.07	.08	.385	−.02	.08	.843
Relative response speed	−.39**	.14	.004	.47**	.13	<.001
R^2 (standardized)	.15**	.03	<.001	.07**	.02	.003
	Knowledge seeking			**Knowledge sharing**			**Knowledge hiding**		
	Coeff	***SE***	***p*-Value**	**Coeff**	***SE***	***p*-Value**	**Coeff**	***SE***	***p*-Value**
Social comparison[a]	.21**	.05	<.001	−.40**	.07	<.001	.12*	.06	.037
Challenge appraisal	.40**	.03	<.001	.20**	.04	<.001	–	–	–
Hindrance appraisal	–	–	–	.01	.04	.896	.17**	.04	<.001
Interest in solving related tasks	.13**	.04	.001	.13**	.05	.011	−.01	.04	.796
Gender[c]	−.04	.05	.440	.16*	.07	.014	.04	.06	.489
Relative response speed	.21*	.09	.023	−.15	.11	.189	.24*	.10	.022
R^2 (standardized)	.38**	.04	<.001	.17**	.03	<.001	.09**	.03	.001

Note: $N = 414$.

Abbreviations: Coeff, unstandardized coefficient; *SE*, standard error of unstandardized coefficient.

[a]0 = lateral social comparison and 1 = upward social comparison.

[b]Refers to the proportional age difference score.

[c]0 = female and 1 = male or diverse.

*$p < .05$. **$p < .01$.

TABLE 12 Indirect effects of upward social comparison on knowledge seeking, knowledge sharing and knowledge hiding for Study 2.

	Test of mediation		
	Coeff	**CI LL**	**CI UL**
H4a: Upward social comparison → challenge appraisal → knowledge seeking	.28	−.04	.61
H4b: Upward social comparison → challenge appraisal → knowledge sharing	.28	−.04	.61
H5a: Upward social comparison → hindrance appraisal → knowledge sharing	−.01	−.09	.10
H5b: Upward social comparison → hindrance appraisal → knowledge hiding	.18*	.04	.35

Note: $N = 414$. Significant coefficients are highlighted with an asterisk.

Abbreviations: CI LL, lower level of bias-corrected 95% confidence interval; CI UL, upper level of bias-corrected 95% confidence interval; Coeff, unstandardized coefficient.

Preliminary analyses

Table 9 contains the means, standard deviations, and correlations of the study variables along with the reliability scores for each measurement scale. Fit indices for the CFAs indicated a good model fit for the five-factor structure (see Table 10). Additionally, the CFAs showed that the hypothesized model outperformed the alternative four-, three-, two- and one-factor models, emphasizing the construct validity of the present measures.

Hypotheses testing

Table 11 contains the direct effects and Table 12 shows the indirect effects of the path analysis. In total, our hypothesized model showed a good model fit, $\chi^2(9) = 22.12$, $p = .009$, CFI = .97, RMSEA = .06, SRMR = .03.

Concerning the approach pathway, upward social comparison did not have a significant positive effect on challenge appraisal ($\gamma = .69$, $SE = .41$, $p = .087$), showing no support for Hypothesis 1a. However, challenge appraisal had a significant positive effect on knowledge seeking ($\gamma = .40$, $SE = .03$, $p < .001$) and knowledge sharing ($\gamma = .20$, $SE = .04$, $p < .001$), thus supporting Hypotheses 2a and 2b. As to the indirect effects, upward social comparison had neither a significant positive indirect effect on knowledge seeking (*indirect effect* = .28, 95% CI [−.04, .61]) nor on knowledge sharing (*indirect effect* = .28, 95% CI [−.04, .61]) via challenge appraisal, thereby rejecting Hypotheses 4a and 4b. Moreover, we found no significant moderation of the direct effect of upward social comparison on challenge appraisal by age difference ($\gamma = -.42$, $SE = .38$, $p = .268$), not supporting Hypothesis 6a. Table 13 displays the conditional indirect effects of social comparison on knowledge seeking and knowledge sharing via challenge appraisal conditional upon age difference. Both Hypotheses 7a and 7b were rejected as the conditional indirect effects on knowledge seeking (*compound effect* = −.17, 95% CI [−.46, .12]) and knowledge sharing (*compound effect* = −.17, 95% CI [−.47, .13]) via challenge appraisal did not reach significance.

Concerning the avoidance pathway, upward social comparison had a significant positive effect on hindrance appraisal ($\gamma = 1.06$, $SE = .40$, $p = .007$), supporting Hypothesis 1b. Moreover, hindrance appraisal only had a significant positive effect on knowledge hiding ($\gamma = .17$, $SE = .04$, $p < .001$), but no significant negative effect on knowledge sharing ($\gamma = .01$, $SE = .04$, $p = .896$), rejecting Hypothesis 3a and supporting Hypothesis 3b. In line with this, regarding the indirect effects, upward social comparison did not have a significant negative indirect effect on knowledge sharing via hindrance appraisal (*indirect effect* = −.01, 95% CI [−.09, .10]), not supporting Hypothesis 5a. Yet, upward social comparison showed a significant positive indirect effect on knowledge hiding via hindrance appraisal (*indirect effect* = .18, 95% CI [.04, .35]), supporting Hypothesis 5b.

In addition, regarding the moderation of these effects, age difference emerged as a significant negative moderator of the direct effect of upward social comparison on hindrance appraisal ($\gamma = -.73$, $SE = .37$, $p = .046$) in support of Hypothesis 6b. We plotted this moderation effect in Figure 3. Table 14 contains the conditional indirect effects of social comparison on knowledge sharing and knowledge hiding via hindrance appraisal conditional upon age difference. The conditional indirect effect on knowledge

TABLE 13 Conditional indirect effects of upward social comparison on knowledge seeking and knowledge sharing via challenge appraisal upon age difference for Study 2.

	Test of moderated mediation		
	Coeff	**CI LL**	**CI UL**
Upward social comparison → challenge appraisal→ knowledge seeking			
At higher (+1*SD*) levels of age difference	.24	−.02	.51
At lower (−1*SD*) levels of age difference	.31	−.06	.71
Difference between higher and lower levels of age difference	−.07	−.20	.06
Index of moderated mediation	−.17	−.46	.12
Upward social comparison → challenge appraisal→ knowledge sharing			
At higher (+1*SD*) levels of age difference	.24	−.02	.51
At lower (−1*SD*) levels of age difference	.31	−.06	.71
Difference between higher and lower levels of age difference	−.07	−.20	.06
Index of moderated mediation	−.17	−.47	.13

Note: $N = 414$. Age difference refers to the proportional age difference score. Significant coefficients are highlighted with an asterisk.

Abbreviations: CI LL, lower level of bias-corrected 95% confidence interval; CI UL, upper level of bias-corrected 95% confidence interval; Coeff, unstandardized coefficient.

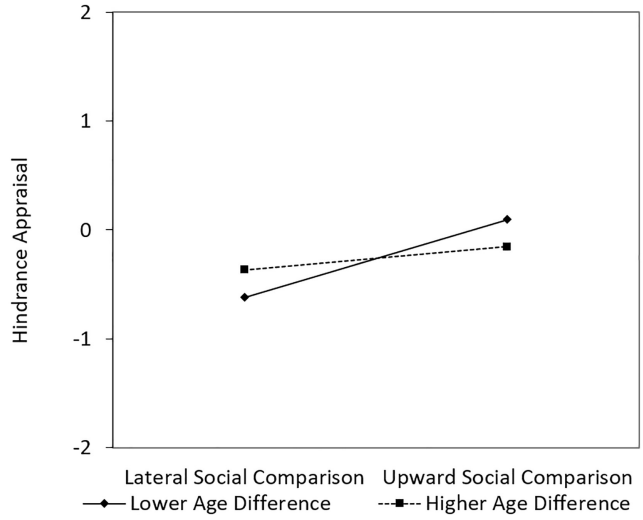

FIGURE 3 Age difference moderates the effect of social comparison on hindrance appraisal for Study 2. Hindrance appraisal ratings are shown for lower and higher levels of proportional age difference to the social comparison target in the lateral and upward social comparison conditions.

TABLE 14 Conditional indirect effects of upward social comparison on knowledge sharing and knowledge hiding via hindrance appraisal upon age difference for Study 2.

	Test of moderated mediation		
	Coeff	**CI LL**	**CI UL**
Upward social comparison → hindrance appraisal → knowledge sharing			
At higher (+1*SD*) levels of age difference	.01	−.07	.08
At lower (−1*SD*) levels of age difference	.01	−.10	.11
Difference between higher and lower levels of age difference	−.002	−.03	.03
Index of moderated mediation	−.004	−.07	.06
Upward social comparison → hindrance appraisal → knowledge hiding			
At higher (+1*SD*) levels of age difference	.15*	.04	.29
At lower (−1*SD*) levels of age difference	.20*	.04	.40
Difference between higher and lower levels of age difference	−.05*	−.11	−.001
Index of moderated mediation	−.12*	−.30	−.004

Note: $N = 414$. Age difference refers to the proportional age difference score. Significant coefficients are highlighted with an asterisk.

Abbreviations: CI LL, lower level of bias-corrected 95% confidence interval; CI UL, upper level of bias-corrected 95% confidence interval; Coeff, unstandardized coefficient.

sharing via hindrance appraisal was not significant (*compound effect* = −.004, 95% CI [−.07, .06]), not supporting Hypothesis 8a. In contrast, the indirect positive effect on knowledge hiding via hindrance appraisal was significantly weaker at higher levels of age difference (*indirect effect* = .15, 95% CI [.04, .29]) as compared to lower levels of age difference (*indirect effect* = .20, 95% CI [.04, .40]; *difference* = −.05, 95% CI [−.11, −.001]). The moderated mediation index was also significant (*compound effect* = −.12, 95% CI [−.30, −.004]). These results support Hypothesis 8b.

Regarding the total effects of the predictor on the outcome variables, upward social comparison had a significant positive total effect on knowledge seeking ($\gamma = .49$, $SE = .17$, $p = .005$) and knowledge hiding ($\gamma = .30$, $SE = .09$, $p = .001$), and a significant negative total effect on knowledge sharing ($\gamma = -.26$, $SE = .11$, $p = .017$).

DISCUSSION

We aimed to investigate the social antecedents of knowledge exchange through a social comparison lens while utilizing stress appraisal theory to decipher the underlying mechanisms linking social comparison and knowledge exchange. Specifically, we developed a dual pathway model of upward social comparison and knowledge exchange behaviours featuring an approach and an avoidance pathway in line with the challenge-hindrance stress model to shed light on the underlying mechanisms. Moreover, we examined the age difference between an employee and their comparison target as a potential buffer to the effects of upward social comparison on challenge and hindrance appraisals and its downstream indirect effects on knowledge exchange behaviours.

The data collected in two experimental studies consistently showed that upward social comparison significantly fostered knowledge hiding via hindrance appraisal. The age difference with the comparison target additionally buffered the relationship such that the adverse effects of this avoidance behaviour were weaker. In contrast, the hypothesized negative effect of upward social comparisons on knowledge sharing via hindrance appraisal, along with the buffering effect of the age difference for this relationship, were only significant in Study 1. Across both studies, we found no support for the proposed approach pathway connecting upward social comparison to knowledge exchange behaviours via challenge appraisal or a moderation of these relationships by age difference.

Theoretical implications

First, by linking research on knowledge exchange with social comparison theory, we extend our understanding of the social processes that inform knowledge exchange behaviours at the interpersonal level. Whereas existing research has focused on exploring social factors that either exclusively foster (e.g., trust, Park & Kim, 2018; cooperative relationships, Fasbender & Gerpott, 2022b; Ghobadi & D'Ambra, 2012) or hinder (e.g., injustice, Cao, 2022; Fasbender & Gerpott, 2021; interpersonal competition, Wang, 2022) knowledge exchange, we took a more holistic perspective by considering the dual nature of upward social comparison with its potential to simultaneously facilitate and inhibit knowledge exchange behaviours (Campbell et al., 2017). We found that in terms of stress appraisal-related mechanisms, upward social comparison (in contrast to lateral social comparison) elicits an avoidance reaction but not an approach reaction. To that end, our findings do not align with scholars who have established the approach potential of upward social comparison (Onu et al., 2016). Instead, our research lines up with literature painting upward social comparison as a barrier to knowledge exchange (Weng et al., 2020).

In contrast to this interpretation, although not explicitly hypothesized, both studies also show a significant positive direct effect of upward social comparisons on knowledge seeking. In addition, we found a significant negative direct effect of upward social comparison on knowledge sharing and a significant positive direct effect on knowledge hiding in Study 2. On the one hand, these effects are reminiscent of findings from research on high performers highlighting the paradoxical combination of favourable and unfavourable behaviour shown towards high performers (Campbell et al., 2017): upward social comparison seems to encourage employees to approach upward targets to capitalize on them through knowledge seeking (compared to targets performing similarly). At the same time, upward social comparisons may lead employees to avoid upward comparison targets by not sharing their knowledge with them or actively hiding knowledge from them. On the other hand, this combination of approach and avoidance behaviours in response to upward comparisons allows for a different interpretation: knowledge seeking may also open employees' way to initiate a reciprocal knowledge exchange relationship with a fairly unfamiliar colleague which may be more compatible with social rules related to the perceived status differential suggested by the upward comparison direction (cf. Rosen et al., 2007). Similarly, concerns about not being able to contribute meaningfully to knowledge exchange with the upward comparison target due to the perceived inferiority could drive employees to avoid contributing their knowledge (cf. fear of losing face; Fasbender & Gerpott, 2022a).

Second, our research contributes to a more nuanced understanding of stress appraisal in social comparisons. Importantly, our exploratory analyses on downward social comparisons indicated that the stress appraisal framework is exclusively applicable to upward social comparisons in contrast to lateral or downward social comparisons. This distinction underscores that not all social comparisons are perceived equally, with upward comparisons uniquely contributing to stress perceptions. However, our findings differ from prior research, according to which upward social comparison can be appraised as both a challenge and a hindrance (Zhou et al., 2023). In contrast, we only showed that upward social comparison is related to hindrance appraisal. One reason for the disparity in these results may be that Zhou et al. (2023) focused on temporal upward social comparison, which takes into account past and future development. We, on the other hand, zoomed in on a more momentary perspective of upward social comparison by simulating a one-time comparison without past or future collaboration with the comparison target. Such a momentary upward social comparison may only invoke hindrance appraisal in participants as it does not offer the development potential of a challenge because it lacks perceived opportunities to change the situation through future collaboration (cf. Fasbender & Gerpott, 2022a; Reh et al., 2022).

Third, our findings also contribute to the ongoing debate on age-related conflict at work. Research on intergenerational rivalry suggests that the evolving structures of the professional world stimulate increasing competition between colleagues of different ages (North & Fiske, 2012). In particular, social comparison research has cautioned against the pitfalls of upward temporal social comparisons with colleagues of different ages (Fasbender & Gerpott, 2022a). By contrast, our results suggest that, at the static comparison level and from a stress appraisal perspective, social comparisons made with age-different comparison targets may be more beneficial than same-age comparison targets. Therefore, as this debate continues, it is important to adopt a differentiated view of the processes for which, and the conditions under which, age differences at work can be beneficial (cf. Fasbender & Gerpott, 2022a).

Practical implications

Our work points to different practical implications that may aid organizations in leveraging the social side of knowledge exchange. First, organizations should acknowledge that social comparison between colleagues is inevitable as it satisfies employees' natural need to obtain information about their relative standing (Greenberg et al., 2007). At the same time, even for the highest performer, social comparison is likely to be directed upward at a certain point in time. Due to the social nature of most workplaces, practitioners should thus focus on alleviating the potential negative influences of upward social comparison. Our work emphasizes age differences between colleagues as a malleable parameter that may help achieve this aim. Specifically, organizations may deliberately pair colleagues with age differences for cooperative work activities to reduce employees' experience of potential performance disparities as a stressor that hinders knowledge exchange. Conveniently, age differences between colleagues may also maximize the breadth of exchanged knowledge, since employees of different ages usually bring different kinds of knowledge to the table (Burmeister & Deller, 2016; Li et al., 2021). Therefore, we suggest that organizations should strive for a heterogeneous age composition within their workforce in general and within collaborative teams. However, it is crucial to recognize that age diversity alone is not a panacea and may lead to unfavourable work outcomes if not managed properly (Guillaume et al., 2013). For instance, team diversity may be accompanied by interpersonal biases, norms, and perceptions that affect outcomes such as employees' health and behaviour towards colleagues as well as team performance (Fletcher & Beauregard, 2022). Specifically, team age diversity may foster the emergence of an age-discrimination climate, which in turn harms organizational performance (Kunze et al., 2013). Thus, to truly harness the benefits of age diversity, we urge organizations to cultivate a supportive environment that guards against such drawbacks, for instance through suitable human resource management practices (Froidevaux et al., 2020) that establish a positive age-diversity climate (Boehm et al., 2014).

Second, our findings are particularly important for work situations that are prone to frequent changes in team constellations, such as project-based industries or project-based teams in general (Fong & Choi, 2009). In such work environments, teams are often formed to work on time-limited projects and are regrouped once a project has been completed. Our studies demonstrate that upward social comparison made under such conditions (i.e., without the possibility of including comparison targets' past and expected future developments) has the potential to impede knowledge exchange through its appraisal as a demand that obstructs one's goal achievement. Therefore, organizations with temporary teams should seek to reduce employees' hindrance appraisal of upward social comparison. This could be achieved by establishing objective performance criteria or emphasizing within-person development trajectories and potentials (cf. McColskey & Leary, 1985; Zhao, 2022).

Limitations and future research directions

Our work is limited in different ways, which points to future research directions. First, the inconsistent findings observed across the two studies regarding the relationship between stress appraisal and knowledge sharing indicate interesting avenues for future research. Specifically, we found in Study 1 that hindrance appraisal negatively affected knowledge sharing, with upward social comparison having an indirect negative effect via hindrance appraisal. In contrast, in Study 2 challenge appraisal was positively related to knowledge sharing, while hindrance appraisal did not significantly affect it. These inconsistencies could be explained by the lack of differentiation between proactive and reactive knowledge sharing (Teng & Song, 2011). Although we derived the relationship between stress appraisal and knowledge sharing primarily from the proactive perspective, which involves the voluntary dissemination of information, knowledge sharing can also occur in response to explicit knowledge requests or needs. Future research should thus aim to disentangle these facets of knowledge sharing and investigate their distinct relationships with stress appraisal to provide a more nuanced understanding of how social workplace stressors influence employees' knowledge sharing (cf. Sung et al., 2024).

Second, we employed a measurement-of-mediation design (Pirlott & MacKinnon, 2016) for both studies. This allowed us to examine causal relationships between upward social comparison and challenge as well as hindrance appraisal, which gives our studies an advantage over existing correlation-based research (Brown et al., 2007). Yet, we used statistical techniques to examine the mediation effects on the three investigated knowledge exchange behaviours. Therefore, we cannot confidently draw conclusions about the causal evidence of the observed mediation relationships. However, manipulating challenge appraisal and hindrance appraisal would have complicated the creation of a realistic experimental context. Still, we encourage scholars to replicate our experiment with respect to the social comparison manipulation while adding a manipulation of challenge appraisal and hindrance appraisal to further probe the causality of the links between these mediators and outcomes. To this end, Pirlott and MacKinnon (2016) illustrate several studies that use manipulation-of-mediation designs and provide guidance for implementing such experiments.

Third, despite the advantages of our experimental approach concerning the causality of the observed relationship between our predictor and mediators, our social comparison manipulations involved a specific feedback scenario that does not reflect the full range of possible social comparisons employees may face in their day-to-day working lives. To probe the generalizability of our findings across different occupational social comparison scenarios, future research could, therefore, conduct field experiments that provide a more comprehensive representation of social comparison situations at work. To this end, future research could target professions in which social comparisons naturally occur overtly and social comparison information can be manipulated relatively easily (e.g., sales figures in sales occupations, performance metrics for professional athletes or student evaluations and examination results for teaching occupations). Going forward, such professions might also be compared with others in which relative measures of job performance and success are less straightforward.

Fourth, the age difference manipulation poses a limitation that should be considered in the interpretation of our results. We manipulated the age difference by setting the age of the comparison target to be 10 years older or younger than that of the participants in the respective experimental conditions. Although a minimal age gap of 10 years between colleagues is common in dyadic research on age diversity and knowledge exchange (Burmeister et al., 2020; Burmeister, van der Heijden, et al., 2018), a wide variety of age differences may naturally occur in employees' working realities. Therefore, we deem it valuable for future research to examine age differences between colleagues in social comparison processes as a continuous variable. This would allow researchers to determine whether the buffering effects of age difference as a moderator decrease, stagnate or increase as the age difference increases, or whether they follow a different trajectory.

Fifth, our studies relied on self-reported hypothetical behaviour towards the social comparison target as the outcome measure. Using behavioural intentions as proxies for actual behaviour is generally supported by theory (cf. theory of planned behaviour; Ajzen, 1985) and substantiated by meta-analytical findings specific to knowledge sharing behaviours (Afshar-Jalili & Ghaleh, 2021). Nevertheless, in line with repeated calls advocating the value of collecting behavioural data (Baumeister et al., 2007; Fischer et al., 2020; Gerpott & Lehmann-Willenbrock, 2022; Gerpott et al., 2020), future research should verify the transferability of our findings to employees' actual behaviour. In this context, we advocate considering the day-to-day within-person variance in knowledge exchange behaviour which is affected by employees' daily experiences (Li, She, & Gu, 2022) such as social comparisons (Arigo et al., 2019).

Moreover, our research leaves certain areas unexplored, which provides directions for future research. As such, our experimental scenarios do not offer insights into how the stress appraisal of upward social comparisons responds to the prospect of interaction with the comparison target. For instance, one's perceived relative inferiority could be perceived as less of a hindrance when facing the prospect of collaborating on a task in which the comparison target's knowledge could be a valuable resource (Hendricks et al., 2023; Zhu et al., 2024). As part of such endeavours, scholars may draw from research on the social workplace climate as cooperative (Buunk et al., 2005) or competitive (Shamsudin et al., 2023), which could change the perception and impact of social comparison information. Furthermore, given that we examined age difference as a social moderator, scholars could examine individual and contextual moderators. At the individual level, future research could consider employees' perceived learning direction (i.e., beliefs as to where knowledge is located within a hierarchical system one belongs to; Zhang, Wang, & Galinsky, 2022) as a relevant factor. The perceived learning direction could also impact the target of knowledge exchange behaviours. For instance, if employees consider lateral or downward social comparison targets as additional sources of knowledge, disengagement from an upward social comparison target could also be accompanied by more engagement with other colleagues.

CONCLUSION

Our work seeks to aid research and practice in handling the social side of the knowledge exchange process considering demographic workforce developments. Specifically, our findings from two experimental studies call attention to the adverse consequences of upward social comparison on knowledge exchange due to its appraisal as a hindrance stressor. Nevertheless, our research further advocates the consideration of age differences to bridge these interpersonal gaps opened by upward social comparison. Overall, our work thus contributes to a more holistic view of the social components of knowledge exchange and points to the benefits of age differences at work.

AUTHOR CONTRIBUTIONS

Anne Burmeister: Funding acquisition; conceptualization; writing – review and editing; supervision; methodology. **Fabiola H. Gerpott:** Funding acquisition; conceptualization; writing – review and

editing; supervision; methodology. **Laura Rinker:** Conceptualization; investigation; writing – original draft; writing – review and editing; visualization; methodology; formal analysis; project administration; data curation; software; validation. **Ulrike Fasbender:** Conceptualization; funding acquisition; writing – review and editing; supervision; methodology.

ACKNOWLEDGEMENTS

This research was funded by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) – 438083224. We would like to thank Olav Hoel Dørum (former test manager at Mensa Norway) for letting us use the matrices created by him as test material for Study 1.

CONFLICT OF INTEREST STATEMENT

We have no conflict of interest to disclose.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study will be openly available in the Open Science Framework at https://osf.io/cyf3b.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

Data S1.

How to cite this article: Rinker, L., Fasbender, U., Gerpott, F. H., & Burmeister, A. (2024). Conquering knowledge exchange barriers with age differences: A stress appraisal perspective on the consequences of upward social comparisons. *Journal of Occupational and Organizational Psychology*, *00*, 1–34. https://doi.org/10.1111/joop.12545