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Upward social comparison toward proactive and reactive knowledge sharing: The roles of envy and goal orientations

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ABSTRACT

By integrating the social comparison and emotion literature, this study theorizes that upward social comparisons indirectly predict employees' proactive and reactive knowledge sharing by eliciting benign and malicious envy, respectively. We further hypothesize that learning goal orientation (LGO) and performance goal orientation (PGO) moderate the indirect effects. Evidence from two studies, including data from 176 employee–supervisor dyads in various industries and an online scenario-based simulation, supported most of the hypotheses. For employees with a high LGO, upward social comparison had a significantly positive indirect effect on proactive knowledge sharing through benign envy. Conversely, for employees with a low PGO, upward social comparison exhibited a significantly negative indirect effect on reactive knowledge sharing via malicious envy. Our analysis revealed mostly positive implications of upward social comparison toward employees' emotional reactions and knowledge sharing, emphasizing the unique role of social comparisons of abilities and performance in the workplace.

1. Introduction

In today's competitive landscape, contemporary organizations increasingly rely on knowledge management to create and sustain a competitive advantage (Gagné et al., 2021; Li et al., 2022). Knowledge sharing, which is the transfer or exchange of task-related information, advice, and expertise, is vital for preserving and utilizing knowledge effectively (Wang and Noe, 2010). From the dominant view of knowledge sharing as a mixed-motive situation or social dilemma, individuals may choose to act selfishly and withhold knowledge, potentially harming the collective (Cabrera and Cabrera, 2002). This prevailing approach identifies the economic and social–relational predictors of knowledge sharing, mitigating concerns about losing personal advantages or being exploited by others (Wang and Noe, 2010). However, the existing focus on motivational aspects and reward contingencies may restrict a broad balanced view of knowledge sharing as a social behavior. By incorporating social comparison and social emotion theories, this study aims to extend the knowledge management literature by examining the roles of interpersonal emotions driven by social comparisons on various forms of knowledge sharing.

Social comparison, described as the "process that individuals relate their own characteristics to those of others," is a prominent social cognitive process (Buunk and Gibbons, 2000, p. 491). As elaborated by Festinger (1954) and subsequent studies, social comparison is a pervasive, ongoing process that affects nearly every aspect of human life, influencing emotions, perceptions, and behaviors (Strickhouser and Zell, 2015). In work teams where members with diverse capabilities work together and competent performance is specifically concerned and required, people often strive to outperform their peers and continuously compare their performance to others (Greenberg et al., 2007). When considering abilities and performance, individuals tend to choose high-performing people for self-improvement (*unidirectional drive upward*; Festinger, 1954). Thus, we isolate upward social comparison as a critical driver of social behavior in the workplace.

The social comparison literature emphasizes various emotional reactions, such as envy, sympathy, pride, and schadenfreude, as central and immediate outcomes of social comparison (Greenberg et al., 2007). Given the complexity of emotional responses to upward social comparison, which can portray a better-off target as either a role model or a threatening competitor (Li et al., 2023), theorizing and empirically exploring the mechanisms and boundary conditions underlying the resulting productive and counterproductive behaviors is crucial (Duffy

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et al., 2021). Although social emotions (e.g., liking, hatred, and anger) are potent drivers of social behavior (Tangney et al., 2007), surprisingly limited attention has been given to social emotions in relation to knowledge sharing. In this study, we identify upward social comparison as a critical driver of knowledge sharing and focus on interpersonal emotions to explore these effects.

As the most representative comparison-based emotion (Boecker et al., 2022), envy arises "when a person lacks another's superior quality, achievement, or possession and either desires it or wishes that the other lacked it" (Parrott and Smith, 1993, p. 906). When employees perceive an unfavorable comparison (i.e., upward comparison), they often experience feelings of "pain and inferiority," which are fundamental elements of envy (Hoogland et al., 2017; Tai et al., 2012). The term envy originates from the Latin word *invidere* (to look at another with malice), inherently implying envy's dark side. Consequently, traditional research has primarily viewed envy as a catalyst for negative social attitudes and behaviors (malicious envy; Smith and Kim, 2007). However, recent studies have proposed a dual model of envy, suggesting a potentially positive form of envy that motivates people to excel and elevate themselves (benign envy; Crusius and Lange, 2014; Hoogland et al., 2017). In response to upward social comparison, people attempt to reduce the gap by either diminishing the target's advantages (leveling down) or promoting their own advantages (leveling up), reflecting the duality of envy based on *malice* and *benignity*.

Given the distinct action tendencies and divergently valenced motivations (Duffy et al., 2021), the two forms of envy may lead to different types of knowledge sharing. Recent knowledge management theorists have suggested that, on the basis of the initial motive, some employees may proactively share their ideas and information, whereas others may only share knowledge reactively when faced with specific requests and external demands (Teng and Song, 2011). Recognizing these different motivational drivers has provided nuanced and contextualized explanations for various employee behaviors, such as helping (Parker and Collins, 2010) and creativity (Grant and Ashford, 2008). This dimensional approach, based on the proactive–reactive framework of employee behavior, complements existing studies that rely on a broad and general conceptualization of knowledge sharing (Griffin et al., 2007). Similarly, this study offers a detailed insight into knowledge sharing by examining proactive and reactive types associated with distinct social emotions, such as benign and malicious envy. As such, upward social comparison may predict both types of knowledge sharing by triggering two forms of envy.

An essential question that arises is when upward social comparison leads to benign versus malicious envy. On the basis of achievement goal theory (Dweck, 2000), we identify goal orientations as a critical boundary condition. This prominent motivation theory identifies two classes of goals (i.e., learning and performance) to explain why individuals engage in achievement behaviors. These goals reflect individuals' implicit theory of ability, which specifies one's abilities as either malleable (i.e., incremental theory) or fixed (i.e., entity theory; Noordzij et al., 2021). Dispositional goal orientations, which represent growth and fixed mindsets concerning one's ability, determine one's belief in the changeability of competence or attainability of improved performance (Vandewalle, 1997). Such belief is essential to perceive discrepancies between the target and oneself as bridgeable or controllable. Social comparison studies highlight that emotional reactions to upward social comparison largely depend on perceived control or attainability of the given performance or domain of abilities (cf. assimilative vs. contrastive; Boecker et al., 2022; Van De Ven et al., 2009). In this study, we propose that employees with a high learning goal orientation (LGO), who seek development and mastery, are likely to experience benign envy when faced with upward social comparison. Conversely, those with performance goal orientation (PGO), who emphasize the demonstration of their fixed competence, are more likely to experience malicious envy, leading to different types of knowledge sharing.

In sum, this study makes several significant contributions to the literature. First, we introduce the social comparison perspective to explain employee knowledge sharing, which has become increasingly important in knowledge-intensive work and organizations. Second, by complementing existing findings on situational and motivational predictors, this study identifies social emotions arising from upward social comparison as predictors of different types of knowledge sharing. Third, by applying achievement goal theory, we further theorize how different goal orientations produce unique emotional responses to upward social comparison, resulting in proactive and reactive knowledge sharing. Our theoretical propositions are empirically validated using field data collected from 176 employee–supervisor dyads across diverse industries and an online simulation with 308 participants.

2. Theoretical framework and hypotheses

2.1. Proactive versus reactive knowledge sharing

As the appreciation for employees' spontaneous extra-role contributions grows, the organizational literature has identified various positive behaviors, such as helping and creativity (Parker and Collins, 2010). In recent years, scholars have further distinguished the motivational drivers behind these extra contributions, uncovering different antecedents and outcomes associated with proactive and reactive helping (Qian et al., 2020), promotive and prohibitive voice (Huang et al., 2018), proactive and responsive creativity (Sung et al., 2015), and voluntary and solicited knowledge sharing (Teng and Song, 2011). This framework, based on proactive and reactive/responsive drivers, explains why individuals exhibit these behaviors. Recent developments indicate that the same observed behaviors, such as being helpful or creative, can be predicted by different antecedents and result in various outcomes, depending on the underlying motives. For example, proactive creativity is predicted by employees' psychological empowerment, whereas responsive creativity is predicted by cognitive overload that deprives autonomous motives (Sung et al., 2015). In addition, reactive helping, but not proactive helping, engenders ego depletion and moral disengagement, which lead to subsequent unethical behavior (Qian et al., 2020).

On the basis of the latest evidence highlighting the importance of the fundamental factors influencing employee behavior, we apply the proactive–reactive framework in the context of knowledge sharing (Teng and Song, 2011). *Proactive knowledge sharing* is characterized as an autonomous behavior wherein employees actively choose to share knowledge voluntarily. By contrast, *reactive knowledge sharing* is a more passive behavior, where employees only share knowledge when solicited. This study aims to clarify the mechanisms by which employees participate in these different forms of knowledge sharing. Fig. 1 summarizes our overall conceptual model.

2.2. Social comparison theory

People have a constant innate drive to compare themselves with others to satisfy their self-evaluation needs (Strickhouser and Zell, 2015), and tend to compare themselves with those who are similar, as they provide the most relevant information for assessing one's current status (*similarity hypothesis*, Festinger, 1954). Subsequent studies have expanded the scope to include other motives, such as self-enhancement and self-improvement, thereby shifting the focus to downward and upward comparisons (Buunk and Gibbons, 2000; Wills, 1981). Comparing oneself with those who are worse off (downward comparison) can alleviate anxiety and protect self-esteem, whereas comparing oneself with those who are better off (upward comparison) may induce negative emotions; but also offer information and inspiration for improvement (cf. rank-order paradigm; Thornton and Arrowood, 1966). Downward and upward social comparisons can have self-enhancing and self-effacing effects, with their advantages and disadvantages depending

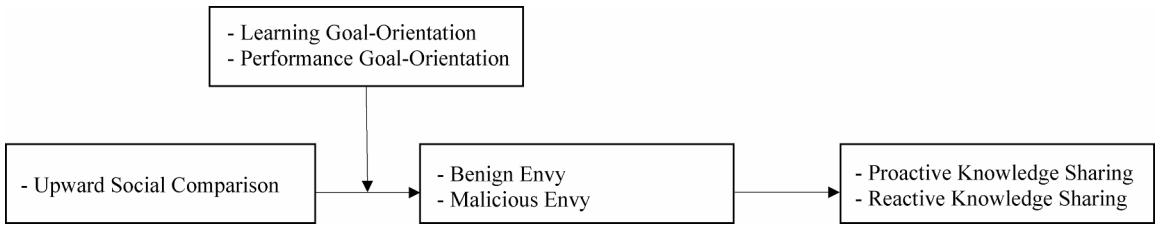

Fig. 1. Theoretical Framework Predicting Knowledge Sharing.

on various individual and situational contingencies (Buunk and Gibbons, 2000).

A *meta*-analysis indicates that people generally tend to engage in upward comparison: "a strong preference… for upward choices when there was no threat; there was no evidence for downward comparison… even when threatened" (Gerber et al., 2018, p. 177). Particularly for abilities, people compare themselves with those who are slightly better (Festinger, 1954). In organizations, employees naturally focus on superior performers and aim to enhance their position instead of pursuing comfort by comparing themselves with inferior colleagues. Such a tendency for upward social comparison may benefit organizations and employees by providing useful information for self-improvement and motivating employees to exert additional effort and achieve higher performance (Lockwood and Kunda, 1997). Greenberg et al. (2007) also highlighted the prevalence of upward social comparison in connection with justice and leadership in organizations and called for additional explorations of its organizational functions, because "fully understanding human behavior in the workplace requires appreciating social comparison processes" (p. 37). Unfortunately, direct investigations of social comparison in organizational settings remain limited.

In a recent study, Li et al. (2022) adopted social comparison theory to demonstrate that overqualified employees tend to engage in downward (viewing peers with less skills and knowledge as worthless) and upward comparisons (perceiving peers with undeserved job positions as lucky). These employees may feel contempt toward less-skilled peers and envy for the perceived luck of others in obtaining decent positions despite their inferiority, leading to knowledge hiding. The current study further extends the role of social comparison in different types of knowledge sharing by examining employees' emotional reactions to superior colleagues in the workplace.

2.3. Upward social comparison and benign versus malicious envy

Emotional reactions are recognized as the immediate psychological responses to social comparison. Buunk et al. (2005) proposed three dimensions that underlie these affective reactions: (a) the direction of comparison (upward or downward), (b) the focus of attention (self or others), and (c) the nature of reaction (contrast vs. identification or assimilation). In the case of upward social comparison, self-focused affective reactions may include anxiety or frustration (Jankowski and Takahashi, 2014). Envy, a prominent other-targeted emotional reaction, often follows upward social comparison (Smith et al., 1999). The model of envy indicates that pain and inferiority, the core elements of envy, can develop in multiple directions, with malice and benignity being the two major paths (Hoogland et al., 2017). The two forms of envy may also relate to the third dimension proposed by Buunk et al. (2005), that is, whether the target is viewed as a non-assimilable contrast or a potential role model for identification and learning (cf. selective accessibility model, Mussweiler, 2003).

Envy is an inherently unpleasant emotion resulting from upward social comparison and is characterized by negative interpersonal feelings, such as hostility and resentment toward the envied targets (Van De Ven et al., 2009). Thus, when following the malicious path, comparing oneself to those with greater ability or performance may lead to a negative and destructive emotional state of malicious envy, particularly when the gap seems insurmountable. However, envy is not always associated with malice. When following the benign path, envy can be an "impetus for advancement" that motivates efforts to adopt the characteristics of superior others (Cohen-Charash and Larson, 2017; Dineen et al., 2017; Lee and Duffy, 2019). In this case, upward social comparison can prompt benign envy, representing an adventurous and constructive emotion without hostility or malice toward the envied target, with whom the individual can psychologically identify (Kwon et al., 2017). Thus, we expect that upward social comparison can generate benign and malicious envy.

Hypothesis 1. Upward social comparison is positively related to benign envy.

Hypothesis 2. Upward social comparison is positively related to malicious envy.

2.4. Benign and malicious envy and two types of knowledge sharing

As a positive stimulator, upward social comparison may promote benign envy and proactive motivation in employees, inspiring them to close the gap between the envied targets and themselves (Crusius and Lange, 2014; Dineen et al., 2017). Benign envy is linked to the desire for success and the pursuit of setting and accomplishing goals similar to those of the envied targets (Lange et al., 2018). Accordingly, employees experiencing benign envy exert effort to alleviate their discomfort by observing those they envy and seeking their advice to learn new skills and improve performance (Lee and Duffy, 2019; Van De Ven et al., 2009). They attempt to raise themselves rather than undermine others through proactive self-improvement initiatives (Kwon et al., 2017; Tai et al., 2012).

Driven by the desire for self-improvement, employees experiencing benign envy are likely to exhibit autonomous motivation. Proactivity entails the aspiration and determination to change one's environment for a better future (Parker et al., 2010). Given that proactive behaviors are voluntary, the decision to engage in them is based on autonomous motivation. For example, proactive helping and proactive creativity have been linked to factors such as enjoyment, the intrinsic desire to help others, and psychological empowerment (Qian et al., 2020; Sung et al., 2015). Gagné et al. (2021) also reported that autonomous motivation mediates the positive effects of cognitive job demands and job autonomy on the frequency and usefulness of knowledge sharing. Benign envy may drive proactive knowledge sharing, which can satisfy employees' self-improvement needs by emulating the envied targets. Knowledge sharing involves searching, collecting, and refining task-related information, know-how, and expertise to make it accessible to colleagues. These processes of knowledge elaboration and transfer are essential actions that support the learning and development of the individual sharing the knowledge (Le and Lei, 2018). Thus, we propose the following:

Hypothesis 3. Benign envy is positively related to proactive knowledge sharing.

By contrast, employees experiencing malicious envy hold resentment and hostility toward the envied targets, which fuels their desire to escape unfavorable social situations by undermining or demeaning the

envied targets (Dunn and Schweitzer, 2004; Van De Ven et al., 2009). Their self-perception of inferiority can lead to frustration, potentially manifesting in passive and destructive behaviors within the workplace. When people experience malicious envy, they tend to fill the gap between the envied targets and themselves through destructive means, such as preventing others from making further achievements (Smith and Kim, 2007). Thus, they may spread negative rumors about the targets, dismiss their efforts, and become reluctant to share information (Cohen-Charash and Larson, 2017; Dunn and Schweitzer, 2004).

Given that malicious envy stems from destructive motives and resentment toward others, employees experiencing this emotion tend to exhibit reduced team cohesion, decreased cooperation, and hesitancy to help others (Duffy et al., 2021). Their primary goal is to reduce the gap by preventing others from advancing (Smith and Kim, 2007). Consequently, people may resort to covert tactics to sabotage high-performing colleagues while avoiding organizational sanctions (Connelly et al., 2011). Thus, they are unlikely to voluntarily share knowledge, as doing so will not only relinquish their asset but also potentially benefit the envied targets (Wang and NOE, 2010). However, to maintain a covert approach in undermining the envied targets' performance, they may still provide knowledge passively when it is solicited explicitly to avoid appearing ignorant or incompetent (Li et al., 2022). Therefore, employees experiencing malicious envy may reluctantly and passively offer knowledge only in response to direct requests. This line of reasoning leads to the following hypothesis.

Hypothesis 4. Malicious envy is positively related to reactive knowledge sharing.

The above propositions supporting the relationships between envy and knowledge sharing can be integrated with earlier hypotheses suggesting that employees may experience benign and malicious envy as a result of upward social comparisons. These theoretical considerations lead to the subsequent mediation hypotheses.

Hypothesis 5. Benign envy mediates the relationship between upward social comparison and proactive knowledge sharing.

Hypothesis 6. Malicious envy mediates the relationship between upward social comparison and reactive knowledge sharing.

2.5. Boundary condition: Goal orientations as a moderator

Upward social comparisons may promote proactive and reactive knowledge sharing because it elicits two distinct types of envy. However, a crucial question is why some exhibit proactive knowledge sharing via benign envy, whereas others exhibit reactive knowledge sharing via malicious envy (Duffy et al., 2021). This question can be addressed by adopting achievement goal theory because its constituting beliefs regarding abilities may influence individuals' assessments of their potential to improve their performance to the same level as the better-off comparison target (Dweck, 2000). How people feel about social comparison depends on their interpretation of the information obtained from the comparison results (Buunk et al., 2005). Major et al. (1991) identified esteem–relevance and perceived control as two key determinants of social comparison consequences. When individuals notice others' advantages in a self-relevant domain, controllability determines the valence of subsequent affective reactions and whether the resulting emotion takes a benign or malicious path (Hoogland et al., 2017). In this regard, employees' beliefs about the changeability of their competence and performance levels should dictate their emotional responses to upward social comparisons. We draw on achievement goal theory to identify goal orientations as the boundary condition that may activate distinct forms of envy.

Goal orientations encompass essential motivational forces leading to distinct psychological responses and behavioral choices, particularly in achievement situations (Noordzij et al., 2021). The literature identifies LGO and PGO as two separate motivational categories. LGO aims to develop competence by acquiring new skills and mastering new tasks, whereas PGO focuses on demonstrating and validating their fixed competence by seeking favorable judgments from others (Vandewalle, 1997). LGO and PGO may distinctly shape employees' beliefs on the changeability of their competence and performance. Therefore, we propose that employees with a high LGO and PGO are likely to experience different forms of envy, leading to divergent knowledge-sharing behaviors.

LGO as a positive moderator for benign envy. Individuals with a high LGO perceive abilities as a "malleable attribute" and believe that they can enhance their abilities by exerting effort to acquire new knowledge and skills (Che-Ha et al., 2014; Vandewalle, 1997). They view their efforts as instrumental for achieving personal mastery and performance improvements. Thus, employees with a high LGO have high perceived controllability, which helps them view the unfavorable results of upward social comparisons as challenges to overcome (Van De Ven et al., 2012). Therefore, in comparison with those with a low LGO, employees with a high LGO are more likely to conceive upward social comparisons as a learning and growth opportunity, leading them to experience benign forms of envy rather than malicious ones (Crusius and Lange, 2014).

Moreover, employees with a high LGO may experience an increased sense of perceived fit when surrounded by highly competent and high-performing colleagues who can satisfy their desire for mastery and improvement (cf. needs-supplies fit, Kristof-Brown et al., 2005). They appreciate working environments where they can learn from their co-workers. This perceived fit encourages employees with a high LGO to develop strong motivation for improvement (benign envy), fostering their learning and enabling them to keep up with the envied targets. In a way, the perceived fit of the work context supporting their LGO activates their inherent desire for growth, thereby generating self-enhancement motivation and proactive knowledge sharing (Dweck, 2000). Thus, we propose that high LGO activates the path toward benign envy, which promotes proactive knowledge sharing.

Hypothesis 7. LGO moderates the indirect effect of upward social comparison on proactive knowledge sharing through benign envy, such that the mediated relationship is stronger for individuals with higher LGO.

PGO as a positive moderator for malicious envy. From the perspective of performance goals, abilities are seen as fixed and unchangeable, representing an "uncontrollable attribute" (Vandewalle, 1997). Individuals with a high PGO prefer situations where they can outperform others and effectively avoid negative judgments, as well as further documentation of their inadequate abilities (Dweck, 2000). The reason is that individuals with a high PGO believe that they "have no control over the outcomes of the problems and they can do nothing to mend the situation" (Che-Ha et al., 2014, p. 2811); thus, they cannot significantly improve their competence through their efforts. With this sense of helplessness, employees with a high PGO tend to view upward comparisons as a negative situation that threatens their self-esteem, performance, and status, leading them to regard the envied targets as intimidators and develop malicious envy (Fisher et al., 2013). These employees may perceive knowledge sharing as a loss of personal assets, further hindering and damaging their advantages by helping others improve performance (Hislop, 2003).

Accordingly, employees with a high PGO may experience a low perceived fit in their work environment when they find themselves among superior, high-performing colleagues (Kristof-Brown et al., 2005). Faced with the threat that they cannot prove their competence, these employees may feel that the work context is unsuitable for fulfilling their PGO-based desires, resulting in deteriorated fit perceptions that hinder proactive task engagement (Kristof-Brown et al., 2005). Given these negative fit perceptions, they may avoid work and only share knowledge in a highly defensive and responsive manner to avoid others' negative impressions of themselves, such as incompetence or

inadequate contribution (Che-Ha et al., 2014; Chen and Lin, 2018). Thus, the intervening role of malicious envy between upward social comparisons and reactive knowledge sharing will be strengthened by PGO. Therefore, we propose the following moderated mediation hypothesis:

Hypothesis 8. PGO moderates the indirect effect of upward social comparison on reactive knowledge sharing through malicious envy, such that the mediated relationship is stronger for individuals with higher PGO.

3. Study 1: Field study

3.1. Sample and data collection

We contacted 230 managers enrolled in executive MBA programs at a large South Korean university to validate our theoretical propositions empirically. The managers were instructed to complete the leader survey and distribute the employee survey to a randomly selected follower. The participating managers and employees returned the completed questionnaires separately in post-stamped and self-addressed envelopes. Over a two-week period, we received completed questionnaires from 179 managers and 184 employees who had given informed consent to participate in the study (response rate = 78.7 %). We excluded questionnaires with incomplete responses and employee responses without corresponding manager surveys. After the screening process, we obtained a final sample of 176 matched pairs of employees and supervisors, resulting in 176 independent observations, in which each employee was rated by their own supervisor. The participants represented various industries, including finance (9.1 %), manufacturing (29.0 %), information technology and telecommunication (15.3 %), service (16.5 %), public (12.5 %), and others (17.6 %). Their roles encompassed general management (38.6 %), sales (16.5 %), R&D (20.5 %), production (5.7 %), and others (18.8 %).

In the final analysis sample, 56.8 % of the employee participants were male, with an average age of 35.3 years (SD = 11.27) and an average organizational tenure of 6.7 years (SD = 6.90). Employees' education levels included high school (6.8 %), two-year college degree (10.8 %), bachelor's degree (65.3 %), and graduate degree (17.0 %). The supervisor sample consisted of 79.0 % males, with an average age of 45.3 years (SD = 8.66) and an average organizational tenure of 13.56 years (SD = 9.55).

3.2. Measures

The participating employees provided information on the predictors and moderating variable, whereas their supervisors evaluated the two types of knowledge sharing. All constructs were measured using multi-item measures with a five-point Likert-type scale (1 = strongly disagree, 5 = strongly agree). The scales were initially prepared in English, translated into Korean by two bilingual researchers, and then back-translated into English by another pair of researchers to ensure the validity of the translated items (Brislin, 1981).

Upward social comparison (members). We assessed upward social comparison by adopting items developed by Jarvenpaa et al. (1998). The scale included the following items (α = 0.93): "Compared to me, other members in this team have (a) more of the knowledge needed to perform the tasks, (b) greater abilities to accomplish task goals, and (c) higher overall task abilities in doing tasks."

LGO and PGO (members). We measured LGO and PGO using the scale from Vandewalle (1997). LGO was assessed with these items (α = 0.75): (a) "I am willing to select a challenging work assignment that I can learn a lot from;" (b) "I prefer to work in situations that require a high level of ability and talent;" and (c) "I often read materials related to my work to improve my ability." PGO was assessed by the following items (α = 0.72): (a) "I would rather prove my ability on a task that I can do well than to try a new task;" (b) "I prefer to work on projects where I can prove my ability to others;" and (c) "I enjoy it when others at work are aware of how well I am doing."

Benign and malicious envy (members). We used items from Lange and Crusius (2015) to measure benign envy (α = 0.86): (a) "When I envy other members, I try to become equally successful in the future;" (b) "If I notice that other members are better than me, I try to improve myself;" and (c) "Envying other members motivates me to accomplish my goals." Malicious envy was assessed by the following items (α = 0.89): (a) "I wish that other members lose their advantage;" (b) "Envious feelings cause me to dislike other members;" and (c) "Seeing other members' achievements makes me resent them."

Proactive and reactive knowledge sharing (supervisors). The supervisors rated proactive knowledge sharing using Teng and Song's (2011) three-item scale (α = 0.91). The scale included the following items: "This member (a) shares important information with team members in a voluntary manner, (b) voluntarily gives useful information and knowledge to other team members, and (c) makes voluntary contributions in sharing his/her critical knowledge." The supervisors also rated reactive knowledge sharing using the following three-item scale (α = 0.90): "This member (a) shares information only when s/he receives a special request, (b) only fulfills requests for specific information, and (c) shares knowledge only when there is a specific request."

Control variables. We controlled for the effects of demographic variables, such as gender (0 = male, 1 = female), age (in years), tenure (in years), and education (1 = high school, 2 = two-year college, 3 = bachelor's degree, 4 = graduate degree), considering their potential influence on envy and knowledge sharing (Siemsen et al., 2008; Teng and Song, 2011).

3.3. Analytic strategy

To test the current hypotheses involving the main, mediated, and moderated mediation effects of upward social comparisons, we utilized a bootstrapping procedure with all the control variables as covariates (Hayes, 2013). The bootstrapped resampling technique was recognized as the best practice for examining indirect effects comprising a series of direct relationships (Mackinnon et al., 2007). In this procedure, we tested the product of direct effects by applying a bootstrapping procedure that computes the bias-corrected 95 % confidence intervals for indirect and conditional indirect effects based on 5,000 bootstrapped samples obtained using the PROCESS macro in SPSS (Hayes, 2013). If the 95 % confidence interval of a coefficient's upper and lower limits does not contain 0, then the effect is confirmed at a 0.05 significance level (Edwards and Lambert, 2007).

An alternative approach for validating the current hypotheses empirically is through a series of hierarchical regression analyses. In this approach, regression models were estimated with benign and malicious envy or proactive and reactive knowledge sharing as the dependent variables. This regression method allows for step-by-step testing of the given hypothesis by including control variables, main effect variables, and moderating effect terms into the equations. Although we employed the PROCESS macro to simultaneously test direct, indirect, and conditional indirect effects, we have provided regression tables as online supplemental materials for alternative hypothesis testing methods, which display the same results.

3.4. Results

The data were collected at the same time although we used different sources. Thus, a confirmatory factor analysis (CFA) of the 21 items comprising the measures of seven study variables was conducted using AMOS (version 24) to test their empirical distinctiveness. Table 1 shows that the seven-factor model had a good fit with the observed data (χ^2 (df = 168) = 238.03, p = 0.00, CFI = 0.97, RMSEA = 0.05) and presented a significantly better fit than alternative measurement models (all $\Delta\chi^2$

Table 1
Confirmatory factor analysis and model comparison (Study 1).

Model	χ^2	*df*	P	CFI	RMSEA	AIC
Seven-factor model	238.03	168	0.00	0.97	0.05	364.03
Six-factor model: *proactive and reactive knowledge sharing as a single construct*	480.38	174	0.00	0.85	0.10	594.38
Five-factor model: *upward social comparison, LGO, and PGO as a single construct*	816.55	179	0.00	0.69	0.14	920.55
Four-factor model: *benign and malicious envy, proactive and reactive knowledge sharing as a single construct*	1,039.56	183	0.00	0.58	0.16	1,135.56
Three-factor model: *upward social comparison, LGO and PGO as a single construct, benign and malicious envy as a single construct, and proactive and reactive knowledge sharing as a single construct*	1,315.67	186	0.00	0.45	0.19	1,405.67
Two-factor model: *upward social comparison, LGO and PGO as a single construct, and all others collapsed as a single construct*	1,752.19	188	0.00	0.23	0.22	1,838.19
Single-factor model: *all variables as a single construct*	1,847.63	189	0.00	0.19	0.22	1,931.63

Note. CFI = Comparative fit index; RMSEA = Root mean square error of approximation; AIC = Akaike''s information criterion.

tests, $p < 0.001$). All measurement items had significant loadings on their corresponding latent factor (all $p < 0.001$). Overall, these CFA results demonstrate the empirical distinctiveness of the study variables. Table 2 shows the descriptive statistics and correlations among the variables. To verify the main, mediated, and moderated effects simultaneously, we conducted a bootstrapping analysis with all the control variables as covariates. Table 3 summarizes the results.

Main effects. In Hypotheses 1 and 2, we hypothesized that upward social comparison is positively related to benign and malicious envy. As reported in Table 3, upward social comparison is significantly and positively related to benign envy (b = 0.20, 95 % CI [0.06, 0.33]), which confirms Hypothesis 1. However, the results revealed a negative (not positive) effect of upward social comparison on malicious envy (b = −0.21, 95 % CI of [−0.36, −0.05]), which rejects Hypothesis 2. This counter-intuitive pattern will be discussed later.

Hypotheses 3 and 4 posited that benign and malicious envy predict proactive and reactive knowledge sharing, respectively. Benign envy was a significant predictor of proactive knowledge sharing ($b = 0.20$, 95 % CI [0.03, 0.37]), supporting Hypothesis 3. Malicious envy exerted a significant positive effect on reactive knowledge sharing ($b = 0.18$, 95 % CI [0.04, 0.32]), confirming Hypothesis 4.

Mediation effects. Hypotheses 5 and 6 suggested that benign and malicious envy mediate the effect of upward comparison on proactive and reactive knowledge sharing, respectively. Upward social comparison had a significant positive indirect effect on proactive knowledge sharing through benign envy (b = 0.04, 95 % CI [0.01, 0.13], Table3), confirming Hypothesis 5. The indirect effect on reactive knowledge sharing through malicious envy was significant and negative (not positive) (b = − 0.04, 95 % CI [−0.09, −0.01], Table 3), rejecting Hypothesis 6.

Moderated mediation effects. In Hypotheses 7 and 8, we proposed that LGO and PGO moderate the indirect effects of upward social comparison on proactive and reactive knowledge sharing via benign and malicious envy, respectively. As recommended by Edwards and Lambert (2007), we initially tested whether LGO and PGO moderate the relationships between upward social comparison and two types of envy. All variables were mean-centered to reduce multicollinearity between the main effect variables and the interaction term (Katrichis, 1993). We entered the interaction terms after controlling for the corresponding main effects to test the hypothesized moderating effects.

As reported in the online supplemental materials (see Model 3 of Online Table 1), LGO exhibited a significant and positive interaction with upward social comparison in predicting benign envy ($\beta = 0.23$, $p < 0.01$). We conducted a simple slope analysis to explore the significant interaction further (Aiken and West, 1991). Plot A in Fig. 2 shows that upward social comparison is positively related to benign envy for employees with a high LGO (b = 0.87, $p < 0.001$) but not for those with a low LGO (b = 0.06, *ns.*). PGO had a significant and positive interaction with upward social comparison in predicting malicious envy ($\beta = 0.25$, $p < 0.05$; Model6 of Online Table 1). Plot B in Fig. 2 indicates that the effect of upward social comparison on malicious envy is significant and negative for employees with a low PGO (b = − 0.91, $p < 0.001$), but not for those with a high PGO (b = − 0.23, *ns.*).

We further verified whether the indirect effect of upward social comparison changes at different levels of LGO and PGO (Edwards and Lambert, 2007; Preacher et al., 2007). Table 4 summarizes the results of the bootstrapping analysis, including all the control variables as covariates. The conditional indirect effect of upward social comparison on proactive knowledge sharing through benign envy was stronger and significant for employees with a high LGO (b = 0.05, 95 % CI [0.01, 0.16]) but insignificant for those with a low LGO (b = 0.01, 95 % CI [−0.06, 0.04]), confirming Hypothesis 5. The results of the bootstrapping analysis further demonstrated that the indirect effect of

Table 2
Means, standard deviations, and correlations among study variables (Study 1).

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Gender	1.43	0.50	–										
2. Age	35.25	11.27	−0.16*	–									
3. Education	3.93	0.74	−0.04	0.08	–								
4. Organization tenure	6.70	6.90	−0.21**	0.52**	0.07	–							
5. Upward social comparison	3.35	0.82	0.09	−0.05	0.01	−0.23**	–						
6. LGO	3.71	0.69	−0.20**	0.09	0.07	−0.04	0.02	–					
7. PGO	3.74	0.63	−0.02	−0.05	0.04	−0.23*	−0.01	0.35**	–				
8. Benign envy	3.70	0.74	−0.02	0.00	−0.02	−0.13	0.24**	0.40**	0.30**	–			
9. Malicious envy	2.02	0.86	−0.06	0.26**	−0.06	0.10	−0.19*	0.02	0.14	−0.02	–		
10. Proactive knowledge sharing	3.67	0.81	−0.08	0.04	−0.01	0.12	−0.03	−0.00	0.01	0.16*	0.05	–	
11. Reactive knowledge sharing	3.77	0.77	−0.05	−0.03	0.01	−0.07	0.01	−0.03	0.02	−0.04	0.18*	0.27**	–

Note. $N = 176$.
* $p < 0.05$; ** $p < 0.01$.

Table 3
Direct and indirect effects of upward social comparison (Study 1).

Direct effects					Indirect effects			
			Bootstrapping bias-corrected 95 % CI			Point estimate	Bootstrapping bias-corrected 95 % CI	
	b	*SE*	*Lower limit*	*Upper limit*			*Lower limit*	*Upper limit*
Outcome: Proactive KS								
USC → Proactive KS	−0.04	0.08	−0.19	0.12	USC → Benign Envy → Proactive KS	**0.04**	**0.01**	**0.13**
USC → Benign Envy	**0.20****	**0.07**	**0.06**	**0.33**				
Benign Envy → Proactive KS	**0.20***	**0.09**	**0.03**	**0.37**				
Outcome: Reactive KS								
USC → Reactive KS	0.04	0.07	−0.11	0.18	USC → Malicious Envy → Reactive KS	**−0.04**	**−0.09**	**−0.01**
USC → Malicious Envy	**−0.21****	**0.08**	**−0.36**	**−0.05**				
Malicious Envy → Reactive KS	**0.18***	**0.07**	**0.04**	**0.32**				

Note. USC = upward social comparison; KS = knowledge sharing. Bold figures denote statistically significant effects.
$^{*}p < 0.05$; $^{**}p < 0.01$.

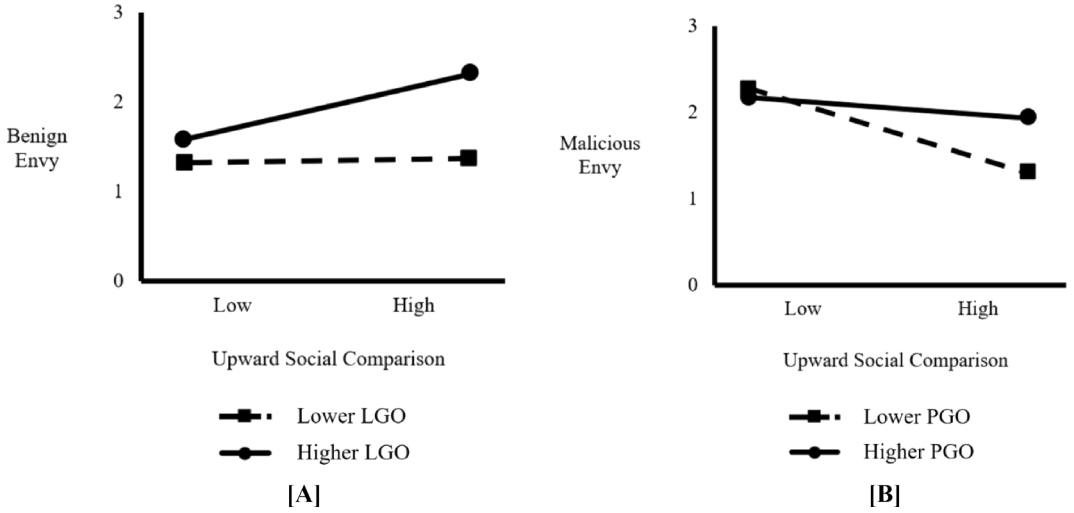

Fig. 2. Interaction between Upward Social Comparison and LGO in Predicting Benign and Malicious Envy.

Table 4
Bootstrapped conditional indirect effects for moderated mediation (Study 1).

Independent variable	Moderator	Mediator	Dependent variable	Moderator level	Conditional indirect effect	Bootstrapping bias-corrected 95 % CI	
						Lower limit	*Upper limit*
Upward social comparison	LGO	Benign envy	Proactive knowledge sharing	Lo (Mean − 1 SD)	0.01	−0.06	0.04
				Hi (Mean + 1SD)	**0.05**	**0.01**	**0.16**
	PGO	Malicious envy	Reactive knowledge sharing	Lo (Mean − 1 SD)	**−0.09**	**−0.17**	**−0.02**
				Hi (Mean + 1 SD)	−0.01	−0.05	0.03

Note. Bootstrap sample size = 5,000. Coefficients in bold indicate significant conditional indirect effect. CI = confidence interval.

upward social comparison on reactive knowledge sharing through malicious envy was negative and significant for employees with a low PGO (b = − 0.09, 95 % CI [−0.17, −0.02]) but insignificant for those with a high PGO (b = − 0.01, 95 % CI [−0.05, 0.03]), confirming Hypothesis 6.

Path analysis. Although we tested our hypotheses using PROCESSS macro with complementary regression equations reported as online supplemental materials, we further validated our framework using a path analytic procedure that included all the study variables in a single model. The results were consistent with those based on the bootstrapping method and regression equations, which indicated a full mediation by different forms of envy of the relationships between upward social comparison and the two dimensions of knowledge sharing.

We compared the model fit of our hypothesized full mediation model [χ^2 = 22.50 (df = 19), p = 0.26, CFI = 0.97, RMSEA = 0.08, AIC = 74.50] with that of the partial mediation model by adding two paths from upward social comparison to the two dimensions of knowledge sharing [χ^2 = 20.73 (df = 17), p = 0.24, CFI = 0.97, RMSEA = 0.08, AIC = 76.73]. Although the fit of the partial mediation model was acceptable, it failed to significantly improve the model fit ($\Delta\chi^2$ (Δdf = 2) = 1.77, $p > 0.40$), and none of the added direct effect paths was statistically significant, as depicted in Fig. 3. In sum, various analytic approaches, including bootstrapping procedure, regression equations, and path analysis, provided consistent analysis results, which supported the full mediation by the two forms of envy of the relationship between upward social comparison and knowledge sharing.

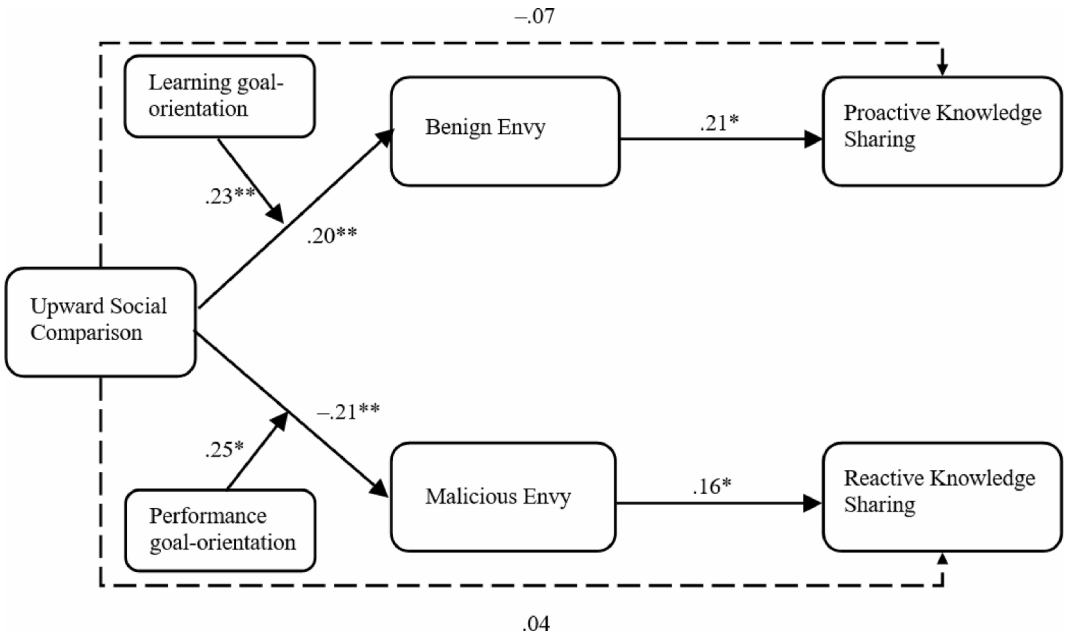

Fig. 3. Path Analysis Results of the Overall Theoretical Framework (Study 1). *Note.* Insignificant paths are depicted as dotted lines in the diagram. Control variables are not depicted in the diagram. The moderating effects in the diagram are based on regression analyses.

4. Study 2: Online scenario study

One main limitation of Study 1 was the cross-sectional design, which made it difficult to discern the causal ordering of upward comparison, envy, and knowledge sharing. Therefore, we conducted Study 2 to constructively replicate our findings in Study 1 using data from the US and to provide stronger evidence for the direction of causality. In Study 2, we used a scenario-based methodology that enhances experimental realism and allows experimenters to manipulate predictor variables.

4.1. Sample

We collected data from working adults in the US using Amazon Mechanical Turk, an online crowdsourcing platform service (Berinsky et al., 2012; Buhrmester et al., 2011). We initially recruited 319 participants, among which, 11 failed our screening criteria, such as incorrect completion code, overly short survey duration, and attention check (Oppenheimer et al., 2009; Paolacci et al., 2010). Accordingly, the final analysis sample comprised 308 individuals (96.6 % passing rate). The sample demographics are as follows: 33.1 % of the participants were female with an average age of 36.1 years (SD = 24.26) and an average organizational tenure of 7.8 years (SD = 6.05). The education levels of the participants were classified as high school (7.8 %), two-year college degree (3.2 %), bachelor's degree (60.1 %), and graduate degree (28.9 %).

4.2. Procedures

We developed two vignettes: (a) upward social comparison (experimental condition) and (b) similar social comparison (control condition). Before the vignettes were introduced, the participants reported their goal orientations using the same LGO and PGO scales used in Study 1. We asked the participants to imagine that they are in a hypothetical work team of five members in a large company, in which team members have worked closely to complete various task-related issues and projects. Then, the participants were randomly assigned to one of the two conditions (upward social comparison vs. similar social comparison) and provided with one of the following scenarios.

Experimental condition (upward social comparison): "Compared to you, other members have more task-related knowledge and greater abilities to accomplish task goals. Overall, they have higher overall task competence for performing tasks and exhibit higher performance than you."

Control condition (similar social comparison): "All members, including yourself, have similar levels of task-related knowledge and abilities to accomplish task goals. Overall, all other members have comparable levels of task competence for performing tasks and exhibit similar performance as you."

After reading one of these vignettes, the participants responded to the upward social comparison and two envy scales used in Study 1. Then, we asked them to imagine that they are in hypothetical project meetings with other team members and report their intention to share knowledge with other members by responding to the proactive and reactive knowledge-sharing scales employed in Study 1.

4.3. Measures

All the constructs were assessed using multi-item measures with a five-point Likert-type scale (1 = strongly disagree, 5 = strongly agree). The participants responded to the same scale items as used in Study 1 at different stages of the experiment: (a) at the beginning, LGO and PGO (α = 0.70 and 0.65, respectively); (b) right after reading the vignette, upward social comparison (α = 0.84) and benign and malicious envy (α = 0.68 and 0.85, respectively); and (c) at the end with the project coworking situation, proactive and reactive knowledge sharing (α = 0.73 and 0.80, respectively).

4.4. Results

We tested our hypotheses using the experimental data with the participants randomly assigned to the upward social comparison condition (N = 155) and those in the similar comparison condition (N = 153). The participants in the two groups responded significantly differently to the social comparison situations. Those in the upward social comparison condition reported a higher level of upward comparison (M = 4.10, SD = 0.70) than those in the similar comparison condition (M = 3.16, SD = 1.22). The mean difference was significant ($F(308) = 68.41$, $p < 0.001$), indicating a successful experimental

manipulation. The two groups also reported significantly different responses to the two envy scales and the two knowledge-sharing scales. Detailed descriptions of the two samples are presented in Table 5. Table 6 shows the descriptive statistics and correlations among the variables.

Main effects. Table 7 reports that upward social comparison was significantly and positively related to benign envy (b = 0.46, 95 % CI of 0.37 and 0.54), supporting Hypothesis 1. However, upward comparison was negatively related to malicious envy ($b = -0.17$, 95 % CI [−0.29, −0.04]), rejecting Hypothesis 2. Benign envy was a significant predictor of proactive knowledge sharing ($b = 0.55$, 95 % CI [0.46, 0.64]), and malicious envy exerted a significant positive effect on reactive knowledge sharing ($b = 0.50$, 95 % CI [0.42, 0.58]). These results supported Hypotheses 3 and 4.

Mediation effects. The indirect effect of upward social comparison on proactive knowledge sharing via benign envy ($b = 0.25$, 95 % CI [0.16, 0.36]) was statistically significant and positive, confirming Hypothesis 5. However, the indirect effect on reactive knowledge sharing via malicious envy (b = − 0.08, 95 % CI [−0.16, −0.01]) was significant but in the negative direction instead of being positive, thereby rejecting Hypothesis 6.

Moderated mediation effects. In terms of simple moderation effects, the interaction between upward social comparison and LGO was significant and positive in predicting benign envy ($\beta = 0.17$, $p < 0.01$; Model 3, Online Table 3). The interaction between upward comparison and PGO was also a significant predictor of malicious envy ($\beta = 0.15$, $p < 0.05$; Model 6, Online Table 3).

As displayed in Table 8, the conditional indirect effect of upward comparison on proactive knowledge sharing via benign envy was positive and significantly greater when LGO was high ($b = 0.28$, 95 % CI [0.17, 0.39]) but not when LGO was low ($b = 0.18$, 95 % CI [0.00, 0.32]), supporting Hypothesis 7. In addition, the conditional indirect effect of upward comparison on reactive knowledge sharing via malicious envy was significant and negative only when PGO was low ($b = -0.12$, 95 % CI [−0.22, −0.03]) but insignificant when PGO was high ($b = 0.00$, 95 % CI [−0.07, 0.08]), confirming Hypothesis 8. These empirical patterns from the scenario-based experimental study are consistent with those observed in Study 1 based on the field data.

5. Discussion

Knowledge is increasingly appreciated as a critical resource for performance in organizations, where employees often compare their competence and performance with their peers (Gagné et al., 2021; Li et al., 2022). On the basis of the knowledge management and social comparison literature, we investigated how upward social comparison affects different types of knowledge sharing. In line with our theoretical framework, the current analysis based on field data and an online simulation demonstrated that upward social comparison promotes proactive and reactive knowledge sharing through benign and malicious envy, respectively. Moreover, the intensity of the indirect effect of upward social comparison was influenced by individuals' levels of LGO and PGO. In the following sections, we highlight the critical findings, discuss their implications, and address study limitations and potential avenues for future research.

5.1. Affective implications of upward social comparison in workplaces

On the basis of the social comparison literature, we theoretically and empirically examined the possibility of the emergence of distinct types of knowledge sharing resulting from upward social comparisons, which trigger dual modes of employee envy. Emotional reactions are immediate experiences following social comparisons, which affect subsequent behaviors (Keltner and Kring, 1998). Envy is often considered a negative social emotion leading to destructive and harmful behaviors (Tai et al., 2012). However, some scholars have argued that envy can have positive and functional roles in employee attitudes, workplace behaviors, and performance by motivating advancement efforts (Cohen-Charash and Larson, 2017; Dineen et al., 2017). Studies also indicate that upward social comparisons can elicit positive and negative emotions depending on individual and situational factors (Buunk et al., 2005).

Our analysis showed that upward social comparison positively predicted benign envy, but unexpectedly had a significantly negative effect on malicious envy. The predominantly positive emotional reactions in our sample, characterized by high benign envy and low malicious envy, are surprising, given that a recent *meta*-analysis reported mostly negative reactions (e.g., anger, resentment, and jealousy) to upward social comparison, especially when comparing abilities (Gerber et al., 2018). One possible explanation is the unique nature of our sample, which consisted of employees working in interdependent teams, where their performance depended on others. Previous studies typically used lab experiments with students performing individual tasks and receiving feedback on their performance or abilities compared with others. In such isolated, individual-based performance situations, unfavorable comparison results may often hurt one's esteem, aligning with the predominantly negative reactions reported by Gerber et al. (2018).

By contrast, employees working toward a shared goal with coordinated efforts may view competent coworkers positively, as they can contribute to task achievement and enhance collective performance (cf. playing golf vs. playing basketball). Accordingly, competent and high-performing coworkers may represent a favorable performance situation. Conversely, a downward social comparison involving less competent, hindering coworkers can be detrimental for employees working as a team, even though the social comparison literature often categorizes such situations as favorable, self-promoting opportunities (Lange et al., 2018). The similar patterns observed in field and online simulation studies suggest that the implications of upward and downward social comparisons in workplaces and interdependent team situations may

Table 5
Sample descriptions (Study 2).

		Test group ($N = 155$)		Control group ($N = 153$)		Significance of difference
		Mean		Mean		F
Demographic information	Gender	1.29	($SD = 0.46$)	1.37	($SD = 0.49$)	2.35
	Age	35.25	($SD = 9.94$)	36.97	($SD = 32.97$)	0.39
	Education	3.08	($SD = 0.85$)	3.12	($SD = 0.73$)	0.27
	Organization tenure	7.97	($SD = 5.90$)	7.65	($SD = 6.21$)	0.21
Study variables	Upward social comparison	4.10	($SD = 0.70$)	3.16	($SD = 1.22$)	68.41***
	LGO	4.12	($SD = 0.64$)	4.15	($SD = 0.67$)	0.14
	PGO	3.60	($SD = 1.11$)	4.06	($SD = 0.62$)	20.79***
	Benign envy	4.24	($SD = 0.65$)	3.72	($SD = 1.13$)	24.16***
	Malicious envy	2.87	($SD = 1.29$)	3.39	($SD = 1.12$)	14.02***
	Proactive knowledge sharing	4.25	($SD = 0.57$)	3.59	($SD = 1.12$)	42.16***
	Reactive knowledge sharing	3.28	($SD = 1.20$)	4.02	($SD = 0.72$)	42.46***

Note. $N = 308$. *** $p < 0.001$.

Table 6
Means, standard deviations, and correlations among study variables (Study 2).

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Gender	1.33	0.47	–										
2. Age	36.11	24.26	−0.03	–									
3. Education	3.10	0.79	0.11	0.02	–								
4. Organization Tenure	7.81	6.05	−0.10	0.10	−0.14*	–							
5. Upward Social Comparison	3.63	1.10	0.03	0.00	0.05	−0.02	–						
6. LGO	4.13	0.66	−0.02	−0.08	−0.14*	−0.14*	0.16**	–					
7. PGO	3.83	0.93	−0.00	−0.02	0.08	−0.06	−0.18**	0.22**	–				
8. Benign Envy	3.98	0.96	0.06	−0.02	0.03	−0.08	0.53**	0.25**	−0.05	–			
9. Malicious Envy	3.13	1.23	0.01	0.02	0.04	0.04	−0.15*	−0.03	0.41**	−0.32**	–		
10. Proactive Knowledge Sharing	3.92	0.95	0.02	−0.04	−0.01	−0.09	0.57**	0.29**	−0.10	0.70**	−0.28**	–	
11. Reactive Knowledge Sharing	3.65	1.06	0.01	0.02	0.04	0.02	−0.17**	0.02	0.69**	−0.17**	0.60**	−0.25**	–

Note. $N = 308$. * $p < 0.05$; ** $p < 0.01$.

Table 7
Direct and indirect effects of upward social comparison (Study 2).

Direct effects					**Indirect effects**			
			Bootstrapping bias-corrected 95 % CI			**Point estimate**	**Bootstrapping bias-corrected 95 % CI**	
	b	***SE***	***Lower limit***	***Upper limit***			***Lower limit***	***Upper limit***
Outcome: Proactive KS								
USC → Proactive KS	**0.24*** **	**0.04**	**0.16**	**0.31**	USC → Benign Envy → Proactive KS	**0.25**	**0.16**	**0.36**
USC → Benign Envy	**0.46*** **	**0.04**	**0.37**	**0.54**				
Benign Envy → Proactive KS	**0.55*** **	**0.05**	**0.46**	**0.64**				
Outcome: Reactive KS								
USC → Reactive KS	−0.08	0.04	−0.17	0.01	USC → Malicious Envy → Reactive KS	**−0.08**	**−0.16**	**−0.01**
USC → Malicious Envy	**−0.17****	**0.06**	**−0.29**	**−0.04**				
Malicious Envy → Reactive KS	**0.50*** **	**0.04**	**0.42**	**0.58**				

Note. USC = upward social comparison; KS = knowledge sharing. Bold figures denote statistically significant effects.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Table 8
Bootstrapped conditional indirect effects for moderated mediation (Study 2).

Independent variable	**Moderator**	**Mediator**	**Dependent variable**	**Moderator level**	**Conditional indirect effect**	**Bootstrapping bias-corrected 95 % CI**	
						Lower limit	***Upper limit***
Upward social comparison	LGO	Benign envy	Proactive knowledge sharing	Lo (Mean − 1 SD)	0.18	0.00	0.32
				Hi (Mean + 1 SD)	**0.28**	**0.17**	**0.39**
	PGO	Malicious envy	Reactive knowledge sharing	Lo (Mean − 1 SD)	**−0.12**	**−0.22**	**−0.03**
				Hi (Mean + 1 SD)	0.00	−0.07	0.08

Note. Bootstrap sample size = 5,000. Coefficients in bold indicate significant conditional indirect effect. CI = confidence interval.

differ significantly (and possibly reversed) from those in individual task situations. Nonetheless, such speculation requires further validations given the limited research on social comparison in organizational or team settings.

5.2. Proactive and reactive knowledge sharing

The present theoretical and empirical analyses apply the proactive and reactive framework of employee behavior to the domain of knowledge sharing. Similar to recent developments in the literature concerning helping, creativity, and voice (Qian et al., 2020; Huang et al., 2018), the current findings demonstrate that proactive and reactive knowledge sharing have different predictive processes. The results provide a more nuanced understanding of knowledge sharing in organizations, which can be driven by varying levels of proactivity or motivational underpinnings. Consistent with our theoretical expectations, benign envy positively predicted proactive knowledge sharing, whereas malicious envy positively predicted reactive knowledge sharing. Thus, upward social comparison fosters proactive knowledge sharing by encouraging benign envy. However, the indirect effect of upward social comparison on reactive knowledge sharing was negative due to its unexpected negative effect on malicious envy.

The literature suggests that individuals encountering upward social comparison may adopt two primary remedial strategies to restore psychological balance (Crusius and Lange, 2014). First, people may reduce the gap by leveraging benign envy for self-development and improvement at work. This constructive strategy toward self-improvement emphasizes learning suitable strategies to perform tasks from envied targets and refining their know-how and task expertise (Seibert et al., 2001). Our analysis empirically demonstrated this path through the mediating role of benign envy, leading to proactive knowledge sharing. Second, an alternative response to upward social comparison is to catch up with envied targets by diminishing their advantages and pulling them down (Dunn and Schweitzer, 2004). This destructive strategy, based on social undermining, weakens the envied targets' ability to perform further by withdrawing support or obstructing their progress, often covertly (Duffy et al., 2012). Although our analysis indicated that malicious envy positively predicted reactive knowledge sharing, which is reluctant and lukewarm support for others' task performance, upward social comparison did not increase such passive behavior due to its negative effect

on malicious envy.

The current findings, which showed that upward social comparison had largely positive effects by increasing proactive and decreasing reactive knowledge sharing, can be better understood in light of a recent study. Li et al. (2022) showed that perceived overqualification representing downward social comparison, generates contempt toward the inferior target based on condescension and disapproval, leading to knowledge hiding with the incompetent target. At the same time, employees who perceive overqualification also feel envy toward incompetent peers who occupy the same position with the same benefits, which represents a sense of relative deprivation and unfairness that also results in knowledge hiding toward the target. In Li et al.'s (2022) study, envy is a purely negative reaction based on the frustration over job resources unfairly allocated to undeserving others. Thus, unlike upward comparison of abilities and performance that represent one's efforts and achievements and can be mostly positive, as shown in this study, upward comparison resulting from potentially unfair resource allocations can be unilaterally negative, confirming the *meta*-analytic findings (Gerber et al., 2018). The potential contrast between upward comparison involving inherent abilities versus extrinsically provided resources can be even more pronounced in workplaces with daily employee interactions.

5.3. Channeling by goal orientations under upward social comparison

Our analysis further exhibited that employee goal orientations are critical boundary conditions that channel the indirect effects of upward social comparison to the two types of knowledge sharing. Employees with a high LGO experience more benign envy from the upward social comparison (Fig. 2), whereas those with a low PGO experience less malicious envy (Fig. 2). In line with these simple moderation effects, the moderated mediation analysis revealed the formation of distinct paths from upward social comparison toward proactive and reactive knowledge sharing at different levels of LGO and PGO. The online simulation results were consistent with the field data results. These patterns highlighted the significance of individual values and the accompanying interpretations of social comparison information (Buunk et al., 2005; Major et al.,1991).

Goal orientations represent employees' motivation in task situations and channel their interpretation and attribution of unfavorable comparison information (Che-Ha et al., 2014). Employees with a high LGO acknowledge their relative disadvantage as a challenge or opportunity because they believe that their capabilities are not fixed and can be developed through their efforts and continuous learning (growth mindset; Dweck, 2000). Accordingly, perceived fit of the work environment may be high for employees with a high LGO surrounded by and working with high-performing coworkers, which increases their proactive motivation (Kristof-Brown et al., 2005). By contrast, employees with a high PGO and a fixed mindset who prefer to prove their competence may interpret the upward comparison situation as a threat to their current status and future performance, hindering their fit perception (Che-Ha et al., 2014).

Given these functions of goal orientations in channeling upward comparison information, future studies could further explore alternative individual dispositions that might perform similar functions. For example, social comparison information may be interpreted differently by individuals with varying levels of social comparison orientation, need for status and recognition, and narcissistic personality. Individuals with a high status based on their long tenure or hierarchical position that supply superiority and plentiful resources may respond more negatively when they experience unfavorable comparison with low-status members with short tenure or even their followers (Duffy et al., 2021).

In addition, the consequences of upward social comparison and resulting envy may take different paths depending on social, contextual factors. If the envied target is highly personable and liked by a focal person, upward social comparison may most likely lead to benign envy or happiness regarding the fortune and advantages held by the target (Boecker et al., 2022). Work contexts, such as zero-sum climate, interpersonal trust, and organizational justice, can change the implications of upward social comparison for employee motivation and performance (Duffy et al., 2021). In view of the social functional lens of envy, future studies should address these critical questions regarding "the conditions under which envy transmutes into destructive or constructive behaviors" and "What circumstances will promote an ultimately functional outcome for the envier?" (Duffy et al., 2021, p. 31).

5.4. Study limitations and directions for future studies

The current findings should be approached with caution due to several limitations. First, the causal relationships among the constructs may not be definitive because all the study variables were collected simultaneously. Although the current theoretical framework aligns with the social comparison literature, which is largely based on experimental studies, future research could replicate our propositions using longitudinal panel data or field experimental designs to establish causality.

Second, as upward social comparison was measured by comparing oneself to coworkers within the same team to predict knowledge sharing behavior toward them, the current measures represent aggregate social perceptions and interpersonal behaviors. Although this approach has been widely used and effectively explains a team member's interpersonal exchanges, further empirical validation may be valuable for assessing its applicability to dyadic one-on-one interactions (e.g., Li et al., 2022).

Third, our research was conducted at the individual level of analysis, which could be influenced by or extended to team or organizational levels. Various organizational- and team-level factors, such as perceived fairness, performance appraisal criteria, compensation systems, leader-member exchange, competitive group climate, and task structure (Duffy et al., 2021; Li et al., 2023) may emphasize comparisons with others. These situations may generate psychological and behavioral responses to address the discrepancy identified through social comparison (Greenberg et al., 2007). Future studies may benefit from modeling these contextual factors and exploring potential multilevel processes of person–situation dynamics.

Finally, Studies 1 and 2 showed that upward social comparison had a significant negative effect on malicious envy rather than the expected positive effect. People may be reluctant to admit or reveal socially undesirable feelings (e.g., hostility, contempt, and schadenfreude) toward their coworkers even when experiencing negative upward social comparisons. Although we used validated measurement items for malicious envy from prior studies (Lange and Crusius, 2015), their negative tones (e.g., wish others lose advantages, dislike others, and resent others) could make people feel uncomfortable and hesitant to answer honestly. Indeed, envy, especially its malicious form, is often considered a covert and self-demeaning emotion that should be repressed or hidden to convey positive and socially desirable images (Li et al., 2023).

Moreover, employees may avoid or suppress the recognition of negative upward comparisons during daily work activities, as evidenced by the insignificant direct effect on knowledge sharing (see Fig. 3, Table 2, and Online Table 2). Different from experimental conditions that make people aware of negative comparisons directly affecting their knowledge sharing intentions (see Table 6 and Online Table 4), the level and continuity of such awareness in shaping daily behavior remain unclear. The accessibility and frequency of negative comparisons in everyday work should be considered when investigating their positive and negative effects on various work outcomes. Future research may use indirect wordings, reverse-coded items, or coworker/supervisor ratings to avoid potential bias and repression associated with socially desirable and self-enhancing response patterns involving self-demeaning situations.

Despite these limitations, on the basis of the model of envy, we explored the possibility of distinct types of knowledge sharing arising

from upward social comparison that triggers dual modes of employee envy. In this initial application of social comparison theory to knowledge sharing, we observed mostly positive emotional and behavioral responses among employees facing upward social comparison, which is somewhat unexpected given the literature's predominant focus on lab experiments. Although we identified envy as a prototypical social emotion, future research may consider various emotions, such as pride, shame, contempt, sympathy, and schadenfreude in the context of upward or downward social comparison situations (Boecker et al., 2022). These endeavors should provide sophisticated and comprehensive understanding of the underlying social emotional mechanisms of social comparison and subsequent knowledge sharing behavior in work settings.

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CRediT authorship contribution statement

Sun Young Sung: Conceptualization, Data curation, Validation, Writing – original draft, Writing – review & editing. **Yi Xin Li:** Conceptualization, Methodology, Writing – original draft. **Jin Nam Choi:** Conceptualization, Data curation, Funding acquisition, Project administration, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jbusres.2023.114314.

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