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Referents or Role Models? The Self-Efficacy and Job Performance Effects of Perceiving Higher Performing Peers

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What are the effects of perceiving peers' higher performance? Social–cognitive theory emphasizes the positive influence that perceiving higher performers can have on observer task and job performance (because observational learning from role models enhances self-efficacy). Social comparison theory emphasizes the negative self-evaluations that accompany perceiving higher performers, which should under many circumstances reduce self-efficacy and subsequent task and job performance. To more fully understand the effects of perceiving higher performance, we argue the effects of perceived higher performers on observer task and job performance depend on individuals' disposition in how they cognitively process coworkers' performance. Drawing on goal orientation theory, we suggest individuals with higher levels of performance prove goal orientation (PPGO) primarily interpret perceived higher performers as comparative referents rather than as instructive role models, inhibiting social learning and reducing self-efficacy. Results from a 2 studies (a field study of 110 corporate employees as well as an experimental study with 107 undergraduate students) support these ideas: Individuals with higher levels of PPGO have decreased self-efficacy and performance when observing higher performing coworkers, and individuals with lower levels of PPGO have increased self-efficacy and performance when observing higher performing coworkers.

Keywords: goal orientation, self-efficacy, social–cognitive theory, social comparison theory

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Organizations desire high performing employees, but how are individuals affected by their own perceptions of higher performing coworkers? Research converges on the general view that one's own performance is affected by perceiving others to be higher performers (Call, Nyberg, & Thatcher, 2015; Kehoe & Tzabbar, 2015; Lockwood & Kunda, 1997), but there is little consensus on the direction and contingencies of these effects. Perceiving higher performers leads observers to make "upward comparisons" (Festinger, 1954; Tesser, 1988), which can spark detrimental responses like envy and threat (Campbell, Liao, Chuang, Zhou, & Dong, 2017; Kim & Glomb, 2014) as well as harmful behaviors that could negatively impact performance (Jensen, Patel, & Raver, 2014; Lam, Van der Vegt, Walter, & Huang, 2011). However, perceiving higher performers can benefit observers' learning, motivate pursuit of higher goals, and enhance self-image through affiliation (Bandura, 1977; Bandura & Locke, 2003; Cialdini et al., 1976; Stajkovic & Luthans, 1998). Based on these outcomes, should organizations encourage employees to interact with those they see as higher performers, or would such practices invite unfavorable comparisons that negatively affect motivation and performance?

Two theoretical perspectives explain these reactions. On the one hand, social comparison theory (Festinger, 1954) portrays higher performers as *referents* against whom observers evaluate their own levels of ability and performance. At work, social comparisons are difficult to avoid (Shah, 1998) because employees work closely with one another and often share similarities that stem from working in the same organization, industry, and geography. In essence, the social environment of workplaces lays the stage for

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workers to compare themselves against perceptions of higher performers. Comparisons in which individuals perceive themselves to have lower relative performance can negatively impact observers' self-concept (Wood, 1989), which could adversely impact future performance.[1] On the other hand, social–cognitive theory (Bandura, 1986) generally portrays higher performers as *role models* from whom observers learn effective performance strategies. In this view, higher performers should elevate observers' self-efficacy (i.e., confidence in one's own abilities in a job or task), leading to setting higher goals, pursuing goals with more vigor, and ultimately achieving higher performance (Bandura, 2012; Bandura & Locke, 2003; Stajkovic & Luthans, 1998).

Contrasting the predictions of social comparison and social–cognitive theories in this way raises an important theoretical and practical question: When do higher performers function as referents, and when do they function as role models in the workplace? That is, when are higher performers likely to have a negative impact on the performance of those who observe them, and when do they have a positive impact on the performance of their coworkers? We research this question to determine whether the answer depends on a key dispositional characteristic that influences how an observer interprets performance information in a social comparison environment. Conducting two studies (one field study and one experiment), we find that an observer's *performance prove goal orientation* (PPGO) determines whether observing higher performing coworkers harms or helps the observer's own self-efficacy and performance. PPGO describes individuals' desire to display competence and outperform others (Elliot & Church, 1997), which influences how individuals make sense of performance information from multiple simultaneous social comparisons (Levy, Kaplan, & Patrick, 2004). In the context of social comparisons to perceived higher performers, we argue that individuals with higher levels of PPGO view others primarily as evaluative referents (Button, Mathieu, & Zajac, 1996) against whom they compare their own standing. Because self-evaluative thinking can thwart learning (Bandura, 1997), we expect those with higher levels of PPGO to have decreased self-efficacy and performance when observing higher performing coworkers. In contrast, individuals with lower levels of PPGO are not inclined toward competitive self-evaluations against others' higher performance (Elliot, 2005). Without threat to self-evaluation, low-PPGO individuals are free to view others as instructive role models and attend to the performance strategies that enable their higher performance. Social–cognitive theory describes that this observational learning process should lead to increased self-efficacy and job performance (Bandura, 1997).

This integration of social comparison, social–cognitive, and goal orientation theories offers a new depiction of observers' responses to perceptions of peers' higher performance that contributes to several relevant literatures. First, our theory extends research on observer responses to higher performers, particularly those focusing on observers' feelings of envy and victimization of higher performers (e.g., Jensen et al., 2014; Kim & Glomb, 2014; Lam et al., 2011) as well as stars, who are higher performers but also have greater visibility, social capital, and perform disproportionately better than peers (e.g., Aguinis & O'Boyle, 2014; Call et al., 2015; Kehoe, Lepak, & Bentley, 2018). Researchers in these areas have highlighted the emotional reactions (e.g., envy; Campbell et al., 2017; Kim & Glomb, 2014) and cognitive mechanisms (e.g., appraisal of threat or benefit to resources; Campbell et al., 2017) that drive observers' attitudes and behaviors toward higher-performing peers. Yet more nascent is research exploring how perceptions of higher performance influence observers' own job performance. For example, Lee and Duffy (2019) identified envy as an emotional mechanism through which peers' own performance changes after perceiving a higher performer. Building on this emotional mechanism, we examine self-efficacy as a cognitive mechanism through which comparisons to higher performers should impact observers' own subsequent job performance. We contend that perceiving coworkers as higher performing employees (whether or not they meet the more substantial criteria requisite to qualify as a star; Call et al., 2015) can spark self-evaluative cognitions that can influence future performance.

A second contribution lies in extending social comparison and social–cognitive theories by jointly applying them to observers' responses to perceptions of higher performance. Our key research question highlights that observing higher performance could have either positive or negative effects on observers' future performance. In social–cognitive theory, role models enable learning, which is generally seen as beneficial (e.g., Myers, 2018). Under certain adverse circumstances, learning does not occur and there is no effect. Yet if learning is impeded as a result of social comparison processes, observing higher performance should be negative—and not simply neutral—for observers' future performance. Despite Bandura (1997) raising the issue, this potential negative effect on observer performance has gone underdeveloped in research employing social–cognitive theory. In contrast, social comparison theorists have articulated this duality and pointed to several situational contingencies that determine whether effects should be positive or negative (e.g., identification; Kim & Glomb, 2014; assimilation/contrast, Lam et al., 2011; similarity, Tesser, 1988). We move beyond these situational explanations by highlighting individuals' predisposition to differentially interpret perceptions of peers' higher performance (i.e., PPGO). Cognitively processing situational contingencies across multiple peers at work is complex, leading individuals to develop systematic heuristics, such as PPGO, that simplify interpretation of social environments (Mischel & Shoda, 1995).

Finally, our work extends literature on goal orientation by more deeply connecting social comparisons, learning, and PPGO. Research on PPGO in educational contexts has suggested that PPGO affects the frequency of social comparisons (Régner, Escribe, & Dupeyrat, 2007), but it remains an open question whether PPGO affects responses to social comparisons once they are made. Our research offers new theory describing how PPGO affects the development of self-efficacy. It also contributes to research emphasizing the role of PPGO in social situations (e.g., Dietz, van Knippenberg, Hirst, & Restubog, 2015; Dragoni, Tesluk, Russell, & Oh, 2009).

[1] Although social comparison theory has recognized that in certain specific circumstances this reduced self-concept can be functional in producing an internal drive toward higher performance (e.g., Buunk & Gibbons, 2007), the effect often observed in the literature is that perceiving others as better performers adversely affects one's self-concept (Dineen et al., 2017; Suls et al., 2002).

Theoretical Background

According to Bandura (1997, p. 90), observers interpret higher performers through a "complex set of interrelated [cognitive] subfunctions." Two subfunctions that are germane to our research are the instructive function that oversees social learning, and the self-evaluative function that oversees social comparison (Bandura, 1997). Self-efficacy is instilled and strengthened by "maximizing modeling's instructive function and minimizing its comparative evaluation function" (Bandura, 1997, p. 92). Thus, although social–cognitive theory recognizes multiple cognitive functions, researchers examining the theory have focused primarily on the conditions under which the instructive function dominates, as well as the outcomes of that instructive function. Social comparison theory (Festinger, 1954) recognizes similar cognitive processes (e.g., Tesser, 1988), referring to them sometimes as *motives* for self-improvement or self-evaluation (see Wood, 1989). In contrast to social–cognitive theory, research on social comparison typically focuses on the conditions under which the self-evaluative function dominates, as well as the outcomes of that self-evaluation. In Wood's (1989) view, social comparison theory "emphasized accurate self-evaluation as the purpose of social comparison" (p. 232) and lamented that "very little research has been aimed at discovering the ways in which social comparisons may be used for self-improvement" (p. 238). Both theories also agree that achievement contexts regularly confront individuals with perceptions of higher-performing others, and in doing so initialize the self-evaluative and instructive functions in the minds of observers. Bandura (1997) describes this as workers being "continually confronted with comparative appraisals whether they seek them or not" (p. 457). Social comparison theorists describe the phenomenon as upward social comparisons that "occur automatically" as part of everyday life (Wood, 1989, p. 233).

One important point is that both social comparison and social–cognitive theories base their propositions on perceptions of higher performers in the work environment rather than veridical performance. Veridical performance reflects peers' true underlying performance that can be verified as factual against some data, such as number of widgets produced, sales volume, or rating in the performance management system. In the veridical performance environment, the highest performer has no one with whom they can make an upward comparison. In contrast, the perceived performance environment assumes that individuals must cognitively make sense of their social environment, including (a) choosing which coworkers are salient for comparison (i.e., Kulik & Ambrose, 1992; Shah, 1998), (b) considering which dimensions of broader job performance are relevant to their own jobs, and (c) forming perceptions of salient coworkers' performance levels. This means that even the individual with the highest veridical performance may perceive other salient coworkers as higher performers in the perceived performance environment. These perceptions are prominent in both social–cognitive and social comparison theories because they are proximal to individuals' motivation and behavior. This is because observers must perceive higher performance for it to have an effect on self-evaluation and learning; a veridically higher performer in an individual's work environment can only initiate comparison and learning cognitions if the observer (a) views the coworker as salient and (b) perceives the coworker to be a higher performer.

Social Cognitive Theory

Social–cognitive theory suggests that peers influence observers' job performance (Bandura, 1977) through self-efficacy, which refers to "people's sense of personal efficacy to exercise some control over events that affect their lives" (Bandura, 1986, p. 391). Self-efficacy is not the presence of skills or competencies per se, but rather one's own perception of one's capabilities to organize skills into a course of action to achieve goals. Although Bandura (1997) identified a number of mechanisms that influence self-efficacy, observational learning is most germane to our hypotheses. Observational learning occurs when individuals, having observed a role model's behavior or performance strategies, process that behavior as personally relevant, and subsequently add it to their own behavioral response repertoire (Bandura, 1986; Myers, 2018). Observers' vicarious experiences allow them to evaluate courses of action and determine which performance strategies will be effective in a given domain (Bandura, 1997; Gist & Mitchell, 1992), enhancing self-efficacy and performance.

Social–cognitive theory recognizes that observational learning can be inhibited by certain characteristics of the environment, observer, or role model. Bandura (1986) refers to these inhibitory features of social learning as "attentional deficits" (p. 54), which prevent observers from noticing and integrating the information role models provide. Observational learning requires that observers pay attention to role models, mentally rehearse what they have observed, and then incorporate their new understanding of performance into their expectations about their future performance (Bandura, 1997). Provided that observers devote sufficient cognitive resources to the performance strategies and outcomes of role models, observers should learn and enjoy higher levels of self-efficacy (Bandura, 1997).

Social Comparison Theory

According to Festinger's (1954) social comparison theory, in situations where standards are ambiguous, people compare themselves with salient others to gauge their own standing or worth on some comparison dimension. Although some work activities provide objective performance feedback, the true performance value of most kinds of work contributions are ambiguous. Thus, at work, employees use social comparison information to construct a sense of what adequate performance looks like (Tesser, 1988). This comparative information can be valuable even when objective performance feedback is provided, as given performance levels take on richer meaning through social comparison. For example, selling 15 units is objective performance feedback for a salesperson, but selling 15 units shifts in meaning in a context where others sell 20 units compared with a context where others sell 10 units. Social comparisons are likely even more important in uncertain contexts that are common to the workplace where performance is defined along multiple criteria, includes subjective components, and may not be transparent or easily discernable among workgroup members.

The effects of upward social comparisons in the workplace are generally described as detrimental for the observer in organizational research (Buunk, Zurriaga, Gonzalez-Roma, & Subirats, 2003; Dineen, Duffy, Henle, & Lee, 2017; Duffy, Scott, Shaw, Tepper, & Aquino, 2012). Although scholars have noted that upward social comparisons can have positive outcomes for observ-

ers under specific circumstances (Lockwood & Kunda, 1997; Suls, Martin, & Wheeler, 2002), many organizational researchers posit that upward social comparisons generally highlight individuals' shortfalls relative to others (Hogg, 2000), which threatens self-esteem (Buunk & Gibbons, 2007; Lockwood, Jordan, & Kunda, 2002) and incites feelings of inferiority and envy (Cohen-Charash & Mueller, 2007; Dineen et al., 2017; Duffy et al., 2012). For these reasons, upward comparisons are often cast as negative for observers' self-concepts and well-being.

Applying the Theories to Higher Performers' Influence on Observer's Performance

Both social–cognitive theory and social comparison theory offer predictions about how perceiving higher performers influences observers. The theories are similar in positioning the self-concept as the mechanism through which peers shape observers' job performance. However, they often depict the self-concept differently; social comparison theory emphasizes self-esteem whereas social–cognitive theory focuses on self-efficacy. Self-efficacy and self-esteem differ in their breadth. Self-efficacy represents beliefs about one's ability to perform specific tasks, whereas self-esteem represents broad feelings of self-worth across domains (Harter, 1990). Researchers have positioned both constructs as aspects of the self-concept (Judge, Locke, & Durham, 1997), noting that as the focus of the self-esteem construct becomes narrower, it becomes more closely related to self-efficacy (Brockner, 1988; Gist & Mitchell, 1992).

Hypothesis Development

Both social–cognitive and social comparison theories recognize that the instructive cognitive function, which enables learning and should elevate self-efficacy, and the self-evaluative cognitive function, which focuses on observers' relative poor performance and should reduce self-efficacy, are at odds with one another (Bandura, 1997; Wood, 1989). This is because cognitive resources are limited, and those spent on the self-evaluation are unavailable for instruction. Accordingly, we suggest that the number of higher performers one observes relates positively to self-efficacy for individuals who view higher performers through an instructive lens, and negatively for individuals who view higher performers through a self-evaluative lens.

Core to this proposition is the notion that interpreting uncertain social environments requires the use of cognitive heuristics that simplify one's understanding of his or her social world. People differ in how they form and access these heuristics, leading to variation in how they process the informational cues available in social situations (Mischel, 1973; Mischel & Shoda, 1995). People derive different meaning of the same events and behaviors; two different observers could consider the same set of peers as either evaluative referents or instructive role models. These cognitive patterns of processing social information should qualify the impact of perceived higher performance on observers' self-efficacy.

Goal orientation (GO) is a major dispositional influence on how individuals view and process information in achievement-related environments such as the workplace (Lee, Sheldon, & Turban, 2003; Poortvliet & Darnon, 2010). Goal orientations are expressed in three dimensions: learning goal orientation (LGO), PPGO, and performance-avoid goal orientation (PAGO). LGO reflects individuals' desire to improve their knowledge and master skills (Dweck, 1986), PPGO describes individuals' desire to display their competence and outperform others (Elliot & Church, 1997), and PAGO represents individuals' desire to avoid appearing incompetent in achievement pursuits. In the current study, we focus on PPGO rather than LGO or PAGO as the key moderator of the outcomes of upward social comparisons. This is because high-LGO individuals are typically self-focused rather than others-focused; they have a general "tendency to evaluate performance relative to past episodes of performance" (Button et al., 1996, p. 40). High-LGO individuals define competence using an "absolute-intrapersonal" (Elliot, 2005, p. 62) standard, which reflects individuals' improvement over time at completing the requirements of the task. In contrast, high-PPGO individuals look to others (i.e., they have a general "tendency to evaluate performance by normative" standards; Button et al., 1996, p. 40), representing an "interpersonal" (Elliot, 2005, p. 62) standard. High-PPGO individuals rely heavily upon the normative standard, answering the question "how well am I performing?" by comparing their own performance to others' performance. Thus, although high-LGO individuals may be more motivated toward learning, they spend much of their cognitive energy focused on self-improvement rather than evaluating and observing referent others. Finally, we focus on PPGO instead of PAGO given that PAGO has been referred to as the "dysfunctional branch" of GO (Payne, Youngcourt, & Beaubien, 2007), and is posited to lead to a helpless motivational process rather than one of adaptation and achievement (Elliot & Church, 1997). For these reasons, high-PAGO individuals are not likely either to compare themselves or aspire to resemble higher performers, but instead observe coworkers in an effort to achieve the minimum level of performance necessary to avoid appearances of incompetence.

High-PPGO individuals, because they pay close attention to others and use social information for self-evaluation, are primed for self-evaluative cognitive process that forestall learning. Individuals with higher levels of PPGO tend to view others' performance as self-evaluative threats rather than instructive role models (Darnon, Dompnier, Delmas, Pulfrey, & Butera, 2009). They evaluate their own performance in terms of demonstrating competence and outperforming others (Elliot & Church, 1997), using normative rather than absolute standards. Owing to the tendency for high-PPGO individuals to interpret social situations as opportunities for self-evaluative comparison, PPGO should explain whether observers benefit from social learning. This proposition is depicted in Figure 1.

When high-PPGO individuals perceive that coworkers have higher performance, they are more likely to view the coworkers as

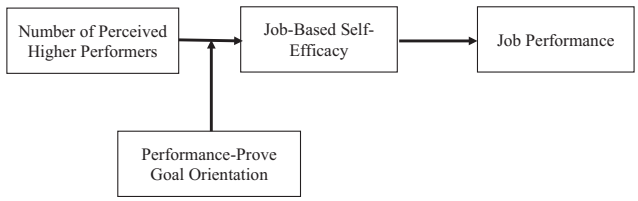

Figure 1. Hypothesized model of relationships.

evaluative referents than instructive role models (VandeWalle, Cron, & Slocum, 2001). These views activate social comparison cognitions that thwart learning. Because high-PPGO individuals weight self-evaluation over learning, the number of higher performers they perceive in the environment should negatively relate to their self-efficacy. Perceiving more higher performers present stronger threat, reinforcing negative social comparisons and pulling cognitive resources from learning. Owing to a focus on self-evaluation over learning, the number of perceived higher performers should negatively relate to job-based self-efficacy for high-PPGO individuals. In contrast, when low-PPGO individuals perceive that coworkers have higher performance, they are more likely to view coworkers as role models rather than evaluative referents. Low-PPGO individuals have a reduced motivational drive to engage in self-evaluative cognitions, and thus have more cognitive resources available to learn from role models (Bandura, 1965). Thus, for low-PPGO individuals we expect a positive relationship between the number of perceived higher performers and self-efficacy.

One important note is that social–cognitive and social comparison theories can be applied in the lower-bound case when individuals do not perceive any higher performers in their environment. Our theory posits that high-PPGO individuals at this lower bound experience higher levels of self-efficacy, and that self-efficacy decreases as the number of perceived upward comparisons rises. For the high-PPGO individual, zero perceived higher performers signifies that she has succeeded in displaying her competence and outperforming others. Because there are no adverse social comparisons, the high-PPGO individual should experience high levels of self-efficacy. In contrast, for the low-PPGO individual, zero perceived higher performers signifies that she has no instructive role models from which she can learn. Because there are no beneficial social comparisons, the low-PPGO individual should experience lower self-efficacy than he or she would in the presence of instructive role models to elevate his or her aspirations. Thus, we suggest that low-PPGO individuals at this lower bound experience lower levels of self-efficacy, and that self-efficacy increases as the number of perceived higher performers.

Hypothesis 1: PPGO moderates the relationship between the number of perceived higher performers and self-efficacy such that a negative relationship exists for high-PPGO individuals and a positive relationship exists for low-PPGO individuals.

Self-Efficacy and Performance

We expect self-efficacy positively relates to job performance. Individuals with higher levels of self-efficacy set more challenging goals and demonstrate more commitment toward achieving those goals (Wofford, Goodwin, & Premack, 1992). By setting their sights on more challenging (relative to easier) goals, individuals aspire to higher levels and are likely to perform at higher levels. Further, individuals with higher levels of self-efficacy are likely to persist to higher levels of job performance beyond individuals with lower self-efficacy (Bandura, 2012). This is particularly true when individuals encounter obstacles and negative feedback, as those with higher levels of self-efficacy remain steadfast in their original goal (Bandura, 1997; Locke & Latham, 2002). For these reasons, self-efficacy should positively relate to performance.

Although this prediction is consistent with social–cognitive theory (Bandura, 1986), recent research on the causal ordering of self-efficacy and performance is in a state of debate. Meta-analytic estimates demonstrate that individuals with higher levels of self-efficacy are generally higher performers (Stajkovic & Luthans, 1998). Yet other research shows that self-efficacy can be just as much—or even more—a reflection of past performance as it is a predictor of future performance (Heggestad & Kanfer, 2005; Sitzmann & Yeo, 2013). Other voices in the debate have argued that self-efficacy is antecedent to performance, but in a negative direction under certain circumstances (Vancouver, More, & Yoder, 2008). There appears to be agreement that self-efficacy can affect performance (Bandura, 2015; Vancouver & Purl, 2017) under certain circumstances. Sitzmann and Yeo's (2013) meta-analysis reports a positive relationship between self-efficacy and performance when the trajectory of performance is positive (i.e., learning is possible; see also Bandura, 2012). Because job and task performance in organizations is often a context in which performance can improve over time (Quiñones, Ford, & Teachout, 1995), we expect a positive relationship between self-efficacy and subsequent performance.

Hypothesis 2: Individual self-efficacy positively relates to performance.

Integrated Conditional Indirect Effects Model

Taken as a whole, Hypotheses 1 and 2 suggest a conditional indirect effects model where the effect of the number of perceived higher performers on performance is mediated by self-efficacy, and this indirect effect is moderated by PPGO. Hypothesis 1 is the first stage of our model, whereby the relationship between the number of perceived higher performers and self-efficacy is negative for individuals high in PPGO and is positive for individuals low in PPGO. Hypothesis 2 is the second stage of our model, where self-efficacy positively relates to performance. This first-stage conditional indirect effects model reflects the core propositions of our theory: for individuals with higher levels of PPGO, higher performers are perceived primarily through the self-evaluative cognitive function that weakens the self-efficacy gains from learning and strengthens the self-efficacy losses from comparison, resulting in lower self-efficacy and performance. For individuals with lower levels of PPGO, higher performers can be perceived as role models, initiating the instructive cognitive function and enhancing observers' self-efficacy. We thus formally hypothesize this conditional indirect effect.

Hypothesis 3: The indirect effect of the number of perceived higher performers on performance via self-efficacy is positive for low PPGO and negative for high PPGO.

Study 1

Method

Sample and procedure. Data were collected from employees in corporate functions of a food production company located in the United States (Approved by University of Iowa Institutional Review Board [Project Number 201410770, Title: "Social Work Context"]). Two hundred fifty-six individuals in supervisory, pro-

fessional, and clerical roles were eligible to participate. The sample was chosen because employees were colocated where they had ample opportunity to observe coworkers' job performance. Employees worked in well-defined yet interconnected jobs across multiple business functions. This was ideal in that employees' roles required them to work independently but also to interact with coworkers across the company. These interactions provided a basis for employees to observe others' performance.

Two surveys were administered online using Qualtrics survey software. The first survey asked respondents to identify the number of perceived higher performers in their social environment (described below). The second survey was administered one month after the first survey. On the second survey, respondents indicated their self-efficacy, goal orientation, and demographic information. Unless otherwise indicated, survey items were based on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*). Employees' supervisors were asked to rate job performance on a separate survey one week after the second survey was administered.

Of the 256 eligible participants, 139 employees responded to Survey 1 (response rate: 54.3%). About one month later, these 139 individuals received an e-mail inviting them to respond to the second survey, and 120 individuals completed Survey 2 (response rate: 86.3%). One case was removed based on an extreme value in which the respondent reported performance comparisons 6.4 standard deviations above the mean. For the remaining analyses, pairwise deletion was used to examine as much usable data as possible. As a robustness check, we conducted the analysis using listwise deletion; substantive conclusions did not vary. We obtained performance ratings for 110 respondents, for a final usable response rate of 43.0%.

Measures.

Dependent variable. *Job performance* was rated by direct supervisors using the 7-item performance scale from Williams and Anderson (1991). A sample item is "this person meets the formal performance requirements of his/her job." The scale exhibited high reliability ($\alpha = .94$). Eleven supervisors rated the 110 participants (on average 10 employees per supervisor, with a range of 7 to 19). Because supervisors rated more than one participant, we conducted ANOVA to determine whether respondent performance differed by supervisor; results suggested employee performance did not significantly vary between supervisors ($F = .58$, *ns*). Multilevel techniques accounting for the nesting of supervisory performance ratings were therefore not necessary.[2]

Independent variables. *Number of perceived higher performers* was measured using a two-step name generation procedure based on commonly used techniques in social network analysis (e.g., Shah, 1998). Each respondent first listed salient coworkers from within the company. They then indicated up to 20 individuals ($M = 8.18$; $SD = 6.37$) to whom they looked as they considered their own performance at work. The following text was used as a prompt:

> Sometimes, when we think about our own level of effort or level of performance at work, we compare ourselves to other people in the company to evaluate how well we are doing. These people might be coworkers we look up to or aspire to be like, coworkers at about our same level, or coworkers who are newer or more junior than ourselves. Please list below the people at work with whom you compare yourself when you evaluate your own level of effort and performance at work.

In the second step of the procedure, respondents reported their perceptions of the relative performance of each salient coworker. For each person listed, respondents were asked to rate the peer's performance relative to their own using the item, "For each name that you entered earlier, please indicate this person's performance relative to yours" (1 = *This person is generally a higher performer than me*, 3 = *We are generally similar in our performance*, and 5 = *I am generally a higher performer than this person*). We used the two network items to compute the number of higher performers for each respondent. Specifically, *number of perceived higher performers* was computed by summing the number of salient coworkers whom observers also perceived to be higher performers (i.e., rated 1 or 2 on the relative performance item). The mean number of higher performers was 2.71 with a standard deviation of 3.29.

Job-based self-efficacy was measured using Wilk and Moynihan's (2005) three-item job-based self-efficacy scale that was designed to measure individuals' self-efficacy, or beliefs in their own abilities, to meet ongoing job demands. A sample item is, "I am certain I can meet the performance standards of this job" ($\alpha = .92$).

Performance-prove goal orientation was assessed on the second survey with Vandewalle's (1997) four-item scale. A sample item is, "I'm concerned with showing that I can perform better than my peers" ($\alpha = .70$).

Control variables. Our measure of the number of perceived higher performers introduces a potential confound in that people who have more salient coworkers overall may have more perceived higher performers. We controlled for this by including the total number of salient coworkers (i.e., number of names listed in step one) throughout analyses.

An alternative explanation for how higher performers influence their coworkers is that they control resources disproportionately, making it difficult for focal individuals to access the things they need to effectively complete their work (Kehoe & Tzabbar, 2015). To account for this possible alternative, we measured *information* and *resource access* using two 3-item scales from Spreitzer (1996). A sample item for resource access ($\alpha = .89$) is "I have access to the resources I need to do my job well." A sample item for information access ($\alpha = .91$) is "I have access to the strategic information I need to do my job well."

Because scholars have debated whether self-efficacy studies should control for prior performance (Heggestad & Kanfer, 2005), we conducted analyses both ways. Specifically, we retrieved archival records from the company's performance appraisals that occurred approximately 10 months before the beginning of the study. The company used a 3-point scale that coded low performers as 2 (2%), middle performers as 3 (52%), and high performers as 4 (36%). This measure positively and significantly correlated with later performance, $r = .78$, $p < .01$; conclusions were unchanged with prior performance included or excluded as a covariate.

Finally, because social comparisons and self-efficacy may vary across tenure or gender, we controlled for the number of years that

[2] As a robustness check, we analyzed regressions using Mplus 7 to account for clustering of standard errors by supervisor. Substantive findings were identical; results are available by request of the first author.

participants had worked for the company and participant gender (1 = male, 2 = female) throughout our analyses. Based on recommendations from goal orientation research, we also controlled for learning goal orientation and performance-avoid goal orientation using Vandewalle's (1997) measures. The learning goal orientation scale has 5 items; a sample item is "I am willing to select a challenging work assignment that I can learn a lot from" ($\alpha = .87$). The performance-avoid goal orientation scale consists of 4 items; a sample item is "I prefer to avoid situations at work where I might perform poorly" ($\alpha = .89$).

Results

We first examined the proposed measurement model using confirmatory factor analysis, entering the two psychometric variables (PPGO and job-based self-efficacy). Results indicated marginal fit ($\chi^2 = 43.04$, $df = 13$, CFI = .93, RMSEA = .14, SRMR = .08). We observed one item on the PPGO scale that had a low factor loading (standardized estimate of .45). We thus analyzed a model without that item (i.e., PPGO measured by three items), and results indicated a stronger fit ($\chi^2 = 17.67$, $df = 8$, CFI = .98, RMSEA = .10, SRMR = .04). We therefore conducted the remaining analyses using both the three- and four-item measures of PPGO, and substantive conclusions did not vary between the two procedures. To facilitate comparability with prior PPGO research, we present results based on the published four-item PPGO measure.

Table 1 reports the descriptive statistics and correlations. Bivariate correlations showed that the number of perceived higher performers was not associated with either job-based self-efficacy ($r = -.01$; *ns*) or performance ($r = -.13$; *ns*), although job-based self-efficacy positively related to performance ($r = .41$; $p < .01$). Table 2 summarizes the regression results. Following guidance from Carlson and Wu (2012), we report models excluding control variables (Models 1 and 4). Models 2, 3, 5, and 6 include control variables as well as main and interactive effects of the number of higher performers and PPGO on job-based self-efficacy and job performance.

Hypothesis 1 proposed that PPGO moderates the effect of the number of perceived higher performers on self-efficacy such that a negative relationship would exist for high-PPGO individuals and a positive relationship would exist for low-PPGO individuals. The interaction term for PPGO and the number of perceived higher performers was significantly related to job-based self-efficacy (Table 2; $b = -.09$, $p < .05$). Figure 2 displays this interaction for a low number of perceived higher performers at 0 and a high number of perceived higher performers at 6 (representing 1 standard deviation above and below the mean). A test of simple slopes showed the number of perceived higher performers negatively related to job-based self-efficacy for individuals high in PPGO ($b = -.04$, $p < .05$) and positively related to job-based self-efficacy for low-PPGO individuals ($b = .07$, $p < .01$), which offered support for Hypothesis 1.

Hypothesis 2 suggested that self-efficacy would positively relate to performance. Job-based self-efficacy was positively and significantly related to individual performance (Table 2; $b = .81$, $p < .01$), which offered support for Hypothesis 2.

Hypothesis 3 posited a conditional indirect effect model whereby the interactive effects of the number of perceived higher performers and goal orientation would influence performance through its effect on job-based self-efficacy. We examined this model using procedures by Edwards and Lambert (2007) for testing a first stage only model (e.g., Tepper, Henle, Lambert, Giacalone, & Duffy, 2008). First, we standardized control variables. Then, we regressed self-efficacy on the control variables, the number of perceived higher performers, PPGO, and the interaction term, which represents the first stage of the model and test of Hypothesis 1. We then regressed job performance on control variables, the number of higher performers, and PPGO. After estimating the regression models, we used Edwards and Lambert's (2007) SPSS macro to bootstrap 1,000 samples to estimate bias-corrected 95% confidence intervals (CI). Table 3 displays the results of this analysis, presenting the first stage and indirect paths for the number of higher performers at high and low (± 1 *SD*) levels of PPGO. Because our theoretical model hypothesized a first-stage moderation model, we constrained the second-stage and direct effect paths to be invariant across levels of PPGO.

Results presented in Table 3 support the predicted first-stage moderation. The relationship between perceived number of higher

Table 1
Study 1 Descriptive Statistics and Correlations

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
1. Prior performance	3.38	0.52											
2. Organization tenure	11.32	11.38	.13										
3. Gender[a]	1.60	0.49	.27**	.12									
4. Information access	3.63	0.84	−.07	.00	−.04								
5. Resource access	3.94	0.63	−.05	−.06	−.20*	.50**							
6. LGO	3.98	0.60	−.19	−.32**	−.17	.28**	.40**						
7. PAGO	2.20	0.66	.04	−.10	.03	−.13	−.30**	−.36**					
8. PPGO	3.30	0.49	−.07	−.31**	−.09	−.01	−.07	.10	.39**				
9. Number of salient coworkers	8.18	6.37	−.01	.14	−.10	−.08	−.02	.07	−.16	.05			
10. Number of higher performers	2.71	3.29	−.15	.02	−.05	−.10	−.06	.09	−.12	.10	.62**		
11. Job-based self-efficacy	4.38	0.53	−.04	−.25**	−.18	.20*	.40**	.46**	−.25**	.19*	.03	−.01	
12. Job performance[b]	3.06	1.05	.78**	−.02	.12	.22*	.19*	−.05	−.05	.09	.01	−.13	.41**

Note. LGO = learning goal orientation; PAGO = performance avoid goal orientation; PPGO = performance prove goal orientation; No. = number. $N = 119$.
[a] 1 = male, 2 = female. [b] $N = 110$.
* $p < .05$ (two-tailed). ** $p < .01$ (two-tailed).

Table 2
Study 1 OLS Regressions of Individual Performance on Job-Based Self-Efficacy and the Number of Perceived Higher Performers

Variable	DV: Job-based self-efficacy						DV: Job performance[ab]					
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	b (*SE*)	β	*b* (*SE*)	β	*b* (*SE*)	β	*b* (*SE*)	β	*b* (*SE*)	β	*b* (*SE*)	β
Intercept	4.40* (.05)		2.82* (.64)		2.87* (.62)		−.83 (.85)		−2.81* (.89)		−5.19* (.85)	
Prior performance			.06 (.10)	.06	.09 (.09)	.09			1.61** (.13)	.81**	1.51** (.11)	.75**
Organization tenure			.00 (.01)	−.05	.00 (.01)	−.04			.00 (.01)	.01	.00 (.01)	.00
Gender[b]			−.05 (.10)	−.04	−.10 (.10)	−.10			−.17 (.15)	−.08	−.08 (.12)	−.04
Information access			−.04 (.06)	−.06	−.03 (.06)	−.06			.19* (.09)	.15*	.24** (.08)	.19**
Resource access			.20* (.10)	.23*	.19* (.09)	.22*			.15 (.09)	.09	.04 (.12)	.02
LGO			.25* (.10)	.30*	.23* (.09)	.27*			−.12 (.14)	−.07	−.32** (.12)	−.19**
PAGO			−.11 (.08)	−.15	−.09 (.08)	−.11			−.12 (.12)	−.08	−.04 (.10)	−.03
Number of salient coworkers			.01 (.01)	.07	.00 (.01)	.04			.01 (.01)	.06	.01 (.01)	.06
Number of higher performers	.01 (.02)	.07	−.02 (.02)	−.10	.00 (.01)	.00	−.05 (.03)	−.16	.00 (.01)	.00	−.01 (.02)	−.02
PPGO	.16 (.10)	.15	.26* (.10)	.25*	.21* (.10)	.20*	.06 (.19)	.03	.30* (.15)	.15*	.15 (.13)	.07
Number of Higher Perfs. × PPGO	−.11* (.04)	−.29			−.09* (.04)	−.22*	.08 (.08)	.10	−.09 (.05)	−.11	−.01 (.05)	−.02
Job-based self-efficacy							.89** (.19)	.43**			.81** (.13)	.38**
R^2	.11		.34*		.37*		.19*		.69*		.78**	

Note. Standard errors reported in parentheses. DV = dependent variable; LGO = learning goal orientation; OLS = ordinary least squares; PAGO = performance avoid goal orientation; PPGO = performance prove goal orientation; Perfs. = performers. N = 119.
[a] 1 = male, 2 = female. [b] N = 110.
* $p < .05$ (two-tailed). ** $p < .01$ (two-tailed).

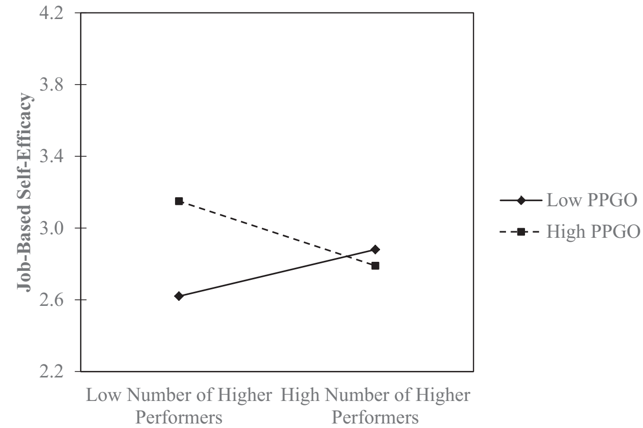

Figure 2. The interactive effect of the number of high performers and participant performance prove goal orientation (PPGO) on job-based self-efficacy (Study 1). High and low levels of PPGO operationalized at ± 1 *SD*. Low and high number of higher performers are approximately ± 1 *SD* (0 and 6 higher performers, respectively). The simple slope for high-PPGO individuals is negative and significant ($b = -.04$, $p < .05$); the simple slope for low-PPGO individuals is positive and significant ($b = .06$, $p < .05$).

performers and job-based self-efficacy was positive for low-PPGO individuals ($b = .07$, $p < .05$; 95% CI [.01, .10]) and negative for high-PPGO individuals ($b = -.04$, $p < .01$; 95% CI [−.06, −.01]). This difference was statistically significant ($b = .11$, $p < .05$; 95% CI [.03, .14]). The first-stage findings carried through to impact performance such that the indirect effect on job performance was negative for high-PPGO individuals ($b = -.04$, $p < .01$; 95% CI [−.06, −.01]), but positive for low-PPGO individuals ($b = .06$, $p < .01$; 95% CI [.01, .10]). This difference was statistically significant ($b = .10$, $p < .01$; 95% CI [.04, .16]). These results offered support for Hypothesis 3.

Supplementary Analysis and Robustness Checks

Research has pointed out the importance of ego-referent similarity in how upward comparisons affect individuals (Tesser, 1988). We argued above that evaluating similarity across multiple simultaneous comparisons is cognitively complex. Although existing research emphasizes ego-referent similarity as a key moderator of social comparison effects, our intent was instead to focus on understanding PPGO as an individual difference in information processing across perceptions of multiple higher performers. Consequently, we did not treat ego-referent similarity as a focal construct, but did account for similarity in several ways.

Most importantly, we collected data that allowed respondents to self-report their salient others at work. Given that similarity plays a critical role in how referent others are selected (Kulik & Ambrose, 1992; Shah, 1998), the salient others in our study have already been deemed similar (or at least relevant) by the focal individual. That is, the referents selected have already overcome the *similarity* hurdle at least to some degree because they were cognitively salient to respondents. However, we acknowledge that among these salient coworkers, more similar peers (e.g., same job or department) might be more meaningful (and thus have a stron-

Table 3
Study 1 Conditional Indirect Effects of the Number of Perceived Higher Performers on Job Performance Through Job-Based Self-Efficacy

Path	Low PPGO	High PPGO	Difference
First stage effect on self-efficacy			
Number of Higher Performers × PPGO → Job-based self-efficacy	.07* [.01, .10]	−.04* [−.06, −.01]	.11* [.03, .14]
Conditional indirect effect on performance			
Number of Higher Performers × PPGO → Job-based self-efficacy → Job Performance	.06* [.01, .10]	−.04* [−.06, −.01]	.10** [.04, .16]

Note. PPGO = performance prove goal orientation. High and low levels of PPGO operationalized at ± 1 *SD*. 95% bias-corrected confidence intervals are represented in brackets. All control variables from regression analyses are entered. $N = 110$.
* $p < .05$ (two-tailed). ** $p < .01$ (two-tailed).

ger effect) than less similar peers. To address this, we coded the number of perceived higher performers who were in the same job. Averaged across respondents, about 21% of all listed coworkers had the same job title as the focal respondent. We included this variable as a moderator, testing a three-way interaction between number of higher performers, same-job higher performers, and PPGO. There were no two- or three-way interactive effects on self-efficacy in this model. Third, one potential explanation for our effects is that observer-peer similarity operates not as a moderator but as a confounding variable. To probe this possibility, we included same-job peers as covariates; conclusions were unaffected (available in the online supplemental materials).

Discussion

Study 1 demonstrated a negative relationship between the perceived number of higher performers and self-efficacy for individuals high in PPGO, and a positive relationship for individuals low in PPGO. There are several strengths of this study. First, employees in the sample worked in a context where working adults had substantial in-person interaction with one another and could observe others' performance. Second, we employed a two-step design to measure the number of perceived higher performers. Specifically, focal individuals identified a salient subset of coworkers, which recognizes that not all coworkers in a social context are equally important for the self-evaluative and instructive cognitive functions. Respondents then evaluated the higher performance of only this salient subset, ensuring that the respondent was aware of and cared about others' higher performance. This measurement strategy corresponds with both social comparison and social–cognitive theories, which place the perceived performance environment as more proximal to individual outcomes than others' veridical performance. Third, variables were time-separated and obtained from different sources to reduce potential common method bias and strengthen the test of the causal claims of our theory.

These strengths notwithstanding, it remains plausible that high-PPGO individuals with high levels of self-efficacy simply perceive a smaller number of higher performers in their environment than do high-PPGO individuals with low levels of self-efficacy. This view accords with our theory that high- and low-PPGO individuals interpret their social environments differently, but it offers a potential reverse-causal explanation where the combination of self-efficacy and PPGO impacts employees' perceptions of the number of high performers. To examine this alternative and establish causal order for our model, we conducted an experimental study in which the number of perceived higher performers could be experimentally manipulated.

Study 2

Method

Sample and procedure. We recruited 128 individuals from a behavioral business laboratory participant pool at a large public U.S. university (Approved by University of Arkansas Institutional Review Board [Protocol Number 1903181360, Title: "High Performer Comparison Study"]). In exchange for participating, each received $12.00. Participants were primarily undergraduates (80%), but also included university staff (8.6%), graduate students (7%), alumni (2.3%), and university faculty (2.3%). After arriving, participants were led to a computer lab and seated at workstations, where we secured voluntary consent and explained that they would complete two product marketing tasks. The number of participants in each session ranged from a low of five to a high of 20 ($M = 12.47$; median = 13). Participants responded to the goal orientation scale and, then completed the first of two 10-min performance rounds. In the first round, participants were asked to design an advertisement to sell socks, using a single Microsoft PowerPoint slide. They were told that their advertisements would be rated by other study participants on five criteria: (a) eye-catching, (b) creative, (c) persuasive, (d), overall quality, and (e) likelihood of making a sale.

After the first round, they were prompted to describe the strategies they used in their design in an open text entry field. They were then presented with four advertisements that were feigned to be from other participants who were with them in the room, along with the strategies each of these peers used to complete their design. The peer advertisements and strategies were in reality developed by the research team (described below). Participants evaluated each advertisement (including their own), and then completed the self-efficacy scale. They were told that the second-round advertisement would be for a different product. That product (toothbrushes) was revealed to them after they completed the self-efficacy scale. Of the 128 participants, 21 failed an item designed to catch careless responding (i.e., "if you are reading carefully, please select *slightly disagree* for this item"; Meade & Craig, 2012) and were removed, resulting in an eligible sample size of 107.

Manipulation. After the first round of advertisement design, participants were randomly assigned to one of two conditions. In

the experimental condition, participants viewed one high-performing peer advertisement and corresponding strategies and three low-performing peer advertisements. In the control condition, participants viewed four low-performing peer advertisements. Participants were then asked to rate each design along the five criteria listed above (used later as a manipulation check). Prior to beginning the study, the peer advertisements were pilot tested with a similar sample to ensure designs reflected intended levels of high and low performance.

Measures.

Goal orientations. We again measured PPGO, LGO, and PAGO using Vandewalle's (1997) scales (α = .73, .83, and .82, respectively).

Task-based self-efficacy. Because job- and task-based self-efficacy differ in scope, we assessed self-efficacy using Tierney and Farmer's (2002) three-item scale, adapted to the task, to anchor self-efficacy ratings appropriately to the context. A sample item is, "I feel confident in my ability to design the next advertisement" (α = .84).

Task performance. Two research assistants, blind to study conditions and hypotheses, independently rated participants' advertisements using the same five criteria used by participants, coding both the sock (Time 1) and toothbrush (Time 2) advertisements. As raters achieved interrater agreement in both rounds (ICC[2]: T1 = .83, T2 = .98), we averaged their ratings.

Manipulation check. To ensure the manipulation operated as intended, we examined participant ratings of the high-performing peer advertisements across the same five criteria as the performance variable. Items were averaged to form a performance index for each "peer." An independent samples t test confirmed that participants in the experimental condition rated the focal high-performing peer as having a better advertisement (M = 4.19, SD = .72) than the average low-performing peer in the control condition (M = 2.62, SD = .67; t = 11.72, $p < .01$). This result suggests our manipulation was successful in inducing higher perceived performance. As additional robustness checks, we examined participants' self-ratings of their own advertisements against their ratings of the higher performing peer. The majority of participants in the experimental condition (46 of 54) rated the manipulated peer advertisement better than they rated their own, as we intended. Further, the majority of participants in the control condition (48 of 53) rated the manipulated peer advertisement as worse than they rated their own. We conducted a first robustness check removing the eight participants in the experimental condition who rated their own advertisement as better than the higher performer. We then conducted a second robustness check removing 13 participants (total across both conditions) who failed the manipulation check. Because results in either check did not differ in terms of substantive conclusions, results reported below include the full sample (n = 107).

Results

We again conducted a CFA of PPGO and self-efficacy to evaluate our measurement model. Results indicated a strong fit (χ^2 = 14.91, df = 13, CFI = .99, RMSEA = .04, SRMR = .05). Tables 4, 5, and 6 present experimental results in parallel to Study 1. The experimental condition did not significantly increase or decrease task-based self-efficacy (M_c = 3.31, M_e = 3.20; *ns*), but did significantly increase task performance (M_c = 2.69, M_e = 2.87; t = 2.74; $p < .01$). Task-based self-efficacy positively related to performance (r = .25 $p < .01$).

Table 5 shows the interaction of PPGO with the experimental condition was significantly related to task-based self-efficacy (Model 3; $b = -.46$, $p < .05$). Figure 3 plots this interaction including mean differences. Working with a high-performing peer (vs. no high-performing peer) significantly decreased task-based self-efficacy for participants high in PPGO ($t = -2.10$; $p < .05$) but had no significant effect on task-based self-efficacy for participants low in PPGO (t = 1.31; *ns*). These findings offered partial support for Hypothesis 1.

Hypothesis 2 suggested that task-based self-efficacy would positively relate to performance. As Table 5 shows, task-based self-efficacy was positively and significantly related to individual performance (Table 5, Model 6; b = .15, $p < .01$), which supported Hypothesis 2.

Examination of Hypothesis 3 followed the same procedures as Study 1 after dummy-coding conditions (0 = control; 1 = experimental). The first stage effect (high performers on self-efficacy) was negative and significant for high-PPGO individuals ($b = -.51$, $p < .05$; 95% CI [−.95, −.02]), as was the indirect effect on task performance through task-based self-efficacy ($b = -.07$, $p < .05$; 95% CI [−.19, −.02]). For low-PPGO individuals, the first stage effect was positive, but not significant (b = .28, *ns*; 95% CI [−.25, .85]), although the indirect effect for low-PPGO individuals was positive and approached

Table 4
Study 2 Descriptive Statistics and Correlations

Variable	M	SD	1	2	3	4	5	6
1. Time 1 task performance	3.07	0.62						
2. PAGO	2.78	0.89	.04					
3. LGO	4.06	0.63	−.08	−.12				
4. PPGO	3.65	0.83	.06	.46**	.17			
5. Higher performer condition[a]	0.50	0.50	.03	−.14	.11	.05		
6. Self-efficacy	3.25	0.98	−.06	.20*	.11	.27**	−.06	
7. Time 2 task performance	2.78	0.45	.18	−.05	−.15	.00	.20*	.25**

Note. LGO = learning goal orientation; PAGO = performance avoid goal orientation; PPGO = performance prove goal orientation. N = 107.
[a] 1 = higher performer present, 0 = no higher performer present.
* $p < .05$ (two-tailed). ** $p < .01$ (two-tailed).

Table 5
Study 2 OLS Regressions of Study Condition on Task-Based Self-Efficacy and Subsequent Task Performance

	DV: Task-based self-efficacy						DV: T2 task performance					
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Variable	*b* (*SE*)	β	*b* (*SE*)	β	*b* (*SE*)	β	*b* (*SE*)	β	*b* (*SE*)	β	*b* (*SE*)	β
Intercept	3.33* (.13)		2.79* (.94)		2.78* (.93)		2.25* (.16)		2.96* (.43)		2.55* (.43)	
T1 perf.			−.11 (.15)	−.07	−.07 (.15)	−.04			.12 (.07)	.16	.13 (.07)	.18
PAGO			.12 (.12)	.11	.11 (.10)	.10			−.04 (.06)	−.08	−.06 (.05)	−.11
LGO			.13 (.15)	.08	.11 (.15)	.07			−.13 (.07)	−.18	−.15* (.07)	−.21*
Number of higher perfs[a]	−.14 (.18)	−.07	−.12 (.19)	−.06	−.12 (19)	−.06	.20* (.08)	.22*	.18* (.09)	.20*	.20* (.08)	.22*
PPGO	.54** (.15)	.45**	.25 (.13)	.21	.46** (.17)	.39**	−.06 (.07)	−.11	.06 (.08)	.11	−.01 (.08)	−.02
Number of Higher Perfs. × PPGO	−.49* (.22)	−.27*			−.46* (.23)	−.26*	.03 (.10)	.04	−.07 (.11)	−.09	.00 (.10)	.00
Task-based self-efficacy							.13* (.05)	.29*			.15** (.04)	.32**
R^2	.12*		.09		.13*		.12*		.10		.19*	

Note. Standard errors reported in parentheses. DV = dependent variable; LGO = learning goal orientation; OLS = ordinary least squares; PAGO = performance avoid goal orientation; PPGO = performance prove goal orientation; Perf. = performance; Perfs. = performers. $N = 107$.
[a] 1 or 0.
* $p < .05$ (two-tailed). ** $p < .01$ (two-tailed).

significance ($b = .04$, *ns*; 90% CI [.00, .14]). Both the first stage ($b = .78$, $p < .05$; 95% CI [.02, 1.50]) and the indirect effect ($b = .12$, $p < .05$; 95% CI [.03, .30]) were significantly different across low and high levels of PPGO. These results offered partial support for Hypothesis 3.

Supplementary Analysis Related to Learning

Although we did not hypothesize the mechanisms through which higher performers influence self-efficacy, our theory—drawing from Bandura (1997) and Wood (1989)—implies that high-performing peers initiate two cognitive functions: instruction and self-evaluation. We could not perceptually measure these mechanisms in Study 2 without creating a demand effect (Orne, 1962) in which participants would be prompted for learning before evaluating their self-efficacy. Such a procedure would have threatened the internal validity of our study by potentially sensitizing participants toward our hypotheses. We did, however, include a passive measurement of the amount of time participants spent viewing peer strategies. Time spent on an activity has frequently been used by researchers as an indicator of the amount of personal resources (i.e., effort, attention) expended toward some task (Mitchell & Nebeker, 1973; Northcraft, Schmidt, & Ashford, 2011; Weiss & Sherman, 1973). In our particular application, spending more time reviewing peer strategies provides a reasonable indicator of participants' attention and effort devoted to learning and integrating peer strategies into their own repertoire (Myers, 2018).

Results of this analysis, presented in Table 7, demonstrate an interaction of PPGO on the relationship between the high performer condition and the amount of time participants reviewed peer strategies ($b = -7.46$, $p < .01$). The nature of this interaction is portrayed in Figure 4, which shows that for low-PPGO individuals, the presence of a high performer increased the amount of time participants spent reviewing peer strategies ($b = 7.33$, $p < .05$). In contrast, high-PPGO participants spent less time reviewing peer strategies in the high performer condition, although this negative simple slope was not significant ($b = -5.05$, *ns*). The fact that high-PPGO individuals did not spend more time reviewing higher performers work products and strategies is consistent with our theory that they devote fewer cognitive resources to observational learning and therefore miss out on the self-efficacy gains that accompany learning from role models.

Discussion

The primary purpose of Study 2 was to offer a stronger test of the causal ordering of our hypothesized model. Because participants were randomly assigned to conditions, there is less concern (relative to Study 1) that the number of perceived higher performers were chosen on the basis of participants' self-efficacy and PPGO. Study 2 also explicitly tests the hypotheses with a focus on

Table 6
Study 2 Conditional Indirect Effects of Number of Higher Performers Manipulation on Task Performance Through Task Self-Efficacy

Path	Low PPGO	High PPGO	Difference
First stage effect on self-efficacy			
Number of Higher Performers × PPGO → Task-based self-efficacy	.28 [−.25, .85][a]	−.51* [−95, −.02][a]	.78* [.02, 1.50][b]
Conditional indirect effect on performance			
Number of Higher Performers × PPGO → Task-based self-efficacy → Task performance	.04 [−.02, .15][b]	−.07** [−.19, −.02][b]	.12* [.03, .30][b]

Note. Coefficients are unstandardized. PPGO = performance prove goal orientation. High and low levels of PPGO operationalized at ± 1 *SD*. $N = 107$.
[a] First stage effects significance tests are based on simple slope standard errors. [b] Indirect and difference effects tested using 95% bias-corrected confidence intervals from Edwards & Lambert bootstrap. All control variables from regression analyses are entered into both equations.
* $p < .05$ (two-tailed). ** $p < .01$ (two-tailed).

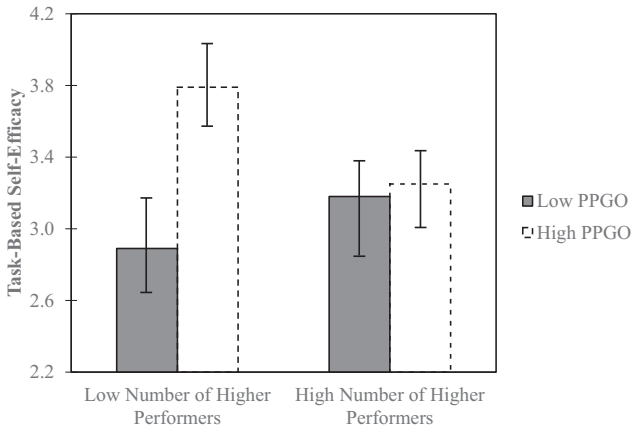

Figure 3. The interactive effect of the number of high performers and participant performance prove goal orientation (PPGO) on task-based self-efficacy (Study 2). High and low levels of PPGO operationalized at ±1 *SD*. For participants high in PPGO, task-based self-efficacy was significantly lower when they worked in a group with a higher performer compared with those who did not work with a higher performer.

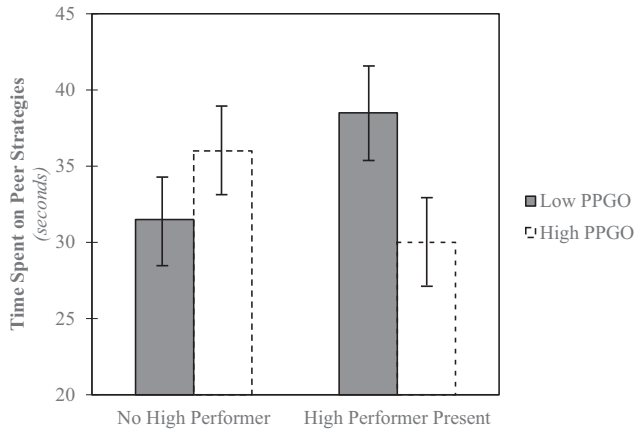

Figure 4. Supplementary analysis of first stage moderation of the number of higher performers on time spent reviewing peer strategies (Study 2). PPGO = performance-prove goal orientation. High and low levels of PPGO operationalized at ± 1 *SD*.

a specific task, complementing the field sample in Study 1 where our hypotheses were assessed at the broader level of the job as a set of tasks that may differ across employees. One additional benefit to this approach is that it enabled us to test our hypotheses in the context of a knowledge work task, where role modeling occurs as performance strategies are explicitly articulated rather than directly observed. As social–cognitive theory points out, observational learning is not merely a function of "behavioral mimicry" (Bandura, 1997, p. 93), but instead can occur as observers' witness the product of higher performance and hear (or in our study, read) the verbalized strategies that led to this higher performance. This is consistent with Bandura's premise that "models do not behave like mute automations" (p. 88). In this way, one advantage of Study 2 was that it utilized a task that enabled us to explicitly test this verbalized form of observational learning beyond rote emulation of behaviors.

Table 7
Study 2 Cognitive Mechanism Supplementary Analysis

Variable	DV: Time spent on peer strategies	
	b (*SE*)	β
Intercept	49.89** (9.88)	
PAGO	−3.00 (1.55)	−.21
LGO	−1.98 (1.93)	−.10
Number of higher perfs.[a]	1.14 (2.37)	.05
PPGO	2.62 (2.11)	.17
Number of Higher Perfs. × PPGO	−7.46** (2.85)	−.33**
R^2	.12*	

Note. Standard errors in parentheses. Perf. = performers; LGO = learning goal orientation; PAGO = performance avoid goal orientation; PPGO = performance prove goal orientation. $N = 107$.
[a] 1 higher performer present, 0 no higher performer present.
* $p < .05$ (two-tailed). ** $p < .01$ (two-tailed).

Finally, Study 2 manipulated the veridical performance environment such that the true underlying quality of coworkers' performance differed across conditions. This manipulation carried through to participants' perceived performance environment (as evidenced by the manipulation check). This design feature complements Study 1 in that it allows us to verify that the perceived performance environment in Study 2 is rooted in veridical differences in performance rather than bias in how individuals with different combinations of PPGO and self-efficacy perceive others' performance.

General Discussion

Perceiving higher performers could be detrimental or beneficial to the motivation and performance of observers. Existing theories offer different predictions about how these effects emerge in the workplace. Through the lens of social comparison theory, perceived higher performers represent self-evaluative referents, leading to reduced job-based self-efficacy and job performance. Through the lens of social–cognitive theory, perceived higher performers represent instructive role models who can elevate job-based self-efficacy and job performance. We developed theory linking these perspectives by describing self-evaluation and learning as alternative cognitive processes individuals adopt when interpreting their environments of higher performers. Because PPGO plays a role in these cognitive processes, we hypothesized it would moderate the relationship between perceived higher performers and self-efficacy.

Our results were consistent with this general proposition. In Study 1, we found that for high-PPGO individuals, the number of perceived higher performers was negatively related to job-based self-efficacy and job performance. In contrast, for low-PPGO individuals, the number of perceived higher performers was positively related to job-based self-efficacy and job performance. In Study 2, we again examined the model using an experimental design that allowed for a stronger test of this causal ordering. Consistent with Study 1, the presence of a higher performing peer had a significant, negative influence on the self-efficacy of high-

PPGO participants. For low-PPGO participants, the presence of a higher performing peer had a positive influence on self-efficacy; however, this relationship failed to reach significance. Although it is difficult to diagnose exactly why the low PPGO relationship was not fully replicated in Study 2, several features of the Study 2 task and sample may be muting effects in the lab that have time to emerged in the field. First, compared with the field, participants in the lab have only a brief performance episode to engage in observational learning and the richness of those learning opportunities are restricted, which may also restrict growth in their self-efficacy. Because Study 1 took place in the field, participants had numerous opportunities and an extended time period to learn from their peers. In contrast, the nature of the Study 2 laboratory experiment offered only a few minutes to learn from higher performing peers. Second, we were also likely advantaged to unearth a stronger positive relationship in the field because, as theorized, beyond just the presence of a high performer (v. none) a linear relationship exists such that the more high performers that employees are around, the more they are likely to learn from and model—if they are low on PPGO. Nevertheless, in both studies social comparison theory better described outcomes of perceiving higher performance for individuals high in PPGO, and social–cognitive theory better described outcomes for individuals low in PPGO. The findings offer several implications for organizational research and practice.

Theoretical Implications

Our research directly extends social comparison theory. First, we tighten the connection between social comparisons and job performance focusing on job-based self-efficacy. A great deal of research on social comparison theory has examined the broader self-concept (e.g., Suls et al., 2002), which is distal to job performance in comparison to job-based self-efficacy. Our research advances social comparison theory by linking comparisons to job performance through job-based self-efficacy, tightening the connection between social comparisons and job performance. Second, we conceptualize social comparisons as stemming from the number of salient higher performers a person has at work. This is a notable departure from existing social comparison research, which has often measured or experimentally manipulated a single social comparison in isolation. This perspective leads our theory away from dyadic moderators of the outcomes of upward comparisons (i.e., similarity between the observer and the referent, Tesser, 1988) and toward a more general cognitive pattern of processing social comparison information: goal orientation. By considering general patterns across multiple comparisons, our theory offers an extension to social comparison outcomes.

Our study also contributes to social–cognitive theory by identifying conditions in which higher performers reduce others' self-efficacy. This extends social–cognitive theory, which has traditionally argued that role modeling should promote self-efficacy, provided the observer pays enough attention to integrate observed performance strategies into their behavioral repertoire. When observers do not pay attention, social–cognitive theory suggests there should be no learning, and there should be no effect on self-efficacy (Bandura, 1997). Our theory extends this by explaining how the effect not only can vary, but that self-evaluative cognitions stemming from observing higher performers thwart learning and hamper self-efficacy for certain kinds of individuals. Our findings are consistent with this proposition.

Our research also contributes to understanding of PPGO in work contexts. Scholars have noted that PPGO should be positively related to social comparisons in general (Régner et al., 2007), and that PPGO influences the quality of relationships individuals form at work (Janssen & Van Yperen, 2004). These conform to the existing narrative that PPGO influences individuals' motivation and actions across many situations (Payne et al., 2007; Phillips & Gully, 1997). We extend this view by articulating how and why PPGO shapes individual responses to the performance environment. In doing so, we position PPGO not as an antecedent of individuals' social behaviors, but rather as a pattern of information processing impacting how they respond to social cues that arise. Viewing PPGO as a condition for how individuals respond to social situations may be valuable in explaining the nuanced and sometimes contradictory effects of PPGO on work performance (e.g., Dietz et al., 2015; Yeo, Loft, Xiao, & Kiewitz, 2009).

Practical Implications

Our research carries a number of implications for practice. Most importantly, managers should tamp down performance-prove goal mindsets in situations where individuals are likely to make self-evaluative comparisons. For example, managers should avoid presenting relative performance feedback to high-PPGO individuals, or make efforts to present relative performance feedback in ways that do not threaten employees' desires to be seen as competent. As negative relative performance feedback can be particularly detrimental to high-PPGO individuals, managers could consider simultaneously delivering additional information that can boost those individuals' self-efficacy. This might include jointly presenting a review of goals they have achieved or highlighting ways that they exceeded expectations based on their own previous performance level. Another potential strategy to manage high-PPGO individuals' self-efficacy is to rely on absolute, rather than relative, performance information when delivering feedback. Absolute feedback could focus on how actual performance deviated from expected performance, or more simply on the raw achievements of the high-PPGO individual. Importantly, delivering feedback to high-PPGO individuals in ways that avoid relative performance information may mitigate the adverse effect of upward comparisons on employees' self-efficacy.

These recommendations are consistent with the feedback literature (Kluger & DeNisi, 1996, 1998), which advises managers to avoid normative comparisons and focus feedback on tasks rather than on social comparisons with others. However, our study offers two implications beyond these recommendations. First, our study points out that normative feedback is actually beneficial for self-efficacy and performance when individuals have lower levels of PPGO. Our study suggests that for these low-PPGO individuals, normative feedback can initiate learning the performance strategies for enhanced performance. Second, we note that employees self-administer feedback through their observations of others. In feedback intervention theory (Kluger & DeNisi, 1996), employees are often considered passive; they wait for the organization to initiate feedback and then act. Our account highlights employees' proactive attunement to coworkers to determine how they are performing. This is notably different from a formal feedback

intervention, because every coworker represents an opportunity to learn or compare. Practically speaking, this means that managers need to go further to guide employees' interpretations of the performance environment even outside of a formal feedback context.

Because this process appears to be self-managed without organizational prompting, a practical implication for individuals is that they should be mindful when comparing themselves to better performers. If they are low-PPGO, individuals could benefit from seeking out a large number of higher performers to observe, as those observations can serve as catalysts for higher self-efficacy and performance. In contrast, if they are high-PPGO, such self-evaluative comparisons are likely to deflate their own sense of self-efficacy. To the extent possible, high-PPGO individuals should avoid relative comparisons to preserve their self-efficacy.

Finally, our research suggests an opportunity for organizations to design staffing plans that capitalize on the motivational effects of upward comparisons. Processes could be designed with sensitivity toward workers' goal orientations. For example, organizations could schedule shiftwork in ways that facilitate low-PPGO employees to cowork with as many top performers as possible. In contrast, schedules might be designed to limit high-PPGO employees' exposure to top performers. The findings could also be applied in the areas of team composition, rotational training programs, and the layout of physical spaces in managing the appropriate opportunities for interaction with higher performers at work given employees' goal orientation.

Although such initiatives may be difficult to manage on an individual-employee basis, certain departments, units, or organizations may have employees with generally lower or higher goal orientations. For example, sales units may have generally higher levels of PPGO than training or operational units. Such differences can be considered in programs that highlight top performers. Units with primarily high-PPGO individuals (e.g., sales organizations) should tread lightly when planning opportunities that encourage employees to compare themselves to the very top performers. In this context, the average performer, because of her performance goal orientation, is likely to experience a reduced sense of self-efficacy and motivation from such comparisons. These initiatives may be more successful in units with lower levels of PPGO.

Limitations and Future Research

Although there are a number of strengths of the present research, including data collected over multiple time points and sources using experimental and field designs, there are limitations. First, Study 1 may have prompted social comparisons which respondents may not otherwise have conducted. If our survey unduly prompted social comparisons, our findings may be overstated. We mitigated this concern by separating the referent identification from referents' performance evaluation into different steps in the first Study 1 survey. While recruiting participants, we described the purpose of the study was to understand the ways employees work with coworkers to avoid artificially cuing comparison processes. However, we cannot rule out the possibility that our survey was a cause of, as well as an evaluation of, workers' social comparisons. Future research may benefit from using passive measurement to avoid these issues.

Second, we did not collect data about how managers influence comparative and learning processes as salient role models or referents. To examine the extent to which our findings were the result of managers being listed as salient coworkers, we identified whether the focal individual listed the supervisor as a higher performer in Study 1. We excluded this comparison for these 39 respondents (33% of the sample) and reanalyzed the data. Although substantive conclusions were identical, it seems plausible that perceiving a supervisor as higher-performing is fundamentally different than perceiving peers as higher-performing.

Finally, we applied a relatively simple operationalization of higher performers by summing the number of salient higher performers an observer named. Given the complex nature of social contexts, future research might offer alternative approaches that capture salient features of employees' social environments. One potential way to represent an individual's pattern of higher performers would be to measure the proportion of total salient coworkers that are higher performing. We tested this operationalization but found no main or moderated effects on self-efficacy. However, it remains plausible that the proportion, rather than the raw number, of perceived higher performers influences self-efficacy perceptions. Perhaps maintaining a balanced portfolio of comparisons is important to self-efficacy. Furthermore, it may be that some comparisons with specific individuals carry more influence than other comparisons. For example, individuals' other types of relationships (e.g., rivals, friends, advisors) may weight social comparisons. More generally, future research might identify theoretically relevant (and potentially complex) ways people make sense of a higher performing set of peers.

The social context plays a pivotal role in how individuals evaluate themselves and learn to perform their jobs at work. For low-PPGO individuals, the social context is an environment for learning from role models to improve their own performance. For high-PPGO individuals, the social context is an environment of competitive referents for whom performance is on display. Social comparison and social–cognitive theories describe similar aspects of workers' social context, depending on how employees interpret and respond to these social worlds. Our research shows how the social context of work influences employees differently by shaping their internal beliefs about themselves and ultimately their performance on tasks and jobs.

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