Collective Pay for Performance: A Cross-Disciplinary Review and Meta-Analysis

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Rewarding collective outcomes has become an increasingly important strategic motivational tool for driving collective success, reflecting the insight that paying employees for individual contributions does not always optimize performance in collective endeavors. Research into different types of collective pay for performance (PFP), or pay that is contingent on collective outcomes, has been studied in diverse academic fields (e.g., economics, strategy, psychology), but the compartmentalization between these academic disciplines hinders conceptual coordination. To advance this research and its related insights, this article provides a review of the theory and evidence pertaining to the relationships between different collective PFP types and collective outcomes. We also provide a meta-analysis that shows that collective PFP has desirable outcomes (e.g., meta-analysis shows an overall $\rho = 0.11; p < .001$), substantiating the value of studying collective PFP separately from individual PFP. The review also reveals a lack of empirical and theoretical development and highlights the need for a comprehensive theory of collective PFP. Our cross-disciplinary review of 106 empirical articles builds a foundation for advancing common pursuits, integrating knowledge, and creating theory. The consolidated perspectives point to promising directions for future research.

Keywords: compensation; incentive effect; sorting; collective outcomes; cross-level teams; pay for performance; firm performance; meta-analysis

Supplemental material for this article is available with the manuscript on the JOM website.

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Established theories (e.g., equity, expectancy) and strong empirical evidence (e.g., Cerasoli, Nicklin, & Ford, 2014; Jenkins, Mitra, Gupta, & Shaw, 1998) demonstrate individual pay-for-performance (PFP) incentive effects (Gerhart, 2017; Maltarich, Nyberg, Reilly, Abdulsalam, & Martin, 2017; Mitra, Jenkins, Gupta, & Shaw, 2015), but less is known about collective PFP, which is defined as pay that is contingent on collective outcomes. This is troubling, because employees are nested in units (Conroy, Gupta, Shaw, & Park, 2014), where their individual behaviors, attitudes, and performance combine to determine collective performance (Gupta & Shaw, 2014; Ployhart, Nyberg, Reilly, & Maltarich, 2014). Collective PFP can be a strategic differentiator between firms because it links pay and strategy (Gerhart & Milkovich, 1990) and is less constraining than fixed pay. More than half of all public companies report using collective PFP (WorldatWork, 2016), recognizing that collectives, rather than individuals, drive firm performance (Mathieu, Maynard, Rapp, & Gilson, 2008). Still, theoretical models in the compensation literature still mostly focus on individuals rather than collectives (G. Chen & Kanfer, 2006; Gerhart, Rynes, & Fulmer, 2009; Shaw, 2015b). Incentivizing collectives is distinct and complex, and it requires coordinating multiple members’ roles and potentially conflicting goals (Gomez-Mejia, Welbourne, & Wiseman, 2000).

Understanding how and why collective PFP affects collective outcomes remains a challenge (Alchian & Demsetz, 1972; Conroy et al., 2014; Dumaine, 1994) despite growing empirical evidence that collective PFP can influence talent quality, motivate talent toward common goals, and lead to competitive parity (Gerhart & Fang, 2014; Gerhart & Rynes, 2003; Shaw, 2015a). Mechanisms driving collective PFP’s influence on collective outcomes include complex social processes (Beersma, Hollenbeck, Humphrey, Moon, Conlon, & Ilgen, 2003), which distinguishes them from the mechanisms driving individual PFP (Gerhart et al., 2009). Understanding collective PFP also requires the consideration of both sorting and incentive effects (Gerhart & Rynes, 2003; Lazear, 1986). Sorting effects are the influence that different pay types have in attracting and retaining talent. Incentive effects are the effects of pay on motivation and attitudes, which direct employees’ attention and efforts to perform. Examining PFP without considering both the makeup and motivation of a firm’s employees is limiting.

Existing research about collective PFP spans scholarly disciplines (e.g., management, accounting, finance) that take distinct but complementary perspectives on how various collective PFP types sort employees into collectives and motivate them. However, cumulative understanding has been hindered by divergent language, assumptions, norms, and empirical findings, as well as by studying different types of collective PFP practices separately. Through a comprehensive, multidisciplinary review, we examine both the sorting and incentive effects of collective PFP to identify commonalities and inconsistencies across collective PFP research. We highlight contradictory findings and suggest an agenda for further research to guide compensation researchers toward important, unanswered questions. Our qualitative investigation is supplemented by a meta-analytic assessment to quantify effects and identify meaningful distinctions among six types of collective PFP. The resulting insights will help guide research into how, why, and when collective PFP induces different collective outcomes.

**Collective PFP Research**

*Overview*

This review differs from the most thorough prior compensation review (Gerhart et al., 2009) and a recent meta-analysis of 21 papers (Garbers & Konradt, 2014) in three key ways.
First, in contrast to prior reviews, we advance research by identifying lessons learned from research of different collective PFP types, levels of analysis, and disciplines. This allows for focused conclusions while avoiding the cross-level fallacy that might result from assuming collective effects on the basis of knowledge about individuals. Second, our work is more exhaustive and includes works published after Gerhart et al.‘s (2009) review. Third, many of the studies included in Garbers and Konradt’s (2014) meta-analysis either did not include a team PFP component or measured team-level dispersion of individual pay (e.g., Bloom, 1999). These studies therefore could more appropriately be labeled as pay dispersion rather than team PFP.

In the next section, we outline the scope of our review, then describe the criteria used to identify articles. We later detail six collective PFP types—including top management team (TMT) PFP, broad-based stock options, employee stock ownership plans (ESOPs), profit sharing, gainsharing, and team PFP—grouped in five categories before leveraging our findings to create a typology of collective PFP dimensions. Finally, we provide commentary related to six areas in which further research can drive the theoretical and practical understanding of collective PFP.

Scope

Our review focuses on articles that study the effects of at least one of these six collective PFP types on collective outcomes. Most reviews focusing on microperspectives exclude TMT studies (e.g., Conroy & Gupta, 2016); however, we include them for five reasons. First, TMT PFP disproportionately influences the firm’s strategy and performance (Gerhart et al., 2009, Hambrick & Mason, 1984) and thus must be considered when reviewing how collective PFP affects collective outcomes. Second, though some argue that TMTs differ conceptually from other organizational areas (Sesil & Lin, 2011), substantial overlap in how TMT members and other organizational members respond to PFP is likely, allowing for insights across broader organizational applications. Third, TMT members have a clearer line of sight than other employees because their decisions affect the value of equity holdings more directly (Carpenter & Sanders, 2004); therefore TMT PFP may offer greater insight into how people respond in specific situations. Fourth, the sorting and incentive effects of TMT PFP can provide insights for other organizational levels. Fifth, researchers examining TMT PFP often ignore research at other organizational levels, creating a potentially artificial distinction and ignoring lessons and concepts previously accumulated and detailed. By including research involving TMT PFP, we bridge artificial research boundaries and highlight lessons that each side can learn from the other.

We exclude articles that refer exclusively to chief executive officer (CEO) PFP or pay dispersion. Both of these research areas are unique enough that their lessons are less directly relevant to the research that we focus on. For instance, CEO PFP is based on the organizational outcome but applies to only one employee, implying that many of the complex social and emergent effects of collective PFP will not apply. Further, CEO pay levels are often dramatically higher than even those of other TMT members, suggesting that they could represent an outlier in the realm of collective PFP. Pay dispersion is not a pay type but rather an implementation feature that applies to several pay types and therefore does not fit our definition of collective PFP. Finally, these topics have recently been meta-analyzed (Van Essen, Otten, & Carberry, 2015; Shaw, 2014; Wei, 2016).
Literature Search

To find published research that examines collective PFP relationships, we searched peer-reviewed articles on EBSCO, SAGE, and Google Scholar, using keywords such as team, group, competitive, cooperative, and TMT. We matched these terms with phrases such as pay, rewards, incentives, compensation, and pay for performance. Additional key terms included profit sharing, reward interdependence, employee stock ownership plans or ESOPs, gain-sharing, rent sharing, and stock options. We also leveraged the references from key articles to identify additional studies. Our search yielded empirical studies, conceptual articles, and reviews that examined collective PFP aggregated to the unit (as an independent variable) and its collective outcomes (unit-level dependent variables). Our conclusions rely more heavily on recent, high-quality, peer-reviewed research, but for the sake of inclusiveness, we did not limit our search by time.

In addition to conceptual contributions, our search yielded 106 empirical articles from organizational behavior (OB), psychology, strategic human resources management (HRM), strategy, economics, accounting, finance, and marketing. Table 1 presents a cross-tabulation of the number of empirical studies in each discipline, and Table 2 provides relevant definitions. To supplement our qualitative review, we conducted a meta-analysis. We coded effect sizes and study data following the procedures outlined by Lipsey and Wilson (2001), then calculated population correlation estimates, confidence intervals, and tests for heterogeneity based on these correlations, aggregated to the study level (Hunter & Schmidt, 2004). Of the 106 empirical articles, only 41 included useable bivariate estimates, partly because the norms for reporting such relationships vary across disciplines. For example, our meta-analysis uses only three papers from economics or finance because only one of these studies included bivariate relationships, and our requests to authors yielded two additional data points. This limitation pushed our quantitative analysis more toward OB/psychology, strategic HRM, and strategy research (33/41 studies). We discuss our meta-analytic findings throughout this text and summarize key results in Table 3.

Literature Review: Collective PFP Types

We organize our review according to the type of collective PFP plan under investigation. The resulting classification includes six collective PFP types, constituting five broad categories.

TMT PFP

Overview. Examining TMT PFP as a form of collective PFP can be controversial, due to the belief that TMT PFP differs substantially from other types of collective PFP and should be treated separately. TMTs are seen as having disproportionate firm influence and traditionally were seen as not truly functioning as a collective (Finkelstein, Hambrick, & Cannella, 2009). In contrast, some studies have argued there is no reason to examine TMT PFP because TMT members ought to respond to collective PFP just as in other teams. We recognize both perspectives but see opportunities to extend our knowledge by examining TMT PFP and incorporating other relevant research lessons.
In particular, TMT PFP most frequently takes the form of equity (e.g., stock options or restricted stock), and it is often measured by the presence of equity programs or the ratio of TMT PFP to total pay. We reviewed 17 relevant empirical studies of TMT PFP, which generally theorize that PFP aligns the interests of management and shareholders (Fama & Jensen, 1983) and increases productivity by enhancing TMT motivation (Sesil & Lin, 2011). Evidence shows that PFP can shape TMT behavior and performance such that its existence and extent are positively associated with firm performance (Carpenter & Sanders, 2004), though it can also affect TMT turnover (Hambrick, Humphrey, & Gupta, 2015).
Different types of collective PFP are intended to induce different outcomes (see Table 4). Often based in agency theory, TMT PFP seeks to align TMTs with shareholder interests to affect organizational performance. Thus, TMT PFP should be compared with shareholder returns (e.g., stock price), not accounting returns (Nyberg, Fulmer, Gerhart, & Carpenter, 2010). To match interventions with outcomes, an organization that wants to increase TMT cohesion might consider PFP tools that affect team cohesiveness rather than relying on a PFP mechanism designed to ensure more distal shareholder performance. TMT cohesion is rarely considered by traditional TMT scholars (Finkelstein et al., 2009) but is a burgeoning area of concern for firms and an area where lessons from team PFP may apply (Cragun, Nyberg, & Wright, 2016; Schepker, Nyberg, Ulrich, & Wright, in press).

### Table 2
Definitions of Collective PFP Types and the Dimensions Reviewed

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collective PFP</td>
<td>Pay applied to collectives that is contingent on collective outcomes.</td>
</tr>
<tr>
<td>TMT PFP</td>
<td>A type of collective PFP directed to the members of the TMT.</td>
</tr>
<tr>
<td>Broad-based stock options</td>
<td>A type of collective PFP that grants the right but not the obligation to buy an asset at a specified price, such that the relative value depends on the firm’s performance.</td>
</tr>
<tr>
<td>ESOPs</td>
<td>A type of collective PFP that grants employees opportunities to buy shares in their organization and receive returns that reflect the organization’s overall performance.</td>
</tr>
<tr>
<td>Profit sharing</td>
<td>A type of collective PFP where pay is based on a collective financial target achievement.</td>
</tr>
<tr>
<td>Gainsharing</td>
<td>A type of collective PFP that links pay to a results-based collective performance measure, such as productivity at the facility level.</td>
</tr>
<tr>
<td>Team PFP</td>
<td>A type of collective PFP where team members’ pay is contingent on the team’s output.</td>
</tr>
<tr>
<td>Research discipline</td>
<td>The academic research area of the study based on journal or lead author affiliation.</td>
</tr>
<tr>
<td>Focus of research</td>
<td>The overarching mechanism that is studied.</td>
</tr>
<tr>
<td>Sorting effect</td>
<td>Focus is on the role of PFP in constituting a workforce.</td>
</tr>
<tr>
<td>Incentive effect</td>
<td>Focus is on the motivational influences that PFP practices exert.</td>
</tr>
<tr>
<td>Locus of collective outcome</td>
<td>The level of analysis of the collective outcome.</td>
</tr>
<tr>
<td>Team level</td>
<td>Outcomes pertaining to a small group of employees with some interdependence and a shared goal.</td>
</tr>
<tr>
<td>Unit level</td>
<td>Outcomes that are derived from a relatively large group, including plants, department, or facility, but lower than the organizational scope.</td>
</tr>
<tr>
<td>Organization level</td>
<td>Outcomes that reflect the firm as a whole.</td>
</tr>
<tr>
<td>Type of collective outcome</td>
<td>The operationalization of the collective outcome.</td>
</tr>
<tr>
<td>Behavioral</td>
<td>Measures of collective behaviors, attitudes, and perceptions/cognition.</td>
</tr>
<tr>
<td>Financial</td>
<td>Outcome-based financial measures that reflect the fulfillment of the economic goals of the firm.</td>
</tr>
<tr>
<td>Operational</td>
<td>Nonfinancial measures of business performance.</td>
</tr>
</tbody>
</table>

*Note:* ESOP = employee stock ownership plan; PFP = pay for performance; TMT = top management team.
Of the 17 TMT PFP studies we reviewed, 16 investigated incentive effects (Table 1). TMT PFP relates positively to financial measures of performance; specifically, a proportion of TMT PFP relates positively to return on assets (Carpenter & Sanders, 2002), return on equity (Leonard, 1990), and market-to-book ratios (Carpenter & Sanders, 2004) as well as to nonfinancial performance outcomes, such as corporate social responsibility (Ji, 2015). In contrast with its positive effect on accounting returns, market reactions to high levels of TMT PFP can be unfavorable (Steinbach, Holcomb, Holmes, Devers, & Cannella, in press). Our meta-analysis (Table 3) shows that the overall effect of TMT PFP on collective outcomes is positive and statistically significant ($\rho = .12$, $SD_\rho = .04$; $p < .001$) but heterogeneous ($Q = 127.69$; $p < .001$), implying potential moderators. Further, TMT PFP correlates more strongly with operational outcomes ($\rho = .28$, $SD_\rho = .04$; $p < .001$) than with financial outcomes ($\rho = .08$, $SD_\rho = .04$; ns). TMT PFP appears to drive behavioral choices, such as acquisition volume (Steinbach et al., in press), but, contrasting with predictions from

<table>
<thead>
<tr>
<th>Collective PFP Type</th>
<th>$s$</th>
<th>$K$</th>
<th>$N$</th>
<th>Mean $\rho$</th>
<th>$SD_\rho$</th>
<th>95% CI</th>
<th>$Q$</th>
<th>% Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Collective PFP</strong> total</td>
<td>41</td>
<td>116</td>
<td>19,581</td>
<td>.11***</td>
<td>.02</td>
<td>[.07, .15]</td>
<td>205.62***</td>
<td>20</td>
</tr>
<tr>
<td>Financial outcomes total</td>
<td>23</td>
<td>41</td>
<td>15,874</td>
<td>.11***</td>
<td>.03</td>
<td>[.06, .16]</td>
<td>182.24***</td>
<td>12</td>
</tr>
<tr>
<td>Operational outcomes total</td>
<td>20</td>
<td>39</td>
<td>10,953</td>
<td>.12***</td>
<td>.02</td>
<td>[.08, .17]</td>
<td>68.32***</td>
<td>28</td>
</tr>
<tr>
<td>Behavioral outcomes total</td>
<td>17</td>
<td>36</td>
<td>2,208</td>
<td>.11***</td>
<td>.04</td>
<td>[.03, .18]</td>
<td>43.30***</td>
<td>36</td>
</tr>
<tr>
<td><strong>TMT PFP</strong> total</td>
<td>10</td>
<td>17</td>
<td>8,141</td>
<td>.12***</td>
<td>.04</td>
<td>[.02, .20]</td>
<td>127.69***</td>
<td>8</td>
</tr>
<tr>
<td>Financial outcomes total</td>
<td>7</td>
<td>12</td>
<td>7,878</td>
<td>.08</td>
<td>.04</td>
<td>[−.01, .17]</td>
<td>94.76***</td>
<td>8</td>
</tr>
<tr>
<td>Operational outcomes total</td>
<td>2</td>
<td>2</td>
<td>1,812</td>
<td>.28***</td>
<td>.04</td>
<td>[.20, .35]</td>
<td>3.72</td>
<td>45</td>
</tr>
<tr>
<td>Behavioral outcomes total</td>
<td>2</td>
<td>3</td>
<td>194</td>
<td>.05</td>
<td>.07</td>
<td>[−.09, .19]</td>
<td>1.41</td>
<td>100</td>
</tr>
<tr>
<td>Broad-based stock options/ESOPs total</td>
<td>12</td>
<td>26</td>
<td>8,106</td>
<td>.11*</td>
<td>.03</td>
<td>[.05, .17]</td>
<td>52.65***</td>
<td>22</td>
</tr>
<tr>
<td>Financial outcomes total</td>
<td>4</td>
<td>7</td>
<td>2,031</td>
<td>.18*</td>
<td>.07</td>
<td>[.04, .33]</td>
<td>36.81***</td>
<td>10</td>
</tr>
<tr>
<td>ESOPs total</td>
<td>8</td>
<td>19</td>
<td>6,075</td>
<td>.06***</td>
<td>.01</td>
<td>[.04, .09]</td>
<td>3.42</td>
<td>100</td>
</tr>
<tr>
<td>Profit-sharing total</td>
<td>7</td>
<td>18</td>
<td>1,761</td>
<td>.09***</td>
<td>.03</td>
<td>[.03, .14]</td>
<td>9.03</td>
<td>76</td>
</tr>
<tr>
<td>Gainsharing total</td>
<td>2</td>
<td>3</td>
<td>784</td>
<td>.10**</td>
<td>.04</td>
<td>[.03, .17]</td>
<td>0.83</td>
<td>100</td>
</tr>
<tr>
<td>Team PFP total</td>
<td>8</td>
<td>32</td>
<td>673</td>
<td>.13**</td>
<td>.04</td>
<td>[.05, .20]</td>
<td>3.67</td>
<td>100</td>
</tr>
</tbody>
</table>

Note: Two studies aggregated more than one collective PFP type; hence, they cannot be classified further. ESOP = employee stock ownership plan; PFP = pay for performance; TMT = top management team; $s$ = number of studies; $K$ = number of correlations; $N$ = total combined sample size; mean $\rho$ = average corrected correlation; $SD_\rho$ = standard deviation of corrected correlation; CI = confidence interval; % Variance = percentage variance in correlations explained by statistical artifacts; $Q$ = statistical test for homogeneity in the true correlations.

Studies that measured turnover as an outcome. Collective PFP, $s = 8$, $K = 11$; TMT PFP, $s = 1$, $K = 1$; ESOPs, $s = 3$, $K = 3$; profit sharing, $s = 3$, $K = 4$; gainsharing, $s = 1$, $K = 1$; multiple PFP types, $s = 2$, $K = 2$. Effect sizes are substantially unchanged when studies with turnover outcomes are omitted, except collective PFP behavioral outcomes and TMT PFP behavioral outcomes. Removing studies with turnover outcomes in these two cases increases these effect sizes by 0.04 or 36% and 80%, respectively.

*p < .05
**p < .01
***p < .001

**TMT PFP incentive effects**. Of the 17 TMT PFP studies we reviewed, 16 investigated incentive effects (Table 1). TMT PFP relates positively to financial measures of performance; specifically, a proportion of TMT PFP relates positively to return on assets (Carpenter & Sanders, 2002), return on equity (Leonard, 1990), and market-to-book ratios (Carpenter & Sanders, 2004) as well as to nonfinancial performance outcomes, such as corporate social responsibility (Ji, 2015). In contrast with its positive effect on accounting returns, market reactions to high levels of TMT PFP can be unfavorable (Steinbach, Holcomb, Holmes, Devers, & Cannella, in press). Our meta-analysis (Table 3) shows that the overall effect of TMT PFP on collective outcomes is positive and statistically significant ($\rho = .12$, $SD_\rho = .04$; $p < .001$) but heterogeneous ($Q = 127.69$; $p < .001$), implying potential moderators. Further, TMT PFP correlates more strongly with operational outcomes ($\rho = .28$, $SD_\rho = .04$; $p < .001$) than with financial outcomes ($\rho = .08$, $SD_\rho = .04$; ns). TMT PFP appears to drive behavioral choices, such as acquisition volume (Steinbach et al., in press), but, contrasting with predictions from
agency theory, Souder and Bromiley (2012) found that higher TMT PFP reduces investment in long-term assets. This lack of clarity is reflected in the statistically nonsignificant meta-analytic results for behavioral outcomes for TMT PFP.

**TMT PFP sorting effects.** We found only one empirical study of the relative attractiveness of different TMT PFP schemes (Cho & Shen, 2007). However, preliminary indications suggest that the sorting effect of TMT PFP may not be as favorable as its incentive effects, in that TMT turnover rates are higher when TMT PFP represents a higher proportion of total compensation (Hambrick et al., 2015). For instance, in a study of 109 organizations in the computer hardware and software industry, Hambrick et al. (2015) considered cash pay, bonus, and equity holdings among the TMT and determined that this combination produces higher turnover rates among this group. The benefits of TMT PFP thus may come at a cost. This cost is often attributed to intragroup conflict and competition, but conclusions about the causes and impact of such turnover are speculative because no research has examined the characteristics or motives of those who leave. In contrast, if TMT PFP has the effect of driving out poor performers, it could represent beneficial sorting outcomes.

**TMT PFP research challenges.** As noted, most research on TMT PFP examines equity-based PFP (e.g., stock options), often measured as the ratio of TMT PFP to total TMT pay (Ji, 2015; Sanders & Hambrick, 2007). This is informative because it captures TMT PFP relative to other types of pay instead of its absolute level. A challenge associated with this research is the persistent focus on accounting-based measures; only one study (Anderson, Banker, & Ravindran, 2000) considered the effects of TMT PFP on shareholder returns. This

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**Table 4**

<table>
<thead>
<tr>
<th>Collective PFP Type</th>
<th>Intended Collective Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMT PFP</td>
<td>Alignment with shareholders</td>
</tr>
<tr>
<td></td>
<td>Long-term organizational performance</td>
</tr>
<tr>
<td></td>
<td>Attraction and retention</td>
</tr>
<tr>
<td></td>
<td>Organizational commitment</td>
</tr>
<tr>
<td>Broad-based stock options and ESOPs</td>
<td>Alignment with shareholders</td>
</tr>
<tr>
<td></td>
<td>Long-term organizational performance</td>
</tr>
<tr>
<td></td>
<td>Organizational commitment</td>
</tr>
<tr>
<td>Profit sharing</td>
<td>Increased organizational profits</td>
</tr>
<tr>
<td></td>
<td>Wage flexibility</td>
</tr>
<tr>
<td>Gainsharing</td>
<td>Increased productivity</td>
</tr>
<tr>
<td></td>
<td>Employee involvement/participation</td>
</tr>
<tr>
<td></td>
<td>Coworker monitoring</td>
</tr>
<tr>
<td></td>
<td>Process improvements</td>
</tr>
<tr>
<td>Team PFP</td>
<td>Cooperation</td>
</tr>
<tr>
<td></td>
<td>Communication</td>
</tr>
<tr>
<td></td>
<td>Team performance</td>
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</tbody>
</table>

*Note: ESOP = employee stock ownership plan; PFP = pay for performance; TMT = top management team.*
is problematic because equity-based TMT PFP is designed to affect market, not accounting, performance (Nyberg et al., 2010). Thus, the empirical tests remain inconsistent with its theoretical basis.

Another challenge for drawing lessons from these studies is that they almost universally used the five top-paid employees within the organization as a proxy for the TMT. Although it is difficult to collect information on all TMT members, this measure is both deficient and contaminated. The TMT is often composed of substantially more than five members (Guadalupe, Li, & Wulf, 2014; Tihanyi, Ellstrand, Daily, & Dalton, 2000), and the five highest-paid workers often include non-TMT members (Cragun et al., 2016). Widespread misrepresentation of the TMT reduces our confidence in the conclusions from that research. One paper that used a more accurate representation of the TMT for 67 firms (Siegel & Hambrick, 2005) refuted findings regarding pay disparity from several otherwise similar papers that used a top-five TMT proxy. A final challenge is that many studies examine overlapping samples, often relying on Execucomp data, such that the samples draw from the same set of about 1,500 companies. Even when the observation years differ, some overlap exists, making the accumulation of knowledge difficult because it is hard to know how much unique information appears in any individual work.

TMT PFP research needs. Substantive gaps remain in our cumulative knowledge about TMT PFP—this is critical because TMT PFP is a substantial portion of the pay for TMT members. For the reasons described, several answers are unclear, and many questions remain unaddressed. First, we do not know how TMT PFP influences sorting or the resulting composition of human capital resources (HCR)—the individual or unit-level capacities based on individual knowledge, skill, ability, and other characteristics that are accessible for unit-relevant purposes (Ployhart et al., 2014). More research is required to understand the attractiveness of TMT PFP as well as the relationship of TMT PFP and turnover. Similarly, it is unknown how TMT PFP affects long-term shareholder performance, which is surprising because agency theory centers on aligning managerial interests with those of shareholders (Nyberg et al., 2010).

Finally, questions of how changes in TMT PFP affect future TMT decisions remain unanswered. Further research should test TMT PFP theories, but this will be complicated by the close link between firm performance and the proportion of pay that comes from TMT PFP. That is, when stock prices increase, the proportion of TMT PFP in an employee’s total compensation necessarily rises. This confound, coupled with the possibility that better-performing firms could be more generous or have more opportunity to offer more TMT PFP, challenges the ability to draw causal conclusions.

Broad-Based Stock Options and ESOPs

Overview. Broad-based stock options grant employees the right to buy equity at a specified price (Brandes, Dharwadkar, & Lemesis, 2003; Merton, 1973). ESOPs grant employees the right to buy shares in their firm and receive returns that reflect the firm’s overall performance (Dillavou, 1945). We examined 31 empirical studies related to these two types of collective PFP. The theoretical mechanisms through which they work appear similar to those that affect the TMT (i.e., alignment of interests and motivation), but there is likely a weaker
link between employee effort and firm outcomes, although this has not been extensively examined.

Broad-based stock options and ESOPs are both associated with improved financial outcomes (Kaarsemaker, Pendleton, & Poutsma, 2009; Kruse, 1992; Sesil & Lin, 2011), higher productivity (Kruse, 1992; Lin & Sesil, 2011; Sesil, Kroumova, Blasi, & Kruse, 2002; Sesil & Lin, 2011), increased innovation (Chang, Fu, Low, & Zhang, 2015), and more employee empowerment (Blasi, Freeman, & Kruse, 2016). Announcing such plans has short-term market benefits (C.-Y. Chan, Tai, Li, & Jelic, 2012). However, beyond some evidence that the plans enhance employee retention (Gielen, 2011; Green & Heywood, 2011), little is known about how they affect sorting.

**Broad-based stock options and ESOPs intended outcomes.** Equity-based PFP schemes, such as broad-based stock options and ESOPs, follow agency theory predictions, similar to perspectives on TMT PFP (Sesil et al., 2002), in that firms seek to improve firm performance through aligning shareholder interests with those of a larger number of employees (Brandes et al., 2003). These pay strategies also attempt to encourage employee risk taking (Brandes et al., 2003) and instill a sense of firm ownership (Chi & Han, 2008). The effectiveness of such plans should therefore be assessed on the basis of shareholder returns rather than accounting returns. However, relative to TMT PFP, broad-based stock options and ESOPs may be less effective, due to the weaker perceived link between employee actions and organizational outcomes. This weaker line of sight, coupled with the difficulty of judging the value of options, may explain the mixed findings regarding their effects. Although broad-based stock options are designed to create a greater sense of ownership among all participants, depending on their relative size compared with other pay forms, it may be unrealistic to expect strong incentive effects.

**Broad-based stock options and ESOPs incentive effects.** Of the 31 studies of broad-based stock options and ESOPs, 30 investigated incentive effects (Table 1). Broad-based stock options and ESOPs are associated with higher employee empowerment (Blasi et al., 2016), and firms with broad-based stock options tend to outperform their competitors (Gerhart & Milkovich, 1990). The effects seem to be driven by employee productivity gains, particularly when PFP is available to most employees (Sesil et al., 2002). Furthermore, research has shown that ESOPs improve credit ratings (Lee, 2008). However, theoretical development lags that of other collective PFP streams, as most studies focus on results or implications rather than theory.

Our meta-analytic findings (Table 3) show that the effect of broad-based stock options and ESOPs on collective outcomes is positive and statistically significant ($\rho = .11, SD_{\rho} = .03; p < .05$) but heterogeneous ($Q = 52.65; p < .001$). The effect of ESOPs ($\rho = .06, SD_{\rho} = .01; p < .001$) is positive, statistically significant, and homogeneous; the effect of broad-based stock options ($\rho = .18, SD_{\rho} = .07; p < .05$) is larger but suggests moderators. Beyond the positive findings for internal firm outcomes, market reaction results are mixed. A study in Taiwan (Chan et al., 2012) found that announcing an ESOP adoption evoked higher abnormal market returns, but a similar study (H. Kato, Lemmon, Luo, & Schallheim, 2005) found that announcements of broad-based stock options were associated with lower cumulative abnormal returns for Japanese firms.
Mixed findings also characterize the effect of these plans on innovation. One study (Chang et al., 2015) suggested that stock options granted to non-TMT employees had a positive effect on the number of patents issued and on subsequent citations to those patents, in line with the theoretical expectation that tying employee pay to collective outcomes leads employees to perform better on tasks that lead to collective outcomes. However, Sesil et al. (2002) found no such effect on patents. These differences in findings point to conceptual variation across the measures that purport to capture the same construct, as we will discuss in more detail later.

**Broad-based stock options and ESOPs sorting effects.** Oyer and Schaefer (2005) made the compelling case that broad-based stock options and ESOPs attract and retain employees more effectively than they motivate performance. Oyer (2004) also suggested that broad-based stock options promote retention because people overvalue their current options. They may also be less effective for attracting employees because people undervalue options they have yet to receive (Abudy & Shust, 2013). Despite this, there is little empirical evidence for sorting effects of broad-based stock options or ESOPs (see Table 1).

Evidence also suggests that ESOPs reduce employee turnover, such that U.K. engineering firms with ESOPs enjoy lower quit rates (Wilson, Cable, & Peel, 1990). Yet when examining the effects of coexisting collective PFP types among companies on the 2005–2007 “100 Best Companies to Work for in America” list, Blasi et al. (2016) specified that collective PFP plans affect voluntary turnover only if they are part of a bundle of practices (also see Robinson & Wilson, 2006). One important implication of this finding is that studying any pay practice in isolation may be misleading.

**Broad-based stock options and ESOPs research challenges.** Agency and expectancy arguments suggest that equity-based collective PFP types (TMT, broad-based stock options, ESOPs) should lead to shareholder returns, not accounting returns (Masson, 1971), because rewards and these outcomes are more closely connected. The challenges discussed regarding the comparison of equity-based pay results with accounting returns for TMT PFP thus apply to broad-based stock options and ESOPs as well.

Some of the interesting theoretical differences, including the line of sight, that separate broad-based stock options and ESOPs from TMT PFP have not been fully leveraged. Although the underlying theories may be similar for these types of compensation, they are measured in different ways. In many studies, broad-based stock options and ESOPs reflected dichotomous measures (e.g., Blanchflower & Oswald, 1988; Sesil et al., 2002), though some examined effects based on the percentage of employees who receive broad-based stock options (e.g., Blasi et al., 2016) or ESOPs (Kruse, 1992) or the percentage of firm stock owned by an ESOP (e.g., Klein & Hall, 1988). Even complex measures of equity ownership fail to clarify how equity is distributed among the firm’s employees. For example, Chang et al. (2015) subtracted the value of the stock options granted to the five top-paid employees from the total value of options granted, then normalized that value by the number of employees. This approach creates questions about how broadly based the distribution really is and to whom options might be granted. Answering these questions is central to developing and extending the theoretical basis for this stream of research.
With few exceptions, past studies have relied on subjective survey measures gathered from managers regarding both the amount and the relative effectiveness of broad-based stock options or ESOPs. Thus they measure perceptual, rather than performance, outcomes and risk common method bias (e.g., Blanchflower & Oswald, 1988; Kalmi, Pendleton, & Poutsma, 2005). Differences among measures imply that they represent different theoretical constructs, which might account for the substantively different or contradictory results. For example, Sesil et al. (2002) showed that firms with broad-based stock options (measured dichotomously) did not produce more patents than firms without them, whereas Chang et al. (2015) found that the total value of a firm’s stock options granted to nonexecutives was positively associated with patents and their citations. These discrepant findings imply that implementing equity-based collective PFP may be insufficient for increasing performance unless it offers meaningful value.

**Broad-based stock options and ESOPs research needs.** Despite excellent empirical reviews (Blasi et al., 2016; Blasi, Conte, & Kruse, 1996), we know little about how these two equity-based PFP types affect collective performance. Studies that fail to find effects (e.g., Sesil et al., 2002) often use simplified, dichotomous measures. With their more fine-grained measure, Blasi et al. (1996) found that firms in which at least 10% of employees participate in ESOPs achieved no better performance than firms that had 5% to 10% ESOP participation. While acknowledging that the different findings might be a result of the substantively different measures, we offer another possible interpretation. Equity-based collective PFP might increase overall pay levels or be associated with higher fixed pay, in which case the observed effect could be due to the higher total rewards rather than the form of pay. Research into ESOPs and broad-based stock options could benefit from the approach taken by TMT PFP researchers, who commonly account for the relative amounts of TMT PFP and fixed pay, reflecting findings that showed that these ratios matter. The value of offering equity-based collective PFP plans to broader groups may depend not only on the percentage of employees with these plans but also the percentage of employees’ total pay that comes from such plans.

Further research also is needed to understand the causal relationship between these programs and firm performance. Cross-sectional studies leave open the possibility that sharing equity with employees is a result, rather than the cause, of firm success (Blasi et al., 1996; Krounova & Sesil, 2006).

**Profit Sharing**

**Overview.** In profit-sharing plans, PFP is based on achieving collective financial targets, such as net income, usually at the firm level (Rynes, Gerhart, & Parks, 2005). Profit sharing can, but does not necessarily, require employee participation and is often targeted widely. We examined 23 studies pertaining to profit-sharing plans and their collective outcomes. In contrast to other collective PFP types based on firm-level outcomes (TMT PFP, broad-based stock options, ESOPs), theoretical treatments of profit sharing focus more on attitudinal and behavioral effects than on performance. Evidence generally supports the efficacy of these plans for improving employee attitudes and teamwork and offers limited evidence of a productivity effect.
Profit-sharing intended outcomes. Firms often institute profit sharing to encourage employees to focus on profits and reduce costs (Bhargava, 1994). Firms also gain some pay flexibility from profit sharing because they are not required to pay profit-sharing bonuses during times of poor performance (Azfar & Danninger, 2001). However, as with broad-based stock options, profit sharing is unlikely to motivate employees who cannot see clearly how their performance relates to a firm’s profits. Further, increasing short-term profits may not be the best way to achieve long-term growth, resulting in a conflict between goals motivated by profit sharing and those motivated by equity.

Profit-sharing incentive effects. Of the 23 profit-sharing studies we reviewed, 21 investigated incentive effects. These plans work by enhancing employees’ sense of psychological ownership (Chi & Han, 2008) or increasing their positive behaviors, including managerial knowledge transfer (Fey & Furu, 2008) and organizational citizenship behaviors (Chiu & Tsai, 2007). Profit sharing affects units directly and influences management policies, such as training investments (Gielen, 2011; Green & Heywood, 2011). Adopting profit sharing can also increase labor productivity and wage flexibility (Daneshfar, Simyar, Rolleri, & Wnek, 2010). Our meta-analysis (Table 3) shows that the overall effect of profit sharing on collective outcomes is positive ($\rho = .09$, $SD_\rho = .03$; $p < .001$) and homogenous ($Q = 9.03$; $ns$). There is additional evidence that the benefits of profit sharing decrease over time (Lucifora & Origo, 2015). The increase in productivity is sharpest immediately after implementation (Bhargava, 1994), then levels off, showing that the benefits to behavioral outcomes may be short-lived.

Profit-sharing sorting effects. Other than finding that profit sharing depresses quit rates (Gielen, 2011; Green & Heywood, 2011), there is little theory or evidence regarding the sorting effects of profit sharing (see Table 1). Accordingly, there is substantial room for research into how profit sharing influences potential employees.

Profit-sharing research challenges. Deficiencies of design and theory in this research area inhibit a clear overall understanding of the findings. Profit sharing and gainsharing are conceptually distinct, but many studies combine their measures (e.g., Chandler & McEvoy, 2000; Cooke, 1994; Lucifora & Origo, 2015), making it difficult to separate their effects.

Similar to equity-based collective PFP studies, some studies dichotomize profit sharing (e.g., Blanchflower & Oswald, 1988; T. Kato & Morishima, 2003; Wadhwani & Wall, 1990), and others use the percentage of employees who share in the profit (e.g., Blasi et al., 2016). The results thus can be interpreted differently. For example, if a study compares firms with and without such practices, results could reflect broad high-performance work practices (HPWPs), thus overstating practice effects (Jiang, Lepak, Hu, & Baer, 2012). Examining differences in the breadth, coverage, or value of profit-sharing programs instead may leave studies less prone to conflating the effects of HPWPs.

Most studies examine profit sharing using cross-sectional data, which makes causal inferences difficult. For example, theoretical treatments often focus on how profit sharing affects performance, but Kraft and Lang (2016) showed that prior performance can lead to profit-sharing plans. Thus, presuming causality from cross-sectional studies may be unfounded. In
longitudinal studies, the choice of lag periods is crucial, as the benefits of profit sharing were shown to dissipate over just 2 or 3 years (Lucifora & Origo, 2015; Magnan & St-Onge, 2005).

**Profit-sharing research needs.** The temporal aspects of the effects of profit sharing have been identified but are not well understood. Specifying the timing of benefits and subsequent declines will advance the theoretical development of this research and help evaluate whether profit sharing is cost-effective. Because profit sharing is tied to unit-level profits, which in turn can be influenced by external factors, motivation may decrease if employees observe that an increase in effort is not associated with higher profits, possibly accounting for a diminishing effect over time. Though our review suggests that profit sharing has a positive relationship to performance, further research is needed to understand its causal mechanisms and sorting effects.

**Gainsharing**

**Overview.** Gainsharing “links pay to results-based performance at a collective (usually facility and in manufacturing settings) level” (Rynes et al., 2005: 589). It involves employee participation targeted to specific work units. In contrast to profit sharing, gainsharing is likely to be tied to productivity gains or cost savings rather than profit. We reviewed 13 empirical gainsharing studies. Most do not focus on theory, but the mechanisms discussed resemble those of profit sharing. Gainsharing relates positively to cost savings (Masternak & Ross, 1992), productivity (Cooke, 1994; Schuster, 1984), and service quality (Knez & Simester, 2001).

**Gainsharing intended outcomes.** Gainsharing differs from other collective PFP types because gainsharing is typically tied to nonfinancial outcomes (Rynes et al., 2005). Aligning gainsharing with more proximal outcomes drives performance (Welbourne & Gomez-Mejia, 1995). Furthermore, gainsharing typically involves employee involvement in developing plans (Arthur & Aiman-Smith, 2001), which can influence employee attitudes. Research shows that gainsharing incentivizes employees to suggest process improvements (Arthur & Aiman-Smith, 2001) and monitor coworkers (Welbourne & Gomez-Mejia, 1995). However, to the extent that each work group must rely on other groups within the organization to perform, intergroup conflicts can occur, promoting loyalty to the focal group rather than the organization.

**Gainsharing incentive effects.** All 13 studies examined incentive effects. They found that gainsharing shaped a company’s culture (Masternak & Ross, 1992) and increased communication and knowledge transfer (Arthur & Kim, 2005; Fey & Furu, 2008) by encouraging employees to suggest improvements (Arthur & Aiman-Smith, 2001). Meta-analytic results (Table 3) also show a positive association (ρ = .10, SDρ = .04; p < .01) with collective outcomes. Some evidence suggests that the benefits of gainsharing diminish over time (Arthur & Aiman-Smith, 2001; Arthur & Huntley, 2005; Obloj & Sengul, 2012). In a well-designed study, Schuster (1984) considered the effects of gainsharing on the production and repair
divisions of an aircraft engine manufacturer and observed that an initial flood of employee improvement suggestions decreased over time, reaching a relatively constant rate.

**Gainsharing sorting effects.** The sorting effects of gainsharing are unclear. Schuster (1984) found stable turnover rates in an industry with an upward turnover trend, suggesting that gainsharing may make employees more likely to stay. However, strong conclusions cannot be drawn from this single study of a single firm.

**Gainsharing research challenges.** Agency and expectancy perspectives both imply that a clearer line of sight should result in stronger motivational effects for gainsharing than for broad-based stock options, ESOPs, or profit sharing. However, gainsharing presents similar measurement challenges; studies often use the percentage of employees who receive gainsharing (Blasi et al., 2016) or the average percentage of employee take-home pay (Arthur & Aiman-Smith, 2001) to measure gainsharing. Several gainsharing studies include observations from just one company or facility (e.g., Arthur & Aiman-Smith, 2001; Masternak & Ross, 1992; Schuster, 1984), which raises generalizability concerns and makes it difficult to compare effects across studies that rely on different measures of gainsharing.

**Gainsharing research needs.** Dissipating performance gains from gainsharing likely result from two processes. First, as employees become acclimated to the new system, they begin to take the incentives for granted, either losing interest in the system or learning to game it (Obloj & Sengul, 2012). Second, pent-up ideas for improvement become quickly exhausted (Arthur & Aiman-Smith, 2001; Schuster, 1984). The specific mechanisms at work have not been tested extensively, though Obloj and Sengul (2012) found that Polish bank employees adapted to various collective PFP plans within 13 months, leading profits to increase initially but then decrease despite continued growth in bonuses. These findings suggest that companies must work constantly to (re)define, measure, and update their pay systems.

Such research also could be extended with more tests of theoretical propositions that link gainsharing to teamwork and loyalty, or investigations of the separate effects related to attitudes due to the motivation prompted by financial incentives. Existing theoretical treatments also suggest untested moderators related to the line of sight or interdependence across units.

**Team PFP**

**Overview.** In team PFP, each team member’s pay is contingent on the team’s aggregate output or performance (Conroy & Gupta, 2016). However, members’ pay can be split equally among all team members or divided in proportion to their contribution to the team. We reviewed 26 empirical studies of team PFP, which highlighted two opposing theoretical perspectives. On one hand, team PFP encourages behaviors that help the team through goal setting (Guthrie & Hollensbe, 2004; Hollensbe & Guthrie, 2000), knowledge sharing (Bartol & Srivastava, 2002; Johnson, Hollenbeck, Humphrey, Ilgen, Jundt, & Meyer, 2006), and coordination (Wageman, 1995). On the other hand, team PFP can hinder performance due to social loafing or other self-interested behaviors (Barnes, Hollenbeck, Jundt, DeRue, & Harmon, 2011; Pearsall, Christian, & Ellis, 2010). Compared to fixed pay, team PFP improves
team performance, but comparisons with individual PFP or mixed PFP (individual PFP plus team PFP) yield conflicting findings.

**Team PFP intended outcomes.** Team PFP aims to incentivize cooperation and communication among team members to improve team performance (Wageman & Baker, 1997). However, because it is contingent on group outcomes, it may result in unintended consequences, including social loafing or free riding (Karau & Williams, 1993; Wageman & Baker, 1997). This implies that contextual elements, like task interdependence, play a role. Organizational outcomes also might not improve with better team performance, as the team is more likely to work to attain outcomes that specifically benefit it than those that lead to broader organizational success.

**Team PFP incentive effects.** Of the 26 team PFP studies, 12 linked team PFP to financial or operational outcomes; four tested behavioral, perceptual, or attitudinal outcomes; 10 investigated both. When team PFP is distributed equally, performance is higher than for teams with individual PFP, fixed pay, or no pay. This holds across multiple performance outcomes, including accuracy (Allen, Sargent, & Bradley, 2003; Barnes et al., 2011; Beersma, Hollenbeck, Conlon, Humphrey, Moon, & Ilgen, 2009; Johnson et al., 2006; Kelly, 2010), speed (Fan & Gruenfeld, 1998), productivity (Hamilton, Nickerson, & Owan, 2003; Libby & Thorne, 2009), revenue (T. Chan, Li, & Pierce, 2014), creativity (C. Chen, Williamson, & Zhou, 2012), sales (Friebel, Heinz, Krüger, & Zubanov, 2017), efficiency (Friebel et al., 2017; Rosenbaum et al., 1980), and optimization (Pearsall et al., 2010). Our meta-analysis (Table 3) shows that the overall effect of team PFP on team outcomes is positive, statistically significant, and homogeneous ($\rho = .13$, $SD_\rho = .04$; $p < .01$). Still, theories of team PFP feature more moderators than other streams, including pay distribution, task characteristics, choice of outcome, and coexisting pay types.

Researchers debate whether team PFP promotes all outcomes. For example, there may be a trade-off between speed and accuracy because cooperation promotes quality but costs time. In studies that tested both outcomes, team PFP created greater accuracy but lower speed than individual PFP (Beersma et al., 2003; Johnson et al., 2006). However, in a rare field study, team PFP resulted in faster work than did fixed pay (Friebel et al., 2017). These conflicting results may reflect differences between intact and newly formed teams.

A primary theoretical and empirical distinction in team PFP literature also involves whether the payout is cooperative, target based, or piece rate. Cooperative reward systems reflect team performance relative to other teams, and only top-performing teams receive rewards (e.g., Barnes et al., 2011; Beersma et al., 2003, 2009). In contrast, a target-based system rewards teams for reaching goals (e.g., Gomez-Mejia & Balkin, 1989), and a collective piece-rate system rewards teams for incremental output (e.g., Hamilton et al., 2003). C. Chen et al. (2012) found that cooperative team PFP is more effective than team piece-rate PFP for enhancing group creativity because it promotes within-group cohesiveness and idea elaboration.

Theoretically, team cohesion and coordination may be more impactful for interdependent tasks (Allen et al., 2003; Miller & Hamblin, 1963; Wageman, 1995; Wageman & Baker, 1997). Libby and Thorne (2009) found that team PFP improved performance when tasks were characterized by complex interdependence but not for sequentially interdependent tasks.
(for a discussion of task interdependence, see Saavedra, Earley, & Van Dyne, 1993). Fan and Gruenfeld (1998) showed that team PFP is less effective for idea generation than it is for implementing solutions. They also found that combining individual and team PFP leads to better performance than either type of PFP alone. Some theoretical logic supports the use of individual and team PFP in combination (DeMatteo, Eby, & Sundstrom, 1998; Kozlowski & Ilgen, 2006), but other research has failed to replicate this effect. Wageman and Baker (1997) found that team PFP alone maximized performance when task interdependence was high, but a combination of the two worked best when task interdependence was moderate.

**Team PFP sorting effects.** Of the 26 studies, two investigated sorting. Theoretically, team PFP influences performance by changing how employees behave or perform as well as by shaping team composition (Gerhart & Milkovich, 1992; Gerhart & Rynes, 2003; Lazear, 1986, 2000; Rynes, 1987). Many individual-level studies have examined sorting into various team PFP systems (Bozionelos & Wang, 2007; Cable & Judge, 1994; DeMatteo & Eby, 1997; Dohmen & Falk, 2011; Haines & Taggar, 2006; Kirkman & Shapiro, 2000; Shaw, Duffy, & Stark, 2001). These studies are not our focus, but some of their findings suggest sorting implications for teams. Individual-level studies yield mixed findings about the relationship between individual performance and individual preferences for individual or team PFP. Some studies show that team PFP is unattractive to students (Shaw et al., 2001) and high-tech manufacturing employees (Haines & Taggar, 2006). Other studies have observed a preference for team pay among employees of a California garment manufacturer (Hamilton et al., 2003) or among better performers (Dohmen & Falk, 2011). Related evidence implies that the social aspects of team PFP are important and can lead to different outcomes than individual PFP. For example, in a field study, Bandiera, Barankay, and Rasul (2009) found that fruit pickers who were paid fixed wages preferred to work with friends, whereas under collective PFP, they preferred to work with others of similar ability regardless of their social ties. The opportunity to work with high-ability others thus may be an important element in sorting decisions.

In addition to affecting job attractiveness, team PFP influences turnover. Hamilton et al. (2003) showed that people working under team PFP were less likely to leave, regardless of their ability, whereas DeMatteo and Eby (1997) indicated that employees with high self-perceived ability relative to their peers were less satisfied with team rewards, suggesting a possibility of increased turnover. According to Pizzini (2010), medical professionals sorted themselves into units of roughly equal ability under a team PFP scheme, partly through attrition.

**Team PFP research challenges.** Conflicting findings related to team PFP and sorting leaves several open questions. It is not clear theoretically or empirically why contradictory findings emerge, but the choice of comparison seems to be important. Hamilton et al.’s (2003) study of garment workers in California appears to contradict prevailing theory, but its mostly immigrant sample might have had cultural characteristics (e.g., collectivism) that influenced the findings. In some circumstances, the social benefits of team PFP may provide incentives that overcome concerns about pay gains or social loafing.

Additional complexity in the operation of team PFP stems from another type of comparison. Several studies showed that changes to the PFP scheme (e.g., adding or removing
team PFP) or pay history can influence future behaviors and performance (e.g., Beersma et al., 2009; Johnson et al., 2006), so caution is necessary when interpreting results about team PFP. For example, in a field study where Wageman (1995) introduced changes to team PFP or mixed pay, performance was dependent on the order in which these changes were implemented. Similarly, inconsistent results emerged from comparisons of equitably distributed (as a function of individual contributions) versus equally distributed (uniform payment to all team members) rewards on collective outcomes (Miller & Hamblin, 1963; Rosenbaum et al., 1980).

These challenges are further complicated by how underlying studies differentiate team from individual PFP schemes or how potential antecedents are conceptualized. The studies also featured sharp differences in the size of potential rewards (e.g., $10 per individual in Barnes et al., 2011, versus $40 per individual in Pearsall et al., 2010). In studies that pair team PFP with individual PFP, competition can take place within the team (Barnes et al., 2011) or between teams (Pearsall et al., 2010). Subtle differences can inhibit the accumulation of knowledge because of difficulties in reporting or replicating work.

Studies of team PFP often have difficulty differentiating between sorting and incentive effects, especially in field studies where pay systems seldom change in isolation. For example, team PFP changes are sometimes accompanied by job design changes (e.g., Hamilton et al., 2003) or shifts in other human resources systems (Román, 2009). This point highlights the inherent trade-offs between lab and field studies. Laboratory researchers can isolate causal mechanisms, but doing so often involves small PFP amounts and simple tasks as proxies for workplace motivation.

Another challenge is that our meta-analytic estimates (Table 3) suggest homogeneous effect sizes, but this contrasts with theory that predicts the presence of moderators (DeMatteo et al., 1998). Perhaps this stems from a shortcoming of meta-analytic methods. For example, the average correlation in Beersma et al.’s (2003) study ($r = .16$) is close to our reported meta-analytic estimate between team PFP and total collective outcomes ($\rho = .13$). However, a breakdown of the outcome variable in the Beersma et al. (2003) study shows substantially different effects of team PFP on the two different outcomes, speed ($r = -.26$) and accuracy ($r = .47$). When the moderating conditions are well represented, averaging effect sizes within studies can be misleading in terms of effect sizes and homogeneity.

**Team PFP research needs.** Studies of team PFP span research disciplines, yet few link disciplines, neglecting opportunities for theoretical development. For example, Knight, Durham, and Locke’s (2001) study clearly pertains to strategy literature because the authors studied “strategic risk,” but their findings have yet to be substantively integrated into strategy research.

Though social loafing is assumed to be one of the primary risks of collective PFP, few studies measure it directly (Pearsall et al., 2010). Even though team PFP is predicted to promote greater team unity, trust, cohesiveness, and support (Gomez-Mejia & Franco-Santos, 2015), team trust has not been confirmed as a mediator of the team PFP–performance relationship (Hertel, Konradt, & Orlikowski, 2004). Too much trust could instead make team members reluctant to monitor one another (Langfred, 2004) or challenge others, even though such efforts promote creativity and knowledge sharing. Finally, expectancy theory is among the most frequently cited theories for explaining how collective PFP motivates team
performance, but expectancy theory components have been measured in only two studies (i.e., Hertel et al., 2004; Kelley, Heneman, & Milanowski, 2002). Trust, cohesiveness, and coordination theories imply that smaller teams should perform better under team PFP than larger teams do, but Friebel et al. (2017) instead found the opposite, which they have called a group-size paradox (Esteban & Ray, 2001).

Further investigation is also needed regarding how different pay mixes and pay allocations (e.g., relative amount of collective versus fixed pay) influence team behaviors, attitudes, and performance. For instance, studies of organizational justice and teams (e.g., Colquitt & Jackson, 2006; Kabanoff, 1991) suggest that distributive rules based on equality can produce very different outcomes than those based on equity. At the same time, additional attention needs to be paid to outcomes, including the counterproductive behaviors that collective PFP could influence. The majority of studies we reviewed take place in laboratory settings; only two field studies use unit sales as a unit-level outcome. Various outcomes offer different information about the effectiveness and efficiency of team PFP, so knowledge from the TMT PFP literature may be informative to the team PFP literature.

Finally, greater understanding of how team PFP influences sorting is necessary. Our review shows that preferences for team PFP are more complex than those for individual PFP, spanning social and financial considerations, and suggests that research based on preferences for individual PFP is therefore inadequate for understanding preferences for team PFP. Furthermore, most scales used to measure attitudes toward team rewards have focused on nonmonetary rewards (e.g., Shaw et al., 2001). There is also no clear understanding about the stability of these attitudes, but attitudes change over time, based on life circumstances, prior experiences, and team stages (R. Heneman, Dixon, & Gresham, 2002). Longitudinal research examining sorting effects linked to applicant data and collective performance might provide new answers to some of the most pressing questions regarding sorting and collective PFP.

**Typology and Integrative Lessons Learned**

On the basis of our review of collective PFP literature, we categorized studies to build an overview of the collective PFP landscape, including similarities across literatures and topics. To build this typology, we iteratively examined studies and classified the empirical papers according to their research discipline, focus (incentive or sorting effects), locus of the collective outcome (team level, unit level, or organization level), and type of collective outcome (behavioral, financial, or operational). These dimensions are defined in Table 2. We draw on this typology to extract themes and lessons to highlight areas where further research is needed.

### Typology of Collective PFP Dimensions

**Research discipline.** Table 1 classifies collective PFP research by academic discipline. In our review, 23 studies were in economics journals, 29 in strategic HRM, 16 in OB and psychology, 17 in strategy, 19 in accounting and finance, and two in marketing. Each discipline imposes its own assumptions, methods, and priorities, such that knowledge develops in silos, inhibiting the development of a general theory and shared understanding. However, this disjointed research also reveals wide interest in collective PFP. Even though each discipline approaches the topic differently, the underlying mechanisms and consequences are
similar. Research silos highlight the need to integrate across disciplines to develop a shared understanding of collective PFP, as we discuss in Research Direction 1.

**Focus of research.** Studies involving collective PFP typically approach the topic from one of two perspectives. Studies of sorting effects focus on collective PFP preferences and entry (e.g., Bozionelos & Wang, 2007; Cornelissen, Heywood, & Jirjahn, 2014; DeMatteo & Eby, 1997) or the attractiveness of collective PFP (Geng, Yoshikawa, & Colpan, 2016; Kruse, 1996). Studies of incentive effects consider how collective PFP can lead to unit-level outcomes (e.g., Blasi et al., 1996; Johnson et al., 2006). However, narrow focus often makes it challenging to understand the specific relationships between sorting and incentive effects. Failing to integrate these two effects confounds the outcomes, creating greater ambiguity about the causal mechanisms. More work is needed to understand how both effects work together over time, as we discuss in relation to Research Directions 2 and 3.

**Locus of collective outcome.** Table 1 shows that 25 articles involved team-level outcomes, 19 addressed unit-level outcomes, and 62 pertained to organization-level outcomes. Most collective PFP research occurs at the organizational level, but isolating the specific causal mechanisms that drive collective PFP effectiveness at that level can be difficult. Focusing on the organizational level, then, may hinder theory testing and knowledge accumulation unless it is supplemented with other findings. Moreover, we observed that collective PFP research primarily focuses within rather than across levels, creating substantive challenges to understanding the multilevel aspects of collective PFP. Little attention has been paid to the question of whether management incentives influence behavior at lower levels (i.e., top-down causes) or if the behavioral responses and performance aggregated from individuals and lower levels of the organization affect managers (i.e., bottom-up consequences). We discuss these concerns in more detail in Research Directions 1, 4, and 6.

**Type of collective outcome.** The studies reviewed include behavioral, financial, and operational outcomes (Table 2). Using collective PFP can promote unit-level performance and desired behaviors, but it can also prompt social loafing (Karau & Williams, 1993; Meidinger, Rullière, & Villeval, 2003) or perceptions of inequity (Farr, 1976). Little is known about such deleterious effects. A separate challenge is understanding the theoretical meaning of various measures of the same construct. For example, it is unclear which of the PFP types drive which outcomes. This point underlies our Research Directions 4 and 5. More generally, few collective PFP studies elaborate on or test theory, and many underlying theories are based on individual-focused PFP mechanisms, as we discuss in Research Direction 1.

**Best Practices in Different Lines of Inquiry**

The unique benefits of each line of inquiry suggest substantial potential for sharing ideas and collaboration among researchers across research fields and types of collective PFP. For example, a unique feature of TMT PFP research is its emphasis on the proportion of total pay represented by TMT PFP. The findings suggest the importance of this aspect beyond the simple existence of such a plan (Carpenter & Sanders, 2004). Yet the ratio of collective PFP
to total pay is rarely considered elsewhere, as the existence of plans (Sesil et al., 2002) or the proportion of workforce coverage (Blasi et al., 2016; Kruse, 1992) is emphasized instead.

In contrast to studies of other collective PFP types, investigations of ESOPs often extend beyond performance assessments to examine more proximal outcomes, such as innovation. Gainsharing studies similarly stand out for choosing more proximal outcomes, like productivity, such that the mechanisms implied by the conceptual underpinnings differ. These features highlight the need for better consistency between theoretical mechanisms and empirical outcomes. Measures of the extent to which broad-based options apply to non-TMT employees (e.g., the eligible proportion of the workforce) might also inform TMT PFP research.

Studies of profit sharing have begun to examine temporal aspects to better understand when and how long effects persist. This research can clarify the durability and cost-effectiveness of profit-sharing plans. Some longitudinal studies also describe gainsharing, though information about temporal effects is lacking for most other types of collective PFP. Understanding the long-term effects of the different collective PFP types is necessary to judge their value to the firm.

Research into team PFP exhibits the most unique aspects that have the potential to inform other types of collective PFP research. For example, team PFP research includes the most extensive treatment of the potential pitfalls of collective PFP, such as social loafing. It also is unique in its exploration of the distribution of rewards, distinguishing equal (each member gets a fixed amount) from equitable (each member receives a percentage of individual pay) reward sharing, an insight we view as especially valuable to other streams of research. Team PFP research further provides specific insights into the consequences of combining individual and fixed pay schemes, though it tends to focus on their coexistence rather than the proportion of total pay provided by each, as is more common in TMT PFP research. Finally, experimental designs give team PFP the unique advantage of establishing causal priority more strongly.

Lessons Learned From Integration

Our review, typology, and exploration of the unique advantages of each line of inquiry suggest some general lessons learned across collective PFP types and research disciplines.

**Broad lessons.** A few general lessons stand out. First, more collective PFP research examines incentive effects (104 of 106 studies) than sorting effects (15 of 106 studies; 13 study both), even though research that highlights the importance of HCR (Nyberg, Moliterno, Hale, & Lepak, 2014) and its emergence (Ployhart et al., 2014) suggests that sorting is critical for unit performance. Further, what we know about sorting primarily reflects a turnover perspective, rather than revealing the attractiveness of the PFP system or its impact on the characteristics of the workforce. Second, the locus (i.e., team level, unit level, or organization level) of collective PFP outcomes correlates closely with collective PFP types (e.g., team PFP, gainsharing, stock options) and disciplines (e.g., economics, psychology). Knowledge learned in one area does not appear to permeate other areas. Third, collective PFP positively influences collective outcomes, but many questions remain about the causal mechanisms driving such results.
Collective PFP incentive effects. The collective PFP incentive effects studied span a variety of research disciplines. According to our meta-analysis (Table 2), the overall effects of collective PFP in any form on collective outcomes are positive and statistically significant ($\rho = .11, SD_\rho = .02; p < .001$) but also heterogeneous ($Q = 205.62; p < .001$). Nevertheless, we note contradictory findings and make room for theoretical advancement.

A theoretical perspective based on instrumentality (Vroom, 1964) suggests individual-based PFP should be more effective than collective PFP, because collective outcomes depend on factors outside an individual’s control (DeMatteo et al., 1998; Hertel et al., 2004; Kuvaas, 2006; Magnan & St-Onge, 2005), which can weaken the line of sight. Extrapolating this finding, the better the line of sight, the more effective collective PFP should be (Oyer, 2004). But our meta-analytic findings contradict this prediction, suggesting the need for further research.

Prevailing theory also suggests collective PFP should drive collective support and coordination among coworkers (Barnes et al., 2011). This perspective is elaborated using ideas from the collective-effort model (Karau & Williams, 1993), agency theory (Jensen & Meckling, 1976), and social motivation (Bandiera et al., 2009). However, even though many articles apply these rationales, they rarely test these mechanisms explicitly.

Another theoretical issue relates to how the type of collective PFP influences workers, as collective PFP can be distributed either equally or equitably. When it is distributed equally, PFP is contingent on team outputs and shared equally among team members. When it is distributed equitably, it is contingent on team outputs but shared among team members according to their individual contributions (e.g., Miller & Hamblin, 1963; Weinstein & Holzbach, 1973). To the degree that team PFP is split equitably rather than equally, it more closely approximates individual-based PFP. Other distributions of collective PFP rely on a within-team tournament scheme (e.g., Beersma et al., 2009; Johnson et al., 2006). These differences hinder comparisons of the incentive effects of collective PFP but also present research opportunities.

Mixed PFP systems. Collective PFP plans often combine with individual pay schemes, and this emerges from our review as an important but cloudy issue. Such complex pay systems are common and intuitively appealing, yet Barnes et al. (2011) offer a cogent argument against them. Furthermore, few studies examine mixed PFP schemes and the specifics of the pay mix. Empirical results have been inconsistent; some studies concluded that mixed PFP outperforms both team and individual PFP (e.g., Blazovich, 2013; Fan & Gruenfeld, 1998; Guthrie & Hollensbe, 2004; Pearsall et al., 2010), but others reported detrimental effects, concluding that mixed signals create a social dilemma that hinders members’ ability to allocate resources across tasks and goals (e.g., Barnes et al., 2011; DeShon, Kozlowski, Schmidt, Milner, & Wiechmann, 2004; Wageman, 1995). However, drawing conclusions is challenging due to inconsistent conceptualizations and measures of mixed PFP, which might be observed in the level or ratio of PFP, or else in the existence of a system, and involves choices about how to treat pay levels.

Finally, the reviewed research in this realm also frequently suffers from a severe restriction of the range of collective PFP levels, sometimes motivating student participants with small sums of money to perform tasks that are of little importance to them (Barnes et al., 2011; Dohmen & Falk, 2011). The inconclusive results may indicate that collective PFP operates differently across contexts (Schwab, 1991). However, understanding mixed PFP is crucial to the development of the collective PFP literature, because it is the most common
collective PFP scenario in organizations (e.g., fixed plus variable pay), so understanding how mixed PFP works in lab settings could inform studies in areas like TMT PFP, where data are harder to obtain.

**Collective PFP sorting effects.** Sorting research adopts perspectives from either economics, where pay type is matched with performance expectations (e.g., Lazear, 1986), or psychology, which recognizes that pay type can influence HCR composition, in line with predictions from individual attraction theory (e.g., Cable & Judge, 1994; Fang & Gerhart, 2012). The economic perspective implies that certain workers—such as better performers and those with high-risk preferences—seek PFP (Gerhart & Milkovich, 1992), leading to better collective performance (Cadsby, Song, & Tapon, 2007). The psychology perspective predicts that people are attracted to firms that employ workers similar to them and that those who are different leave the organization (Schneider, 1987). This model implies that groups become more homogeneous over time due to several influences, including pay practices.

Sorting also has evolved into its own theoretical perspective, crossing disciplines, though consistently maintaining an individual-level focus. For instance, Belogolovsky and Bamberger (2014) examined how pay secrecy influences sorting effects and determined that high performers are the most sensitive to negative PFP perceptions. Most theoretical work seeks to identify individual attributes (e.g., risk preference, performance capability) that determine individual pay preferences (e.g., Shaw et al., 2001), effects on productivity (e.g., Dohmen & Falk, 2011; Larkin & Leider, 2012), or the likelihood that higher performers will be more sensitive to pay and promotions (Nyberg, 2010). As described throughout, these studies offer implications for collectives, but their inferences rest on individual-level theory and studies rather than considerations of emergent effects or other potential differences across levels of analysis.

An additional complexity related to sorting is that the sorting process itself changes the nature of a unit and therefore can shape its attractiveness to new members. For example, if a firm’s collective PFP practice attracts high performers, the resulting setting will be populated with high performers. Prospective employees might then see limited opportunity for social recognition and prestige compared with other contexts. The complexities of such emergent processes (D. Chan, 1998; Kozlowski & Klein, 2000) suggest the need for more explicit theory about whether, how, and when the attractiveness of pay systems contributes to HCR.

In the few studies that consider both sorting and incentive effects on collective outcomes (e.g., Gerhart & Milkovich, 1992), the combination of better employees and greater motivation led to higher collective performance. Yet even collective PFP studies that have direct implications for sorting effects rarely mention it directly. For example, Green and Heywood (2011) showed that employees receiving profit sharing are less likely to leave their company, but the authors did not discuss sorting effects. Cornelissen et al. (2014) offered a notable exception: They found that firms with profit sharing are more attractive to potential employees.

**Line of sight.** Collective PFP types that target different outcomes and levels appear to have effects of similar magnitude (Table 3), despite theoretical predictions that the line of sight should be stronger for team PFP. Several explanations for this are plausible. First, firm performance may be important enough to outweigh the line-of-sight influences. Alterna-
tively, line of sight might not be as influential as has been assumed, or the coordinative effects of collective PFP could outweigh financial incentives. This result also could reflect an artifact of the empirical differences across studies. For instance, team PFP studies often compare individual PFP to team PFP, but gainsharing and ESOP studies tend to compare the use of collective PFP to a lack of PFP or investigate differences in the proportions of employees affected by collective PFP when all firms in the sample offer it. Additionally, the higher-order collective PFP outcomes are almost exclusively based on adding collective PFP without decreasing individual PFP, whereas in labs, trade-offs between collective PFP and individual PFP are common.

Pay policies are organization-level choices, intended to affect organizational outcomes. Such outcomes have their foundation in individual reactions and behaviors, but the issue of how they combine to influence higher levels remains largely untested. Along these lines, reward effectiveness might vary depending on person and group characteristics (e.g., size). Identifying differences among the mediating mechanisms (teamwork processes, emergent states) would also extend insights (Cohen & Bailey, 1997; Ilgen, Hollenbeck, Johnson, & Jundt, 2005; Marks, Mathieu, & Zaccaro, 2001). For example, benefits might accrue from exploring how collective PFP leads to the formation of teams and members’ willingness to work together to achieve a common outcome, as well as how focusing on different outcomes can encourage teamwork.

**Task interdependence.** Our review of team PFP literature suggests that task interdependence moderates the relationship between collective PFP and performance (e.g., Libby & Thorne, 2009; Miller & Hamblin, 1963; Wageman, 1995). When tasks are less interdependent, the cooperation and mutual support promoted by collective PFP schemes are less valuable, limiting the motivation for and benefits of such behaviors. Most studies involving task interdependence occur at the team level, but the lessons likely apply to other levels (e.g., TMT), which raises questions about how organizations should tailor collective rewards to groups with various structures. For example, applying ESOPs to an entire firm with highly interdependent functions might be beneficial. Similarly, it would be helpful if research could identify how higher percentages of TMT PFP affect TMT coordination (e.g., increasing communication and coordination between finance and sales leaders). These lessons also may suggest that ESOPs and gainsharing could be more effective for tasks that are more interdependent.

**Social loafing and free riding.** Theories of social loafing and free riding suggest that collective PFP can cause employees to shirk responsibility (Holmström, 1982; Jones, 1984). Perhaps smaller collectives are more responsive to collective PFP, but contrasting theories suggest larger groups are more appropriate when rewards are public (Esteban & Ray, 2001). Social-loafing concerns appear much more frequently in team PFP studies than other settings, and studies of nonteam PFP types might benefit from incorporating this theoretical perspective.

The influences of social loafing and free riding also could have different effects in the field versus the lab, potentially because these issues are not as pertinent as theory suggests or are simply easier to capture in a laboratory setting (Karau & Williams, 1993). Participants in laboratory studies often experience less peer pressure to avoid free riding, and they lack motivational forces associated with the prestige of a job, career advancement, or being fired,
so they may exhibit a greater propensity to free ride than do real workers in firms. In the lab, groups brought together for a short time also may be less trusting of others and thus less strongly influenced by collective PFP. Many lessons learned from team PFP lab studies thus cannot perfectly reflect the responses to collective PFP that are likely to arise in professional environments, although they raise important issues.

**Collective PFP type and context.** TMT PFP appears to be more impactful on operational outcomes than other collective PFP types (Table 3). It is unclear why, but isolating these effects could prove insightful. For example, the differences may reflect line-of-sight considerations or suggest that TMT PFP is more effective than broad-based stock options because TMT members receive a higher percentage of contingent pay. In this sense, collective PFP magnitudes may produce varying results. These differences would be difficult to isolate in firms but could be addressed in the lab using teams. Although different theoretical perspectives sometimes lead to contradictory conclusions, they can also point to opportunities.

Greater contextual variety also is needed to examine each collective PFP type. Different measurement methods are closely linked to the collective PFP type examined: Team PFP research often relies on laboratory settings (e.g., Barnes et al., 2011; Guthrie & Hollensbe, 2004), TMT PFP research primarily uses archival data extracted from Execucomp (e.g., Carpenter & Sanders, 2002; Hambrick et al., 2015), and surveys are the most common tools for gainsharing and profit-sharing studies. These differences partially reflect the predominant research discipline (e.g., team PFP is studied primarily in OB and psychology, while TMT PFP research is most frequently studied by strategy scholars), but they also relate to the research requirements. For example, it would be difficult to conduct lab studies with TMT samples. However, the stark measurement differences, which closely correspond to the collective PFP level, raise the possibility that measurement issues confound the differences across collective PFP types.

**Antecedents of collective PFP.** The scope of our review did not allow for a comprehensive examination of the antecedents of collective PFP, though our discussion of the causal ambiguity in some studies implies its importance. Several articles examined the conditions in which gainsharing (Collins, Hatcher, & Ross, 1993), profit sharing (Kruse, 1996; Long & Fang, 2015), and broad-based stock options (Core & Guay, 2001) tended to be adopted (Yanadori & Marler, 2006), yet these are among the least theoretical papers contained in our review. Rather, they are descriptive, as the theory about why collective PFP comes into existence and how it changes over time is notably underdeveloped.

**Looking Forward: Research Directions and Suggestions**

Drawing from these results, we present six research directions and an agenda for research derived from the extant literature. Table 5 presents a summary of these insights.

1. **Develop and Integrate Collective Motivational Theories**

Collective PFP lacks a cohesive theory due to a lack of group-level motivational theories (G. Chen & Kanfer, 2006) as well as inappropriate applications of individual-level theories
to collectives. The theories applied to team PFP often differ from those pertaining to TMT PFP, ESOPs, and broad-based stock options, and research in gainsharing and profit sharing rarely focuses closely on theory. Furthermore, several inconsistencies among theoretical perspectives are noteworthy, such as the persistent disconnect between lower- and higher-order PFP theories. For instance, management research about individual responses to PFP relies on psychological theories, such as expectancy theory (Vroom, 1964), to explain how PFP affects

Table 5

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<thead>
<tr>
<th>Future Directions for Collective PFP Research</th>
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<tbody>
<tr>
<td>1. Develop and integrate collective motivational theories.</td>
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<tr>
<td>Reduce overreliance on individual-level theories.</td>
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<td>Consider how pay spans levels and hierarchies.</td>
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<td>Connect lower- and higher-order motivational theories.</td>
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<td>Integrate between person and across levels.</td>
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<td>Recognize the motivational effects of collective PFP for interdependent work.</td>
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<td>Address how to achieve optimal individual and higher-order outcomes.</td>
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<td>Identify boundary conditions and contingencies that affect collective PFP.</td>
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<td>Address the top-down and bottom-up effect of collective PFP.</td>
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<td>Address line-of-sight issues.</td>
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<td>Increase integration of expectancy and agency theory.</td>
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<td>Integrate team-level and organizational-level perspectives.</td>
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<td>2. Examine sorting and incentive effects of collective PFP.</td>
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<td>Consider sorting at the collective level and its effects on HCR.</td>
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<td>Consider sorting and incentive effects simultaneously.</td>
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<td>Evaluate how collective PFP practices affect sorting.</td>
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<td>Investigate how collective PFP affects sorting over time.</td>
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<td>Examine individual preferences in regards to collective PFP schemes.</td>
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<td>Explore the effect of collective PFP on culture.</td>
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<td>3. Elaborate on the temporal processes of collective PFP.</td>
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<tr>
<td>Consider short- and long-term trajectory of outcomes due to collective PFP schemes.</td>
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<td>Investigate how employees react to collective PFP changes over time.</td>
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<td>Think through how changes in collective PFP change human capital resources.</td>
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<td>Consider how PFP varies with changes in employees’ job requirements over time.</td>
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<td>4. Examine collective PFP effects on competitive advantage.</td>
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<td>Examine how leaders establish and communicate collective PFP affects effectiveness.</td>
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<td>Study how collective PFP practices evolve over time and the combinations of various collective PFP schemes.</td>
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<td>Investigate how collective PFP contributes to microfoundations perspectives.</td>
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<td>Identify how collective PFP systems fit within other human resources systems and strategies.</td>
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<td>5. Explain how collective PFP outcomes should be operationalized.</td>
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<td>Investigate the effects of numerical- versus behavioral-based targets.</td>
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<td>Investigate collective counterproductive behaviors that may result.</td>
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<td>Explore how collective PFP feedback affects collective PFP efficacy.</td>
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<td>6. Examine relationships across elements of the total compensation system.</td>
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<td>Explore how the entire compensation system fits with collective PFP schemes.</td>
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<td>Investigate how human resources systems’ alignment with collective PFP schemes affects outcomes.</td>
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<td>Think through how nontangible rewards affect collective PFP outcomes.</td>
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<tr>
<td>Identify how collective PFP affects the unit’s coordination, communication, motivation, behaviors, and performance.</td>
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*Note: PFP = pay for performance; HCR = human capital resources.*
individual behavior (H. Heneman & Schwab, 1972). In contrast, research into firm outcomes is grounded in economic theories, such as agency theory (Jensen & Meckling, 1976), which predicts that equity motivates employees to achieve firm goals and assumes that firms know which behaviors drive those goals. However, most research neglects between-person or cross-level mechanisms that connect unit behavior to firm outcomes, such as interdependence, social forces, or emergence. Psychology and economics studies rarely incorporate lessons from one another (Gupta & Shaw, 2014; Shaw, 2014). Interest in bridging conversations is increasing (e.g., Larkin, Pierce, & Gino, 2012; Nyberg, Pieper, & Trevor, 2016), as is recognition of the need to integrate perspectives (Gerhart, 2005; Gupta & Shaw, 2014). But the lack of cross-level PFP research (Shaw, 2014, 2015a) limits knowledge of how collective PFP plans affect cross-level outcomes.

New insights into collective PFP could stem from understanding the trade-off created by expectancy theory and agency theory, and between line of sight and alignment. Expectancy theory (Vroom, 1964) implies that a clear line of sight between pay and performance increases employee effort (Porter & Steers, 1973). At the individual level, this effect can explain employee motivation, assuming the rewards and requirements are clear (Schwab, Olian-Gottlieb, & Heneman, 1979). However, the value of such rewards decreases as the line of sight blurs. In contrast, agency theory calls for alignment when causal ambiguity, social complexity, or information asymmetry make it difficult to specify precise employee actions that promote unit goals (Fama, 1980; Fama & Jensen, 1983; Jensen & Meckling, 1976). Expectancy and agency theory are rarely considered together, though, perhaps because they stem from two distinct disciplines. In a collective PFP context, these theories predict contrasting motivations, and a trade-off arises between PFP that maximizes the line of sight and PFP that rewards common interests. One way to increase understanding of these areas is to combine knowledge about collective PFP in small teams and in TMTs. Theoretical mechanisms for balancing these perspectives could enhance collective PFP research, such as examining TMT members’ awareness of their collective PFP and the degree to which percentages of collective PFP correspond with TMT cohesion and cooperation.

The collective-effort model (Karau & Williams, 1993) offers a potential way forward by extending expectancy theory to team contexts, where working on group tasks leads members to view their individual efforts as more dispensable, decreases expectancy, and reduces instrumentality. The collective-effort model also explicates how work interdependence within and across levels leads to multiple pay practices that may target different outcomes and behaviors. When performance is determined by factors beyond one’s own control (including the efforts of teammates), the line of sight between individual effort and the reward gets blurred (Schwab, 1973), prompting social loafing (Karau & Williams, 1993). Other issues related to team-level rewards include perceived inequity, which occurs when team members appear to contribute unequally but receive the same reward (Farr, 1976). However, despite its potential promise, the collective-effort model has not received widespread attention or been linked closely to collective PFP. It appears just once among our reviewed works (Barnes et al., 2011).

To understand the phenomenon of higher-order collective PFP, we need additional theory to clarify when, how, and why collective PFP is more or less effective. Collective PFP influences cohesion, information sharing, and teamwork, but it may harm individual performance (DeMatteo et al., 1998). At higher levels, collective PFP effects are even more challenging to
balance, because a change to one aspect of pay can alter relationships and behaviors at that level as well as the levels below. Interdependence may help reveal ways to optimize collective PFP, but it means different things, depending on the level of analysis and the historical context.

Finally, continued research should recognize that collective PFP is characterized by both top-down and bottom-up processes. In top-down processes, managers set pay practices for subordinate units but are paid for higher-level outcomes. The manager’s PFP affects how she or he deploys, directs, and monitors subordinates. Managerial intent flows from the top, but the behaviors that pay systems motivate emerge from the bottom. Understanding these contrasting flows requires careful attention to collective PFP throughout the organization, including understanding why TMT members respond differently than other groups to collective PFP.

2. Examine Sorting and Incentive Effects of Collective PFP

Few studies examine sorting effects at the collective level, and even fewer consider them alongside incentive effects. These two elements are essential for collective formation and motivation; examining them together could lead to increased understanding of the role of collective PFP in organizations. Evidence regarding sorting effects centers on the individual level, but over time, sorting must also affect emergent HCR. It is even possible that collective PFP could be an attractive sorting mechanism but also lead to greater job dissatisfaction, which could translate into greater voluntary turnover.

Individual PFP clearly influences sorting (Gerhart & Rynes, 2003; Shaw & Gupta, 2007), but how do employees view collective PFP, and what factors do they consider when selecting a firm? Do they prefer practices that reward behaviors within their control or those that consider their contributions to greater outcomes? Do they weigh the social benefits of team interdependence? Sorting research that describes how PFP influences decisions to join or stay with an organization implies that these strategies can attract, retain, and drive out employees, but entry and exit are affected at different times, potentially influencing collective PFP effectiveness (Cable & Judge, 1994; Cadsby et al., 2007; Gerhart & Rynes, 2003; Lazear, 1986, 1999; Nyberg, 2010; Rynes, 1987). Although individual sorting research is robust, it is not clear that we should expect the same results in collective PFP situations. For instance, if a firm succeeds in attracting high performers, it may become more attractive if the collective PFP system is based on cooperation, but a competition-based system may become unattractive to all but the highest performers once a firm is composed of especially effective workers.

It also would be useful to explore the role of collective PFP in shaping organizational culture or how collective PFP and culture interact to influence employee sorting, attitudes, and behaviors. Collective PFP affects employee attraction, selection, and attrition by communicating an organization’s values, goals, culture, and interests (Rynes, 1987). These factors are the basis for Schneider’s (1987) vision of the attributes that produce homogeneity. However, we also note confounding incentive and sorting effects. The role of collective PFP can help shape HCR and organizational culture (Nyberg & Ployhart, 2013). Simultaneously, it affects the motivation associated with HCR, such that collective PFP will attract different people than would individual PFP as well as motivate them differently. High performers may find it more difficult to attain recognition or advancement in a firm with other high achievers. This combination of factors, prompted by collective PFP, requires further investigation; we
note particularly the possibility of replicating Lazear’s (2000) work in different environments, job levels, and complexity levels.

3. Elaborate on the Temporal Processes of Collective PFP

A commonality across collective PFP types is that the research rarely considers the role of time or change. However, such considerations are crucial, as exemplified by the historical effects observed by Johnson et al. (2006). They showed that reactions relevant to the introduction of individual and team PFP depend heavily on the PFP practices previously in place. Similarly, research on ESOPs and broad-based stock options shows the effects of these systems can be short-lived as employees can learn to manipulate the system. As time is perhaps the least studied area in collective PFP research, studying its motivations cross-sectionally limits the practicality of the conclusions (Nyberg et al., 2016).

Exploring the duration of collective PFP effects also might provide theoretical and practical benefits. Organizational change and inertia, shifts in referent others, and habituation to outcomes all suggest the need to understand how time affects collective PFP outcomes. Some studies consider PFP over time (e.g., Nyberg et al., 2016; Tenhiälä & Lount, 2013), but they generally use time as an analytical tool rather than focus on duration or its changing consequences. In particular, Sesil and Lin (2011) showed that broad-based stock options’ productivity benefits lasted 6 years for executives but just 2 years for other employees. Further, pay systems are designed to motivate specific outcomes marked by interdependence among tasks, demands, and organizational levels (Van de Ven, Delbecq, & Koenig, 1976). When first implemented, the disruption and acclimation caused by a change can delay benefits; longer-term changes and diminished attention instead eventually might reduce the efficacy of such shifts. Accounting for temporal changes in PFP represents a valuable research opportunity.

4. Examine Collective PFP Effects on Competitive Advantage

A raison d’être of many TMT and strategic HRM studies is identifying sources of competitive advantage. Despite its potential to inform such conversations, though, collective PFP is rarely described as a viable mechanism for creating competitive advantage. However, Obloj and Sengul (2012) illustrated the possibilities of companies using collective PFP to differentiate themselves from their competitors. As collective PFP practices evolve over time, combinations of collective PFP practices might be causally ambiguous or inimitable, potentially leading to strategic value, similar to the way that HRM can drive organizational performance and create a competitive advantage (Chadwick & Dabu, 2009).

In the strategic management literature, a growing interest in microfoundations (Felin & Foss, 2005; Felin & Hesterly, 2007; Foss, 2011)—that is, understanding individual-level constructs in firm-level theorizing—suggests a desire to describe emergent HCR processes (Coff & Kryscynski, 2011). Three studies (Felin & Foss, 2005; Felin, Foss, & Ployhart, 2015; Felin & Hesterly, 2007) advanced these ideas by contrasting individual- and collective-level explanations. Collective PFP in turn could inform how collective effort emerges to produce organizational actions. Collective PFP therefore offers a new way to consider strategic value (see also Balkin & Gomez-Mejia, 1990; Gerhart & Milkovich, 1990), and more research should focus on how to use collective PFP strategically.
The ramifications of collective PFP also may be less predictable than those of individual PFP, similar to the differences that result from shifting from examining human capital at the individual level to focusing on HCR (Nyberg et al., 2014; Ployhart et al., 2014). To investigate these effects, researchers could combine what we know from micro- and macrolevel studies to clarify what motivates focal actors and what collectively leads to higher-order outcomes (Nyberg & Wright, 2015). Additionally, collective PFP may be firm specific, especially when bundled with other HRM systems. Even general organizational components, when combined in heterogeneous firms, are firm specific (Lazear, 2009). This idea is often overlooked, but it provides a way to understand how collective PFP can sustain competitive advantage by matching a specific organization’s values, culture, policies, and systems. Such matches are challenging for competitors to emulate, particularly in complex organizations. More research should examine the role of collective PFP in producing parity and competitive advantage, such as by comparing firms’ productivity or market competitiveness as a function of differences in its collective PFP.

5. Explain How Collective PFP Outcomes Should Be Operationalized

The range of constructs examined in the collective PFP literature is limited, but measures of these constructs have proliferated. These substantially different indicators often come with important and unrecognized theoretical distinctions. Throughout this review, we have highlighted some seemingly nuanced differences among measures with important empirical and theoretical implications. Even though the outcomes of collective PFP are limited to a few constructs that are consistent within disciplines, specific choices about which type of collective PFP practices to study also drive the choice of outcomes. Complex differences arise between criteria based on hard numeric outcomes and those based on behaviors or adherence to processes (Sarin & Mahajan, 2001). Recognizing and explaining these differences and their effects on sorting and incentive effects could advance our understanding of PFP. Another option would be to consider counterproductive work behaviors. Although they did not measure outcomes at collective levels, two studies indicated that collective rewards were “too motivating” because they promoted individual-level lying and other unethical behaviors (Conrads, Irlenbusch, Rilke, & Walkowitz, 2013; Danilov, Biemann, Kring, & Sliwka, 2013).

Organizations ought to convey expectations, and these communications should be captured accurately in organizational research (Rynes et al., 2005). Accurately portraying information improves the perception of fairness in collective PFP decisions (Fulmer & Chen, 2014). Feedback also must be timely for employees to learn from it. When performance feedback occurs infrequently or unclearly, it makes it difficult for employees to understand expectations or make adjustments. Hence, timely, accurate performance feedback is necessary to communicate organizational goals efficiently (Rynes et al., 2005). Accurately measuring performance also improves the efficacy of the measure, such that collective PFP should be more effective if performance outcomes are measured and clearly tied to pay (Trevor, Reilly, & Gerhart, 2012). Although this effect seems clear at the individual level, how it functions at the collective level remains unknown, and future research should explore variants of collective PFP and examine more proximal outcomes. In this area, gainsharing might inform TMT PFP research, because it often measures productivity gains closely tied to introducing gainsharing plans, whereas similar clarity related to performance outcomes is rare in TMT PFP research.
The variety of methods, measures, and contexts across disciplines also presents an opportunity for closer cooperation. For example, research into team PFP tends to involve lab studies, and TMT PFP research exclusively takes place in the field. Labs provide easier data access, facilitated by the ability to test mechanisms, survey the participants to learn about their mental states, engage in repeated trials under various conditions, and check causal claims. However, they also suffer from small financial motivations, inconsequential tasks, disengaged student samples with no real motivation to perform, and time limitations. TMT PFP studies exhibit complementary strengths and weaknesses: Data are hard to access and rarely include attitudinal or perceptual measures, and causation is often questionable, but the monetary consequences are substantial, actors are highly motivated, and time horizons are flexible.

6. Examine Relationships Across Elements of Total Compensation Systems

Our review reveals that collective PFP often operates in concert with other elements of an overall pay system. To capture more realistic applications, research should explore the relationships of different pay types (e.g., fixed salary) to collective PFP to examine their sorting and incentive effects. The effects of any given collective PFP practice may also reach beyond what is intended. For example, our review showed that collective PFP can cause workers to focus their efforts on work team performance at the expense of cooperating with other units.

A system-level approach to collective PFP could mirror strategic HRM research (Wright, Dunford, & Snell, 2001; Wright & McMahan, 1992) that often assumes an aggregate level of human capital (Wright & McMahan, 2011) and seeks systems to align HRM practices (Becker & Gerhart, 1996). Evidence to support such an approach is found in Blasi et al. (2016), who did not find that a single collective PFP type (i.e., broad-based stock options, ESOPs, profit sharing, or gainsharing) had a significant effect on voluntary turnover, but combining these collective PFP types into a single index revealed positive retention effects. Researchers ought to identify additional mechanisms by which collective PFP affects employee coordination, communication, and motivation while promoting firm goals and how these mechanisms work in concert.

Attending to levels of analysis is also important to advance research into collective PFP. The logic explaining inconsistent findings in teams mimics the logic of individual PFP, where using PFP to focus efforts on individual performance can divert attention from higher-level outcomes. This logic also applies to higher levels, such that collective PFP focused on business units might detract from firm-level performance in the presence of interdependence or competition. However, it may also be that rewarding performance at a higher level of analysis will motivate leaders to be alert to such problems. This implies that top-down and bottom-up processes are unique and operate differently. Investigations could lead to a better understanding of the trade-offs and contingencies across different types of collective PFP.

Limitations

Notable limitations of this review suggest opportunities for further research. First, we focus on the role that collective PFP plays in sorting employees into collectives and motivating collective outcomes; as a result, we exclude individual PFP studies (e.g., Jenkins et al., 1998) unless they simultaneously consider collective PFP and outcomes. Second, the six collective PFP types may confound organizational structures (e.g., team) with certain
collective PFP types (e.g., team PFP bonus). We use this categorization nonetheless because it provides a parsimonious way to identify, classify, and examine collective PFP. Third, we consider TMT PFP but not studies focusing exclusively on CEO PFP or pay dispersion (Nyberg et al., 2010; Shaw, 2014).

A substantial caveat of the conclusions drawn from our meta-analysis is that of the 106 empirical articles, only 41 included usable bivariate estimates, in part because the norms for reporting such relationships vary across disciplines. This raises two primary concerns. The first is that we may not have enough studies, particularly in some categories, to reach meaningful conclusions. The second is that we are meta-analyzing only those results that report bivariate relationships, meaning there is substantial knowledge omitted from our quantitative analyses.

Another substantial shortcoming of this review is that it is intended to combine insights from several disparate streams of literature and topics, highlight commonalities, and suggest specific areas for future research, but we stop short of actually developing a theory about these closely related collective PFP types, despite the need for such an effort.

**Conclusion**

The growing interest in behavioral economics (Ariely, 2008; Thaler & Sunstein, 2008) has led to a proliferation of PFP studies that relax traditional assumptions about individual economic rationality (Camerer & Hogarth, 1999). In the strategy literature, the expanded focus on microfoundations (Felin & Foss, 2005; Felin & Hesterly, 2007; Foss, 2011) and efforts to understand individual-level constructs in firm-level theorizing have produced a macrolevel perspective on emergent processes (Coff & Kryscynski, 2011; Ployhart & Moliterno, 2011), including PFP sorting and incentive effects. OB/psychology has a growing interest in higher-order outcomes (Ployhart, 2015), manifested in team-level research (Humphrey & Aime, 2014). These areas of scholarship adopt novel approaches, but they also share an interest in the role of sorting people into units and the resulting relationship between collective PFP and performance. Attending to insights from other fields can prevent a duplication of effort and create new insights. Our multidimensional review relies on and informs this convergence and identifies opportunities for collective PFP research. This integration also points to some congruence across disciplines. The broad interest in collective PFP implies unique research opportunities that span levels to inform researchers and practitioners about how collective PFP can function to attract talent, motivate employees for a common cause, and strategically differentiate an organization.

The 106 empirical articles we reviewed examine collective PFP across diverse disciplines. They offer distinct but complementary perspectives on how different types of collective PFP can sort people into collectives and then incentivize those collectives to perform. Examining precisely how PFP relates to collectives and collective outcomes can advance the conversation about how to optimize performance through collective rewards. We hope this review informs ongoing PFP scholarship by broadening the understanding of collective PFP across research disciplines and integrating the research. Finally, because collective PFP can be an important source of competitive advantage, our review has nontrivial managerial implications that are relevant for many organizations.
Notes

1. Incentives can have a technical meaning; however, following Gerhart (2017), we use the broad definition of an “inducement offered in advance to influence future performance” (Newman, Gerhart, & Milkovich, 2017: 709).

2. Team and group are often used interchangeably (Cohen & Bailey, 1997). We use teams to refer to two or more employees with some interdependence, considered a defined entity within the organization (Cohen & Bailey, 1997; Guzzo & Dickson, 1996).

References


