Pay Dispersion

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Abstract
This article describes and evaluates the substantial literature on the performance-, turnover-, and attitude-related outcomes of pay dispersion. In the past 15 years, compensation researchers have identified and pursued the resolution of well-known theoretical dilemmas about reward allocations and, as a result, have made much progress in terms of understanding the consequences of pay structures. This review explores the evolution of several contingencies of these relationships, including the effects of explained versus unexplained variation in pay, the role of work interdependence, and the nature of other pay-system characteristics. The article concludes with a summary evaluation, the proposal of several stylized facts about the consequences of pay dispersion, and a research agenda to aid researchers in addressing unresolved issues in the literature.
INTRODUCTION

Many areas of compensation research are considered neglected (Gupta & Shaw 2014), but investigations of the consequences of pay dispersion continue apace in the organizational literature. Pay dispersion, which is also referred to as spread, range, variation, and inequality, is defined generally as differences in pay levels between individuals within (i.e., horizontal or lateral dispersion) and across (i.e., vertical dispersion) jobs or organizational levels (Shaw et al. 2002). Pay dispersion research is informed by a variety of theoretical perspectives, appears in outlets across the spectrum of organizational science (psychology, organizational behavior, human resource management, finance, strategic management, economics, sociology, public administration, sports, and the health sciences, to name a few), and examines outcomes across the individual (e.g., Becker & Huselid 1992), team (e.g., Bloom 1999), organizational (e.g., Shaw & Gupta 2007), industry (e.g., Lin & Tomaskovic-Devey 2013), and societal (e.g., Freeman 2000) levels of analysis.

For the past two decades, researcher interest in the consequences of pay dispersion was buoyed by the perception of a theoretical conundrum in the literature. Pfeffer & Langton’s (1993, p. 382) influential paper began with the statement that “there is currently a theoretical dilemma in the literature concerning reward allocations in organizations.” This statement, although a clear simplification of the underlying issues, seemed to set the tone for many subsequent years of research. Many of the studies reviewed here were framed as attempts to resolve the discord between perspectives suggesting that either compressed or dispersed pay structures were better suited to facilitate individual motivation and organizational effectiveness.

The steady scientific curiosity about pay dispersion appeared alongside vibrant social commentary about appropriate levels of pay spread (Yglesias 2013), cross-cultural comparisons of gaps between factory-floor and C-suite employees (Lazear & Shaw 2008), and the maelstrom of attention paid to individual executives when they receive windfall gains (Fiss et al. 2012). The spirited public-sector and media-based debate reached an apex with the worldwide financial crisis that began in 2007 when record bonus levels in the financial sector preceded a substantial recession, pay freezes and cuts for millions, and high unemployment levels worldwide (Wanberg 2012). Vertical pay dispersion issues may have garnered the most attention, but horizontal pay dispersion issues also remain in the public eye, although perhaps more indirectly. There is ongoing discussion concerning the appropriateness of a migration to dispersion-creating practices such as performance-based pay in the education and government sectors in the United States (Sojourner et al. 2013) and in places such as Hong Kong and Finland (Mitra et al. 2013) where seniority-based practices and pay compression were the norm historically.

In this article, I review and evaluate the literature on the individual, team, and organizational consequences of pay dispersion. The article builds on recent reviews and analyses of the pay dispersion literature (e.g., Gupta et al. 2012) and focuses on the literature relevant to organizational psychology and organizational behavior. I focus primarily on the research conducted in the past 15 years, with selective attention to certain older pioneering works and founding theoretical perspectives. Although I center the review on research in organizational psychology and behavior, I also draw selectively from work in economics and other disciplines. I begin with a brief review of studies that examine the relationship between pay dispersion dimensions of performance, including those examining organizational-, team-, and individual-level outcomes. I then expand the scope of the review to include turnover and worker attitudes. Integrating and extending these general reviews, I then outline an extensive set of suggestions for future pay dispersion research.

I made several decisions in setting the boundaries for this article. First, studies of the relationship between (a) pay structure within small top management teams (TMTs) and (b) distal
financial, accounting, and market-based measures of performance (e.g., Carpenter & Sanders 2004, Kale et al. 2009, Siegel & Hambrick 2005) were generally excluded. I chose instead to focus on studies that examined proximal measures of performance, such as organizational-level productivity, efficiency, and quit rates; team performance; and individual effort, which are more germane to the study of organizational psychology and organizational behavior. Second, I devote little attention to discussing issues related to the operationalization of pay dispersion. A variety of measures of pay dispersion appear in the literature (e.g., range, coefficient of variation, standard deviation, Gini coefficient, ratio of nonmanagerial to managerial pay), and some researchers strongly advocate one type over others. But, studies that have examined alternative dispersion measures show very strong intercorrelations (e.g., Shaw et al. 2002, Yang & Klaas 2011). In addition, despite arguments about the form and function of different operationalizations, the literature is bereft of studies that advance differential predictions for conceptualizations and operationalizations of dispersion. Given the difficulty in obtaining data on pay structures, I do not anticipate a surfeit of future studies designed to compare and contrast alternative measurement approaches in the near future. Thus, unless noted, pay dispersion, variation, range, spread, and inequality are assumed to be synonymous in this review. Third, it was my aim to make the literature review in organizational psychology and organizational behavior exhaustive for the past 15 years; the approach for including literature outside of these subdisciplines and for older works is intended to be representative. Fourth, the pay dispersion literature is somewhat unique because of the oversupply of studies using sports team samples. Ehrenberg & Bognanno’s (1990a, b) influential studies of pay spreads in professional golf were among the first, but they were followed by pay dispersion studies in motorsports racing, baseball, hockey, basketball, American football, world football (soccer), tennis, and marathon running, to name a few. There is a temptation to review these studies separately; as Milkovich et al. (2011) noted, many work environments do not share much commonality with a round of golf. But, after my evaluation of the literature, the findings of these studies seemed no more disparate than those found in the broader literature. As a result, I decided instead to incorporate them in the sections based on outcome type and unit of analysis rather than by sample type.

**PAY DISPERSION AND PERFORMANCE**

In painting a picture of the theoretical debate in the literature, Pfeffer & Langton (1993) outlined two scenes. In the first, motivational perspectives in economics and psychology suggest that higher pay spreads engender higher employee effort levels and organizational productivity. For example, motivation theories in organizational psychology suggest that high pay dispersion may improve motivation by increasing performance-to-outcome perceptions and the desirability of organizational outcomes (Lawler 1971). Other findings such as a robust and positive meta-analytic correlation between financial incentives and individual performance levels (Jenkins et al. 1998) and evidence that pay differentials must be large to be considered meaningful also indirectly support this premise (Mitra et al. 1997). Even equity theory (Adams 1963) can be used to ground the expectation that pay dispersion will result in better performance, to the extent that the outcomes match commensurate input levels (Kepes et al. 2009, Shaw et al. 2002, Trevor et al. 2012).

From an economics standpoint, pay differences may reflect differential inputs and marginal products (Bishop 1987) and be indicative of an internal career and wage path that may raise overall motivation levels (Lazear & Moore 1984). Although Pfeffer & Langton’s (1993) study predates the explosion of research on tournaments, tournament theory is also frequently used to ground the prediction that higher pay dispersion will be associated with higher performance. This perspective suggests that wide pay differentials serve two purposes. High pay dispersion will, on balance,
increase effort levels, as steep increases in prizes across organizational levels will facilitate greater effort and competition. In addition, wide pay dispersion will create workforce sorting, in which winners stay with the organization in order to compete for higher pay, whereas losers self-select out of the organization. High pay spreads serve not only to filter out poor performers over time, increasing average performance levels, but also to attract better applicants (Lazear 1999).

The second scene painted by Pfeffer & Langton (1993) was one of harmony, cooperation, and commitment emanating from compressed or egalitarian pay structures. From this view, high pay dispersion “can undermine feelings of internal equity and damage cooperation and any sense of common purpose across the workforce as a whole” (Beaumont & Harris 2003, p. 54). Many of the arguments in this stream can be tied to earlier work on relative deprivation theory (Crosby 1976) and an emphasis on the dysfunctional consequences of hierarchy (e.g., Anderson & Brown 2010).

It is probably clear from this brief description that the “dilemma” described by Pfeffer & Langton (1993) was a significant oversimplification of the various theoretical issues in both frames. As dramatization and a mechanism for framing, the theoretical dichotomy was effective, but the theories are significantly more nuanced. On one hand, when applied, psychological theories of motivation suggest that pay dispersion may be effective to the extent that the dispersion is driven by legitimate dispersion-creating practices, that individuals have a clear line of sight between effort and performance and between performance and outcomes, and, ultimately, that differentials are meaningful. Explicit in the foundation of tournament theory is that pay differentials are performance based, that performance can be effectively evaluated, and that the workforce is homogeneous in terms of ability (Knoeber & Thurman 1994, Rosen 1986). On the other hand, the harmony- and cohesion-based perspectives also do not suggest equal pay for unequal contributions. Abeler et al. (2010, p. 1300) noted that “whenever workers differ in their performance, horizontal wage equality violates the equity principle since a higher effort is not rewarded with a higher wage.” Failing to recognize these distinctions is itself an inequitable practice (Trevor et al. 2012). Fortunately, over the past 15 years, the literature on pay dispersion and performance has, for the most part, moved beyond these theoretical constructions and made substantial progress in terms of identifying and testing the contingencies of the pay dispersion–performance relationship. I review the recent studies of performance at the organizational, team, and individual levels below.

Organizational Performance

Several studies in recent years have looked at the simple relationship between pay dispersion and measures of organizational performance. For example, Hibbs & Locking (2000) conducted a study among a large sample of organizations in Sweden where pay compression, as a by-product of strong collective bargaining agreements, was the norm. They found that within-plant wage dispersion was positively related to productivity. Ding et al. (2009) examined the relationship between horizontal (intrahierarchy) and vertical (interhierarchy) pay dispersion among a sample of 400 Chinese organizations. They first outlined the theoretical dilemma described above and then used culture-specific arguments to derive differential predictions. Vertical dispersion was predicted to be positively related to firm performance because managerial skill sets are more valuable, because higher pay would be needed to attract talent in a labor market short of skilled managerial talent, and because managers’ efforts were more closely linked to performance than were the efforts of lower-level workers. By contrast, using cooperation and collaboration arguments, the authors predicted that horizontal dispersion would negatively relate to performance. They found that vertical pay dispersion was positively related to sales growth and product/service quality, but horizontal measures were negatively related. These findings should be judged with
caution, however, as the correlations among the pay dispersion measures were very high ($r_s = .71–.87$). Bivariate correlations between the dispersion measures and the outcomes were identical in direction and nearly identical in magnitude. It is difficult to gauge if the findings reflect differential underlying patterns or whether multicollinearity issues played a role. Hunnes (2009) similarly decomposed pay dispersion into horizontal and vertical measures and tested for differential effects among a sample of more than 10,000 Norwegian organizations. He found that neither form of pay dispersion related significantly to a measure of organizational productivity.

At about the same time, albeit in different areas of the literature (strategic management, economics, and industrial relations), three sets of researchers began to attempt to resolve the theoretical inconsistencies in the literature. Shaw et al. (2002) argued that the relationship between pay dispersion and organizational performance rested on two contingencies: whether the dispersion could be explained by legitimate or normatively accepted sources (e.g., individual incentives) and whether work was interdependent. Their basic propositions were that the relationship between pay dispersion and performance would be positive among organizations relying heavily on individual incentives and that the relationship would be negative among organizations where work was designed interdependently. In a setting characterized by highly independent work (long-haul trucking), the authors found strong support for the explained dispersion predictions but also found evidence for matching effects between pay structure and incentives. Low performance levels (i.e., highest rates of accidents and safety violations) were observed when pay dispersion was high and individual incentives were low. High performance levels (i.e., lowest rates of accidents and safety violations) were observed when pay dispersion was high and individual incentives were high. In a second study of manufacturing plants, Shaw et al. (2002) found a somewhat similar interaction of pay dispersion and explained variation (incentives) when work independence was low. The predictions for work interdependence were generally not supported. One potential explanation for the weak findings was the weak assessment of work interdependence in the study. Interdependence was operationalized with the use of self-managed teams, but as Trevor et al. (2012) noted, the “high” condition on the measure of interdependence fell closest to the response option of “almost none” for the measure. Thus, the strongest statements about the contingencies of pay dispersion in this study should be confined to the explained dispersion (individual incentives) interactions.

In an attempt to test elemental predictions from tournament theory, Eriksson (1999) obtained a data set including information on 2,600 managers in more than 200 organizations in Denmark. He examined two dimensions of dispersion: the coefficient of variation in managerial pay (a horizontal measure) and the pay range between the CEO and managers (vertical dispersion). The relationship between these measures (in separate equations) and a measure of profits divided by sales was positive, although the relationship was not significant for the horizontal measure. Eriksson (1999) also attempted to model an underlying assumption of the harmony- and justice-based perspectives on pay dispersion, namely that any positive relationship between pay dispersion and performance would not be observed in highly interdependent situations. The interaction between dispersion and interdependence was not significant, although as Eriksson (1999) noted, the measure of interdependence was only a rough proxy (the ratio of profit center heads to total managers) for the underlying construct.

Beaumont & Harris (2003) also addressed the relationship between pay dispersion and organizational performance with a consideration of the level of interdependence, this time operationalized with coarse industry differences and facility size. Paralleling the arguments from Shaw et al. (2002), these authors stated that “the hierarchical model will produce its hypothesized positive relationship with performance in organizational settings where work interdependencies are minimal, while the compressed model will be most effective in a situation requiring extensive collaboration” (Beaumont & Harris 2003, p. 54). Their data set included facilities in the five
largest manufacturing industries in the United Kingdom from 1978 to 1995. They found that pay spread—the ratio of average blue-collar to white-collar pay levels—related positively to productivity in data processing, motor vehicles and engines, aerospace, and food industries, but negatively to productivity in the pharmaceutical industry. They concluded that the results had more to do with facility size and ownership than with industry, as the negative relationship was strongest among small, United Kingdom–based plants. The positive relationship was stronger among larger, multinational organizations. Ensley et al.’s (2007) study of pay dispersion among family- and non-family-owned organizations had a similar theme. These authors argued that among small, family-dominated TMTs, pay dispersion would indirectly relate to organizational performance via higher conflict, lower cohesion, and lower potency. Their findings were generally in line with expectations—the negative effects of pay dispersion on team process variables and its indirect effects on measures of organizational performance were stronger among family-owned organizations, although the negative indirect effects were apparent for non-family-owned businesses as well. This study is notable, as it deviates from the theme of pay dispersion contingencies in a rare attempt to detail the theoretical mechanisms between pay dispersion and performance.

Several additional studies warrant attention in this section. In a follow-up study of long-haul trucking organizations, Kepes et al. (2009) again addressed the issue of explained or legitimate pay variation and organizational performance. Using equity theory and fairness-based perspectives to ground their predictions, they argued that pay spread among drivers would be positively related to performance when performance-based pay was high [a replication of the Shaw et al. (2002) prediction], but would be negatively related when politically based pay was high. Their results for accident rates, in line with those of Shaw et al. (2002), revealed evidence of internal fit—accidents were highest when pay spread was high (low) and performance-based pay was low (high). Accident rates were generally lower when the pay range matched the performance-based pay approach (wide range and high performance-based pay, or narrow range and low performance-based pay). The results with politically based pay as a moderator were similar—the highest accident rates were observed when the pay spread was wide and politically based pay was high, and the lowest rates were observed when pay spread was high and politically based pay was low. In a different approach to explainable pay dispersion, Fredrickson et al. (2010) created a typical measure of pay dispersion among TMTs of 250 organizations in the S&P 500. They also created measures of expected (predicted pay dispersion scores based on a full model of antecedents) and excess pay dispersion (the difference between the predicted scores and actual pay dispersion values). They found that the overall pay dispersion measure correlated negatively with organizational performance, but further analyses revealed that only the excess, but not the expected, dispersion measure was significantly and negatively related to performance. Mahy et al. (2011) also computed a residual measure of unexplained dispersion and included it in a firm productivity model. They used a within-plant, individual-level regression to predict worker pay with a set of individual-level characteristics. The resulting residuals amount to pay that is unexplained by the individual factors (education, occupation, age, etc.). They then used the standard deviation of these residuals as their measure of dispersion. Surprisingly, this conditional dispersion measure had an inverse-U-shaped relationship with productivity in tests conducted among a large sample of private-sector Belgian organizations. Pay dispersion (unexplained by individual inputs) was positively related to productivity initially, reached an apex at moderate levels, and was negatively related thereafter.

Brown et al. (2003) also looked at contingencies in the relationship between pay structure and organizational performance. In particular, these authors examined whether overall pay levels would moderate the relationship between pay dispersion and dimensions of organizational performance in a sample of short-term-stay, acute-care hospitals. The outcomes were specific to the industry and included length of stay (shorter stays indicating more efficient performance),
coronary survival rates, and return on assets (ROA). For each of these outcomes, the authors observed a curvilinear relationship between pay level and performance such that performance improved as average pay levels increased, but the relationship attenuated at high pay levels. They also found an interaction between pay dispersion and pay level in relation to these outcomes. Higher pay dispersion was associated with better efficiency (shorter stays) and higher coronary survival rates, but lower ROA, among hospitals with low average pay levels. Performance was better, in general, when overall pay levels were high, but there were no differential pay dispersion effects when pay levels were high. A caveat with these results is that the authors did not include a key interaction term—the product of pay-levels squared and pay dispersion—which was needed in the analysis because the relationship between pay levels and outcomes had been established as curvilinear. But, nonetheless, these results provide some indication that high pay levels may minimize any pay structure effects, a finding that should be explored further in future studies. Yang & Klaas (2011) also looked at whether the relationship between pay dispersion and firm performance is curvilinear and moderated by the overall pay competitiveness of the organization. Using governmental survey data that were representative of the population of South Korean business organizations, they predicted that the ratio of the highest paid to lowest paid managers within ranks would relate to firm performance in an inverted-U shape. They further predicted that the inflection point would be farther to the right (optimal pay dispersion would be higher among organizations with high overall pay levels). They found marginal support for this prediction, although like that of Brown et al. (2003), their analysis did not include the quadratic interaction term that would be necessary to make a more definitive statement about the nature of joint pay dispersion and pay-level effects on performance.

Team Performance

As noted above, the pay dispersion literature at the team or group level of analysis has been dominated in recent years by studies using sports team samples. Indeed, during the past 15 years, only one study in the organizational literature, to my knowledge, has examined pay dispersion or inequality at the team level of analysis using a non-sports-based sample. In this study, Beersma et al. (2003) examined the relationship between cooperative and competitive reward structures on team performance across two task dimensions: accuracy and speed. In a laboratory experiment using a simulated war game, participants were assigned to one of 75 four-person teams and randomly to an equal pay structure condition (all team members received the same pay, regardless of inputs) or a pay structure that guaranteed high pay to the best-performing individuals. Although the authors did not manipulate pay dispersion directly, the former condition equates to complete pay compression, and the latter does suggest performance-based pay differentials. They found equality-based pay structures had a positive effect on accuracy and a negative effect on speed, whereas competitive (performance-based) structures had a positive effect on speed and a negative effect on accuracy. These results suggest that the nature of team production may be more cooperative when pay is equally distributed. Franck & Nüesch (2011) attempted to address this issue directly in a study of professional soccer (world football) teams. These authors found that team performance was highest when pay dispersion was either low (compressed) or high. Franck & Nüesch also attempted to analyze whether pay dispersion had an effect on playing style, which is implied in the Beersma et al. (2003) results. Controlling for team characteristics, coaching style, and talent, these authors found that higher pay dispersion was positively associated with the number of individualistic plays (individual runs and dribbles), but not significantly related to the number of cooperative plays (e.g., cross-field passes).

A number of sports-team studies have looked at the direct relationship between pay dispersion and team performance, controlling for proxies for player inputs such as talent, salary, and bonus
levels. Mondello & Maxcy (2009) examined the relationship between team on-field performance and team revenues among teams in the American National Football League (NFL). Controlling for average pay levels and bonus payments, these authors found that pay dispersion among team members was negatively associated with winning percentage, but positively related to the revenue generated by the franchises. The authors concluded that franchise owners may increase dispersion by acquiring high-salaried star players in order to sell season tickets, premium seating, and luxury boxes, perhaps at the expense of winning percentage. Berri & Jewell (2004) and Katayama & Nuch (2011) examined pay dispersion through performance relationships among teams in the US National Basketball Association (NBA). Both studies found that the relationship between inequality measures and team performance was negative, but not significantly so.

Bloom’s (1999) study of baseball teams in Major League Baseball (MLB) has likely attracted the most attention in the organizational literature. He analyzed the relationship between (a) pay dispersion and (b) team and individual performance among professional teams for a 14-year period in the 1980s and 1990s. He found that greater player pay dispersion was negatively related to both team and individual performance. Using essentially the same baseball sample used in Bloom (1999) but with a more extensive set of econometric specifications, Jewell & Molina (2004), Depken (2000), and Frick et al. (2003) also found a negative relationship between pay dispersion and on-field performance. Jane and colleagues (Jane 2010, Jane et al. 2009, San & Jane 2008) found similar negative relationships between pay dispersion and team performance in a series of studies in the Taiwanese professional baseball league.

Although informative, studies such as these (Bloom 1999, Berri & Jewell 2004, Depken 2000, Jewell & Molina 2004, Katayama & Nuch 2011, Mondello & Maxcy 2009) have been criticized for partialling out legitimate player inputs from the pay dispersion measure (e.g., with talent, bonus, and pay-level control variables), leaving only the residual or unexplained pay dispersion component to relate negatively to on-field performance (cf. Gerhart & Rynes 2003, Trevor et al. 2012). The baseball sample study of DeBrock et al. (2004) overcame some of these limitations. Like the authors of the prior studies, they found a significant negative relationship between the general dispersion of player wages and team performance (winning percentage). Much like Fredrickson et al. (2010), they then constructed a measure of expected dispersion or an estimate of the “optimal mix of salaries on the team” (DeBrock et al. 2004, p. 253). Much like in the unconditional dispersion results, this “optimal mix” measure was also negatively associated with performance. By contrast, a measure of average expected wages (high pay levels) was positively associated with winning percentage. Thus, overcoming some of the analytical problems, the DeBrock et al. (2004) findings reported very similar estimates of a negative relationship between pay dispersion and team performance in the baseball context.

Simmons & Berri (2011) conducted an additional analysis in the NBA to overcome the residual dispersion issue and other limitations. Although focused on individual player performance and not team wins as an outcome, they constructed a measure of justified inequality, or the amount of dispersion that could be reasonably explained by existing player talents, as well as a measure of unjustified inequality. Consistent with other findings in the literature, the explained variation measure was positively associated with performance; the unexplained dispersion measure was not significantly related to performance.

Trevor et al. (2012) examined the relationship between explained and unexplained pay dispersion among teams in the US National Hockey League (NHL) (see also Gomez 2002). Using a two-stage approach to create expected and residual pay variation, they found that pay variation that could be explained by differences in player input and talent was positively related to hockey team performance, but unexplained variation was not significantly related. They also found some evidence of a ceiling effect such that the positive effects of explained variation on performance
were attenuated at high levels. This study adds to a growing list of studies that examine the source or the legitimacy of pay differences across employees. Although the authors provided arguments to support their choices, the interpretations may be limited because explained and unexplained pay dispersion measures were always estimated in separate equations from player input and pay-level variables. This is concerning because of the high correlations between variables (e.g., \( r = .68 \) between explained variation and player inputs) and because it precluded examinations of the interaction of pay dispersion variables with pay strategies and pay levels such as those found in Brown et al. (2003) and Shaw et al. (2002).

**Individual Performance**

Three well-cited studies of the effects of pay dispersion on individual effort and performance were also conducted using sports samples. Taking a tournament theory view, Ehrenberg and Bognanno examined the relationship between the spread of prize money and player performance among professional golfers on the US Professional Golfers Association (PGA) tour (Ehrenberg & Bognanno 1990a) and the European PGA tour (Ehrenberg & Bognanno 1990b). They found that higher prize spreads resulted in better performance (lower round scores) for golfers, especially in the later rounds of the tournament. Becker & Huselid (1992) noted that in professional golf, the players compete against the course, but their activities are otherwise independent of one another. They argued that motorsports racing had characteristics that were more similar to organizational settings—drivers not only compete against the racecourse but also must work interdependently with other contestants. In analyses of two racing leagues, Becker and Huselid found that driver performance was positively associated with the size of the prize money spread. In addition, they also uncovered only limited evidence that drivers engaged in hazardous behaviors when prize differentials were high. Safety did diminish, however, when the pay spread was more than one standard deviation above the sample mean.

In the years since these pioneering studies, the literature on pay structure and individual effort and performance has resided almost exclusively in the experimental economics literature (Bloom 1999 is an exception). In general, this stream of research appears to lack the theoretical sophistication of the team- and organizational-level studies in terms of exploring the nuances that may underlie the effects of pay dispersion on outcomes. In an experimental gift-exchange game, Charness & Kuhn (2007) found that worker effort was positively related to one’s assigned pay level, but was not related to the pay level offered to a second participant in the game, regardless of whether the other’s pay level was higher or lower. A similar pattern of results was found by Bartling & Von Siemens (2011). These authors found no productivity differences when comparing those in equal and unequal pay conditions. It should be noted here that participants in the unequal pay condition were “ex ante identical, i.e., no productivity difference might justify unequal wage payments” (Bartling & Von Siemens 2011, p. 9). Thus, given the fact that the pay inequality condition in this experiment was akin to a situation of unexplained dispersion, the null results are somewhat surprising. In a similar gift-exchange scenario, Abeler et al. (2010) found that participants responded to equal payments with low effort levels but exhibited relatively higher effort levels when paid based on individual contributions. As tests of equity theory have often found, individuals who were unfairly underpaid (i.e., performed better but received equal wages) reacted more negatively in terms of effort reduction than those who received proportionally more than expected given their inputs. Two final studies of pay dispersion and individual performance were conducted among samples of men (Gildsford & Sukhatme 2007) and women (Gildsford & Sukhatme 2008) competing in their respective professional tennis tours. In cross-level tests with match-level outcomes, the studies yielded virtually identical results: The higher the prize spread
associated with winning a given match, the more likely that the player with the higher seed would win the match. The findings correspond to a foundation of tournament theory that suggests that wider pay spreads in sequential elimination tournaments result in higher motivation, especially among those capable of winning successive rounds.

**PAY DISPERSION AND TURNOVER**

The overall literature that examines the relationship between pay differences and turnover or quit patterns is sparser than the performance literature, but it appears to be gaining momentum. Two studies that have been rather influential in terms of directing research in this area were conducted in the labor economics area. Powell et al. (1994) focused on dispersion within skill classes and offered competing perspectives on the expected direction of the relationship with quit rates. They first proposed that higher pay dispersion would result in perceptions of resentment for many of those at the lower end of the distribution. This, combined with a drop in motivation among these individuals because they were unlikely to obtain high pay levels, could result in higher quit rates, the authors reasoned. Alternatively, the authors hypothesized that steep age-earning profiles and internal pay ladders could help attach workers to the organization. This position is predicated on the assumption that most workers would receive higher pay over time. Among their sample of early childhood education teachers, neither of these predictions was supported; the relationship between pay dispersion and quit rates was not significant in any equation. One possible explanation is that there was restricted range in the measure of pay dispersion in the sample (teachers and teacher aides). These theoretical positions and the findings, although perhaps raising more than answering questions, served to energize later research in this area. A second study, by Lazear (1999), also provided indirect evidence for how pay structures would influence quit patterns in organizations. In this work, Lazear tracked employees of an auto glass installation chain in a pay-system change from fixed-rate hourly pay to a piece-rate plan. Although pay dispersion was not assessed directly, the piece-rate plan had the effect of spreading pay levels among installers. Once implemented, the piece-rate plan had interesting effects on overall quit patterns. Among high-output individuals, quit rates fell 16% in the new plan, but among normal-output employees, quit rates rose 15%.

In the following years, the theory position of choice with respect to turnover became tournament theory. From this view, wider pay spreads based on relative performance serve several functions that may cause differential turnover rates. First, to the extent that higher pay spreads are based on relative performance, they create a situation in which the paths of winners and losers diverge (Rosen 1986). Not only should this increase effort throughout the organization, but winners in the tournament should remain, whereas losers are likely to leave the organization. The basic argument suggests that there are a greater number of losers than winners in a tournament characterized by high pay spreads based on relative performance and, as such, pay dispersion should be positively associated with overall quit rates.

Bloom & Michel (2002) made this general prediction and tested the relationships in two large data sets: a managerial sample drawn from the Compustat archival database and another generated by a compensation consulting firm. They found consistent negative relationships between the degree of pay dispersion and average tenure when both (a) total compensation and (b) dispersion of salary and bonus only were used in the dispersion calculation. Similarly, they reported a strong positive relationship between pay dispersion and overall managerial turnover rates in both samples. In a similar approach, Messersmith et al. (2011) examined tournament theory-based predictions between pay dispersion and the likelihood of turnover among executive teams. The Messersmith et al. (2011) sample was also gleaned from Compustat. In a series of Bernoulli hierarchical linear models, these authors found that high pay dispersion in the executive team was
associated with a higher likelihood of individual executive turnover. Moreover, these authors found that the relationship between pay dispersion and turnover decisions was stronger when overall pay levels were high and when incentive intensity was low. When pay levels were low, executive turnover was high at all pay dispersion levels. The incentive-intensity findings test a typically unmeasured assumption in tournament theory, namely that the dispersion is based on relative performance. As Shaw et al. (2002) argued and found, the source of the dispersion appears to matter considerably for how individuals react to pay dispersion.

Riddell (2011) drew on tournament and distributive justice arguments in his study of the pay dispersion–quit rates relationship. This study is noteworthy because of its large sample size, because the sample was cross-industry and representative of the population in a large metropolitan area (Toronto, Canada), and because it included pay data on many job positions in the organizations. In Riddell’s analysis, pay dispersion estimates were consistently and positively related to quit rates. In terms of the magnitude of the effects, a “one log point change in dispersion—which is roughly 1.5 standard deviation from the overall mean—raise[d] the quit rate by 2–2.4 percentage points)” (p. 672). These findings were quite robust across a variety of econometric specifications. There are several other similar papers in the literature that show positive relationships between pay dispersion measures and overall quit rates. Tsou & Liu (2005) showed a positive relationship among publicly traded manufacturing firms in Taiwan, and similar evidence of a positive relationship between pay dispersion and quit patterns have been found in manufacturing settings in Norway (e.g., Barth & Dale-Olsen 1999), Slovenia (Haltiwanger & Vodopivec 2003), and Finland (Ikmakunna & Maliranta 2003).

Wade et al. (2006) investigated the relationship between (a) pay disparity between the CEO and other managers and (b) the likelihood of turnover of subordinate managers. The data for this study were obtained from a compensation survey administered by a consulting firm. Using a residual approach to operationalization, these authors calculated the managers’ degree of pay inequity relative to their CEO. The results showed that greater external inequity (CEO pay relative to the typical managerial compensation in the marketplace) and internal inequity (CEO pay relative to managerial pay within the company) increased turnover likelihood. In a set of supplemental analyses, the authors also included a pay dispersion measure. Interestingly, they found that the relationship between pay dispersion and turnover was positive and significant, but the relationship fell to nonsignificance when the pay inequity variables were entered into the equation. Although the authors did not report formal mediation tests, these results are consistent with the theory that unexplained dispersion may be perceived as unfair and, as a result, justice may mediate the relationship between dispersion and turnover.

Two studies in recent years have addressed the issue of explained dispersion and sorting effects (i.e., turnover of individuals at different performance levels) of pay dispersion directly. Carnahan et al. (2012) examined a huge (>87,000 legal services organizations) matched employer–employee data set obtained from US government sources. The authors predicted that higher within-organization pay dispersion relative to the market would have differential effects on the likelihood of turnover among extreme performers (low and high). In line with their prediction, Carnahan et al. (2012) found that high performers (those in the top 10%) were less likely to leave when pay dispersion was high, whereas low performers (those in the bottom 10%) were the most likely to leave. A one-standard-deviation increase in pay dispersion was associated with a 16% decrease in the likelihood of good-performer quits. A one-standard-deviation increase in pay dispersion was associated with a 5.5% increase in the likelihood of poor-performer quits.

Although the notion of explained versus unexplained variation in differential quit patterns was implicitly assumed in the Carnahan et al. (2012) paper, it was addressed directly by Shaw & Gupta (2007). The latter group of authors argued that pay dispersion could be legitimately explained
by either performance or seniority provisions. They argued further that the degree of dispersion and the basis for the dispersion would be keys in predicting quit patterns among good, average, and poor performers. Integrating tournament theory arguments for sorting effects with justice-based research, Shaw & Gupta (2007) also argued that seniority-based pay dispersion was best suited for retention of average and poor performers, whereas performance-based pay dispersion was best suited for retaining good performers. Additionally, they predicted that these patterns would be most evident when the pay system was well communicated. Among a sample of long-haul trucking companies, they found that pay dispersion was negatively related to good-performer quits when performance-based pay and pay-system communication were high, but positively related under other conditions. As predicted, the relationship between pay dispersion and average-performer quits was negative when seniority-based pay was used and when the system was well communicated. The predicted relationships were not supported in the poor-performer-quits equations.

**PAY DISPERSION AND ATTITUDES**

Pfeffer & Langton (1993, p. 384) concluded that “there is little evidence that wage dispersion, per se, is positively associated with satisfaction.” This general assumption was based on arguments that pay compression promoted a more harmonious work environment and that cooperation and commitment were higher when horizontal pay dispersion was minimized. There was much more theorizing about these issues at the time, however, than hard empirical evidence. Pfeffer and Langton’s conclusion was drawn indirectly from studies that showed pay dispersion was positively associated with unionization attempts, favorable union voting patterns, and individual preferences for unions (Abeler et al. 2010, Pfeffer & Langton 1993). An underlying assumption of unionized workplaces is that pay equality is a key component of fair pay schemes (e.g., Medoff & Abraham 1980). Pfeffer & Langton (1993) did provide some initial direct evidence to support their contention: Pay dispersion was negatively related to satisfaction among their sample of university faculty. But, heralding the broader contingency approach to the study of pay dispersion, they also found that the relationship was weaker among longer-tenured professors and when pay levels were performance and experience based. It should also be noted that this study has been criticized in the literature for partialling out the legitimate sources of pay variation, that is, controlling for the within-unit correlation between pay and performance (Gerhart & Rynes 2003), perhaps leaving only unexplained variation to correlate with satisfaction.

In recent years, the study of pay dispersion and workplace attitudes has lagged behind other areas, although several intriguing studies have appeared in the literature. Using social comparison and equity theories, Trevor & Wazeter (2006) examined the relationship between pay dispersion and equity judgments both directly and as a function of position in the pay distribution and pay levels relative to other referents. Their sample included more than 2,000 schoolteachers across 400 schools districts in a large US state. They found a weak, but significant, negative correlation between pay dispersion and pay equity perceptions. Further, they found that a stronger negative relationship between pay dispersion and pay equity was observed only among those low in the internal pay distribution. Pay equity perceptions were generally high among those high in internal pay standing, and the pay dispersion relationship with pay equity was not significant among these individuals. These results suggest that wide dispersion of pay has a strong negative effect on attitudes only among those lower in the pay distribution, but that high pay standing negates the negative distributional effects.

Clark et al. (2009) tested whether individual job satisfaction would be higher when the pay distribution was wider. They argued that knowledge of “others’ earnings provide[s] sufficient
information about [an employee’s] own future prospects to outweigh any jealousy [the employee] might feel towards [his or her] colleagues” (p. 431). Although the authors’ statement refers to envy, rather than jealousy, the argument is that individuals give greater weight to potential future earnings than current unfavorable comparisons when making satisfaction judgments. In essence, the signals offered by high wage dispersion outweigh the negative status implications associated with a lower position in the pay distribution. In a large sample of Danish employees obtained through the European Community Household Panel and other archival records, the authors found that individual wages and the average wages of the establishment were significantly and positively related to satisfaction. The authors concluded that employees felt that “others’ good fortune today reflects [the employees’] potential good fortune tomorrow” (p. 439). As a supplemental analysis, these authors later decomposed the dispersion variable into establishment-wide (across job categories) and occupation (within job category) dimensions. In these results, the establishment-wide variable had a positive relationship with job satisfaction, but the occupational dispersion variable yielded a significant negative relationship. The authors did not examine an interaction between the pay spread variable and individual pay levels, as found in Trevor & Wazeter (2006). At first glance, it appears as though the findings from Clark et al. (2009) and Trevor & Wazeter (2006) are in conflict, but a closer examination reveals a similar pattern for the within-job category dispersion on attitudes. Trevor & Wazeter (2006) found that, among school teachers, within-group pay dispersion was negatively related to work attitudes, as did Clark et al. (2009). Both studies also found stable positive relationships between individual pay standing (level) and job attitudes. It is reasonable to suppose that Clark et al. (2009) would have uncovered a similar interaction between pay distributions and pay levels had they estimated it in their study.

These two studies examined pay dispersion and attitudes directly, whereas the remaining studies in the literature during the study window provide only indirect evidence. For example, Shore et al. (2006) conducted an experimental study in which the participant base-pay level remained the same across conditions, but the pay of others within and outside the organization was manipulated in order to create fully crossed internal and external under- and overpayment conditions. These pay inequality results yielded a pattern of findings not unlike the set typically found in tests of Adams’s (1963) equity theory. Participants reporting the most dissatisfaction with pay were those in the internal underpayment condition, and this effect was particularly prominent when combined with external underpayment. Those high in the internal pay structure (overpayment) did not report discomfort, but rather reported about the same level of satisfaction as those equitably paid, as typical equity theory studies tend to report. Harris et al. (2008) also examined upward and downward pay comparisons and satisfaction in two experimental settings. They found that pay-level satisfaction was lowest when participant pay levels fell short of upward comparators, increased to high levels as pay matched that of upward comparators, and then declined slightly in overpayment situations. Brown (2001), in a study of nearly 6,000 public-sector employees in Australia, also observed a negative relationship between underpayment relative to an organizational reference and pay satisfaction. One interpretation of the findings would be that high pay levels tend to trump distributional effects in terms of work attitudes, as the Trevor & Wazeter (2006) study also shows. Petrescu & Simmons (2008) looked at these issues from a slightly different angle by correlating workers’ perceptions of the size of the pay gap (e.g., “the workplace pay gap is much too big”) with job and pay satisfaction. Controlling for other attitudes, they found that a perception that the pay differential was “too big” was associated with lower satisfaction judgments. As the authors acknowledge, however, the evaluative nature of the pay-gap perception may itself reflect pay attitudes. Thus, these results should be interpreted with caution.
SUMMARY EVALUATION

Substantial progress has been made the past 15 years in terms of understanding how pay dispersion relates to important work-related outcomes including organizational productivity, safety, turnover, efficiency, and team performance, as well as individual effort and performance quality. In addition to significant advances in terms of theoretical precision and sophistication, the literature has advanced significantly in terms of analytic rigor as well. Studies such as the recent analysis of explained and unexplained dispersion by Trevor et al. (2012) are excellent examples of how researchers are melding conceptual advances with refined analytic approaches. When evaluating the findings from the literature in toto, it is clear that there is not a well-defined conceptual or observed empirical relationship between the overall dispersion of pay—either horizontal, dispersed within job or organizational levels, or vertical, across jobs and organizational levels—and the performance of organizations, teams, or individuals. Future meta-analytic investigations may pinpoint the magnitude of the literature-wide association between pay dispersion and performance, but it would be shocking if the corrected correlation diverged substantially from zero or was not accompanied by a wide credibility interval that suggested the presence of several contingencies.

The theme in the literature has been to outline two opposing viewpoints on the relationship between pay dispersion and performance. Tournament theory, individual motivation theories, and internal wage-path perspectives are often used in the literature to suggest that high pay dispersion levels will increase individual motivation and performance, encourage striving for promotion, and create an environment in which winners thrive and losers exit. An opposing story, drawn from different pockets of the economics and psychology literatures, has also often been told. Using justice-based, relative deprivation, social comparison, cohesion, or resentful demoralization arguments, the same high levels of pay dispersion are argued to lower motivation and performance, create unhealthy competition, and detract individuals’ attention from organizational goals and purposes. As should be clear after reading this review, my view is that the theoretical conundrum never existed in reality, especially in this simplified form. Tournament theory and individual motivation theory, purportedly supporting the positive view of pay dispersion, offer appreciably more nuance in terms of the conditions under which pay spreads should yield organizational and individual benefits. Moreover, theories purportedly supporting the benefits of pay compression do not, in a general sense, advocate equal pay for unequal work. I would point out here that even Pfeffer’s (1998) simplified practitioner-oriented treatment, which advocates pay compression as a best practice, also extols individual pay-for-performance as something organizations should universally adopt.

Given the large number of studies that have examined the main effect of pay dispersion on performance and the clear oversimplification of the underlying issues, I believe that studies framed in this way are no longer of value. Rather, I would encourage research that builds upon and extends the growing line of theoretical advances on the legitimacy and justifiability of pay dispersion, studies that examine the mechanisms or the processes that transpire as a result of differing pay structures (the literature is startlingly bereft of these), and studies that compare the effects of horizontal and vertical consequences of dispersion. At a broad level, the findings and theoretical approaches are often quite similar for studies of horizontal (e.g., Shaw & Gupta 2007) and vertical (e.g., Bloom & Michel 2002) dispersion, but it is likely that the causal pathways for the two types of structures are different. Studies that can elucidate and test for these processes would benefit the scientific community greatly.

In light of the studies reviewed above, I believe some cautious general conclusions and stylized facts can be gleaned from the literature on the outcomes of pay dispersion. First, the relationship between pay dispersion and dimensions of performance at the organizational,
team, and individual levels is complex, but research in the past 15 years has certainly brought greater clarity. Although much remains to be known, it is clear that if a researcher conducts a study of the main-effect relationship between pay dispersion and performance, the nature of that relationship (negative, positive, or nil) is difficult to predict in advance. There are any number of factors that may play a role in determining the nature of the direct relationship, including sample characteristics, type of dispersion, and the set of control variables used, to name a few. But, studies during the time period reviewed here have brought much greater clarity when one considers whether the observed pay dispersion either can be explained by legitimate factors such as individual incentives, seniority, education, or tenure (Kepes et al. 2009, Shaw et al. 2002, Shaw & Gupta 2007) or is the result of legitimate worker inputs such as historical performance (Fredrickson et al. 2010, Trevor et al. 2012). Like in every area of study, some messy findings appear in the literature, but the preponderance of the evidence suggests that explainable or legitimate pay dispersion is generally positively related to organizational productivity and safety, team performance, and individual performance. In addition, once legitimate inputs are controlled for or partialled out of the equation, the literature is quite consistent in suggesting that the residual pay variation (especially in team-level studies) is negatively related to performance.

Second, the literature, in general, seems to suggest that greater pay dispersion is positively related to overall turnover rates, especially when vertical pay dispersion (variation in pay across organizational levels) is examined. Studies such as Bloom & Michel’s (2002) investigation of pay dispersion and managerial turnover, as well as studies by Messersmith et al. (2011) and Riddell (2011), provide fairly convincing evidence of the overall effects. About suggesting a stylized fact related to the findings concerning horizontal pay dispersion and turnover rates, I am somewhat more circumspect. A number of studies show null effects, perhaps owing to restrictions on the spread of pay within job groups or occupational levels or the presence of strong contingency factors. But the tournament theory suggestion that performance-based pay distributions will effectively sort the workforce seems to be largely supported in the horizontal dispersion literature. Shaw & Gupta’s (2007) study shows that good performers are most often retained when pay dispersion is high and well-communicated incentive-based compensation is used. In addition, average performers were most often retained when pay was dispersed using well-communicated seniority-based provisions. Two other studies, although not concerned with pay dispersion, also provide indirect evidence in support of these sorting effects. In an early study, Park et al. (1994) found that pay range among manufacturing employees had a near-zero association with the overall quit rate. Additionally, although the sample size was small, they reported a negative coefficient between pay range and good-performer quits and a positive association with poor-performer quits. Shaw et al. (2009) also provided indirect evidence of these sorting effects of pay range. They found that organizations emphasizing expectation-enhancing practices were more effective at retaining the best performers and also experienced higher poor-performer quit rates.

Third, in terms of workplace attitudes, the literature is less well developed. Pfeffer & Langton’s (1993) study is often cited as an example of pay dispersion’s negative association with attitudes. But, like the authors of several other studies in the literature, these authors may have inadvertently removed explainable or justifiable sources of dispersion in their analyses, leaving only residual, non-performance-based variation. If so, then these results should be placed along the recent wave of studies of explained variation in pay (e.g., Eriksson 1999, Kepes et al. 2009, Shaw et al. 2002). The Trevor & Wazeter (2006) (negative relationship between pay dispersion and pay equity attitudes) and Clark et al. (2009) (positive relationship between pay spread and satisfaction) studies show opposing effects on attitudes. But, these findings can easily be resolved if future researchers take care to examine how individuals react to pay dispersion in light of their own standing in the pay structure, as Trevor & Wazeter (2006) did.
AGENDA FOR FUTURE RESEARCH

Beyond Interdependence, Toward Identifiability

Much has been made over the past 25 years about task interdependence as a major factor in anticipating how organizational members will react to pay dispersion. Researchers have suggested, in general, that differential pay under high work independence is unfair and will lead to resentment, lack of cooperation, sabotage, and lack of team potency. Frank (1984, p. 564) stated that “the difficulties created by a given degree of earnings dispersion in a work group increase with the degree of contact that occurs between the group’s members.” Levine (1991) argued that compression in interdependent situations fosters cohesiveness and trust and increases the likelihood that group norms will be followed. Tests of the interdependence of moderation effects, however, have not produced a set of results that engenders confidence (e.g., Shaw et al. 2002). One explanation for the weak results may be methodological, as the setting and measurement of interdependence in Shaw et al. (2002) may not have yielded sufficient variation and validity (Trevor et al. 2012). But, as Trevor et al. (2012) argued and tested, dispersion pay based on legitimate performance-related inputs can be justifiable and result in favorable workplace outcomes even when work (or at least, the sporting context) is quite interdependent. At this juncture, I believe it is time for researchers to move beyond the notion of interdependence and investigate what I believe is the key underlying issue: the identifiability of individual work inputs. Nearly all work has some degree of interdependence—the Kepes et al. (2009) and Shaw et al. (2002) trucking samples are rare exceptions in terms of the near-complete independence of work efforts. In many, but not all, interdependent and teamwork situations, the nature of individual contributions can be reasonably observed and accurately assessed. In highly independent team sports such as hockey or world football, for example, there are reasonably reliable markers of individual effort and performance. In such situations, the literature has given us reason to believe that dispersed pay can be used effectively. In work situations in which established metrics such as goals scored or assists are not available and accurate assessments of contributions may not be possible, pay dispersion based on individual performance may not be a viable option. It is reasonable to expect that under such circumstances, individuals may react negatively to pay differentiated on performance-related inputs. Future research that identifies the true underlying contingency—the identifiability of individual inputs—and examines how individuals react to dispersed and compressed pay under these circumstances would move the literature forward.

An International View of Explained or Legitimate Pay Variation

At this point, the concept of explained pay variation has been focused primarily on the presence of organizational incentive and seniority provisions and the use of individual performance. Although education, age, tenure, and the like have played some role in this discussion, the tendency has been to use individual performance as the normatively accepted reason for dispersion. But, compensation provisions differ quite considerably around the world—adjustments for housing and family size, special allowances, and many other factors are common in some countries, but not others. In addition, the relative emphasis on various practices for creating dispersion and their acceptability may differ across countries and cultures. Before making general statements about the acceptability of performance-based dispersion, these issues should be addressed directly. Some indirect evidence appearing in the literature may point the way for progress in this area. Sweeney & McFarlin (2004, 2005) conducted a pair of interesting studies of social comparison processes and income satisfaction. In the first, they surveyed workers in 12 countries and examined whether social comparison effects differed across countries. Across all countries in the sample, there was a significant
negative relationship between unfavorable pay comparisons with “other people in your country” and income satisfaction. When the social comparison was changed to “others with a similar education,” unfavorable pay comparisons were generally negatively related to satisfaction except in former Communist-bloc countries (e.g., Bulgaria, East Germany, Hungary, and Russia). The results were even more variable, and without a specific pattern, when the unfavorable social comparison referred to “others with a similar job.” In a second study, Sweeney & McFarlin (2005) examined pay satisfaction reactions of US employees to internal and external comparators in four different samples. In each sample, pay comparisons to internal and external comparators were significant predictors of pay satisfaction (when one’s own pay was held constant). There was some evidence that pay comparisons outside the organization were stronger predictors of pay satisfaction, although these differences were not evident when the comparison involved generic similar and dissimilar others. Similarly, He et al. (2004) found that reward allocation preferences differed among workers in Chinese state-owned organizations as a function of whether the organization had been swept up in market-oriented reforms (see also Werner & Ones 2000). The authors found individual reward preferences (individual or group allocation rules) differed by ownership type (pure state-owned or market-listed organizations), along with individual differences in collectivism and goal orientation.

Although the theoretical explanations for these differences have yet to be elucidated, it does seem clear that social comparison effects, and by extension the effects of horizontal and vertical pay dispersion, on work attitudes may differ across cultures. These results suggest that individuals across countries, societies, and cultures may use somewhat different referents for making judgments about their own pay and, in addition, prefer different pay allocations as a function of the cultural or organizational context. If these speculations can be extended to the domain of pay dispersion research, it may be that individuals across countries use different standards for determining whether dispersion is justifiable. But, these results also suggest that if workers in different countries pay greater (lesser) attention to certain social comparisons, there may be stronger (weaker) reactions to horizontal and vertical pay dispersion across countries. Hopefully, future researchers will take up the challenge of exploring these important issues.

**Workforce Characteristics**

Tournament theory (e.g., Rosen 1986) suggests that wide vertical pay spreads have motivational properties when performance is the basis for differentiating employees, when those performance differentials are in relative rather than absolute terms, when the spread becomes increasingly wide as the tournament progresses through hierarchical levels, and when the workforce is relatively homogeneous in terms of ability (Knoeber & Thurman 1994, Rosen 1986). The notions of relative performance, increasing pay range, and winners and losers in the sequential tournament are well discussed in the organizational and economics literature, but for the most part, this last boundary condition of the theory has been ignored. The assumption of homogeneous ability is a very important concept that future researchers should address going forward. In expectancy theory terms, effort to performance perceptions (expectancies) play an important role because individuals will not be motivated if they do not believe that their effort will result in acceptable performance levels. Tournament theory rests on the foundation that all players in the tournament have similar ability and, by extension, they will believe that it is possible for them to perform well (and perhaps win) in the tournament for rewards and promotion. Many studies seem to simply ignore this provision and, worse, explicitly recognize and model differences in individual abilities and performance levels in tournament theory tests (e.g., Mahy et al. 2011). Only one study, to my knowledge, has explicitly examined composition effects at the organizational level. Lallemand
et al. (2004) examined whether the pay dispersion and firm performance relationship differed as a function of the ratio of white- to blue-collar workers in the organization. They reasoned that there was less variability in performance among blue-collar workers, whereas performance variability and differences in intrinsic motivation among white-collar employees may weaken any motivational effects of pay dispersion. Their results were suggestive, not definitive. The interaction between pay dispersion and the white-collar ratio was significant in ordinary least squares regressions, but not in the fixed-effect regressions that the authors believed were superior. Beyond estimation, the white-to-blue-collar ratio amounts to only a coarse operationalization for homogeneity of ability within the workforce. The ideas are provocative, however, and future research is needed in order to conduct tests more in line with the theory. Additional indirect evidence can be gleaned from the tournament theory tests among players on the professional tennis tours. Here, higher prize money spreads were associated with a greater likelihood of the stronger player (higher seed) winning a given match (Gilsdorf & Sukhatme 2007, 2008). Although he did not examine prize spread, Sunde (2009) also found that heterogeneity in terms of capabilities had significant motivational effects (in terms of games won) for underdogs and favorites in professional tennis. My suggestion for going forward is that researchers consider whether the composition of the workforce may play a role in terms of how pay structures relate to organizational outcomes. In addition to studies that examine homogeneity or heterogeneity at the organizational or team level, multilevel studies, such as the one conducted by Trevor & Wazeter (2006), should be able to shed light on how individuals with differing performance and ability levels respond to pay dispersion.

Mediators: The Mechanisms Between Pay Dispersion and Outcomes

A significant gap in our knowledge concerns the underlying mechanisms or the mediators between pay dispersion and outcomes at the organizational, team, and individual levels. The empirical literature to date is more extensive in terms of answering questions of when rather than why or how. Of the studies reviewed here, only Ensley et al.’s (2007) study of TMT pay structure in family- and non-family-owned businesses was designed to uncover mediating mechanisms. They argued and found support for conflict, cohesion, and potency as intervening variables between pay structure and organizational performance, with additional evidence that these negative effects were stronger among family-owned businesses. Two sets of researchers have begun to address these issues conceptually; it is hoped that future empirical research will follow. In a paper aimed at better understanding of the relationship between person—group fit and team effectiveness, Aime et al. (2010) positioned the legitimacy of pay dispersion as a mediating mechanism between person—group supplementary and complementary fit and team outcomes. Although this paper was grounded in the justice literature with few references to the pay dispersion literature reviewed here, the attempt by these authors to build a legitimacy-based model of pay dispersion is a step in the right direction. Future researchers would be well served to combine their ideas with the existing findings on explained or normatively accepted pay variation reviewed here as a way of advancing our knowledge. Downes & Choi (2014) developed predictions between a simple typology of pay dispersion (performance- or non-performance-based by vertical and horizontal dispersion) and developed predictions for outcomes of the typology. They drew from equity, expectancy, and tournament theories to demonstrate how differential predictions could be made with organizational performance as the ultimate outcome. This ambitious first attempt at typology-based theory development (e.g., Doty & Glick 1994) is a welcome addition to the literature. Although the mediators of interest were general (motivation or sorting effects), the study does provide a set of testable ideas that researchers could use as a point of departure for elaboration on the mechanisms between pay dispersion and outcomes. In general, future studies that examine mechanisms
between pay dispersion and performance-related outcomes, while also attending to the known
moderators of this relationship, are certainly needed.

**Expanded Criteria**

The literature on pay dispersion is somewhat restricted in terms of the outcomes of interest, es-
pecially at the individual level. There are a number of possibilities for expanding the scope of
outcomes in pay dispersion research. First, one thing that is clear in research on financial incentives
is that they can focus individuals’ efforts on what is (or what is perceived to be) rewarded. Kerr
(1975) addressed these issues in his pioneering essay. Recent psychological work shows that
reminders of money create self-sufficiency, reduce requests for help, and even result in greater
physical distance between individuals in work contexts (Vohs et al. 2009). It is reasonable to
question whether greater pay differentials within and across organizational levels cause individ-
uals not only to focus on their productive capability, but to do so at the exclusion of others in the
organization. Citizenship behaviors are central to the study of organizational psychology and
organizational behavior and, arguably, are a central facet of the functioning of organizations.
Drago & Garvey (1998) found that helping in teams was lower, but individual effort was higher,
to the extent that promotion incentives were strong. In a study of status differentials that included
pay differences among NBA players, Christie & Barling (2010) found higher withdrawal
behaviors and lower physical health among low-status players, especially when the level of
uncooperative behavior (suspensions, game ejections) within the team was high. To the extent
that the pay structure creates an uncooperative, unhelpful environment, it is possible that
high-capability or high-status individuals succeed, whereas low-status individuals find fewer
developmental opportunities and increasing difficulties in gaining the support necessary to im-
prove. Organizational- and cross-level studies that examine potential productivity and citizenship
trade-offs as a function of explained and unexplained pay dispersion would be useful.

Second, pay dispersion research and the theories associated with it also imply that greater pay
spreads may, beyond reducing citizenship, increase antisocial behavior and sabotage. For tour-
nament theory in particular, relative performance differentials rather than absolute excellence are
the criteria for success. As a result, any efforts to lower the performance of rivals may serve to work
in favor of an individual’s case for promotion or bonus. Research in experimental economics
provides some preliminary evidence in this vein. Harbring & Irlenbusch (2008) found that pay
differentials showed no relationship with sabotage, but a balanced proportion of winner and loser
prizes in the tournament was associated with greater productivity and lower antisocial behaviors.
But, a later study by these authors revealed higher levels of effort and sabotage when prize spreads
were high (Harbring & Irlenbusch 2011). Freeman & Gelber (2006) similarly found that higher
prize spreads were associated with more cheating in a maze game, especially when participants
were given information about their relative performance positions in the game. Future field studies
that examine measures of organizational deviance, including organizationally direct behaviors
such as production deviance (Duffy et al. 1998), but also forms of interpersonal deviance such as
social undermining (Duffy et al. 2006), would be useful additions to the literature.

Third, the study of workplace envy—the emotion that arises from unfavorable social com-
parisons—is gaining in popularity in the organizational psychology literature. For future mul-
tilevel research, I would encourage researchers to consider situational and episodic envy as a
potential emotional response to pay dispersion. Cabrales (2010) highlights the importance of
envy in a theoretical economic model and demonstrates that damaging invidious reactions are
quite likely in situations in which “increases have no relation with productivity” (p. 371), which
bear a striking resemblance to the unexplained pay dispersion situations examined by several
authors noted in this review. What is provocative about envy in the realm of pay dispersions is that the behavioral consequences of envy are negative only in a limited set of circumstances (Duffy et al. 2012). Invidious reactions can sometimes be benign in terms of behavioral reactions and can even lead to positive outcomes, such as self-improvement efforts (Sterling et al. 2013, Tai et al. 2012). Understanding when and how pay dispersion and pay inequality lead to workplace envy and, in turn, the conditions under which invidious reactions relate to positive and negative individual and workplace outcomes would advance the knowledge base in terms of expanded criteria, but also in terms of the underlying mechanisms of pay-system reactions.

The Nature of Dispersion

Unlike Gupta et al. (2012), I devoted little space in this review to measurement and operationalization issues in the study of pay dispersion and focused my attention instead on the underlying theoretical issues and the cumulative empirical findings. But, much does remain to be learned concerning whether alternative assessments of pay dispersion play a role in shaping the nature of relationships with performance-, attitudinal-, and withdrawal-related outcomes. As a reviewer noted, the literature in general has examined only a narrow set of dispersion measures (e.g., heterogeneity, variance, range) that tend to be strongly correlated. But other specifications are possible. As Aguinis & O’Boyle (2013) discuss at length, twenty-first-century organizations may be led in large part by star performers, or those who contribute a disproportionate amount of output relative to others. As such, other operationalizations of dispersion (e.g., power laws or functions) that map more effectively to the distribution of inputs may be more applicable. Such research could lead to new advances in this research area.

CONCLUSION

Despite the dearth of compensation research in the organizational literature, research on pay dispersion remains vibrant. It is an important feature in the landscape of organizational psychology and organizational behavior. My goal in this review was to summarize the existing empirical literature and derive some general stylized facts about the state of knowledge as it relates to the consequences of pay dispersion at the organizational, team, and individual levels. In doing so, it became clear to me that researchers have made much progress in the past 15 years; the pay dispersion literature is replete with exemplary scientific contributions. Further, I strived to provide a platform from which future researchers could advance this literature. I suggest that we put to rest the simplified “theoretical dilemma” that has been used to excess for theoretical framing in the literature; researchers have identified and explored the inconsistencies and contingencies in a number of different studies. Instead, my suggestion is that researchers (a) focus on understanding and refining the notions of explained (legitimate) and unexplained (illegitimate) pay structures across societal cultures, (b) move beyond the broad concept of interdependence and focus instead on the identifiability of individual efforts, (c) strive to understand the theoretical mechanisms that lie between pay structures and their distal outcomes, (d) explore the contingency role of workforce composition, and (e) expand the scope of consequences to include citizenship, antisocial behavior, and envy.

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**LITERATURE CITED**


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