Causes and Consequences of Collective Turnover: A Meta-Analytic Review

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Abstract

Given growing interest in collective turnover (i.e., employee turnover at unit and organizational levels), the authors propose an organizing framework for its antecedents and consequences and test it using meta-analysis. Based on analysis of 694 effect sizes drawn from 82 studies, results generally support expected relationships across the 6 categories of collective turnover antecedents, with somewhat stronger and more consistent results for 2 categories: human resource management inducements/investments and job embeddedness signals. Turnover was negatively related to numerous performance outcomes, more strongly so for proximal rather than distal outcomes. Several theoretically grounded moderators help to explain average effect-size heterogeneity for both antecedents and consequences of turnover. Relationships generally did not vary according to turnover type (e.g., total or voluntary), although the relative absence of collective-level involuntary turnover studies is noted and remains an important avenue for future research.

Keywords: collective turnover, organizational performance, retention, meta-analysis

The issue of collective turnover—that is, "the aggregate levels of employee departures that occur within groups, work units, or organizations" (Hausknecht & Trevor, 2011, p. 353)—has a long history in management and applied psychology research. Discussions of organizational-level turnover rates extend back nearly a century, as seen in early work addressing "rates of departure" (Greenwood, 1919, p. 187) and the "stability of employment" (Fish, 1917, p. 162). Topical interest further formalized via several influential accounts of collective turnover's causes and consequences (March & Simon, 1958; Mobley, 1982; Price, 1977; Staw, 1980). More recently, this attention has intensified in terms of empirical studies (e.g., Batt & Colvin, 2011; Shaw, Dineen, Fang, & Vellella, 2009; Siebert & Zubanov, 2009; Trevor & Nyberg, 2008), theoretical contributions (Dess & Shaw, 2001), and narrative reviews (Hausknecht & Trevor, 2011; Shaw, 2011). Indeed, over 100 studies have been published on the topic—nearly two thirds in the last decade alone—mostly in leading journals in management and related fields (Hausknecht & Trevor, 2011).

Alongside the growing interest, the number of constructs that have been postulated as potentially related to collective turnover has grown substantially. This increase stems from turnover rates serving as a key predictor or outcome variable across a wide range of both emerging and established research topics at group, unit, and firm levels (e.g., high-commitment human resource [HR] practices, collective attitudes, human and social capital, organizational demography). Moreover, while general understanding of how different constructs relate to turnover within a given topical domain has appeared (e.g., *within* strategic human resource management [HRM]; see Combs, Liu, Hall, & Ketchen, 2006), there has been little systematic attention to understanding which constructs matter most *across* these areas. In this study, we take a broad view of collective turnover to organize its relevant causes and consequences

conceptually and then use meta-analysis to determine which factors matter most from an empirical standpoint.

Our intended contributions are threefold. First, we classify the multitude of variables that have been studied to date into a more theoretically parsimonious organizing framework. Second, we leverage this framework and use meta-analysis to understand which factors most strongly relate to collective turnover. Given vast differences in sample sizes across studies, we examine whether between-study differences represent sampling error rather than variation in true effects. Third, we test several study-level moderators that could explain effect-size heterogeneity. In doing so, we address a number of extant theoretical propositions that can benefit from the cross-study analysis that meta-analysis allows. We conclude by discussing implications for research and practice. Throughout the article, we refer to *collective turnover or simply turnover, recognizing that similar terms exist (e.g., unit-level or organizational turnover, turnover rates).*

Organizing Framework

In a recent narrative review, Hausknecht and Trevor (2011) organized causes of collective turnover into three areas: HRM practices, collective attitudes/perceptions, and collective characteristics. They classified consequences in terms of productivity, firm performance, and customer outcomes. Although we aim to test their overall framework empirically, we focus on antecedents for two primary reasons. First, the collective turnover literature contains substantially more effect sizes for antecedents than for outcomes. Based on our literature search and inclusion criterion of at least three available independent effect-size estimates, we identified 40 antecedents and 12 outcomes (Appendix A lists names, definitions,

and sample citations for all 52 variables). Indeed, of the 694 effect-size estimates identified here, 526 (75.8%) pertained to turnover antecedents. From a variable standpoint, 40 of 52 variables (76.9%) captured presumed turnover causes. Thus, the literature on antecedents is much larger—and more diffuse—and could therefore benefit substantially from systematic consolidation. Second, given several recent studies that exclusively focused on turnover's consequences (e.g., Hancock, Allen, Bosco, McDaniel, & Pierce, 2013; T. Park & Shaw, 2013; Shaw, 2011), systematic examination of its determinants remains an important but as of yet untested issue. Although we emphasize antecedents, we also include meta-analyses of consequences to highlight findings that extend our understanding beyond existing research.

Causes of Collective Turnover

We organize the multitude of collective turnover antecedents into six categories: (a) HRM inducements and investments, (b) HRM expectation-enhancing practices, (c) shared attitudes toward the job and organization, (d) quality of work group and supervisory relations, (e) job alternative signals, and (f) job embeddedness signals. Rather than provide an exhaustive account of the theory and findings for all constructs within each category, we focus on general descriptions of the categories in the text and include a more detailed rationale in Table l.[1]

[1] We note up front that, although researchers debate whether antecedents and consequences of turnover vary across different turnover types (e.g., voluntary vs. involuntary; see Batt & Colvin, 2011; T. Park & Shaw, 2013; Shaw et al., 1998), extant collective turnover research almost uniformly reflects total or voluntary turnover rates, particularly with regard to antecedents. As such, our theory and hypotheses generally pertain to total or voluntary turnover rates, yet we also report relationships with involuntary turnover in the tables in those few cases where possible. We discuss turnover types more explicitly in later sections.

HRM inducements and investments. Broadly, scholars explain the influence of HRM-turnover relationships in terms of how they promote different forms of the employee-organization relationship (Tsui, Pearce, Porter, & Tripoli, 1997). Practices that signal investments and inducements should negatively relate to turnover rates because they imply employer commitment to building long-term, rewarding employee relationships. This includes high-commitment or high-performance work systems (Combs et al., 2006; Guthrie, 2001; Huselid, 1995) and other HR practices that enhance motivation and commitment and decrease the attractiveness of available alternatives (Batt & Colvin, 2011; Shaw et al., 2009), such as tangible rewards (e.g., pay, benefits) and indirect investments (e.g., training opportunities) that are less monetary in nature but nonetheless, promote favorable employee response (Shaw, Delery, Jenkins, & Gupta, 1998).

Certain HR practices generate their primary effects by increasing the desirability of current employment for employees; others simultaneously influence the organization's preferences toward employee retention by increasing the costs—pecuniary and otherwise—associated with departures. Such practices generate stronger, compounded effects on turnover rates because employees are not only less likely to leave of their own accord (Horn et al., 2009; Tsui et al., 1997) but also are viewed as more valuable by the organization itself. For instance, participation-enhancing practices that increase employee discretion, autonomy, and control over work (Batt, 2002; Haines, Jalette, & Larose, 2010) such as team- based work systems, flexible job design, and problem-solving groups reduce turnover because "the firm has to invest in setting up participatory structures and then relies on employee experience and commitment to improve their effectiveness" (Doellgast, 2008, p. 294). In the same vein, a workforce characterized by a high proportion of full-time employees may be indicative of organizational proclivities toward

primary (vs. secondary) employment systems (Osterman, 1987), once more signaling greater desirability of current employment among employees and greater desires for retention among organizations. Such structures represent mutual investment strategies with respect to the employee-organization relationship—that is, "some degree of open-ended and long-term investment in each other by *both* the employee and the employer" (Tsui et al., 1997, p. 1093)—and suggest enlargement of potential organizational gains from employee retention. Similarly, investments in workforce quality (e.g., staffing selectivity) may generate compounded effects as both the organization's return to retention is increased via enhanced employee utility and employees' desirability of employment is increased via better organizational fit. Taken together and using prior literature as a guide, we identify 14 inducement and investment variables (see Appendix A for definitions and study names) and expect the following:

> *Hypothesis 1:* HRM inducements and investments (i.e., benefits, dispute resolution, high-commitment HR systems, internal mobility, participation-enhancing work design, proportion of full-time employees, relative pay, straight pay, variable pay, selection sophistication, skill requirements, staffing levels, staffing selectivity, and training) will be negatively related to collective turnover.

HRM expectation-enhancing practices. Expectation-enhancing HRM practices—for example, monitoring and routinization (e.g., Batt, Colvin, & Keefe, 2002; Mueller & Price, 1989; Shaw et al., 1998)—include those interventions that reduce employee autonomy, expand organizational control over work behaviors, and effectively increase employee accountability for organizationally desired contributions. HRM practices that demonstrate an organization's

aversion toward long-term employee investments—for example, pursuit of secondary employment subsystems or employee divestiture through downsizing—should increase aggregate turnover as the direct and indirect costs of departures and replacements to organizations are effectively reduced (from the employer's perspective), as is the desirability of current employment (from employees' perspectives). Other common forms of expectation-enhancing practices include close supervision and electronic performance monitoring. These oversight mechanisms are thought to reduce trust, increase stress, and signal organizational preference for short- rather than long-term employee- organization relationships, all of which should increase the desirability of leaving and lead to higher turnover rates (Batt & Colvin, 2011; Tsui et al., 1997).

Insert Table 1 Here

Hypothesis 2: Expectation-enhancing practices (i.e., downsizing rate, electronic monitoring, managerial oversight, and routinization) will be positively related to collective turnover.

Shared attitudes toward the job and organization. Numerous researchers have linked collective-level employee attitudes and perceptions (e.g., aggregated views of satisfaction, commitment, justice) to unit-level turnover rates (e.g., Liu, Mitchell, Lee, Holtom, & Hinkin, 2012; McNulty, Oser, Johnson, Knudsen, & Roman, 2007; Riordan, Vandenberg, & Richardson, 2005; Ryan, Schmit, & Johnson, 1996). Although these aggregates are not interchangeable with their individual-level counterparts, all have been conceived as unit-level indicators of collective

favor or disfavor with the job, organization, and/or work environment (Whitman, Van Rooy, & Viswesvaran, 2010). When attitudes and perceptions are sufficiently shared (as research indicates is often the case due to social contagion and exposure to similar work environments; Felps et al., 2009; Ryan et al., 1996; Whitman et al., 2010), these constructs may signal a collective-level desirability of movement that is analogous to the concept most often found at the individual level (and most often indexed as job satisfaction; Mobley, 1982). Positive shared attitudes and perceptions signal that members derive benefits (e.g., working in a committed team) that would be foregone through leaving, whereas negative views, especially those that are shared, become a common topic of discussion among members (Felps et al., 2009), inducing employees to look elsewhere for more satisfying work. We include four constructs as indicators of shared attitudes toward the job or organization—satisfaction, commitment, justice, and turnover intentions—and predict the following:

> *Hypothesis 3*: Unit-level commitment, justice, and satisfaction will be negatively related to collective turnover; unit-level turnover intentions will be positively related to collective turnover.

Quality of work group and supervisory relations. In addition to targeting collective feelings about a given job and/or organization, scholars have also addressed group perceptions regarding the quality of relations within the work group and/or with the supervisor. We identify six such variables: climate, cohesiveness, supervisory relations, organizational citizenship behaviors (OCBs), age diversity, and tenure diversity. For example, units with positive climates tend to have high levels of employee participation, information sharing, and employee

investment—characteristics that employees find desirable (Gelade & Ivery, 2003; Richardson & Vandenberg, 2005; Tsui et al., 1997). Similarly, units with high cohesiveness tend to have lower turnover rates because group members value and enjoy group membership (George & Bettenhausen, 1990). In terms of supervisory relations, Nishii and Mayer (2009) studied leader-member exchange (LMX) and argued that high-LMX-mean units signal a higher proportion of employees feeling validated and supported by leaders, greater power sharing between leaders and employees, and a heightened sense of psychological safety, all of which should reduce the desirability of leaving. OCBs also relate to the desirability of movement because, in units characterized by high OCBs (i.e., those possessing a strong tendency of members to help one another, offer suggestions for process improvements, etc.), members should derive satisfaction and belonging that would be lost via departure. As Podsakoff, Whiting, Podsakoff, and Blume (2009) noted, "OCBs may also enhance team spirit, morale, and cohesiveness, thereby reducing the amount of time and energy spent on team maintenance functions and enhancing the organization's ability to attract and retain the best people" (p. 125). Thus, higher OCBs likely signal a more favorable work environment, less desirability of leaving, and less actual turnover. Finally, age and tenure diversity should relate positively to unit turnover, as organizational demography theory implies that dissimilarity may create disparities in beliefs and value systems, increasing conflict (Pfeffer, 1983; Wagner, Pfeffer, & O'Reilly, 1984) and desirability of leaving. In light of these arguments, we expect the following:

> *Hypothesis 4*: Climate, cohesiveness, supervisory relations, and OCBs will be negatively related to collective turnover; age diversity and tenure diversity will be positively related to collective turnover.

Job alternative signals. Job alternative signals encompass nonaffective attributes of organizational members, establishments, and the labor market that indicate enhanced (or constrained) ability to find extraorganizational alternatives (March & Simon, 1958) and include signs of both the quantity and quality of other employment opportunities (Griffeth, Steel, Allen, & Bryan, 2005; R. P. Steel & Griffeth, 1989). March and Simon's (1958) notion of "ease of movement"—that is, an individual's perception of the "number of perceived extraorganizational alternatives" available (March & Simon, 1958, p. 100)—addresses the quantity dimension and helps explain the influence of several antecedents. The number of available alternatives is dependent on characteristics of organizational members (i.e., education) and the labor market (i.e., unemployment rate). Just as higher levels of education create more available alternatives (and higher turnover) due to increased human capital (e.g., Becker, 1962), higher unemployment rates reduce the number of alternatives available to employees (and reduce turnover).

Complementing ease of movement factors, those that reflect March and Simon's (1958) notion of desirability of movement also may explain collective turnover by addressing the quality of alternatives. Griffeth et al. (2005, p. 336) argued that researchers should address both quantity and quality dimensions, stating that "having an abundance of employment alternatives does not ensure that the alternatives will be attractive or desirable." Despite this direction, alternative quality is rarely studied at the collective level; hence, we examine here several related factors that may signal collective desirability of movement with regard to current employment (i.e., size, age, and site quality). When the unit's standing on these dimensions is favorable to employees, the relative attractiveness of alternatives may be offset via the opportunity cost of foregoing current employment. Specifically, we expect lower desirability of movement (and

lower turnover) in units that are smaller (i.e., smaller groups are less susceptible to coordination difficulties; Hausknecht, Trevor, & Howard, 2009), favorably located (i.e., establishments with easy access to customers, proximity to frequently visited locations, and a presence in more densely populated locales with more expansive customer bases should be more favorable due to more frequent and positive customer interactions; Holwerda, Ericksen, & Dyer, 2010; Kacmar, Andrews, Van Rooy, Steilberg, & Cerrone, 2006), and older (i.e., over time, older organizations offer relatively more employment stability and more favorable employment structures and practices; Brown & Medoff, 2003). Based on the arguments above, we expect the following:

> *Hypothesis 5*: Alternative availability, average employee education, and size will be positively related to collective turnover; site quality, unemployment rate, and establishment age will be negatively related to collective turnover.

Job embeddedness signals. In introducing the concept of job embeddedness, Mitchell, Holtom, Lee, Sablynski, and Erez (2001) noted the need to break away from a focus on traditional antecedents of turnover such as attitudes and alternatives and instead consider other potential on-the-job and off-the-job influences, such as the links and fit between a person and his or her organizational and community environments as well as the sacrifices involved with leaving a job. For instance, higher job embeddedness is associated with decreased turnover, as individuals perceive a high cost (e.g., sacrifice) of leaving environments to which they feel a higher degree of attachment (e.g., links and fit; Mitchell et al., 2001)—in essence, reducing the desirability of movement (March & Simon, 1958). Particularly relevant to the current study, this

effect has also been found at the organizational level, as higher firm-level job embeddedness is associated with reduced quit intentions (Horn et al., 2009).

Drawing from the above logic, we expect that units with higher average employee tenure (Bennett, Blum, Long, & Roman, 1993; Cotton & Tuttle, 1986), as well as those with higher experience concentrations, will exhibit lower turnover. Employees in these units have become embedded in their jobs over time (Mitchell et al., 2001) and have become tied to social networks (e.g., Burt, 1987; Granovetter, 1973) within their organizations. Leaving involves a high degree of sacrifice, thus decreasing desirability of movement. In addition, scholars have long noted higher departure rates of younger versus older workers (due in part to more plentiful entry-level jobs and greater likelihood of early-career misfits; Mobley, 1982) and of women versus men. Job embeddedness may be lower for females, as family obligations may cause interruptions in employment, disrupting the formation and degree of links and fit between females and the organization. Similarly, family obligations may prompt a greater percentage of females to accept part- time and temporary employment, creating a concentration of females in jobs without formal career ladders (Baron, Davis-Blake, & Bielby, 1986). Altogether, this suggests that average age and proportion of female employees will share negative and positive associations with turnover rates, respectively. Finally, unionization should also decrease collective turnover, as unions not only enhance job security (Trevor & Nyberg, 2008) but also negotiate higher wages and provide employee voice mechanisms, both of which should embed workers and decrease the desirability of leaving (Delery, Gupta, Shaw, Jenkins, & Ganster, 2000; Freeman & Medoff, 1984; Hirschman, 1970). Overall, we identify five variables representing job embeddedness signals: average employee age, average employee tenure, experience concentration, unionization, and proportion female. We expect the following:

Hypothesis 6: Average employee age, average employee tenure, experience concentration, and unionization will be negatively related to collective turnover; proportion female will be positively related to collective turnover.

Moderators of Antecedent-Turnover Relationships

Beyond the aforementioned main effect relationships, theory and past research suggest that certain antecedent-turnover relationships may be context dependent. As such, we sought to identify antecedent-turnover relationships that possess a theoretical basis for moderation and a sufficient number of available studies for estimating relationships across subgroups. These criteria led us to examine moderators for four different antecedents: training, internal mobility, high-commitment HR practices, and size.

Firm specificity of training investments. Although researchers often view training as an inducement and investment that should reduce turnover (e.g., Huselid, 1995), others have argued, on the basis of human capital theory (Becker, 1962), that investments in training—particularly those that are general versus firm specific—may actually increase turnover (Benson, Finegold, & Mohrman, 2004; Haines et al., 2010). That is, while training investments may be viewed generally as a signal of longer term organizational commitment to employees, to the extent that training increases external marketability (e.g., Trevor & Nyberg, 2008) or an individual's movement capital (Trevor, 2001), higher turnover is likely. Given arguments that general training is more visible externally, it is expected to relate positively to turnover. Conversely, because firm-specific training is generally both less valuable and less visible to external

employers, it is expected to bind employees to their current employer, resulting in negative training-turnover relationships (Becker, 1962).

Hypothesis 7: Training-collective turnover relationships will be negative when training is firm specific and positive when training is general.

Strength of internal mobility practices. Alongside other characteristics of internal labor markets (e.g., seniority-based rewards, firm-specific training, implicit or explicit job security), policies and practices that promote internal mobility (e.g., promotion from within) should foster long-term commitment and reduce the attractiveness of alternatives (Osterman, 1987). However, although internal mobility policies may reduce turnover generally, effects are likely stronger when internal mobility reflects the *actual* rate of internal promotion (e.g., Batt & Colvin, 2011) versus perceptions or reports generated by key informants regarding the organization's general *emphasis* on promoting from within (e.g., Mueller & Price, 1989). Indeed, there is evidence that objective measures of internal mobility are better predictors of individual- level turnover than subjective measures (Carson, Carson, Griffeth, & Steel, 1994). At the collective level, actual promotion rates serve as relatively objective signals of an organization's adherence to internal labor market employment structures (and, by extension, its focus on long-term employment relationships), whereas perceptual measures reflect more subjective, and therefore potentially less accurate, assessments of these same practices.

Hypothesis 8: Negative internal mobility-collective turnover relationships will be stronger when measured in terms of actual (vs. perceived) internal mobility.

Industry effects of high-commitment HR practices. Extant studies of the relationship between high-commitment HR systems and collective turnover represent a mix of single-industry (e.g., Batt & Colvin, 2011) and multi-industry studies (e.g., Huselid, 1995). However, when compared with single-industry studies (e.g., financial services, transportation, hospitality), multi-industry studies confound differences in industry-specific norms in both HR practices and turnover rates (e.g., what constitutes low turnover in the hospitality sector might be considered high within financial services), as well as differences in the nature of knowledge, skills, and abilities, organizational processes, and work structures, both of which should weaken relationships between the focal constructs. Conversely, when industry is held constant, relationships between high-commitment HR practices and turnover should be more evident.

Hypothesis 9: Negative high-commitment HR practice- collective turnover relationships will be weaker in studies conducted in multi-industry (vs. single-industry) studies.

Context dependence of collective size. Although size is routinely defined in terms of the number of employees, scholars contend that the size-turnover relationship depends on whether size reflects group/subunit or total firm size. Porter and Lawler (1965, p. 40) argued, "it is conceivable, for example, that although working in a large subunit has disadvantages ... working in a large total organization might have advantages as long as the subunits within the organization are relatively small." Consistent with this reasoning, authors of firm-level studies contend that larger size signals greater resource availability for combating turnover (e.g., use of high-involvement HR practices, greater likelihood of internal mobility practices; Guthrie, 2001; Mobley, 1982), whereas authors of group-level studies maintain that larger size creates

coordination difficulties, increases conflict, weakens leader relations, and inhibits cohesiveness (Green, Anderson, & Shivers, 1996; LePine, Piccolo, Jackson, Mathieu, & Saul, 2008; Terborg & Lee, 1984). Taken together, these competing rationales suggest that size is negatively related to turnover at the firm level but positively related at the group/subunit level.

Hypothesis 10: The relationship between size and collective turnover will be negative in firm-level studies and positive in group/unit-level studies.

Consequences of Collective Turnover

Turning next to the consequences of collective turnover, most turnover-performance research rests upon one of three broad theoretical arguments: (a) turnover damages performance because it conveys a loss of valuable knowledge, skills, and abilities (the human capital argument; Osterman, 1987; Shaw, Gupta, & Delery, 2005); (b) turnover hinders performance because it disrupts established patterns of interaction, creates flux in coordination, and diverts attention to nonproductive activities (the operational disruption argument; Staw, 1980; Summers, Humphrey, & Ferris, 2012); or (c) turnover damages performance because it incurs replacement costs that deplete potential financial gains (the cost argument; Cascio, 2006). In all three cases, high turnover constrains productive capacity (Hausknecht & Holwerda, 2013), which should inhibit both short- and longer term performance. Following past work (Dyer & Reeves, 1995) and foreshadowing a potential moderating characteristic, we organize consequences into proximal and distal outcomes. Proximal outcomes signify direct outputs and include measures such as customer satisfaction, production efficiency, and error rates. Distal outcomes capture the

financial returns (e.g., sales, profits) generated by the group's or firm's activities. We expect the following:

> *Hypothesis 11*: Collective turnover will be negatively related to customer satisfaction, production efficiency, financial performance, and sales; collective turnover will be positively related to counterproductivity, error/loss rates, and absenteeism.

Moderators of Turnover-Effectiveness Relationships

Given the diverse array of settings in which turnover's consequences have been studied, we expect that overall effect-size estimates will be heterogeneous, thereby suggesting moderators. Theory and past research suggest that turnover relationships should vary across studies that differ with respect to the (a) definition of turnover (e.g., total, voluntary, involuntary), (b) causal proximity of turnover to the outcomes investigated, (c) study setting (i.e., within- vs. between-organization), (d) complexity of the job(s) under investigation, and (e) industry within which the study was conducted.

Turnover type. In the most aggregated form, employee departures for any reason are combined into a total turnover rate (i.e., ratio of total number of leavers to group size). Yet researchers have long noted that not all departures signal equivalent losses of human capital. Instead, some are organizationally initiated and may generate functional effects (Dalton & Todor, 1979; Staw, 1980), while other, voluntary departures may signal significant human capital losses that the organization would avoid if possible (Price, 1977; Shaw, 2011). Hence, total turnover rates confound voluntary turnover (i.e., employee-initiated departures, which may

include high, average, and/or low performers) with involuntary turnover (i.e., organization-initiated departures, which often include low performers). Specifically, "involuntary turnover rates . . . signal the extent to which workforce quality is problematic" (Hausknecht & Trevor, 2011, p. 369), while voluntary turnover rates more specifically represent departures of employees who perform well (or at least adequately) and whom a given organization would prefer to retain (or at least not terminate). Combined total turnover rates essentially represent two distinct constructs, which attenuates observed relationships by introducing unobserved heterogeneity into turnover relationships through the combination of unmeasured employee subpopulations. Thus, we expect the following:

> *Hypothesis 12*: The magnitudes of collective turnover- effectiveness relationships will be stronger when collective turnover is measured as voluntary turnover rather than when collective turnover is measured as a total rate.

Proximal/distal nature of outcome. The magnitude of turnover-consequence relationships should also depend on the causal proximity of the focal outcome to the turnover construct itself. Dyer (1984) and Dyer and Reeves (1995) predicted an increasing likelihood of contamination of outcome measures as one moves from operational and organizational outcomes toward financial/bottom-line outcomes. Thus, the magnitude of turnover- outcome relationships should decrease as more distal (financial and/or market-based) outcomes considered as factors unrelated to the turnover construct (e.g., cyclical changes in sales, variations in input prices) begin to contribute to observed variance of the measures in question.

Hypothesis 13: Negative collective turnover-effectiveness relationships will be weaker for distal (financial) than for proximal (operational) outcomes.

Within-organization versus between-organization settings. Turnover-outcome relationships should be larger in within- organization studies because they control for unobserved covariates such as company policies, work design, HRM practices, and the like, as opposed to their between-organization counterparts for which such controls are regularly incomplete or unavailable. Glebbeek and Bax (2004) discussed the prominent role that unmeasured organizational differences in between-organization settings play in obscuring turnover-performance relationships and noted the impossibility impossibility of applying statistical controls for all such differences. By constraining the sample, within-organization studies should decrease unobserved heterogeneity relative to between- organization studies. Thus, we expect the following:

Hypothesis 14: Negative collective turnover-effectiveness relationships will be weaker in studies conducted in a between- organization (vs. within-organization) context.

Industry effects. In those industries characterized by high turnover, we propose that organizations will actively take strategic steps to mitigate the impact of turnover on performance. Such steps may produce a sort of immunity effect—that is, structural characteristics of the nature of work in a given industry or the industry itself that insulate firms from the negative effects of turnover. Immunity effects can be generated by several means, for instance, minimizing the training or educational requirements necessary to perform a job, de-skilling or otherwise dividing

components of a job into discrete tasks, increasing routinization or centralization, decreasing autonomy, or, more generally, moving toward a control-based (Arthur, 1992, 1994) HR system. Such efforts increase the size of the viable labor pool and therefore minimize the time and cost needed to find suitable replacements. For instance, the U.S. Bureau of Labor Statistics has documented large differences in both voluntary and involuntary turnover rates across specific industries, with some industries, such as leisure and hospitality, reporting voluntary rates as high as 60%, while government occupations report rates around 10% at the high end (Hausknecht & Trevor, 2011). Organizationally led generation of immunity effects is evident in the fast-food industry, where key job duties have been standardized through technology or other means so that someone can perform front-line jobs with minimal experience or training. Conversely, for complex jobs in which work tasks are not (or are less) able to be divided into routine components, the effects of turnover on performance should be stronger as greater human capital is required to perform such tasks, thus shrinking the number of suitable replacements and limiting organizations' abilities to generate structural immunity.

> *Hypothesis 15*: Negative collective turnover-effectiveness relationships will be weaker when (a) the industry is characterized by high turnover and (b) job complexity is low.

Method

Study Identification

Literature search. To identify relevant studies, we first searched several computerized databases (ABI/INFORM, Business Source Complete, JSTOR, ProQuest, PsycARTICLES) using the search terms *turnover, quit, discharge, layoff, dismissal,* and *termination* in combination with the terms *organizational, collective, unit, proportion, rate,* and *ratio*. No limitations were placed on the year of publication. Second, a manual search of articles published in *Academy of Management Journal, Journal of Applied Psychology, Journal of Management,* and *Personnel Psychology* was conducted from the year 2000 forward. Third, citation searches were conducted for articles referencing seminal studies addressing collective turnover (e.g., Batt, 2002; Shaw et al., 1998; Staw, 1980). Fourth, we scanned reference lists of relevant articles. Fifth, to help mitigate possible publication bias, a computerized search of conference programs/proceedings was conducted for both the Academy of Management Annual Meeting and the Society for Industrial and Organizational Psychology Conference from the year 2007 forward due to the availability of electronic databases for this period. In the same vein, the ProQuest Dissertations and Theses database was searched using the aforementioned search terms. Altogether, these procedures resulted in the initial identification of 128 potentially eligible studies.

Inclusion criteria. Included studies had to report a Pearson correlation for collective turnover and a unit-level antecedent or consequence, or data from which a correlation could be derived, as well as sample size. We retained for analysis any antecedent or consequence variable

so long as three or more independent effect- size estimates were available. Studies reporting only individual- level turnover were omitted. After applying these criteria, we arrived at a final sample of 82 studies and 694 effect sizes. Appendix B lists study names, effect sizes, and moderator codes. Appendix C contains exclusion reasons for the 46 excluded studies.

Coding Procedure

Identification of antecedent and consequence variables. To create the final list of variables, we independently examined variable names, construct definitions, and measures used in primary studies. We independently categorized variables as causes or consequences and, within each, further classified variables into subcategories based on Hausknecht and Trevor's (2011) framework, as expanded upon in the current work. Discrepancies were resolved by discussion and unanimous consensus over a series of meetings until the final variable groupings were decided. With the final variable list in hand, we then defined each variable/construct to facilitate valid and consistent organization of effect sizes into appropriate categories for analysis. Appendix A lists the 52 included variables—40 causes and 12 consequences—and provides definitions, citations, and sample variable names used by the original authors.

Coding of effect sizes. After finalizing our list, we then extracted the relevant effect sizes. Accompanying sample sizes were coded as the number of units used to compute the correlations found within individual studies. In cases where the same sample was used in multiple studies, only those effect sizes not present in the original study were included for further analysis to eliminate possible double counting. Further, multiple effect sizes for a single construct were combined using Hunter and Schmidt's (1990) formula for linear composites.

Coding of study characteristics. Our coding scheme recorded study characteristics that would serve as the basis for our moderator analyses. The coding scheme was first developed by one of the authors and then discussed with the remaining authors until consensus was reached. Study characteristics were then coded independently by two of the authors. Discrepancies in this phase were resolved by discussion and required unanimous consensus. We coded *turnover type* according to voluntariness (i.e., voluntary, involuntary, or total/combined). Those studies whose measures of turnover were ambiguous or indeterminable were classified as falling into the total category based on the logic that (a) if either only involuntary or only voluntary turnover were measured, it would have likely been reported and (b) even poorly defined measures—those for which the structure of the numerator and/or denominator was not clear or for which the voluntariness of what was being measured was not apparent—are still measuring turnover and thus merit inclusion. Regarding antecedent moderators, we coded training as either firm specific or general (Becker, 1962), internal mobility as perceptual or an actual rate, size as either firm size or group/subunit size, and industry as single or multiple. *Proximal/distal outcome* was coded based on Dyer and Reeves's (1995) conceptual hierarchy of effectiveness outcomes. Proximal outcomes included absenteeism, counterproductivity, customer satisfaction, error/loss rates, and production efficiency. Distal outcomes included sales, sales efficiency, sales growth, operating profit, profit margin, return on assets, and return on equity (proximal = 0, distal =1). We coded *study setting* such that studies addressing multiple subunits (e.g., stores, groups) within a single organization were coded as within-organization, while those involving more than one firm were coded as between-organization (within- organization = 0, between-organization =1). Coding of *job complexity* was performed by matching job titles (coded from primary studies) to occupational listings on 0*NET (www.onetonhne.org) and coding as an integer value the listed

job zone (e.g., a listing of Job Zone 1 indicates “little or no preparation needed” while a listing of Job Zone 5 indicates “extensive preparation needed”). Finally, *industry* was coded according to the median wage for production and nonsupervisory employees for relevant industries by North American Industry Classification System code as listed by the U.S. Bureau of Labor Statistics (www.bls.gov).

Meta-Analytic Procedures

Random-effects meta-analyses were conducted according to procedures recommended by Hunter and Schmidt (1990, 2004) and Borenstein, Hedges, Higgins, and Rothstein (2009). We report k, the number of independent effect sizes used to compute the mean effect; N, the number of work units within the sample; $\bar{r}$, the weighted mean correlation; and the 95% confidence interval for the mean effect. In addition, we report three statistics to quantify heterogeneity: the Q statistic, the weighted sum of squares and its associated p value (a statistically significant p value allows one to reject the null hypothesis that effect sizes are constant across studies); T, the standard deviation of true effect sizes, which indicates the absolute amount of deviation in effect sizes about the mean; and the I^2 statistic, which indicates the proportion of dispersion that can be attributed to real differences in effect sizes as opposed to within-study error (Borenstein et al., 2009). All estimates were calculated using Comprehensive Meta-Analysis 2.0 software (Borenstein, Hedges, Higgins, & Rothstein, 2005).

Note that in the following tables, summing k values for voluntary, involuntary, and total turnover categories may not add up to the k value for corresponding summary figures. This is a result of efforts to avoid double counting and to use the most detailed information available.

More specifically, voluntary and involuntary categories are comprised of studies in which the turnover measure clearly captured voluntary or involuntary turnover, respectively. The total category contains studies in which the measure was undifferentiated or clearly a combination of voluntary and involuntary turnover. Finally, the summary category was composed of any kind of measured turnover (i.e., voluntary, involuntary, or total) but, to avoid double counting, excluded total turnover effect sizes from a study if voluntary and/or involuntary effect sizes for that same study were available. In cases where a given study provided an effect size only for total turnover that effect size was included in the summary analysis.

Concerning moderator tests, we posit five factors that might account for heterogeneity in turnover-effectiveness relationships. For turnover type, we report meta-analytic results separately for total, voluntary, and involuntary turnover (as well as for the summary category). Concerning the remaining moderators, which represent several continuous and possibly correlated variables, we used weighted least squares (WLS) multiple regression. WLS techniques are preferred because they account for correlated moderators, assign proper weighting to studies based on the inverse of the sampling error variance, and avoid dichotomization of continuous moderators (P. D. Steel & Kammeyer-Mueller, 2002). Given that moderators of antecedent-turnover relationships involved different variables, we tested these hypotheses using subgroup analysis.

Finally, we calculated meta-analytic intercorrelations of different turnover types (e.g., voluntary-involuntary turnover, voluntary-total turnover). Numerous scholars have argued that combined or total turnover measures mask important differences across determinants and/or outcomes of voluntary and involuntary turnover (e.g., McEvoy & Cascio, 1985; Shaw et al., 1998). Examining relationships between voluntary and involuntary turnover rates (and between

each type with total turnover rates) indicates the degree of overlap across these different approaches to collective turnover measurement.

Results

Antecedents of Collective Turnover

HRM inducements and investments. In Hypothesis 1, we stated that HRM inducement and investment practices would negatively relate to collective turnover. As reported in Table 2 and in support of Hypothesis 1, we found negative weighted mean correlations for benefits ($\bar{r}$ = —.14), dispute resolution ($\bar{r}$ = —.14), high-commitment HR systems ($\bar{r}$ = —.23), internal mobility ($\bar{r}$ = — .25), participation-enhancing work design ($\bar{r}$ = —.17), relative pay ($\bar{r}$ = —.13), skill requirements ($\bar{r}$ = —.16) and staffing selectivity ($\bar{r}$ = —.24) in relation to summary turnover. (This latter finding suggests that the more selective organizations are in their hires, the lower the turnover rate.) For each of these estimates, the 95% confidence intervals excluded the null value, suggesting that the mean true correlation is significantly different from zero.[2]

[2] Although we discuss and report mean effect-size estimates here as the "best estimate of the construct-level correlation" (Hunter & Schmidt, 2004, p. 16), it is also important to consider the dispersion around these estimates. In the tables of results, the value of T indicates the estimated standard deviation of true effect sizes, which can be used to construct prediction intervals (Borenstein et al., 2009) around the mean (e.g., an 80% prediction interval is approximated by the mean effect size ±[T X 1.28]). In doing so, consistent with the assumption of random-effects meta-analysis, results suggest that many relationships examined in this study have relatively wide prediction intervals (e.g., the 80% prediction interval for high-commitment HR systems is —.40 to —.06, suggesting that a study selected at random would fall in this range 80% of the time). This overall pattern is reinforced by statistically significant Q values, which indicate that most effect-size estimates are heterogeneous. Thus, we urge caution when interpreting mean effect-size values as there is often variability around these estimates.

Contrary to expectations, we did not find support for variable pay, proportion of full-time employees, straight pay, selection sophistication, staffing level, or training. Examining the full set of HRM inducements and investments by the other turnover classifications (i.e., voluntary, total, involuntary) revealed similar results, although we found several items of note. First, while results for benefits held across summary and voluntary turnover, the relationship was not significant for total turnover. Conversely, while results for training were not statistically significant for summary and voluntary turnover, the relationship with total turnover was statistically significant ($\bar{r}$ = —.25). Altogether, results indicate partial support for Hypothesis 1.

Hypothesis 2 predicted that HRM expectation-enhancing practices would be positively related to collective turnover. As shown in Table 2, we found positive relationships for electronic monitoring ($\bar{r}$ = .18) and routinization ($\bar{r}$ = .36). Contrary to expectations, we did not find support for downsizing or managerial oversight. Examining these practices across the other turnover classifications (i.e., voluntary, total, involuntary) revealed similar results, although the confidence intervals for routinization included zero for measures of total turnover. These results indicate partial support for Hypothesis 2.

Shared attitudes about the job and organization. Meta-analytic results for the shared attitudes-collective turnover relationship are reported in Table 3. As posited in Hypothesis 3, we found a significant negative correlation for satisfaction ($\bar{r}$ = — .14), as well as a significant positive correlation for turnover intentions ($\bar{r}$ = .34). Contrary to expectations, no significant relationships were found with commitment or justice. Thus, Hypothesis 3 was partially supported.

Quality of work group and supervisory relations. Results for the quality of work group and supervisory relations-collective turnover relationship are reported in Table 3. Consistent with

Hypothesis 4, we found significant negative correlations for cohesiveness ($\bar{r}$ = —.16), supervisory relations ($\bar{r}$ = —.10), and OCBs ($\bar{r}$ = —.12), as well as a significant positive correlation for age diversity ($\bar{r}$ = .19). However, we did not find significant relationships for climate or tenure diversity. Thus, we found partial support for Hypothesis 4.

Job alternative signals. Relationships between job alternative signals and collective turnover are reported in Table 4. As stated in Hypothesis 5, we found significant, negative weighted mean correlations for establishment age ($\bar{r}$ = —.10) and site quality ($\bar{r}$ = —.10), as well as a significant, positive weighted mean correlation for alternative availability ($\bar{r}$ = .16). Unexpectedly, we did not find a statistically significant relationship between turnover and unemployment rate ($\bar{r}$ = —.01). Results were generally consistent across the total and voluntary turnover classifications. Unexpectedly, we did not find a significant effect between turnover and size or average employee education. Thus, Hypothesis 5 was partially supported.

Job embeddedness signals. Consistent with Hypothesis 6, we found significant, negative weighted mean correlations for average employee age ($\bar{r}$ = —.26), average employee tenure ($\bar{r}$ = —.25), proportion of unionized employees ($\bar{r}$ = —.21), and union presence ($\bar{r}$ = —.13). Results (shown in Table 4) were generally similar for the total and voluntary turnover classifications. In terms of job embeddedness signals expected to share a positive association with turnover, we found a significant relationship with proportion of female employees ($\bar{r}$ = .17), but not with experience concentration. Hypothesis 6 was partially supported.

Insert Table 2 Here

Moderators of Antecedent-Turnover Relationships

Within antecedent-turnover relationships, we proposed four moderators based on theory and past research. We found substantial variability around the mean effect size for the four antecedents (i.e., training, internal mobility, high-commitment HR practices, and size), as indicated by statistically significant Q values, substantial dispersion around the mean effect (e.g., see T values in Table 2), and fairly wide credibility intervals. One of the more visible examples of this concerns training, as the mean effect size was just —.08 (ns) but dispersion was substantial (T = .35), suggesting that moderators may explain why the training-turnover relationship is moderate and positive in some instances but moderate and negative in others. Results also suggested that moderators were present for the remaining three relationships, so we proceeded to test Hypotheses 7-10 using subgroup analysis.

Insert Table 3 Here

Hypothesis 7 stated that training-turnover relationships would be negative when training was firm-specific and positive when it was general. As shown in Table 5, we found partial support for Hypothesis 7, as firm-specific training was moderately and negatively related to turnover ($\bar{r}$ = —.40), whereas general training was unrelated to turnover ($\bar{r}$ = .01). Hypothesis 8 stated that internal mobility-turnover relationships would be stronger when measured in terms of actual promotion rates rather than perceived internal mobility. Findings supported Hypothesis 8, as the effect-size estimate for actual promotion rates ($\bar{r}$ = — .38) was higher than that for perceived internal mobility ($\bar{r}$ = —.05) and confidence intervals did not overlap. Results did not

support Hypothesis 9 or 10. Although we found that high-commitment HR practice-turnover relationships were indeed weaker in cross-industry ($\bar{r}$ = —.15) versus single-industry settings ($\bar{r}$ = —.27), which is consistent with Hypothesis 9, confidence intervals overlapped between the two estimates. Hypothesis 10 suggested that size would be positively related to turnover at the group/subunit level and negatively related to turnover at the firm level, but confidence intervals included zero and overlapped substantially for average group/subunit size ($\bar{r}$ = .02) and firm size ($\bar{r}$ = .05) relationships with turnover.

Note that for the remaining antecedents, we identified a subset of variables where we determined that the mean effect size (mean r) was homogeneous and that moderators were unlikely. This was the case when either the value of Q was not statistically significant or the estimated dispersion around the mean effect size was trivial (or, in some cases, both). Using these criteria, we concluded that moderators were unlikely to be present for 16 of the 40 antecedents. For example, many of the effect-size estimates for shared attitudes were homogeneous (e.g., job satisfaction, cohesiveness), as were both dimensions of unionization (union status and union percent). For the remaining 20 antecedents, moderators were somewhat likely (as indicated by statistically significant Q values and/or a moderate amount of dispersion around the mean effect), but examination of both the mean effect size and 80% credibility intervals (which are based on T) suggested that conclusions regarding the relationship in question would not substantively change (i.e., effect sizes remain directionally consistent and similar in magnitude to the mean). In other cases, a small number of studies and/or lack of theoretical grounding for possible moderators suggested that additional analysis to uncover moderators would be premature (e.g., moderators may explain variability around the average

effect size for benefits [— .14], but credibility intervals suggest negative and weak relationships even at different levels of a given moderator).

Insert Table 4 Here

Consequences of Collective Turnover

Meta-analytic results for the collective turnover- organizational effectiveness relationships are reported in Table 6. As stated in Hypothesis 11, we expected that collective turnover would be negatively related to proximal and distal measures of organizational effectiveness (and positively related to measures of counterproductivity, error/loss rates, and absenteeism). Partially supporting these hypotheses, we found weighted mean correlations between turnover and customer satisfaction ($\bar{r}$ = —.22), profit margin ($\bar{r}$ = —.15), production efficiency ($\bar{r}$ = —.22), sales efficiency ($\bar{r}$ = —.09), counterproductivity ($\bar{r}$ = .27), and error/loss rates ($\bar{r}$ = .14). No significant relationships were found for absenteeism, operating profit, return on assets, return on equity, sales, or sales growth. These results indicate partial support for Hypothesis 11.

Moderators of Turnover-Consequence Relationships

Heterogeneity tests and turnover types. Examining Q statistics for turnover-effectiveness relationships revealed that moderators were likely. As shown in Table 6, 11 of 12 turnover- effectiveness relationships (see Summary rows) had statistically significant Q values

($p < .05$), suggesting that effect sizes were not homogeneous. Breaking down relationships by turnover type (e.g., voluntary, involuntary), however, yielded smaller estimates. Several Q values were no longer statistically significant, indicating homogeneity within a particular turnover type (e.g., see voluntary turnover-customer satisfaction). Further examination revealed that in no instance did the confidence intervals differ across turnover types, suggesting that despite clear conceptual differences, turnover-consequence relationships did not vary based on turnover type. Although these findings must be interpreted with caution given the small number of studies for some relationships, the available evidence does not support our prediction (Hypothesis 12) that relationships would be stronger for voluntary turnover.

Insert Table 5 Here

Moderator results. We used WLS regression to test the remaining four moderators. Descriptive statistics and intercorrelations are presented in Table 7. Note that small-to-moderate correlations were found among the moderators, reinforcing the need to estimate their independent influences within a multivariate framework. We hypothesized that turnover-effectiveness relationships would be weaker for distal (vs. proximal) outcomes (Hypothesis 13), weaker for between-organization (vs. within-organization) studies (Hypothesis 14), weaker in industries characterized by high turnover rates (Hypothesis 15a), and weaker in settings where job complexity is low (Hypothesis 15b). The dependent variable in this analysis is the turnover-effectiveness effect size (i.e., correlation) as defined by the Summary estimates shown in Table 6. Across these outcomes, complete moderator data were available for 118 effect-size estimates.

WLS regression results (shown in Table 8) indicate that, as hypothesized, turnover-effectiveness relationships are stronger for both proximal outcomes ($B = .12, p < .05$) and within- organization studies ($B = .08, p < .05$). Stated differently, consistent with Hypotheses 13 and 14, relationships were weaker for distal outcomes and between-organization studies (i.e., the overall average negative effect shifts closer to zero for distal outcomes and between-organization studies). Results did not support Hypothesis 15a or 15b, as effect-size estimates did not vary across our operationalizations of industry ($B = .00, p > .05$) or job complexity ($B = .00, p > .05$).

Our final goal was to examine intercorrelations of different turnover types (i.e., among total, voluntary, and involuntary rates). As shown in Table 9, we found a modest, positive correlation between voluntary and involuntary turnover ($\bar{r}$ = .28) and much stronger correlations between total turnover and voluntary turnover ($\bar{r}$ = .85) and between total turnover and involuntary turnover ($\bar{r}$ = .74). Note that these latter estimates are upwardly biased as they represent part-whole correlations (i.e., total turnover rates are the sum of voluntary and involuntary turnover rates). Confidence intervals excluded zero across all analyses, suggesting statistically significant relationships across various operationalizations of turnover rates.

Discussion

The current work makes three contributions to inquiry surrounding collective turnover. First, we offer a parsimonious framework by which to organize this large and arguably growing list of factors based on categories and definitions in the relevant extant literature (e.g., Hausknecht & Trevor, 2011; see also Appendix A). Second, our meta-analysis provides the first

comprehensive quantitative summary of the many and varied antecedents of collective turnover. Third, we extend knowledge of antecedent-turnover relationships via examination of pertinent moderators and find support for predictions that firm-specific training and internal promotion levels are associated with lower turnover rates.

To broadly summarize antecedent-turnover relationships, we present Figure 1, which plots the absolute values of each weighted mean correlation against its associated sample size. The predominance of points in the lower left quadrant—characterized by weaker relationships and relatively fewer independent effect sizes—is indicative of the still-emerging nature of this field. As antecedent theory and measurement are further refined, we expect the precision and consistency of these estimates to improve. The lower right quadrant depicts mean correlations that are similarly weak but have received more research attention (e.g., alternative availability, establishment age, and unemployment rate). These relationships, although weak, may constitute important influences in some settings as moderator or control variables and thus merit continued attention. Upper quadrants depict the strongest correlations, highlighting the importance of certain collective characteristics (e.g., average employee age, average employee tenure, unionization percentage) and HR practices (e.g., high-commitment HR systems, internal mobility, routinization) in predicting turnover. Relationships in the upper right quadrant indicate factors possessing some degree of theoretical maturity and fairly robust support, whereas those in the upper left quadrant represent potentially strong and important relationships, where future research can contribute to generalizability.

Insert Table 6 Here

Revisiting our organizing framework, both organizational investments in employees and inducements to maintain current employment generally related negatively to turnover. While we note the considerable variability in magnitudes of observed correlations at the individual-practice/policy level ($\bar{r} = \pm.04 - .24$), results pertaining to internal mobility, high-commitment HR systems, and participation-enhancing work design corroborate evidence that, as coherent constellations of individual practices, bundles/systems of practices generate the greatest effects on key organizational outcomes (e.g., see Arthur, 1994). Specifically, the relative strength of these relationships is likely reflective of both additive effects and synergies associated with sets of multiple mutually supportive and reinforcing practices and supports the logic that a practice that exists as part of a consistent system generates larger impacts than the same practice on its own (Combs et al., 2006). This pattern may reflect increased alignment of utilities between employers and their workforces. Substantial organizational investments and reliance on discretionary employee effort (Doellgast, 2008) increase potential departure costs for employers while decreasing the desirability of departure for employees. As organizations become less willing to see employees leave and employees themselves become less willing to go, their respective utilities approach alignment, and the effects on turnover are compounded. These mechanisms and our findings lend credence to arguments that employment arrangements that enhance worker well-being may be beneficial for both employees and employers.

Insert Table 7 Here

Insert Table 8 Here

Conversely, expectation-enhancing practices generally related positively to collective turnover although, once again, variance in magnitudes was substantial ($\bar{r} = \pm.04 - .36$). Tellingly, those practices that most directly and pervasively influence work design and, by extension, employees' day-to-day activities—routinization and electronic monitoring—had the strongest relationships. These results suggest that those employment practices that constrain employee decision-making processes (e.g., see Mueller & Price, 1989) or constitute invasive supervision (Batt & Colvin, 2011) may have particularly deleterious effects on turnover. However, given the small number of studies from which these estimates were drawn, caution is urged with respect to their interpretation until further work documents the generalizability of these effects.

In addition, positive shared attitudes toward the job and organization as well as positive shared perceptions of work group and supervisory relations generally related significantly and negatively to turnover. With two exceptions—turnover intentions ($\bar{r}$ = .34) and justice/fairness ($\bar{r}$ = —.03)—variability in magnitudes across these categories was relatively limited, with eight of 10 examined relationships falling in the range of $\bar{r} = \pm.10 - .19$. The consistency of magnitudes across these antecedent classes suggests they may be among the more stable correlates of collective turnover. Further, these general findings bear resemblance to magnitudes of counterpart constructs considered by Griffeth, Horn, and Gaertner (2000), suggesting that these sets of constructs are at least as influential on turnover at the collective level as they are at the individual level of analysis (see also Harter, Schmidt, & Hayes, 2002).

While job alternative signals exhibited relatively weak relationships ($\bar{r} = \pm.01 - .16$; five of six observed correlations fell at or below ±.10) and only half of those relationships excluded zero in the 95% confidence interval (alternative availability, establishment age, site

quality), relationships among job embeddedness signals were relatively stronger ($\bar{r} = \pm.13 - .26$) and all constructs except experience concentration significantly related to turnover. Given these differences across antecedent classes, factors pertaining to employee attachment to jobs and firms (e.g., see Felps et al., 2009; Mitchell et al., 2001)—as opposed or in addition to those pertaining to opportunity to leave—emerge as particularly important.

Finally, where possible we examined moderators of antecedent- turnover relationships to address heterogeneity in our results. Among significant moderators, we found firm-specific (vs. general) training negatively related to turnover, suggesting that its reduced visibility and value to external employers (Becker, 1962) may generate organizational benefits by inducing employee retention and protecting organizational investments that presumably drive productivity and performance. In addition, actual promotion rates (as opposed to perceived internal mobility) negatively related to turnover. While this finding in itself suggests that objective measures of policy outcomes may possess greater validity than perceptual measures, taken together these moderators suggest greater specificity of measurement of turnover-related constructs may help account for the marked heterogeneity of many antecedent-turnover relationships as well as improve the consistency of findings across studies.

Insert Table 9 Here

With respect to consequences, and consistent with theory predicting detrimental performance impacts (e.g., Osterman, 1987; Staw, 1980), we found evidence that collective turnover negatively relates to effectiveness outcomes such as customer satisfaction, production efficiency, and sales efficiency. Further, turnover positively associated with increased

counterproductivity and error rates. Heterogeneity in our findings once again prompted us to consider moderating variables; relationships between turnover and performance were stronger for proximal (e.g., operational efficiency, customer satisfaction) than for distal (e.g., financial outcomes) performance indicators and weaker for data collected in between-organization versus within-organization designs. In light of these findings, we encourage careful consideration of outcome proximity and study design going forward.

Insert Figure 1 Here

Future Research

Given our results as well as the characteristics of our sample, several implications for future research are apparent. First and foremost is that our meta-analytic approach largely leaves open questions regarding causality, process mechanisms, and within- study moderation, all of which would benefit from additional study. While our findings help summarize the relevant correlates of collective turnover, many of the included estimates were drawn from studies that did not seek to formally model antecedents or consequences of collective turnover. Additional studies that develop and test process models, as well as those that address contingencies and other boundary conditions of these effects, are needed. In doing so, echoing Hausknecht and Trevor (2011), we highlight the need for theory specific to turnover at the collective level. Fortunately, such theoretical work is emerging (e.g., Bartunek, Huang, & Walsh, 2008; Hausknecht & Holwerda, 2013; Nyberg & Ployhart, 2013), and we encourage follow-up empirical studies along these same lines.

Further, at a conceptual level, some conclusions about turnover interventions (e.g., HR practices) or turnover's impacts on performance depend, in part, on exactly who leaves. In nearly every study included here (see H. Y. Park, Ofori-Dankwa, & Bishop, 1994; Shaw et al., 2009, for exceptions), turnover rates theoretically included high, average, and low performers as well as an assortment of leavers who departed different occupational levels, thus precluding any inferences about specific employee populations. As this area progresses, developing research strategies and measures that isolate the potentially unique causes and consequences of turnover for different employee groups will be especially valuable (e.g., retaining a diverse workforce; Horn, Roberson, & Ellis, 2008). Additionally, characteristics of the employment practices themselves also warrant further study. As one reviewer noted, in some cases there is a rationale to expect that certain practices within the same category could have different effects (e.g., within the variable pay category, different effects may be found for short- vs. long-term or individual- vs. group-based incentives; see also Batt et al., 2002, for evidence that certain forms of variable pay actually increase voluntary turnover because they shift risk from the employer to employees).

Also notable is the veritable lack of empirical consideration of involuntary turnover. Just three of 52 included variables had sufficient data to calculate effect-size estimates specific to involuntary turnover. Further, results revealed a weak correlation between voluntary and involuntary turnover (i.e., sharing less than 10% variance). Thus, combining the two turnover rate types into a single total turnover rate is inadvisable. Further, firm conclusions about whether antecedent-turnover relationships differ by turnover type are premature given that very few studies have measured antecedents of involuntary turnover (e.g., Batt & Colvin, 2011; Shaw et al., 1998). These conditions, taken together, suggest that fundamental questions regarding

involuntary turnover at collective levels of analysis, although currently unanswerable from an empirical standpoint, represent significant and fruitful avenues for future inquiry.

Another opportunity pertains to the potential moderating effects of unemployment rates. In their review, Hausknecht and Trevor (2011) discussed unemployment's important empirical role as a means to account for the presence of employment alternatives and, thus, turnover propensity. Specifically, high unemployment rates effectively enlarge organizations' respective labor pools—that is, viable alternatives are reduced while the number of employees seeking those alternatives is increased—thus easing identification and acquisition of suitable replacements and mitigating turnover's negative performance effects. Despite our interest in evaluating unemployment rate as a moderator, many primary studies included neither unemployment rates nor years of data collection (which would allow imputation). Researchers are encouraged to include more specific unemployment rates when possible (e.g., see Ny- berg, 2010; Trevor, 2001) or provide information that will allow others to ascertain unemployment rates themselves—that is, the location(s) and year(s) in which data were collected.

Finally, some recommendations arise from limitations of the current work. Although we obtained a sizable number of effect sizes from primary sources, several relationships reported here are based on only three or four studies. While we consider our detailed approach to variable categorization a strength as it allowed for construct-level investigations (as opposed to collapsing potentially distinct constructs into broader but conceptually heterogeneous categories), this strategy also drives low k values for some relationships. Thus, reconsideration of these relationships is warranted as additional primary sources become available. In addition, although we account for type of turnover measurement (e.g., summary, total, voluntary, involuntary) and discuss differences in findings where possible, in some cases we were unable to determine how

primary sources measured turnover. While our summary category of turnover addresses all types, we recognize the value of comparing results across turnover types, as interesting and important differences may arise, and, further, strongly recommend explicit delineation of employed turnover measures (i.e., formulas for calculation) in future work.

Practical Implications

First and most obvious, managers should regularly monitor turnover rates via HR dashboards or other reporting tools. As we have shown, rising turnover rates forecast numerous performance deficiencies and signal overall workforce health or functionality. The observed magnitudes of antecedent-turnover relationships suggest possible interventions (see Figure 1). Stronger relationships for internal mobility, high-commitment HR, and participation-enhancing work design suggest the utility of these practices; however, given substantial development and implementation costs, these should be viewed as long-term solutions rather than short-term remedies, especially if such systems are not preexistent (e.g., see Doellgast, 2008). Additionally, while productivity-focused practices (e.g., electronic monitoring) and work designs (e.g., routinization) may have benefits, they also increase turnover; managers who eliminate these practices may enhance retention. Further, given the consistency of relationships between shared attitudes and perceptions of work group or supervisory relations, managers could target unit-level aggregates of these variables—for example, facilitating working conditions for all employees versus providing bonuses for individual accomplishment.

Additionally, distinct empirical differences across conceptually related antecedent constructs offer additional guidance for managers. For instance, staffing selectivity related

relatively strongly and negatively to collective turnover, while the sophistication of selection systems themselves shared only weak and nonsignificant relationships. Thus, faced with turnover problems and limited resources, managers should increase the quality and size of applicant pools rather than improve the quality and sophistication of their selection instruments, although the latter are not unimportant. Further, managers and organizations must also be mindful of relevant contextual characteristics. As our findings indicate, work units are influenced by numerous external factors unrelated to management quality. For example, while results pertaining to straight pay were statistically insignificant across all specifications, relative pay exhibited consistent, negative, and significant relationships to turnover.

Finally, managers should note that rank-order comparisons of turnover across work units (e.g., dashboards showing the top five and bottom five units) invite simplistic and potentially misleading inferences that turnover is mostly traceable to leadership quality. As our results indicate, turnover is multiply determined by collective characteristics of organizational members, establishments, and labor markets—and not mainly a reflection of weak leadership or low engagement. One means of evaluating turnover interventions in this context is to pilot interventions and assess efficacy with data and metrics with subsets of randomly selected test units, especially when large variance in contextual factors across sites is expected—an approach consistent with the recent push toward evidence-based management (e.g., Pfeffer & Sutton, 2006; see also Davenport, Harris, & Shapiro, 2010). In short, contextual variances preclude one-size-fits- all solutions to problems arising from collective turnover.

Conclusion

In the closing chapter of his seminal work, Price (1977) pointed to the exponential expansion of knowledge regarding organizations and emphasized the importance of systematic codification as means to allow consumers of research to screen and evaluate a large and expanding body of work, noting that "systematic research does not automatically 'add up' to cumulative knowledge" (p. 123). While cumulative knowledge regarding the importance of collective turnover to salient organizational outcomes is established here and elsewhere (Hancock et al., 2013; T. Park & Shaw, 2013), to this point, cumulative treatment of turnover's antecedents, at least from an empirical standpoint, has been lacking. Thus, it is our hope that by providing a parsimonious framework by which to organize this large body of extant work and quantitatively summarizing relationships, the current work provides an initial step toward the establishment of such cumulative knowledge. While we have found support for many hypothesized relationships and their underlying theoretical rationales, definitive answers to many questions about collective turnover remain unanswerable given available data and require further study.

Table 1

Table 1
Main Effects Predictions: Causes and Consequences of Collective Turnover

Causes/consequences	Included variables	Theoretical rationale
Causes		
Hypothesis 1: HRM inducements and investments	Benefits (−), dispute resolution (−), full-time % (−), high-commitment HR systems (−), internal mobility (−), participation-enhancing work design (−), relative pay (−), selection sophistication (−), skill requirements (−), staffing levels (−), staffing selectivity (−), straight pay (−), training (−), variable pay (−)	HR practices that convey inducements and investments in human capital (e.g., high-commitment HR systems, benefits, pay, training; Shaw, Delery, Jenkins, & Gupta, 1998; Shaw, Dineen, Fang, & Vellella, 2009) or promote involvement and participation via high-involvement work design (e.g., dispute resolution, participation-enhancing work design; Batt, 2002; Batt & Colvin, 2011) should reduce turnover because they satisfy employee self-interests and promote commitment and satisfaction. Investments in workforce quality (e.g., full-time %, internal mobility, selection sophistication, skill requirements, staffing levels, staffing selectivity) simultaneously decrease employees' desire to leave and increase organizations' desire to retain employees.
Hypothesis 2: HRM expectation-enhancing practices	Downsizing % (+), electronic monitoring (+), managerial oversight (+), routinization (+)	HR practices that reduce autonomy and exert control, such as increased managerial oversight (Detert, Trevino, Burris, & Andiappan, 2007; Kerr, 1947), monitoring (e.g., Batt, Colvin, & Keefe, 2002; Shaw et al., 1998), and routinization (e.g., Mueller & Price, 1989), should increase turnover due to their impact on employee stress, morale, and trust (Batt & Colvin, 2011). Employees will be more likely to exit when they experience a shock such as downsizing (T. W. Lee, Mitchell, Wise, & Fireman, 1996; Trevor & Nyberg, 2008).
Hypothesis 3: Shared attitudes toward job and organization	Commitment (−), satisfaction (−), justice (−), turnover intentions (+)	Work units that share attitudes toward the job and organization, such as high commitment (Riordan, Vandenberg, & Richardson, 2005), satisfaction (Hurley & Estelami, 2007), and justice (Mossholder, Bennett, & Martin, 1998), are desirable to employees (Tsui, Pearce, Porter, & Tripoli, 1997) and should reduce turnover. Conversely, aggregate turnover intentions may elicit a collective group response, with social interaction spreading withdrawal behavior via contagion (Felps et al., 2009; McNulty, Oser, Johnson, Knudsen, & Roman, 2007).
Hypothesis 4: Quality of work group and supervisory relations	Climate (−), cohesiveness (−), supervisory relations (−), OCBs (−), age diversity (+), tenure diversity (+)	The qualities of a work group, such as positive climates (e.g., Gelade & Ivery, 2003), cohesiveness (George & Bettenhausen, 1990), and high OCBs (Podsakoff, Whiting, Podsakoff, & Blume, 2009), as well as effective supervisory relations (Nishii & Mayer, 2009), decrease desirability of leaving (Tsui et al., 1997). Via disparities in beliefs and value systems, age and tenure dissimilarity may create conflict (Wagner, Pfeffer, & O'Reilly, 1984), which may result in higher turnover (Pfeffer, 1983).
Hypothesis 5: Job alternative signals	Alternative availability (+), average employee education (+), size (+), establishment age (−), site quality (−), unemployment rate (−)	Employees will be less likely to exit when they perceive a lack of available alternatives (Gray & Phillips, 1996; March & Simon, 1958; Price, 1977) as indicated by unemployment rate, for example. Similarly, higher education levels increase human capital (Becker, 1962), which creates more alternatives. Larger organizations have more process inefficiencies, which may increase the attractiveness of alternatives (Hausknecht, Trevor, & Howard, 2009). Older organizations have resources to operate more efficiently (Eisenhardt & Martin, 2000), which should make alternatives less attractive. Site quality may also reduce the desirability or attractiveness of other alternatives due to the opportunities favorable locations offer, such as more expansive customer bases (Kacmar, Andrews, Van Rooy, Steilberg, & Cerrone, 2006).
Hypothesis 6: Job embeddedness signals	Average employee age (−), average employee tenure (−), experience concentration (−), female % (+), union % (−), union presence (−)	Older employees are less likely to leave (Bennett, Blum, Long, & Roman, 1993; Cotton & Tuttle, 1986); thus, units with higher average age should have less turnover. Units with higher average tenure and levels of experience concentration should have lower turnover, as these characteristics increase the degree to which employees become embedded in their jobs, thus decreasing turnover (Mitchell, Holtom, Lee, Sablynski, & Erez, 2001). Unionization gives employees a sense of voice (Freeman & Medoff, 1984; Hirschman, 1970), which reduces their desire to exit. Conversely, females are more likely to leave employment due to family obligations or due to an absence of formal career ladders (Baron, Davis-Blake, & Bielby, 1986), suggesting that a higher proportion of female workers will be associated with higher turnover.

Table 1 (continued)

Table 1 (*continued*)

Causes/consequences	Included variables	Theoretical rationale
Consequences		
Hypothesis 11: Organizational effectiveness		Turnover represents a loss of valuable knowledge, skills, and abilities (Osterman, 1987; Shaw, Gupta, & Delery, 2005) and damages performance because it brings excess replacement costs that deplete potential financial gains (Cascio, 2006); turnover disrupts established patterns of interaction, creates flux in coordination, and diverts attention to nonproductive activities (Staw, 1980; Summers, Humphrey, & Ferris, 2012).
Proximal outcomes	Absenteeism (+), counterproductivity (+), error/loss rates (+), customer satisfaction (−), production efficiency (−)	
Distal outcomes	Financial performance (−), sales (−), sales efficiency (−), sales growth (−)	

Note. Direction of hypothesized relationships is provided in parentheses. HR = human resource; HRM = human resource management; OCB = organizational citizenship behavior.

Table 2

Table 2
Meta-Analysis of Relationships Between HRM Inducements and Investments/HRM Expectation-Enhancing Practices and Collective Turnover

Variable	Turnover type	k	N units	$\bar{r}$	95% CI LL	95% CI UL	Q	p	T	I^2
HRM inducements and investments										
Benefits	Summary	15	11,498	−0.14	−0.21	−0.08	93.31	0.00	0.10	85.0
	Total	5	5,603	−0.09	−0.20	0.02	9.52	0.05	0.08	58.0
	Voluntary	12	5,763	−0.16	−0.24	−0.07	43.91	0.00	0.11	74.9
Dispute resolution	Summary	7	5,768	−0.14	−0.21	−0.06	22.12	0.00	0.08	72.9
	Voluntary	6	5,541	−0.15	−0.23	−0.06	21.96	0.00	0.09	77.2
Full-time %	Summary	5	1,329	−0.04	−0.19	0.12	33.20	0.00	0.17	88.0
	Total	4	990	−0.01	−0.21	0.19	28.80	0.00	0.19	89.6
High-commitment HR systems	Summary	21	4,985	−0.23	−0.29	−0.16	102.25	0.00	0.13	80.4
	Total	9	2,338	−0.20	−0.27	−0.12	23.51	0.00	0.09	66.0
	Voluntary	11	2,735	−0.24	−0.33	−0.15	58.82	0.00	0.14	83.0
Internal mobility	Summary	9	5,995	−0.25	−0.39	−0.10	135.04	0.00	0.21	94.1
	Total	5	631	−0.43	−0.70	−0.04	75.66	0.00	0.43	94.7
	Voluntary	4	5,364	−0.11	−0.19	−0.03	14.00	0.00	0.07	78.6
Participation-enhancing work design	Summary	16	7,940	−0.17	−0.25	−0.09	137.31	0.00	0.15	89.1
	Total	4	912	−0.15	−0.27	−0.03	8.68	0.03	0.10	65.5
	Voluntary	12	7,028	−0.19	−0.29	−0.09	133.06	0.00	0.17	91.7
Pay: Relative	Summary	10	7,162	−0.13	−0.19	−0.07	39.45	0.00	0.08	77.2
	Total	5	1,306	−0.20	−0.28	−0.12	9.41	0.05	0.07	57.5
	Voluntary	5	5,856	−0.09	−0.17	−0.02	16.98	0.00	0.07	76.4
Pay: Straight	Summary	14	2,189	−0.11	−0.28	0.06	207.02	0.00	0.32	93.7
	Total	5	441	−0.27	−0.72	0.35	156.88	0.00	0.69	97.5
	Voluntary	8	1,521	−0.06	−0.17	0.05	31.91	0.00	0.14	78.1
Pay: Variable	Summary	12	6,618	0.04	−0.01	0.10	25.81	0.01	0.06	57.4
	Total	5	743	0.07	−0.08	0.21	13.25	0.01	0.13	69.8
	Voluntary	7	5,875	0.04	−0.01	0.09	10.85	0.09	0.04	44.7
Selection sophistication	Summary	13	3,158	−0.09	−0.20	0.01	104.07	0.00	0.18	88.5
	Total	4	1,459	−0.15	−0.39	0.11	57.92	0.00	0.26	94.8
	Voluntary	6	1,170	−0.07	−0.16	0.01	10.40	0.06	0.08	51.9
	Involuntary	4	868	−0.03	−0.15	0.09	8.67	0.03	0.10	65.4
Skill requirements	Summary	4	1,011	−0.16	−0.22	−0.09	1.11	0.77	0.00	0.0
Staffing levels	Summary	3	399	−0.10	−0.39	0.20	19.42	0.00	0.26	89.7
	Total	3	399	−0.10	−0.39	0.20	19.42	0.00	0.26	89.7
Staffing selectivity	Summary	4	1,132	−0.24	−0.16	−0.31	5.57	0.13	0.06	46.2
Training	Summary	15	7,313	−0.08	−0.26	0.11	596.70	0.00	0.35	97.7
	Total	10	2,080	−0.25	−0.37	−0.12	65.98	0.00	0.19	86.4
	Voluntary	7	5,101	0.16	0.00	0.31	52.84	0.00	0.17	88.6
HRM expectation-enhancing practices										
Downsizing %	Summary	4	1,543	0.07	−0.05	0.19	17.58	0.00	0.11	82.9
	Voluntary	3	1,204	0.05	−0.12	0.22	17.05	0.00	0.14	88.3
Electronic monitoring %	Summary	5	1,730	0.18	0.09	0.26	13.50	0.01	0.08	70.4
	Voluntary	3	1,164	0.19	0.04	0.33	12.57	0.00	0.12	84.1
Managerial oversight	Summary	3	583	−0.04	−0.18	0.11	5.23	0.07	0.10	61.7
	Total	3	583	−0.04	−0.18	0.11	5.23	0.07	0.10	61.7
Routinization	Summary	4	222	0.36	0.02	0.62	14.37	0.00	0.30	79.1
	Total	3	175	0.34	−0.12	0.68	11.32	0.00	0.35	82.3

Note. HR = human resource; HRM = human resource management; k = the number of independent effect sizes included in each analysis; N = the number of work units represented in each analysis; 95% CI = 95% confidence interval for $\bar{r}$; LL = lower level of the 95% CI; UL = upper level of the 95% CI; Q = the Q statistic, a measure of potential heterogeneity; p = the p value for the Q statistic; T = the standard deviation of the true effect size; I^2 = the I^2 statistic, a measure of the proportion of dispersion that can be attributed to real differences in effect sizes as opposed to within-study error.

Table 3

Table 3
Meta-Analysis of Relationships Between Shared Attitudes Toward the Job and Organization/Quality of Work Group and Supervisory Relations and Collective Turnover

Variable	Turnover type	k	N units	$\bar{r}$	95% CI LL.	95% CI UL.	Q	p	T	I^2
Shared attitudes toward the job and organization										
Commitment	Summary	11	847	−0.14	−0.28	0.00	36.77	0.00	0.20	72.8
	Total	7	442	−0.12	−0.29	0.05	17.85	0.01	0.19	66.4
	Voluntary	7	500	−0.13	−0.34	0.09	23.53	0.00	0.24	74.5
Job satisfaction	Summary	14	1,880	−0.14	−0.20	−0.07	17.30	0.19	0.06	24.8
	Total	11	1,492	−0.16	−0.21	−0.11	10.11	0.43	0.01	1.1
	Voluntary	6	483	−0.10	−0.26	0.07	8.02	0.16	0.12	37.6
Justice/fairness	Summary	4	648	−0.03	−0.10	0.05	0.86	0.84	0.00	0.0
	Total	3	628	−0.02	−0.10	0.06	0.18	0.92	0.00	0.0
Turnover intentions	Summary	6	613	0.34	0.15	0.50	26.00	0.00	0.21	80.8
	Total	4	372	0.27	−0.01	0.52	22.64	0.00	0.28	86.8
Quality of work group and supervisory relations										
Climate	Summary	13	953	−0.11	−0.22	0.00	33.94	0.00	0.16	64.6
	Total	6	376	−0.17	−0.32	−0.02	9.96	0.08	0.13	49.8
	Voluntary	10	672	−0.05	−0.19	0.08	24.05	0.00	0.17	62.6
Cohesiveness	Summary	5	345	−0.16	−0.29	−0.03	6.08	0.19	0.09	34.2
	Voluntary	3	155	−0.23	−0.47	0.04	5.40	0.07	0.19	62.9
Supervisory relations	Summary	9	1,598	−0.10	−0.17	−0.04	13.33	0.10	0.06	40.0
	Total	6	1,008	−0.09	−0.17	−0.01	7.91	0.16	0.06	36.8
	Voluntary	3	590	−0.13	−0.26	0.00	4.32	0.12	0.08	53.7
Organizational citizenship behaviors	Summary	7	910	−0.12	−0.19	−0.06	5.92	0.43	0.00	0.0
	Total	3	154	−0.07	−0.23	0.10	0.58	0.75	0.00	0.0
	Voluntary	4	756	−0.16	−0.27	−0.06	4.82	0.19	0.07	37.7
Workforce diversity: Age	Summary	3	164	0.19	0.04	0.34	0.81	0.67	0.00	0.0
	Total	3	164	0.19	0.04	0.34	0.81	0.67	0.00	0.0
Workforce diversity: Tenure	Summary	9	1,523	0.15	−0.02	0.30	62.41	0.00	0.22	87.2
	Total	5	238	0.14	−0.05	0.32	7.80	0.10	0.15	48.7
	Voluntary	4	1,285	0.15	−0.10	0.38	52.31	0.00	0.24	94.3

Note. k = the number of independent effect sizes included in each analysis; N = the number of work units represented in each analysis; 95% CI = 95% confidence interval for $\bar{r}$; LL = lower level of the 95% CI; UL = upper level of the 95% CI; Q = the Q statistic, a measure of potential heterogeneity; p = the p value for the Q statistic; T = the standard deviation of the true effect size; I^2 = the I^2 statistic, a measure of the proportion of dispersion that can be attributed to real differences in effect sizes as opposed to within-study error.

Table 4

Table 4
Meta-Analysis of Relationships Between Job Alternative Signals/Job Embeddedness Signals and Collective Turnover

Variable	Turnover type	k	N units	$\bar{r}$	95% CI LL.	95% CI UL	Q	p	T	I^2
Job alternative signals										
Alternative availability	Summary	16	2,998	0.16	0.08	0.24	62.00	0.00	0.14	75.8
	Total	4	1,906	−0.04	−0.13	0.06	8.89	0.03	0.08	66.3
	Voluntary	12	1,092	0.26	0.20	0.31	10.00	0.53	0.00	0.0
Average employee education	Summary	11	7,130	0.03	−0.09	0.14	101.90	0.00	0.17	90.2
	Total	3	5,623	−0.07	−0.30	0.17	36.88	0.00	0.20	94.6
	Voluntary	8	1,507	0.06	−0.12	0.24	73.88	0.00	0.24	90.5
Establishment age	Summary	20	5,167	−0.10	−0.19	−0.01	159.87	0.00	0.18	88.1
	Total	11	3,357	−0.01	−0.13	0.11	91.79	0.00	0.18	89.1
	Voluntary	8	1,583	−0.18	−0.26	−0.11	16.03	0.02	0.08	56.3
Size	Summary	71	22,166	0.04	−0.02	0.10	1,080.72	0.00	0.23	93.5
	Total	32	11,610	0.03	−0.03	0.09	181.45	0.00	0.13	82.9
	Voluntary	39	10,300	0.05	−0.06	0.15	847.15	0.00	0.31	95.5
	Involuntary	5	765	0.02	−0.20	0.23	29.87	0.00	0.22	86.6
Site quality	Summary	3	605	−0.10	−0.18	−0.02	0.47	0.79	0.00	0.0
Unemployment rate	Summary	32	7,388	−0.01	−0.06	0.04	144.57	0.00	0.13	78.6
	Total	10	3,839	0.01	−0.07	0.09	45.15	0.00	0.11	80.1
	Voluntary	22	3,549	−0.04	−0.11	0.02	75.95	0.00	0.13	72.4
Job embeddedness signals										
Average employee age	Summary	18	7,634	−0.26	−0.35	−0.17	134.66	0.00	0.17	87.4
	Total	10	6,674	−0.24	−0.34	−0.13	62.38	0.00	0.14	85.6
	Voluntary	8	960	−0.28	−0.45	−0.09	59.54	0.00	0.26	88.2
Average employee tenure	Summary	21	9,522	−0.25	−0.33	−0.18	194.56	0.00	0.17	89.7
	Total	11	8,323	−0.19	−0.28	−0.09	124.04	0.00	0.15	91.9
	Voluntary	10	1,199	−0.33	−0.46	−0.20	51.47	0.00	0.21	82.5
Experience concentration	Summary	8	701	−0.19	−0.50	0.17	135.82	0.00	0.50	94.8
	Voluntary	7	648	−0.13	−0.49	0.27	135.81	0.00	0.54	95.6
Female %	Summary	16	3,812	0.17	0.08	0.26	109.17	0.00	0.17	86.3
	Total	6	716	0.28	0.06	0.48	36.25	0.00	0.25	86.2
	Voluntary	10	3,096	0.15	0.05	0.24	62.48	0.00	0.14	85.6
Unionization %	Summary	13	7,535	−0.21	−0.27	−0.15	52.79	0.00	0.09	77.3
	Total	4	1,523	−0.17	−0.21	−0.12	2.01	0.57	0.00	0.0
	Voluntary	9	6,175	−0.22	−0.30	−0.14	49.96	0.00	0.11	84.0
Union presence	Summary	18	4,878	−0.13	−0.17	−0.08	38.57	0.00	0.07	55.9
	Total	3	734	−0.14	−0.21	−0.07	1.90	0.39	0.00	0.0
	Voluntary	14	4,051	−0.13	−0.18	−0.07	36.96	0.00	0.08	64.8

Note. k = the number of independent effect sizes included in each analysis; N = the number of work units represented in each analysis; 95% CI = 95% confidence interval for $\bar{r}$; LL = lower level of the 95% CI; UL = upper level of the 95% CI; Q = the Q statistic, a measure of potential heterogeneity; p = the p value for the Q statistic; T = the standard deviation of the true effect size; I^2 = the I^2 statistic, a measure of the proportion of dispersion that can be attributed to real differences in effect sizes as opposed to within-study error.

Table 5

Table 5
Moderators of Antecedent–Turnover Relationships

Variable	Moderator subgroup	*k*	*N* units	$\bar{r}$	95% CI LL.	95% CI UL.	*Q*	*p*	*T*	I^2
Training	General	11	5,674	0.01	−0.15	0.18	161.91	0.00	0.25	93.8
	Firm-specific	3	1,364	−0.40	−0.52	−0.25	14.39	0.00	0.13	86.1
Internal mobility	Perceptual	3	4,542	−0.05	−0.08	−0.02	0.11	0.95	0.00	00.0
	Actual	6	1,453	−0.38	−0.57	−0.15	83.65	0.00	0.28	94.0
High-commitment HR	Multi-industry	7	2,522	−0.15	−0.22	−0.08	19.71	0.00	0.08	69.6
	Single industry	14	2,463	−0.27	−0.34	−0.20	37.41	0.00	0.11	65.3
Size	Group/subunit size	24	4,519	0.02	−0.07	0.10	126.08	0.00	0.16	81.8
	Firm size	47	17,647	0.05	−0.02	0.13	945.78	0.00	0.25	95.1

Note. HR = human resource; *k* = the number of independent effect sizes included in each analysis; *N* = the number of work units represented in each analysis; 95% CI = 95% confidence interval for $\bar{r}$; LL. = lower level of the 95% CI; UL. = upper level of the 95% CI; *Q* = the *Q* statistic, a measure of potential heterogeneity; *p* = the *p* value for the *Q* statistic; *T* = the standard deviation of the true effect size; I^2 = the I^2 statistic, a measure of the proportion of dispersion that can be attributed to real differences in effect sizes as opposed to within-study error.

Table 6

Table 6
Meta-Analysis of Relationships Between Collective Turnover and Organizational Effectiveness

Variable	Turnover type	*k*	*N* units	$\bar{r}$	95% CI LL	95% CI UL	*Q*	*p*	*T*	I^2
Proximal outcomes										
Absenteeism	Summary	8	801	0.11	−0.03	0.25	17.75	0.01	0.14	60.6
	Total	4	508	0.09	−0.12	0.28	7.50	0.06	0.15	60.0
	Voluntary	4	293	0.14	−0.11	0.37	9.20	0.03	0.20	67.4
Counterproductivity	Summary	3	677	0.27	0.03	0.48	18.82	0.00	0.20	89.4
Customer satisfaction	Summary	22	4,822	−0.22	−0.29	−0.15	115.14	0.00	0.15	81.8
	Total	17	4,217	−0.20	−0.28	−0.12	98.31	0.00	0.15	83.7
	Voluntary	4	574	−0.29	−0.43	−0.13	7.96	0.05	0.12	62.3
	Involuntary	3	445	−0.35	−0.60	−0.05	12.63	0.00	0.26	84.2
Error/loss rates	Summary	14	2,141	0.14	0.08	0.20	26.31	0.02	0.08	50.6
	Total	10	1,423	0.13	0.06	0.19	12.95	0.16	0.06	30.5
	Voluntary	4	718	0.19	0.02	0.35	12.98	0.00	0.15	76.9
Production efficiency	Summary	13	2,057	−0.22	−0.33	−0.11	58.70	0.00	0.17	79.6
	Total	8	1,599	−0.18	−0.30	−0.06	26.41	0.00	0.13	73.5
	Voluntary	4	427	−0.25	−0.51	0.05	19.90	0.00	0.28	84.9
Distal outcomes										
Financial performance: Operating profit	Summary	17	4,479	−0.04	−0.10	0.02	52.09	0.00	0.10	69.3
	Total	14	3,789	−0.03	−0.10	0.04	40.19	0.00	0.09	67.7
	Voluntary	3	690	−0.08	−0.26	0.10	11.16	0.00	0.15	82.1
Financial performance: Profit margin	Summary	12	1,987	−0.15	−0.24	−0.06	28.55	0.00	0.11	61.5
	Total	8	1,863	−0.08	−0.15	0.00	13.15	0.07	0.07	46.8
Financial performance: Return on assets	Summary	9	1,326	−0.09	−0.21	0.04	19.88	0.01	0.13	59.8
	Total	8	1,305	−0.04	−0.17	0.09	20.41	0.00	0.14	65.7
	Voluntary	4	116	0.10	−0.24	0.42	8.81	0.03	0.28	65.9
Financial performance: Return on equity	Summary	8	944	0.01	−0.09	0.11	11.12	0.13	0.08	37.1
	Total	5	208	−0.19	−0.39	0.02	9.04	0.06	0.18	55.8
	Voluntary	6	831	−0.01	−0.14	0.13	10.75	0.06	0.11	53.5
Sales	Summary	6	1,094	−0.09	−0.22	0.04	23.64	0.00	0.15	78.8
	Total	5	832	−0.07	−0.22	0.09	19.45	0.00	0.16	79.4
Sales efficiency	Summary	25	6,301	−0.09	−0.16	−0.03	137.89	0.00	0.14	82.6
	Total	14	4,659	−0.05	−0.13	0.04	101.98	0.00	0.15	87.3
	Voluntary	10	1,970	−0.11	−0.20	−0.03	25.42	0.00	0.10	64.6
Sales growth	Summary	7	3,304	−0.07	−0.21	0.09	96.81	0.00	0.19	93.8
	Total	4	2,347	−0.18	−0.39	0.05	68.48	0.00	0.22	95.6
	Voluntary	3	957	0.07	−0.10	0.24	14.71	0.00	0.14	86.4

Note. *k* = the number of independent effect sizes included in each analysis; *N* = the number of work units represented in each analysis; 95% CI = 95% confidence interval for $\bar{r}$; LL = lower level of the 95% CI; UL = upper level of the 95% CI; *Q* = the *Q* statistic, a measure of potential heterogeneity; *p* = the *p* value for the *Q* statistic; *T* = the standard deviation of the true effect size; I^2 = the I^2 statistic, a measure of the proportion of dispersion that can be attributed to real differences in effect sizes as opposed to within-study error.

Table 7

Table 7
Descriptive Statistics for Hypothesized Moderators of Turnover–Consequence Relationships

Variable	Minimum	Maximum	*Mdn*	*M*	*SD*	1	2	3	4
1. Proximal/distal outcome	0.00	1.00	1.00	0.53	0.50	—			
2. Within/between organization	0.00	1.00	0.00	0.23	0.42	.11	—		
3. Job complexity	1.00	5.00	2.00	2.10	1.03	.22*	.44*	—	
4. Industry (median wage)	11.49	26.48	17.20	17.13	4.37	.05	.33*	.62*	—

Note. $k = 118$. $N = 23{,}180$. Distal outcomes and between-organization designs coded higher.
* $p < .05$.

Table 8

Table 8
Weighted Least Squares Regression of Turnover–Consequence Relationships on Hypothesized Moderators

Variable	*B*	*SE*	β
Constant	−.23*	.07	
Proximal/distal outcome	.12*	.03	.35
Within/between organization	.08*	.05	.19
Job complexity	.00	.02	.01
Industry (median wage)	.00	.01	.03

Note. $k = 118$. $N = 23{,}180$. Cases are weighted by the inverse of the sampling error variance using Equation 2 from Hunter and Schmidt (1990). Distal outcomes and between-organization designs coded higher. Overall model $R^2 = .17$.
* $p < .05$.

Table 9

Table 9
Meta-Analysis of Relationships Between Different Turnover Rates

Variables	*k*	*N* units	$\bar{r}$	95% CI LL	95% CI UL	*Q*	*p*	*T*	I^2
Voluntary–involuntary turnover	9	1,308	0.28	0.21	0.35	14.04	0.08	0.08	43.0
Voluntary–total turnover	4	817	0.85	0.77	0.90	24.63	0.00	0.21	87.8
Involuntary–total turnover	2	414	0.74	0.68	0.80	1.30	0.25	0.05	23.3

Note. *k* = the number of independent effect sizes included in each analysis; *N* = the number of work units represented in each analysis; 95% CI = 95% confidence interval for the weighted mean $\bar{r}$; LL = lower level of the 95% CI; UL = upper level of the 95% CI; *Q* = the *Q* statistic, a measure of potential heterogeneity; *p* = the *p* value for the *Q* statistic; *T* = the standard deviation of the true effect size; I^2 = the I^2 statistic, a measure of the proportion of dispersion that can be attributed to real differences in effect sizes as opposed to within-study error.

Figure 1

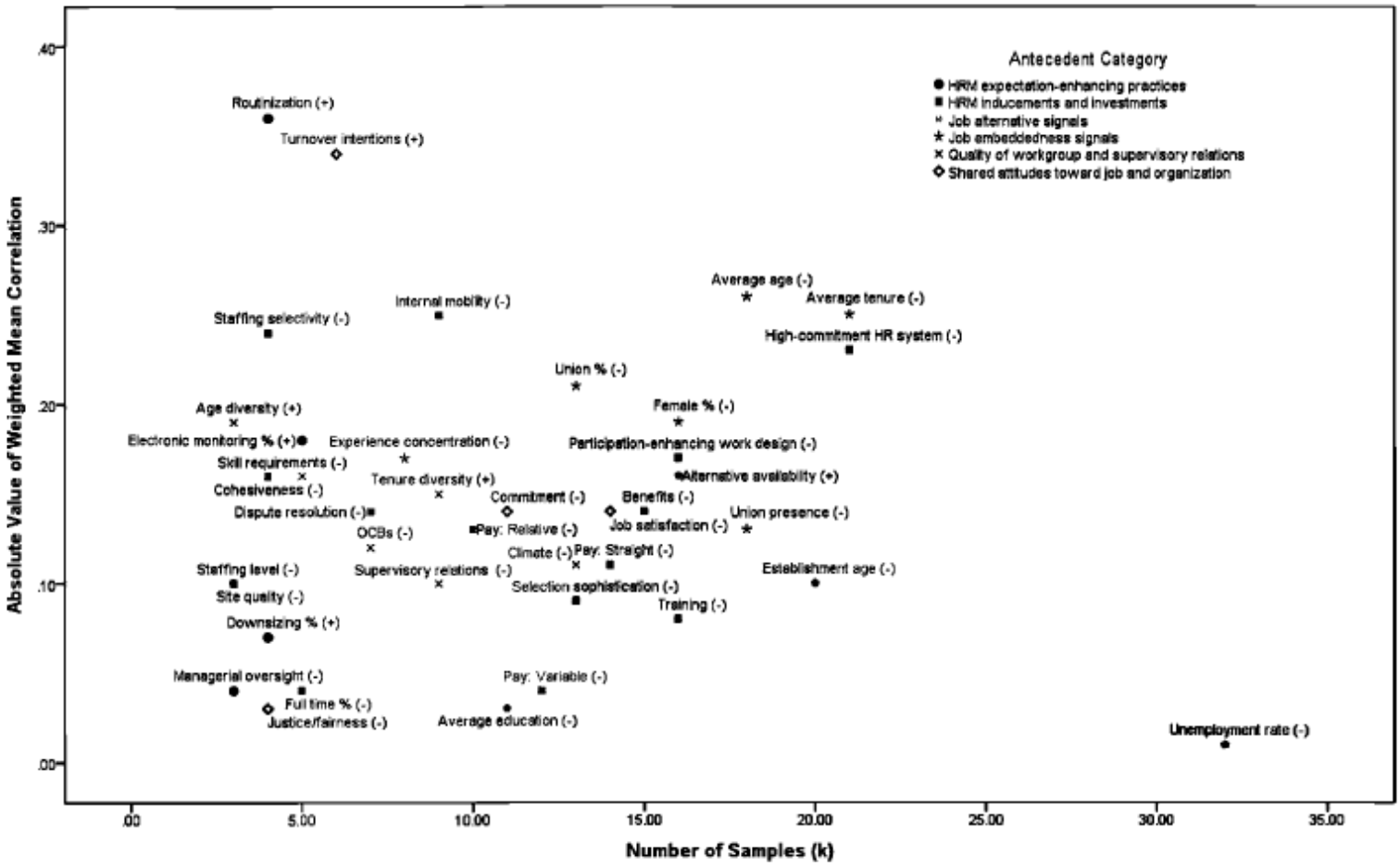

Figure 1. Summary of meta-analytic estimates for turnover antecedents by number of samples. Points represent meta-analytic estimates based on summary turnover values shown in Tables 2–4. Sign of correlation indicated in parentheses. Size (.04, k = 71) not shown. HR = human resource; HRM = human resource management; OCB = organizational citizenship behavior.

Appendix A

Appendix A

List of Included Variables and Definitions

Variable	Definition and clarifications	Example studies	Variable names used in primary studies
HRM inducements and investments			
Benefits	Any organizationally provided nonwage compensation provided to members of work unit over and above base pay "designed to safeguard employees and their families against problems due to sickness, accidents or retirements" (C. H. Lee, Hsu, & Lien, 2006, p. 1952).	Bennett, Blum, Long, & Roman (1993); Delery, Gupta, Shaw, Jenkins, & Ganster (2000); Haines, Jalette, & Larose (2010); Shaw, Delery, Jenkins, & Gupta (1998); Trevor & Nyberg (2008)	Percent labor costs to benefits, paid days off, retirement fund, benefits, fringe benefits, pensions.
Dispute resolution	Any "nonunion procedures . . . providing opportunities for individual voice to redress employee grievances" (Batt, Colvin, & Keefe, 2002, p. 574).	Delery et al. (2000); Haines et al. (2010); Shaw et al. (1998); Spencer (1986); Trevor & Nyberg (2008)	Nonunion formal grievance procedures, formal dispute resolution.
Full-time %	The proportion of employees in a work unit who are employed full-time (e.g., at least 40 hours per week).	Batt & Colvin (2011); Mueller & Price (1989); Ton & Huckman (2008)	Full-time and permanent employees, proportion full-time.
High-commitment HR systems	HR systems designed to "shape desired employee behaviors and attitudes by forming psychological links between organizational and employee goals" (Arthur, 1994, p. 672) through such attributes as increased skill requirements, employee discretion and the opportunity to work collaboratively with others, and motivation-enhancing incentive structures (adapted from Batt, 2002, p. 587).	Doellgast (2008); Ferratt, Agarwal, Brown, & Moore (2005); Guest, Michie, Conway, & Sheehan (2003); Guthrie (2000); Huselid (1995); Richard & Johnson (2001); Sels, De Winne, Maes, et al. (2006); Shaw, Gupta, & Delery (2005); Sun, Aryee, & Law (2007); Way (2002)	High involvement index, work environment and career development, HIWP, HRM intensity, HRM index, high performance HR practices, HPWS, SHRM effectiveness.

(*Appendices continue*)

Appendix A (continued)

Appendix A (*continued*)

Variable	Definition and clarifications	Example studies	Variable names used in primary studies
Internal mobility	The extent to which an organization utilizes "a policy of staffing from within the organization" (Haines et al., 2010, p. 231).	Batt & Colvin (2011); Batt et al. (2002); Malos & Campion (2000); Mueller & Price (1989); Trevor & Nyberg (2008)	Mobility (%), promotion opportunity, career development index, promotion %, promotion probability of average worker, internal mobility opportunities, internal labor markets.
Participation-enhancing work design	Work systems that enable "employee influence and voice" (Haines et al., 2010, p. 229) through consultative and substantive participation (see Batt et al., 2002, p. 581) and, further, "enhance . . . feelings of personal control" (Spector, 1986, p. 1006).	Haines et al. (2010)	Work design index, problem-solving groups (%), participation in decision making, work organization index, participatory management, centralization, survey feedback, empowerment HR practices, consultative committee.
Pay: Relative	Employee pay adjusted for the average rate for the surrounding locality or relevant market (adapted from Siebert & Zubanov, 2009, p. 302).	Batt et al. (2002); Guthrie (2000); Pfeffer & O'Reilly (1987); Trevor & Nyberg (2008)	Store wage relative to county average wage for sales assistants, relative pay.
Pay: Straight	Average dollar amount of annual pay.	Delery et al. (2000); Holden & Peel (1980); McNulty, Oser, Johnson, Knudsen, & Roman (2007); H. Y. Park, Ofori-Dankwa, & Bishop (1994); Shaw et al. (1998); Yanadori & Kato (2007)	Log pay, employee pay, mean counselor salary, salary, average pay, wage rate, starting salary.
Pay: Variable	Performance-based cash compensation for which payouts are contingent upon organizationally specified goals (adapted from Guthrie, 2000, p. 422).	Batt & Colvin (2011); Batt et al. (2002); Ferratt et al. (2005); Haines et al. (2010); Riordan, Vandenberg, & Richardson (2005); Shaw & Gupta (2007)	Variable pay, incentives, individual performance-based rewards, performance-based pay increases, wage incentive system, group incentives, pay at risk.
Selection sophistication	The systematic use of validated selection measures and the level of care with which selection decisions are made.	Batt & Colvin (2011); Ferrat et al. (2005); Guthrie (2000); Shaw et al. (1998)	Nontechnical skill recruitment, systematic selection procedures, selective staffing.
Skill requirements	Measure reflecting typical educational requirements of employees and the time needed for a new employee to become proficient (adapted from Batt, 2002, p. 591).	Batt & Colvin (2011)	Job skill level, difficulty of average job.
Staffing level	The extent to which a unit's personnel level is higher or lower than that authorized or predicted by the organization (adapted from Ryan, Schmit, & Johnson, p. 861).	Gelade & Ivery (2003)	Staffing level, actual staff minus theoretical staff establishment as a percentage of theoretical staff establishment.
Staffing selectivity	The extent to which the organization hires a small proportion of applicants (i.e., one minus the selection ratio).	Batt & Colvin (2011)	Selection ratio (reverse-scored).

(*Appendices continue*)

Appendix A (continued)

Appendix A (*continued*)

Variable	Definition and clarifications	Example studies	Variable names used in primary studies
Training	The extent to which employer-provided instruction/education opportunities are available to employees either on the job or offsite.	Angle & Perry (1981); Batt et al. (2002); Detert, Trevino, Burris, & Andiappan (2007); Gelade & Ivery (2003); Haines et al. (2010); Hurley & Estelami (2007); Shaw et al. (1998)	Employee training, professional development, mentoring, unit specific human capital.
HRM expectation-enhancing practices			
Downsizing %	"The number of core employees displaced . . . as a percentage of the current work force" (Batt et al., 2002, p. 581).	Batt & Colvin (2011); Batt et al. (2002); Trevor & Nyberg (2008)	Downsizing in last 5 years, downsizing rate, recent layoffs.
Electronic monitoring %	The proportion of employees in a work unit subject to organizationally initiated, objective, technology-based supervision.	Batt & Colvin (2011); Batt et al. (2002); Shaw et al. (1998)	Electronic monitoring (%), monitoring intensity.
Managerial oversight	"The number of managers available to supervise a particular number of employees" (Detert et al., 2007, p. 995).	Kerr (1947)	Managerial oversight, amount of supervision (number of hourly employees per supervisor).
Routinization	The extent to which a job and its associated duties are monotonous.	Kerr (1947); Mueller & Price (1989)	Routinization, monotony of average job.
Shared attitudes toward the job and organization			
Commitment	"The experience of loyalty and a desire to stay with the company . . . identification with the organization and willingness to expend extra effort on its behalf" (Simons & Roberson, 2003, p. 435).	Angle & Perry (1981); Gardner, Wright, & Moynihan (2011); Mueller & Price (1989); Riordan et al. (2005); Trevor & Nyberg (2008)	Organizational commitment, collective affective commitment.
Job satisfaction	Shared attitudes of an organizational unit reflecting overall contentment with an employment environment (adapted from Ryan et al., 1996).	Dittrich & Carrell (1979); Giese & Ruter (1949); Hurley & Estelami (2007); Koys (2001); Mueller & Price (1989); Riordan et al. (2005)	General job satisfaction, employee satisfaction, morale score.
Justice/fairness	Perceptions of fairness with respect to organizational policies and practices as well as "the quality of interpersonal treatment received during the implementation of decision-making procedures" (Simons & Roberson, 2003, pp. 432–433).	Detert et al. (2007); Dittrich & Carrell (1979)	Pay fairness, procedural justice.
Turnover intentions	Unit-level corollary of "conscious and deliberate willfullness to leave the organization" (Tett & Meyer, 1993, p. 262).	McNulty et al. (2007)	Turnover intention; intention to leave.

(*Appendices continue*)

Appendix A (continued)

Appendix A (*continued*)

Variable	Definition and clarifications	Example studies	Variable names used in primary studies
Quality of work group and supervisory relations			
Climate	"A set of shared perceptions of policies, practices, and procedures that an organization rewards and supports" (Simons & Roberson, 2003, p. 434).	Gelade & Ivery (2003); Richardson & Vandenberg (2005); Riordan et al. (2005); Sellgren, Ekvall, & Tomson (2007); Sowinski, Fortmann, & Lezotte (2008); Terborg & Lee (1984)	Climate, organizational service orientation, climate of involvement.
Cohesiveness	"A relative property of groups that summarizes the extent to which a group coheres or hangs together" (George & Bettenhausen, 1990, p. 700).	Hausknecht, Trevor, & Howard (2009); van der Vegt, Bunderson, & Kuipers (2010)	Group cohesiveness, social integration.
OCBs	"Extra-role behavior not explicitly linked to a given job and that contributes to organizational effectiveness" (Richardson & Vandenberg, 2005, p. 569).	George & Bettenhausen (1990); Koys (2001); Simons & Roberson (2003); Sun et al. (2007)	Prosocial behavior, OCBs, discretionary service behavior, aggregate service-oriented OCBs.
Supervisory relations	Perceptions of the quality of supervision or leadership within a work unit.	Detert at al. (2007); Hausknecht et al. (2009); Kerr (1947); Nishii & Mayer (2009); Sellgren et al. (2007); Simons & Roberson (2003)	Abusive supervision (reverse-scored), unit supervision, leadership behavior, satisfaction with supervision, average supervisory quality, leader–member exchange mean.
Workforce diversity: Age	Heterogeneity within a work unit with respect to member age.	Jackson et al. (1991); Wiersema & Bird (1993)	Age heterogeneity.
Workforce diversity: Tenure	Heterogeneity within a work unit with respect to organizational tenure.	Alexander, Nuchols, Bloom, & Lee (1995); Jackson et al. (1991); Nishii & Mayer (2009); Pfeffer & O'Reilly (1987); Wiersema & Bird (1993)	Standard deviation of tenure, tenure heterogeneity, tenure diversity.
Job alternative signals			
Alternative availability	The actual or perceived abundance of attainable other employment within the relevant labor market.	Gray & Phillips (1996); Mueller & Price (1989); Ployhart, Weekley, & Ramsey (2009); Spencer (1986); Terborg & Lee (1984); Ton & Huckman (2008)	Job possibilities, help wanted, competitors, hospital beds, retail density.
Average employee education	The mean educational attainment of members of a given work unit.	Batt & Colvin (2011); Gardner et al. (2011); C. H. Lee, Hsu, & Lien (2006)	Average education, education level.
Establishment age	The length of existence of the physical property in which a work unit operates.	Arthur (1994); Batt & Colvin (2011); Delery et al. (2000); Detert et al. (2007); Ployhart et al. (2009); Shaw, Gupta, & Delery (2005); Trevor & Nyberg (2008)	Log age, firm age, organizational age, number of days open, open less than 1 year (reverse-scored).

(*Appendices continue*)

Appendix A (continued)

Appendix A (*continued*)

Variable	Definition and clarifications	Example studies	Variable names used in primary studies
Size	Indicator reflecting how large or small a given organization or unit is.	Alexander et al. (1995); Arthur (1994); Bennett et al. (1993); Delery et al. (2000); Doellgast (2008); Guthrie (2000); Hausknecht et al. (2009); Jackson et al. (1991); Nishii & Mayer (2009); Ployhart et al. (2009); Spell & Blum (2005); Terborg & Lee (1984)	Staff size, firm size, log size, unit size, total employment, team size, department size, number of employees, branch size, space in square feet, employees, beds in hospital, store size.
Site quality	The relative consumer desirability of a given establishment with regard to service quality and location.	Kacmar, Andrews, Van Rooy, Steilberg, & Cerrone (2006); Sun et al. (2007)	Site quality, star rating.
Unemployment rate	The percentage of the workforce that does not have a job, has actively sought work, and is currently available to work (www.bls.gov).	Alexander et al. (1995); Batt & Colvin (2011); Bennett et al. (1993); Gray & Phillips (1996); Hausknecht et al. (2009); H. W. Park et al. (1994); Pfeffer & O'Reilly (1987); Ployhart et al. (2009); Siebert & Zubanov (2009); Sun et al. (2007); Terborg & Lee (1984); Trevor & Nyberg (2008)	Unemployment, unemployment rate, county unemployment rate.
Job embeddedness signals			
Average employee age	The mean length of existence of the members of a work unit.	Bennett et al. (1993); Detert et al. (2007); Glebbeek & Bax (2004); Kerr (1947); C. H. Lee et al. (2006); Wiersema & Bird (1993)	Mean age, employee age, average age, mean team age.
Average employee tenure	The mean time spent working for a given organization among members of a given work unit.	Detert et al. (2007); C. H. Lee et al. (2006); Mueller & Price (1989); Ployhart et al. (2009); Siebert & Zubanov (2009); Terborg & Lee (1984); Yanadori & Kato (2007)	Production employee tenure, seniority, average employee tenure.
Experience concentration	The extent to which tenured hires comprise a work unit.	Hausknecht et al. (2009); Trevor & Nyberg (2008)	Newcomer concentration (reverse-scored).
Female %	The proportion of members of a given work unit who are female.	Batt (2002); Batt et al. (2002); Bennett et al. (1993); Holden & Peel (1980); McNulty et al. (2007); Spell & Blum (2005); Trevor & Nyberg (2008)	Percent of women, percent female, sex ratio, proportion male (reverse-scored), female ratio, percent male employees (reverse-scored), female workforce.
Union %	The percentage of employees in a work unit covered by a collective bargaining agreement.	Delery et al. (2000); Guthrie (2000, 2001); Haines et al. (2010); Huselid (1995); Shaw et al. (1998); Shaw & Gupta (2007); Trevor & Nyberg (2008); Way (2002)	Percent unionized, union representation, union status, firm union coverage, union density, proportion union.

(*Appendices continue*)

Appendix A (continued)

Appendix A (*continued*)

Variable	Definition and clarifications	Example studies	Variable names used in primary studies
Union presence	Indicator variable reflecting whether a union is present (coded as 1) or not (coded 0).	Arthur (1994); Batt (2002); Batt et al. (2002); Bennett et al. (1993); Doellgast (2008); Gardner et al. (2011); Guest et al. (2003); Pfeffer & O'Reilly (1987); Spencer (1986); Yanadori & Kato (2007)	Unionization, union presence, union, collective bargaining, union status, union represented.
Organizational effectiveness			
Absenteeism	Unit-level indicator of "the number of worker-days lost through absence" (Richardson & Vandenberg, 2005, p. 573).	Dittrich & Carrell (1979); Glebbeek & Bax (2004); Guest et al. (2003)	Absence, employee absenteeism, percentage absent.
Counterproductivity	"Intentional employee behavior that is harmful to the legitimate interests of an organization" (Dalal, 2005, pp. 1241–1242).	Detert et al. (2007); Shaw & Gupta (2007)	Out-of-service percentage.
Customer satisfaction	"The consumer's judgment that a product or service meets or falls short of expectations" (Gupta & Zeithaml, 2006, p. 720).	Detert et al. (2007); Harter, Schmidt, & Hayes (2002); McElroy, Morrow, & Rude (2001); Ryan et al. (1996)	Customer satisfaction, customer service quality, unit service performance behavior, customer service score.
Error/loss rates	Product loss occurring as the result of employee error or carelessness in production of goods or provision of a service.	Arthur (1994); Detert et al. (2007); Giese & Ruter (1949); Kacmar et al. (2006); Ryan et al. (1996); Shaw, Gupta, & Delery (2005)	Scrap rate, food loss, food waste, repossession ratio, accident rate, percent error efficiency affecting customers.
Financial performance: Operating profit	Revenues minus costs (e.g., see Detert et al., 2007, p. 997).	Detert et al. (2007); Glebbeek & Bax (2004)	Operating profit, net result, profit, gross profits, operating ratio, profit/employee, profits per partner, adjusted controllable profit.
Financial performance: Profit margin	"Profits after controllable expenses divided by total sales" (Koys, 2001, p. 108).	McElroy et al. (2001); Morrow & McElroy (2007); Riordan et al. (2005)	Profit as a percentage of sales, profitability, gain net premiums written.
Financial performance: ROA	"Net operating gain (after taxes) as a percentage of prior-year admitted assets" (Riordan et al., 2005, p. 476).	Huselid (1995)	Gross rate of return on assets, ROA.
Financial performance: ROE	"Net income divided by total equity" (Shaw, Gupta, & Delery, 2005, p. 60).	Richard & Johnson (2001); Sels, De Winne, Maes, et al. (2006); Wiersema & Bird (1993)	Net profitability over capital and reserves, return on equity, ROE.
Production efficiency	A measure reflecting the labor inputs/resources necessary for the error-free and timely provision of a service or the generation of a standard unit of output (varies by industry).	Arthur (1994); Gelade & Ivery (2003); Jackson et al. (1991); McElroy et al. (2001); Peterson & Luthans (2006)	Labor hours per production unit, wait time per order, cost per loan efficiency, drive-through time per order, labor hours per ton, percent productive efficiency, operating expense per employee.
Sales	Gross revenues.	Gelade & Ivery (2003); Kacmar et al. (2006); Malos & Campion (2000); Thoms, Wolper, Scott, & Jones (2001)	Sales, annual sales, billable hours.

(*Appendices continue*)

Appendix A (continued)

Appendix A (*continued*)

Variable	Definition and clarifications	Example studies	Variable names used in primary studies
Sales efficiency	Measure reflecting the amount of sales generated per unit of input (e.g., per employee, per labor hour, etc.).	George & Bettenhausen (1990); Guthrie (2001); Huselid (1995); Richard & Johnson (2001); Sels, De Winne, Maes, et al. (2006); Sun et al. (2007)	Sales performance ($), productivity, loan generation efficiency, volume, revenue per driver, sales per hour worked, revenues per lawyer.
Sales growth	Change in sales generated by a unit as compared to sales generated by that same unit in some previous period (adapted from Ployhart et al., 2009, p. 1004).	Batt (2002); Huselid (1995); Shaw, Duffy, et al. (2005); Yanadori & Kato (2007).	Receipts vs. flow-through, same store sales, firm sales growth, percent change in sales.

Note. HR = human resource; HRM = human resource management; OCB = organizational citizenship behavior; ROA = return on assets; ROE = return on equity; HIWP = high involvement work practices; HPWS = high performance work system; SHRM = strategic human resource management.

Appendix B

Appendix B

Listing of Study Names, Individual Effect Sizes, and Moderator Information

Reference	Variable	*r*	*N*	Turnover type	W/B org	Industry	Job zone
Alexander, Nuchols, Bloom, & Lee (1995)	Size	0.78	398	Voluntary	1	8	3
	Unemployment rate	−0.02	398	Voluntary	1	8	3
	Workforce diversity: Tenure	0.32	398	Voluntary	1	8	3
Angle & Perry (1981)	Commitment	−0.48	24	Voluntary	1	4	2
	Turnover intentions	0.64	24	Voluntary	1	4	2
	Absenteeism	−0.26	24	Voluntary	1	4	2
	Production efficiency	−0.05	24	Voluntary	1	4	2
Arthur (1994)	Establishment age	−0.10	29	Total	1	3	2
	Size	−0.07	29	Total	1	3	2
	Union presence	−0.26	29	Total	1	3	2
	High-commitment HR system	−0.37	29	Total	1	3	2
	Production efficiency	−0.08	29	Total	1	3	2
	Error/loss rates	0.16	29	Total	1	3	2
Barksdale (1994)	Climate	−0.20	23	Voluntary	1	6	
	Climate	−0.21	50	Voluntary	1	6	
	Climate	0.04	21	Voluntary	1	6	
	Climate	0.09	22	Voluntary	1	6	
	Climate	−0.16	32	Total	1	6	
	Climate	0.27	31	Total	1	6	
	Climate	−0.08	32	Total	1	6	
	Commitment	−0.20	23	Voluntary	1	6	
	Commitment	0.26	50	Voluntary	1	6	
	Commitment	−0.03	21	Voluntary	1	6	
	Commitment	0.33	22	Voluntary	1	6	
	Commitment	−0.19	32	Total	1	6	
	Commitment	0.22	31	Total	1	6	
	Commitment	−0.17	32	Total	1	6	
	Job satisfaction	−0.43	23	Voluntary	1	6	
	Job satisfaction	−0.16	50	Voluntary	1	6	
	Job satisfaction	−0.11	21	Voluntary	1	6	
	Job satisfaction	0.33	22	Voluntary	1	6	
	Job satisfaction	−0.24	32	Total	1	6	
	Job satisfaction	0.24	31	Total	1	6	
	Job satisfaction	−0.12	32	Total	1	6	
	Size	0.13	23	Voluntary	1	6	
	Size	0.01	50	Voluntary	1	6	

(*Appendices continue*)

Appendix B (continued)

Appendix B (*continued*)

Reference	Variable	*r*	*N*	Turnover type	W/B org	Industry	Job zone
	Size	−0.01	21	Voluntary	1	6	
	Size	0.03	22	Voluntary	1	6	
	Size	0.08	32	Total	1	6	
	Size	0.26	31	Total	1	6	
	Size	−0.06	32	Total	1	6	
	Financial performance: ROA	0.44	23	Voluntary	1	6	
	Financial performance: ROA	−0.26	50	Voluntary	1	6	
	Financial performance: ROA	0.23	21	Voluntary	1	6	
	Financial performance: ROA	0.07	22	Voluntary	1	6	
	Financial performance: ROA	0.37	32	Total	1	6	
	Financial performance: ROA	0.21	31	Total	1	6	
	Financial performance: ROA	0.20	32	Total	1	6	
	Financial performance: ROE	−0.48	23	Voluntary	1	6	
	Financial performance: ROE	−0.09	50	Voluntary	1	6	
	Financial performance: ROE	−0.22	21	Voluntary	1	6	
	Financial performance: ROE	−0.04	22	Voluntary	1	6	
	Financial performance: ROE	−0.52	32	Total	1	6	
	Financial performance: ROE	−0.12	31	Total	1	6	
	Financial performance: ROE	−0.35	32	Total	1	6	
	Benefits	−0.03	23	Voluntary	1	6	
	Benefits	0.10	50	Voluntary	1	6	
	Benefits	−0.08	21	Voluntary	1	6	
	Benefits	0.04	22	Voluntary	1	6	
	Benefits	−0.08	32	Total	1	6	
	Benefits	−0.19	31	Total	1	6	
	Benefits	−0.13	32	Total	1	6	
	Training	0.36	23	Voluntary	1	6	
	Training	0.21	50	Voluntary	1	6	
	Training	0.10	21	Voluntary	1	6	
	Training	0.56	22	Voluntary	1	6	
	Training	0.26	32	Total	1	6	
	Training	0.09	31	Total	1	6	
	Training	0.22	32	Total	1	6	
	Voluntary–total turnover	0.49	37				
Batt & Colvin (2011)	Education	−0.20	339	Voluntary	1	7	2
	Education	−0.16	339	Involuntary	1	7	2
	Education	−0.22	339	Total	1	7	2
	Establishment age	−0.05	339	Voluntary	1	7	2
	Establishment age	−0.23	339	Involuntary	1	7	2
	Establishment age	−0.15	339	Total	1	7	2
	Female %	0.12	339	Voluntary	1	7	2
	Female %	−0.04	339	Involuntary	1	7	2
	Female %	0.06	339	Total	1	7	2
	Size	0.12	339	Voluntary	1	7	2
	Size	0.06	339	Involuntary	1	7	2
	Size	0.11	339	Total	1	7	2
	Unemployment rate	−0.07	339	Voluntary	1	7	2
	Unemployment rate	0.19	339	Involuntary	1	7	2
	Union presence	−0.16	339	Voluntary	1	7	2
	Union presence	−0.13	339	Involuntary	1	7	2
	Union presence	−0.18	339	Total	1	7	2
	Benefits	−0.10	339	Voluntary	1	7	2
	Benefits	−0.20	339	Involuntary	1	7	2
	Benefits	−0.17	339	Total	1	7	2
	Downsizing %	−0.05	339	Voluntary	1	7	2
	Downsizing %	0.13	339	Involuntary	1	7	2
	Electronic monitoring %	0.27	339	Voluntary	1	7	2
	Electronic monitoring %	0.20	339	Involuntary	1	7	2
	Full-time %	−0.27	339	Voluntary	1	7	2
	Full-time %	−0.11	339	Involuntary	1	7	2
	Full-time %	−0.25	339	Total	1	7	2
	Internal mobility	−0.20	339	Voluntary	1	7	2

(*Appendices continue*)

Appendix B (continued)

Appendix B (*continued*)

Reference	Variable	*r*	*N*	Turnover type	W/B org	Industry	Job zone
	Internal mobility	−0.22	339	Involuntary	1	7	2
	Internal mobility	−0.25	339	Total	1	7	2
	Participation-enhancing work design	−0.28	339	Voluntary	1	7	2
	Participation-enhancing work design	−0.18	339	Involuntary	1	7	2
	Participation-enhancing work design	−0.29	339	Total	1	7	2
	Pay: Variable	0.08	339	Voluntary	1	7	2
	Pay: Variable	0.11	339	Involuntary	1	7	2
	Pay: Relative	−0.22	339	Voluntary	1	7	2
	Pay: Relative	−0.09	339	Involuntary	1	7	2
	Pay: Relative	−0.20	339	Total	1	7	2
	Selection sophistication	0.03	339	Voluntary	1	7	2
	Selection sophistication	0.01	339	Involuntary	1	7	2
	Selection sophistication	0.03	339	Total	1	7	2
	Staffing selectivity	−0.19	339	Voluntary	1	7	2
	Staffing selectivity	−0.20	339	Involuntary	1	7	2
	Skill requirements	−0.16	339	Voluntary	1	7	2
	Skill requirements	−0.15	339	Involuntary	1	7	2
	Customer satisfaction	−0.14	339	Voluntary	1	7	2
	Customer satisfaction	−0.12	339	Involuntary	1	7	2
	Customer satisfaction	−0.16	339	Total	1	7	2
	Involuntary–total turnover	0.76	339				2
	Voluntary–involuntary turnover	0.38	339				2
	Voluntary-total turnover	0.89	339				2
Batt (2002)	Female %	−0.01	326	Voluntary	1	5	2
	Union presence	−0.19	326	Voluntary	1	5	2
	Sales growth	−0.10	326	Voluntary	1	5	2
	High-commitment HR system	−0.28	326	Voluntary	1	5	2
	Participation-enhancing work design	−0.26	326	Voluntary	1	5	2
	Skill requirements	−0.15	326	Voluntary	1	5	2
Batt, Colvin, & Keefe (2002)	Education	0.08	598	Voluntary	1	5	2
	Female %	0.16	598	Voluntary	1	5	2
	Union presence	−0.24	598	Voluntary	1	5	2
	Dispute resolution	0.01	598	Voluntary	1	5	2
	Downsizing %	0.20	598	Voluntary	1	5	2
	Electronic monitoring %	0.06	598	Voluntary	1	5	2
	Pay: Variable	0.13	598	Voluntary	1	5	2
	Internal mobility	−0.17	598	Voluntary	1	5	2
	Participation-enhancing work design	−0.13	598	Voluntary	1	5	2
	Pay: Relative	−0.14	598	Voluntary	1	5	2
	Training	−0.04	598	Voluntary	1	5	2
Bennett, Blum, Long, & Roman (1993)	Average age	−0.45	265	Voluntary	1	12	
	Female %	0.40	265	Voluntary	1	12	
	Size	−0.15	265	Voluntary	1	12	
	Unemployment rate	−0.14	265	Voluntary	1	12	
	Union presence	−0.23	265	Voluntary	1	12	
	Benefits	−0.20	265	Voluntary	1	12	
Chambers (1989)	Average age	0.04	84	Voluntary	1	8	3
	Average age	−0.14	84	Voluntary	1	8	3
	Average tenure	−0.04	84	Voluntary	1	8	3
	Average tenure	−0.16	84	Voluntary	1	8	3
	Size	−0.23	84	Voluntary	1	8	3
	Size	−0.20	84	Voluntary	1	8	3
	Pay: Straight	0.11	84	Voluntary	1	8	3
	Pay: Straight	0.04	84	Voluntary	1	8	3
Chow, Huang, & Liu (2008)	Size	0.11	241	Total	1	12	
	High-commitment HR system	−0.20	241	Total	1	12	
Delery, Gupta, Shaw, Jenkins, & Ganster (2000)	Establishment age	−0.34	178	Voluntary	1	4	2
	Size	0.22	178	Voluntary	1	4	2
	Tenure: Experience concentration	−0.65	178	Voluntary	1	4	2
	Union %	−0.43	178	Voluntary	1	4	2
	Benefits	−0.52	178	Voluntary	1	4	2

(*Appendices continue*)

Appendix B (continued)

Appendix B (*continued*)

Reference	Variable	*r*	*N*	Turnover type	W/B org	Industry	Job zone
	Dispute resolution	−0.28	178	Voluntary	1	4	2
	Participation-enhancing work design	−0.14	178	Voluntary	1	4	2
	Pay: Straight	−0.25	178	Voluntary	1	4	2
Detert, Trevino, Burris, & Andiappan (2007)	Justice/fairness	−0.01	265	Total	0	9	1
	Justice/fairness	−0.02	265	Total	0	9	2
	Supervisory relations	−0.04	265	Total	0	9	1
	Supervisory relations	0.03	265	Total	0	9	2
	Average age	−0.09	265	Total	0	9	1
	Average age	−0.04	265	Total	0	9	2
	Average tenure	−0.20	265	Total	0	9	1
	Average tenure	−0.19	265	Total	0	9	2
	Average tenure	0.01	265	Total	0	9	2
	Average tenure	0.00	265	Total	0	9	2
	Establishment age	−0.05	265	Total	0	9	1
	Establishment age	−0.02	265	Total	0	9	2
	Financial performance: Operating profit	−0.10	265	Total	0	9	1
	Financial performance: Operating profit	0.02	265	Total	0	9	2
	Managerial oversight	0.04	265	Total	0	9	1
	Managerial oversight	0.01	265	Total	0	9	2
	Training	−0.24	265	Total	0	9	1
	Training	−0.06	265	Total	0	9	2
	Customer satisfaction	−0.19	265	Total	0	9	1
	Customer satisfaction	−0.04	265	Total	0	9	2
	Error/loss rates	0.03	265	Total	0	9	1
	Error/loss rates	0.07	265	Total	0	9	2
Dittrich & Carrell (1979)	Job satisfaction	−0.28	20	Voluntary	0	99	2
	Justice/fairness	−0.22	20	Voluntary	0	99	2
	Absenteeism	0.53	20	Voluntary	0	99	2
Doellgast (2008)	Size	0.37	550	Voluntary	1	5	2
	Union presence	−0.14	550	Voluntary	1	5	2
	High-commitment HR system	−0.46	550	Voluntary	1	5	2
	Participation-enhancing work design	−0.37	550	Voluntary	1	5	2
Elliott (2001)	Commitment	0.25	42	Total	0	9	1
	Turnover intentions	−0.15	42	Total	0	9	1
Ferratt, Agarwal, Brown, & Moore (2005)	High-commitment HR system	−0.22	106	Total	1	5	4
	Pay: Variable	0.02	106	Total	1	5	4
	Selection sophistication	−0.18	106	Total	1	5	4
Gardner, Wright, & Moynihan (2011)	Commitment	−0.41	93	Voluntary	0	4	2
	Average tenure	−0.26	93	Voluntary	0	4	2
	Education	−0.37	93	Voluntary	0	4	2
	Female %	−0.36	93	Voluntary	0	4	2
	Unemployment rate	−0.25	93	Voluntary	0	4	2
	Union presence	0.26	93	Voluntary	0	4	2
	High-commitment HR system	−0.13	93	Voluntary	0	4	2
	Participation-enhancing work design	−0.32	93	Voluntary	0	4	2
Gelade & Ivery (2003)	Climate	−0.33	137	Total	0	6	2
	Sales	−0.32	137	Total	0	6	2
	Staffing level	−0.39	137	Total	0	6	2
	Training	−0.34	137	Total	0	6	2
	Customer satisfaction	−0.57	137	Total	0	6	2
	Production efficiency	−0.28	137	Total	0	6	2
George & Bettenhausen (1990)	Cohesiveness	−0.25	33	Voluntary	0	4	2
	OCBs	−0.29	33	Voluntary	0	4	2
	Sales efficiency	−0.25	33	Voluntary	0	4	2

(*Appendices continue*)

Appendix B (continued)

Appendix B (*continued*)

Reference	Variable	*r*	*N*	Turnover type	W/B org	Industry	Job zone
Ghebregiorgis & Karsten (2007)	Establishment age	−0.15	82	Voluntary	1	12	
	Size	−0.24	82	Voluntary	1	12	
	Sales efficiency	0.01	82	Voluntary	1	12	
	Absenteeism	0.03	82	Voluntary	1	12	
Giese & Ruter (1949)	Job satisfaction	−0.42	25	Total	0	4	2
	Absenteeism	−0.15	25	Total	0	4	2
	Production efficiency	−0.18	25	Total	0	4	2
	Error/loss rates	−0.25	25	Total	0	4	2
Glebbeek & Bax (2004)	Average age	−0.18	110	Total	0	7	3
	Financial performance: Operating profit	−0.23	110	Total	0	7	3
	Absenteeism	0.29	110	Total	0	7	3
Gray & Phillips (1996)	Alternative availability	0.28	103	Voluntary	1	8	3
	Alternative availability	0.32	103	Voluntary	1	8	3
	Alternative availability	0.23	103	Voluntary	1	8	3
	Alternative availability	0.32	103	Voluntary	1	8	3
	Alternative availability	0.21	103	Voluntary	1	8	3
	Alternative availability	0.32	103	Voluntary	1	8	3
	Alternative availability	0.22	103	Voluntary	1	8	3
	Unemployment rate	−0.10	103	Voluntary	1	8	3
	Unemployment rate	−0.05	103	Voluntary	1	8	3
	Unemployment rate	−0.07	103	Voluntary	1	8	3
	Unemployment rate	−0.05	103	Voluntary	1	8	3
	Unemployment rate	0.19	103	Voluntary	1	8	3
	Unemployment rate	−0.05	103	Voluntary	1	8	3
	Unemployment rate	−0.01	103	Voluntary	1	8	3
Guest, Michie, Conway, & Sheehan (2003)	Size	0.21	366	Total	1	12	
	Union presence	−0.09	366	Total	1	12	
	Financial performance: Operating profit	−0.05	366	Total	1	12	
	Sales efficiency	−0.08	366	Total	1	12	
	High-commitment HR system	−0.18	366	Total	1	12	
	Participation-enhancing work design	−0.14	366	Total	1	12	
	Absenteeism	0.04	366	Total	1	12	
Guthrie (2000)	Establishment age	0.01	153	Total	1	12	
	Size	0.03	153	Total	1	12	
	Union %	−0.22	153	Total	1	12	
	High-commitment HR system	−0.20	153	Total	1	12	
	Pay: Variable	0.05	153	Total	1	12	
	Pay: Relative	−0.30	153	Total	1	12	
	Selection sophistication	−0.01	153	Total	1	12	
Guthrie (2001)	Establishment age	0.03	164	Total	1	12	
	Size	−0.06	164	Total	1	12	
	Union %	−0.24	164	Total	1	12	
	Sales efficiency	−0.05	164	Total	1	12	
	High-commitment HR system	−0.26	164	Total	1	12	
	Pay: Relative	−0.32	164	Total	1	12	
Haines, Jalette, & Larose (2010)	Size	−0.02	4160	Voluntary	1	12	
	Union %	−0.10	4160	Voluntary	1	12	
	Benefits	−0.12	4160	Voluntary	1	12	
	Dispute resolution	−0.12	4160	Voluntary	1	12	
	Pay: Variable	0.00	4160	Voluntary	1	12	
	Internal mobility	−0.05	4160	Voluntary	1	12	
	Participation-enhancing work design	0.00	4160	Voluntary	1	12	
	Pay: Relative	−0.04	4160	Voluntary	1	12	
	Training	0.23	4160	Voluntary	1	12	

(*Appendices continue*)

Appendix B (continued)

Appendix B (*continued*)

Reference	Variable	*r*	*N*	Turnover type	W/B org	Industry	Job zone
Hausknecht, Trevor, & Howard (2009)	Cohesiveness	−0.02	75	Voluntary	0	9	2
	Cohesiveness	−0.13	75	Involuntary	0	9	2
	Supervisory relations	0.02	75	Voluntary	0	9	2
	Size	−0.34	75	Voluntary	0	9	2
	Size	0.07	75	Involuntary	0	9	2
	Size	−0.22	75	Total	0	9	2
	Tenure: Experience concentration	−0.33	75	Voluntary	0	9	2
	Unemployment rate	−0.07	75	Voluntary	0	9	2
	Unemployment rate	0.32	75	Involuntary	0	9	2
	Unemployment rate	0.11	75	Total	0	9	2
	Customer satisfaction	−0.31	75	Voluntary	0	9	2
	Customer satisfaction	−0.32	75	Involuntary	0	9	2
	Customer satisfaction	−0.42	75	Total	0	9	2
	Involuntary–total turnover	0.69	75				2
	Voluntary–involuntary turnover	0.28	75				2
	Voluntary–total turnover	0.89	75				2
Holden & Peel (1980)	Female %	0.39	101	Total	1	12	
	Female %	0.21	101	Total	1	12	
	Size	−0.28	101	Total	1	12	
	Size	−0.36	101	Total	1	12	
	Unemployment rate	0.23	101	Total	1	12	
	Unemployment rate	0.38	101	Total	1	12	
	Pay: Straight	−0.73	101	Total	1	12	
	Pay: Straight	−0.65	101	Total	1	12	
Holwerda, Ericksen, & Dyer (2010)	Job satisfaction	−0.17	782	Total	0	4	1
	Establishment age	−0.19	782	Total	0	4	1
	Size	0.07	782	Total	0	4	1
	Unemployment rate	−0.15	782	Total	0	4	1
	Financial performance: Operating profit	−0.09	782	Total	0	4	1
	Customer satisfaction	−0.14	782	Total	0	4	1
	Production efficiency	−0.03	782	Total	0	4	1
Hurley & Estelami (2007)	Job satisfaction	−0.16	275	Total	0	4	1
	Supervisory relations	−0.17	275	Total	0	4	1
	Training	−0.16	275	Total	0	4	1
	Customer satisfaction	−0.17	275	Total	0	4	1
Huselid (1995)	Size	0.13	816	Total	1	12	
	Union %	−0.14	816	Total	1	12	
	Financial performance: ROA	−0.03	816	Total	1	12	
	Sales efficiency	−0.24	816	Total	1	12	
	Sales growth	0.06	816	Total	1	12	
	High-commitment HR system	−0.03	816	Total	1	12	
Jackson et al. (1991)	Size	0.25	93	Total	1	6	5
	Workforce diversity: Age	0.25	93	Total	1	6	5
	Workforce diversity: Tenure	0.02	93	Total	1	6	5
Kacmar, Andrews, Van Rooy, Steilberg, & Cerrone (2006)	Site quality	−0.13	262	Voluntary	0	9	1
	Site quality	−0.08	262	Total	0	9	2
	Size	0.02	262	Voluntary	0	9	1
	Size	0.05	262	Total	0	9	2
	Financial performance: Operating profit	−0.19	262	Voluntary	0	9	1
	Financial performance: Operating profit	−0.13	262	Total	0	9	2
	Sales	−0.20	262	Voluntary	0	9	1
	Sales	−0.11	262	Total	0	9	2
	Production efficiency	−0.37	262	Voluntary	0	9	1
	Production efficiency	−0.33	262	Total	0	9	2
	Error/loss rates	0.19	262	Voluntary	0	9	1
	Error/loss rates	0.11	262	Total	0	9	2

(*Appendices continue*)

Appendix B (continued)

Appendix B (*continued*)

Reference	Variable	*r*	*N*	Turnover type	W/B org	Industry	Job zone
Kasarda (1973)	Size	−0.23	130	Total	1	8	
Keck (1997)	Average tenure	−0.26	56	Total	1	3	5
	Average tenure	−0.26	18	Total	1	3	5
	Establishment age	−0.05	56	Total	1	3	5
	Establishment age	−0.05	18	Total	1	3	5
	Size	0.12	56	Total	1	3	5
	Size	−0.12	18	Total	1	3	5
	Workforce diversity: Tenure	0.13	56	Total	1	3	5
	Workforce diversity: Tenure	−0.28	18	Total	1	3	5
	Financial performance: ROA	−0.01	56	Total	1	3	5
	Financial performance: ROA	−0.50	18	Total	1	3	5
Kerr (1947) Study 1	Average age	−0.26	7	Total	0	3	2
	Female %	0.49	7	Total	0	3	2
	Size	0.50	7	Total	0	3	2
	Internal mobility	−0.76	7	Total	0	3	2
	Pay: Straight	−0.31	7	Total	0	3	2
	Routinization	0.73	7	Total	0	3	2
	Skill requirements	−0.59	7	Total	0	3	2
	Absenteeism	−0.31	7	Total	0	3	2
Kerr (1947) Study 2	Supervisory relations	−0.18	53	Total	0	3	2
	Average age	−0.32	53	Total	0	3	2
	Female %	0.68	53	Total	0	3	2
	Size	0.05	53	Total	0	3	2
	Tenure: Experience concentration	−0.52	53	Total	0	3	2
	Pay: Variable	0.40	53	Total	0	3	2
	Internal mobility	−0.20	53	Total	0	3	2
	Managerial oversight	−0.30	53	Total	0	3	2
	Routinization	0.47	53	Total	0	3	2
	Production efficiency	−0.10	53	Total	0	3	2
	Error/loss rates	0.03	53	Total	0	3	2
Koslowsky & Locke (1989)	Financial performance: Profit margin	−0.02	290	Total	0	4	2
	Sales efficiency	0.04	290	Total	0	4	2
	Counterproductivity	0.04	290	Total	0	4	2
	Production efficiency	−0.09	290	Total	0	4	2
Koys (2001)	Job satisfaction	−0.14	28	Total	0	9	1
	Job satisfaction	0.13	28	Total	0	9	1
	OCBs	0.05	28	Total	0	9	1
	OCBs	−0.02	28	Total	0	9	1
	Financial performance: Operating profit	0.10	28	Total	0	9	1
	Financial performance: Operating profit	−0.22	28	Total	0	9	1
	Financial performance: Operating profit	−0.24	28	Total	0	9	1
	Financial performance: Profit margin	0.00	28	Total	0	9	1
	Financial performance: Profit margin	−0.20	28	Total	0	9	1
	Financial performance: Profit margin	−0.28	28	Total	0	9	1
	Customer satisfaction	−0.10	28	Total	0	9	1
	Customer satisfaction	−0.32	28	Total	0	9	1
	Customer satisfaction	0.08	28	Total	0	9	1
C. H. Lee, Hsu, & Lien (2006)	Average age	−0.26	5169	Total	1	3	
	Average tenure	−0.34	5169	Total	1	3	
	Education	0.10	5169	Total	1	3	
	Size	−0.04	5169	Total	1	3	
	Benefits	−0.01	5169	Total	1	3	

(*Appendices continue*)

Appendix B (continued)

Appendix B (*continued*)

Reference	Variable	*r*	*N*	Turnover type	W/B org	Industry	Job zone
Malos & Campion (2000)	Turnover intentions	0.58	117	Total	1	7	5
	Size	0.15	117	Total	1	7	5
	Financial performance: Operating profit	0.30	117	Total	1	7	5
	Sales	0.02	117	Total	1	7	5
	Sales efficiency	0.25	117	Total	1	7	5
	Internal mobility	−0.79	117	Total	1	7	5
	Pay: Straight	0.49	117	Total	1	7	5
	Training	−0.46	117	Total	1	7	5
McCain, O'Reilly, & Pfeffer (1983)	Size	0.43	32	Voluntary	0	8	5
	Size	0.03	32	Voluntary	0	8	5
	Size	0.10	32	Voluntary	0	8	5
	Size	0.43	32	Voluntary	0	8	5
	Tenure: Experience concentration	0.33	32	Voluntary	0	8	5
	Tenure: Experience concentration	0.26	32	Voluntary	0	8	5
	Tenure: Experience concentration	0.51	32	Voluntary	0	8	5
	Tenure: Experience concentration	0.10	32	Voluntary	0	8	5
	Voluntary–involuntary turnover	0.04	32				5
McElroy, Morrow, & Rude (2001)	Size	−0.41	31	Voluntary	0	6	3.3
	Size	−0.46	31	Involuntary	0	6	3.3
	Financial performance: Profit margin	−0.47	31	Voluntary	0	6	3.3
	Financial performance: Profit margin	−0.49	31	Voluntary	0	6	3.3
	Financial performance: Profit margin	−0.47	31	Involuntary	0	6	3.3
	Financial performance: Profit margin	−0.36	31	Involuntary	0	6	3.3
	Sales efficiency	−0.43	31	Voluntary	0	6	3.3
	Sales efficiency	−0.56	31	Voluntary	0	6	3.3
	Sales efficiency	−0.35	31	Involuntary	0	6	3.3
	Sales efficiency	−0.42	31	Involuntary	0	6	3.3
	Customer satisfaction	−0.46	31	Voluntary	0	6	3.3
	Customer satisfaction	−0.65	31	Involuntary	0	6	3.3
	Production efficiency	−0.58	31	Voluntary	0	6	3.3
	Production efficiency	−0.52	31	Involuntary	0	6	3.3
	Voluntary–involuntary turnover	0.38	31				3.3
McNulty, Oser, Johnson, Knudsen, & Roman (2007)	Turnover intentions	0.34	217	Voluntary	1	8	4
	Education	0.24	217	Voluntary	1	8	4
	Female %	0.11	217	Voluntary	1	8	4
	Participation-enhancing work design	−0.26	217	Voluntary	1	8	4
	Pay: Straight	0.15	217	Voluntary	1	8	4
Mueller & Price (1989)	Cohesiveness	−0.10	115	Total	1	8	3
	Commitment	−0.19	115	Total	1	8	3
	Job satisfaction	−0.13	115	Total	1	8	3
	Turnover intentions	0.31	115	Total	1	8	3
	Alternative availability	−0.21	115	Total	1	8	3
	Average age	0.03	115	Total	1	8	3
	Average tenure	0.19	115	Total	1	8	3
	Education	−0.11	115	Total	1	8	3
	Female %	−0.02	115	Total	1	8	3
	Size	0.25	115	Total	1	8	3
	Full-time %	0.06	115	Total	1	8	3
	Internal mobility	−0.04	115	Total	1	8	3
	Participation-enhancing work design	−0.03	115	Total	1	8	3
	Pay: Straight	0.11	115	Total	1	8	3
	Routinization	0.00	115	Total	1	8	3
Nishii & Mayer (2009)	Supervisory relations	−0.11	348	Voluntary	0	4	1
	Size	0.12	348	Voluntary	0	4	1
	Workforce diversity: Tenure	−0.05	348	Voluntary	0	4	1

(*Appendices continue*)

Appendix B (continued)

Appendix B (*continued*)

Reference	Variable	*r*	*N*	Turnover type	W/B org	Industry	Job zone
H. W. Park, Ofori-Dankwa, & Biship (1994)	Size	0.02	100	Voluntary	1	3	
	Unemployment rate	0.12	100	Voluntary	1	3	
	Union presence	−0.28	100	Voluntary	1	3	
	Benefits	−0.12	100	Voluntary	1	3	
	Pay: Variable	−0.01	100	Voluntary	1	3	
	Pay: Straight	−0.30	100	Voluntary	1	3	
Peterson & Luthans (2006)	Financial performance: Operating profit	−0.47	21	Total	0	9	1
	Production efficiency	−0.49	21	Total	0	9	1
Pfeffer & O'Reilly (1987)	Unemployment rate	−0.20	492	Voluntary	1	8	3
	Union presence	−0.07	492	Voluntary	1	8	3
	Workforce diversity: Tenure	0.38	492	Voluntary	1	8	3
	Pay: Relative	−0.10	492	Voluntary	1	8	3
Ployhart, Weekley, & Ramsey (2009)	Alternative availability	0.05	1255	Total	0	4	2
	Average tenure	−0.17	1255	Total	0	4	2
	Establishment age	0.20	1255	Total	0	4	2
	Size	−0.20	1255	Total	0	4	2
	Unemployment rate	−0.03	1255	Total	0	4	2
	Financial performance: Operating profit	0.01	1255	Total	0	4	2
	Sales efficiency	0.12	1255	Total	0	4	2
	Sales growth	−0.06	1255	Total	0	4	2
Ployhart, Van Iddekinge, & MacKenzie (2011)	Sales efficiency	−0.07	238	Total	0	9	1
	Sales growth	−0.50	238	Total	0	9	1
	Training	−0.45	238	Total	0	9	1
	Customer satisfaction	−0.45	238	Total	0	9	1
Richard & Johnson (2001)	Financial performance: ROE	0.01	73	Total	1	6	2
	Sales efficiency	−0.19	73	Total	1	6	2
	High-commitment HR system	−0.40	73	Total	1	6	2
Richardson & Vandenberg (2005)	Climate	−0.23	167	Voluntary	1	12	
	Supervisory relations	−0.25	167	Voluntary	1	12	
	OCBs	−0.17	167	Voluntary	1	12	
	Absenteeism	0.23	167	Voluntary	1	12	
Riordan, Vandenberg, & Richardson (2005)	Climate	−0.27	92	Total	1	6	2.5
	Commitment	−0.41	92	Total	1	6	2.5
	Job satisfaction	−0.14	92	Total	1	6	2.5
	Size	−0.18	92	Total	1	6	2.5
	Financial performance: Profit margin	0.09	92	Total	1	6	2.5
	Financial performance: ROA	0.23	92	Total	1	6	2.5
	Pay: Variable	−0.19	92	Total	1	6	2.5
	Participation-enhancing work design	−0.08	92	Total	1	6	2.5
	Training	−0.29	92	Total	1	6	2.5
Ryan, Schmit, & Johnson (1996)	Size	0.12	131	Total	0	6	2
	Size	0.07	131	Total	0	6	2
	Financial performance: Operating profit	0.15	131	Total	0	6	2
	Financial performance: Operating profit	0.10	131	Total	0	6	2
	Sales efficiency	0.12	131	Total	0	6	2
	Sales efficiency	0.02	131	Total	0	6	2
	Staffing level	0.00	131	Total	0	6	2
	Staffing level	0.10	131	Total	0	6	2
	Customer satisfaction	−0.13	131	Total	0	6	2
	Customer satisfaction	−0.45	131	Total	0	6	2

(*Appendices continue*)

Appendix B (continued)

Appendix B (*continued*)

Reference	Variable	*r*	*N*	Turnover type	W/B org	Industry	Job zone
	Error/loss rates	0.23	131	Total	0	6	2
	Error/loss rates	0.15	131	Total	0	6	2
	Error/loss rates	0.27	131	Total	0	6	2
	Error/loss rates	0.23	131	Total	0	6	2
Salvaggio (2003)	Job satisfaction	−0.03	347	Voluntary	0	4	1
	OCBs	−0.08	475	Voluntary	0	4	1
	Unemployment rate	0.02	347	Voluntary	0	4	1
Sellgren, Ekvall, & Tomson (2007)	Climate	−0.18	52	Total	0	8	3
	Job satisfaction	−0.30	52	Total	0	8	3
	Supervisory relations	−0.25	52	Total	0	8	3
Sels, De Winne, Maes, et al. (2006)	Financial performance: ROE	0.08	416	Voluntary	1	12	
	Sales efficiency	−0.19	416	Voluntary	1	12	
	High-commitment HR system	−0.04	416	Voluntary	1	12	
Shaw & Gupta (2007)	Size	0.40	226	Voluntary	1	4	2
	Size	0.51	226	Voluntary	1	4	2
	Size	0.46	226	Voluntary	1	4	2
	Union %	−0.13	226	Voluntary	1	4	2
	Union %	−0.15	226	Voluntary	1	4	2
	Union %	−0.16	226	Voluntary	1	4	2
	Pay: Variable	−0.02	226	Voluntary	1	4	2
	Pay: Variable	0.03	226	Voluntary	1	4	2
	Pay: Variable	0.00	226	Voluntary	1	4	2
Shaw, Delery, Jenkins, & Gupta (1998)	Establishment age	−0.24	227	Voluntary	1	4	2
	Establishment age	−0.20	227	Involuntary	1	4	2
	Size	0.26	227	Voluntary	1	4	2
	Size	0.35	227	Involuntary	1	4	2
	Union %	−0.29	227	Voluntary	1	4	2
	Union %	−0.19	227	Involuntary	1	4	2
	Benefits	−0.23	227	Voluntary	1	4	2
	Benefits	−0.12	227	Involuntary	1	4	2
	Dispute resolution	−0.23	227	Voluntary	1	4	2
	Dispute resolution	−0.09	227	Involuntary	1	4	2
	Electronic monitoring %	0.25	227	Voluntary	1	4	2
	Electronic monitoring %	0.12	227	Involuntary	1	4	2
	Pay: Straight	−0.21	227	Voluntary	1	4	2
	Pay: Straight	0.12	227	Involuntary	1	4	2
	Selection sophistication	−0.02	227	Voluntary	1	4	2
	Selection sophistication	0.11	227	Involuntary	1	4	2
	Staffing selectivity	−0.21	227	Voluntary	1	4	2
	Staffing selectivity	−0.36	227	Involuntary	1	4	2
	Training	−0.01	227	Voluntary	1	4	2
	Training	0.19	227	Involuntary	1	4	2
	Voluntary–involuntary turnover	0.38	227				2
Shaw, Dineen, Fang, & Vellella (2009) Study 1	High-commitment HR system	−0.33	209	Voluntary	1	4	2
	High-commitment HR system	−0.26	209	Voluntary	1	4	2
	High-commitment HR system	−0.14	209	Involuntary	1	4	2
	Selection sophistication	−0.13	209	Voluntary	1	4	2
	Selection sophistication	−0.23	209	Voluntary	1	4	2
	Selection sophistication	−0.14	209	Involuntary	1	4	2
	Voluntary–involuntary turnover	0.19	209				2
	Voluntary–involuntary turnover	0.33	209				2

(*Appendices continue*)

Appendix B (continued)

Appendix B (*continued*)

Reference	Variable	*r*	*N*	Turnover type	W/B org	Industry	Job zone
Shaw, Dineen, Fang, & Vellella (2009) Study 2	Size	−0.08	93	Voluntary	1	9	2
	Size	−0.01	93	Voluntary	1	9	2
	Size	−0.10	93	Involuntary	1	9	2
	Union presence	0.00	93	Voluntary	1	9	2
	Union presence	−0.02	93	Voluntary	1	9	2
	Union presence	−0.08	93	Involuntary	1	9	2
	High-commitment HR system	−0.11	93	Voluntary	1	9	2
	High-commitment HR system	−0.18	93	Voluntary	1	9	2
	High-commitment HR system	−0.19	93	Involuntary	1	9	2
	Selection sophistication	−0.03	93	Voluntary	1	9	2
	Selection sophistication	−0.05	93	Voluntary	1	9	2
	Selection sophistication	−0.15	93	Involuntary	1	9	2
	Voluntary–involuntary turnover	−0.14	93				2
	Voluntary–involuntary turnover	0.18	93				2
Shaw, Duffy, Johnson, & Lockhart (2005)	Size	0.25	38	Total	0	9	1
	Sales efficiency	−0.32	38	Total	0	9	1
	Sales growth	−0.20	38	Total	0	9	1
Shaw, Gupta, & Delery (2005) Study 1	Establishment age	−0.11	110	Voluntary	1	3	2
	Participation-enhancing work design	−0.04	110	Voluntary	1	3	2
	Production efficiency	0.05	110	Voluntary	1	3	2
	Error/loss rates	0.02	110	Voluntary	1	3	2
Shaw, Gupta, & Delery (2005) Study 2	Establishment age	−0.12	299	Voluntary	1	4	2
	Size	0.16	299	Voluntary	1	4	2
	Union %	−0.18	299	Voluntary	1	4	2
	Financial performance: Operating profit	0.08	299	Voluntary	1	4	2
	Financial performance: ROE	0.12	299	Voluntary	1	4	2
	Sales efficiency	0.06	299	Voluntary	1	4	2
	High-commitment HR system	−0.33	299	Voluntary	1	4	2
	Participation-enhancing work design	0.07	299	Voluntary	1	4	2
	Counterproductivity	0.30	299	Voluntary	1	4	2
	Error/loss rates	0.09	299	Voluntary	1	4	2
Shen & Cannella (2002)	Financial performance: ROA	−0.18	228	Total	1	12	5
	Sales	0.13	228	Total	1	12	5
Siebert & Zubanov (2009)	Average age	−0.50	325	Total	0	4	2
	Average age	−0.28	325	Total	0	4	2
	Average tenure	−0.44	325	Total	0	4	2
	Average tenure	−0.34	325	Total	0	4	2
	Size	0.21	325	Total	0	4	2
	Size	0.10	325	Total	0	4	2
	Unemployment rate	0.04	325	Total	0	4	2
	Unemployment rate	−0.13	325	Total	0	4	2
	Sales efficiency	−0.24	325	Total	0	4	2
	Sales efficiency	−0.02	325	Total	0	4	2
	Pay: Relative	−0.17	325	Total	0	4	2
	Pay: Relative	−0.08	325	Total	0	4	2
Simons & Roberson (2003)	Commitment	−0.17	98	Total	0	9	2
	Justice/fairness	−0.06	98	Total	0	9	2
	Supervisory relations	−0.09	98	Total	0	9	2
	OCBs	−0.11	98	Total	0	9	2
	Turnover intentions	0.21	98	Total	0	9	2
	Customer satisfaction	0.03	98	Total	0	9	2
Sowinski, Fortmann, & Lezotte (2008)	Climate	−0.07	129	Voluntary	0	4	2
	Financial performance: Operating profit	−0.14	129	Voluntary	0	4	2
	Customer satisfaction	−0.36	129	Voluntary	0	4	2

(*Appendices continue*)

Appendix B (continued)

Appendix B (*continued*)

Reference	Variable	*r*	*N*	Turnover type	W/B org	Industry	Job zone
Spell & Blum (2005)	Female %	0.17	360	Voluntary	1	12	
	Size	−0.11	360	Voluntary	1	12	
	Union presence	−0.05	360	Voluntary	1	12	
Spencer (1986)	Alternative availability	0.18	111	Voluntary	1	8	3
	Size	0.13	111	Voluntary	1	8	3
	Unemployment rate	−0.12	111	Voluntary	1	8	3
	Union presence	−0.05	111	Voluntary	1	8	3
	Benefits	−0.01	111	Voluntary	1	8	3
	Dispute resolution	−0.29	111	Voluntary	1	8	3
	Participation-enhancing work design	−0.15	111	Voluntary	1	8	3
Sun, Aryee, & Law (2007)	OCBs	−0.30	81	Voluntary	1	9	2
	Establishment age	−0.17	81	Voluntary	1	9	2
	Site quality	−0.06	81	Voluntary	1	9	2
	Size	−0.13	81	Voluntary	1	9	2
	Unemployment rate	−0.10	81	Voluntary	1	9	2
	Sales efficiency	−0.09	81	Voluntary	1	9	2
	High-commitment HR system	−0.25	81	Voluntary	1	9	2
Terborg & Lee (1984)	Climate	−0.35	65	Voluntary	0	4	2
	Climate	0.17	65	Voluntary	0	4	2
	Climate	0.09	65	Voluntary	0	4	2
	Climate	0.26	65	Voluntary	0	4	2
	Alternative availability	0.06	65	Voluntary	0	4	2
	Alternative availability	0.32	65	Voluntary	0	4	2
	Alternative availability	0.11	65	Voluntary	0	4	2
	Alternative availability	0.45	65	Voluntary	0	4	2
	Average age	0.09	65	Voluntary	0	4	2
	Average age	−0.27	65	Voluntary	0	4	2
	Average age	−0.15	65	Voluntary	0	4	2
	Average age	−0.59	65	Voluntary	0	4	2
	Average tenure	−0.02	65	Voluntary	0	4	2
	Average tenure	−0.51	65	Voluntary	0	4	2
	Average tenure	−0.22	65	Voluntary	0	4	2
	Average tenure	−0.61	65	Voluntary	0	4	2
	Education	−0.13	65	Voluntary	0	4	2
	Education	0.31	65	Voluntary	0	4	2
	Education	0.01	65	Voluntary	0	4	2
	Education	0.55	65	Voluntary	0	4	2
	Size	0.06	65	Voluntary	0	4	2
	Size	−0.10	65	Voluntary	0	4	2
	Size	−0.22	65	Voluntary	0	4	2
	Size	−0.23	65	Voluntary	0	4	2
	Unemployment rate	0.01	65	Voluntary	0	4	2
	Unemployment rate	0.01	65	Voluntary	0	4	2
	Unemployment rate	−0.18	65	Voluntary	0	4	2
	Unemployment rate	−0.24	65	Voluntary	0	4	2
Thoms, Wolper, Scott, & Jones (2001)	Sales	−0.06	88	Total	0	9	1
	Counterproductivity	0.47	88	Total	0	9	1
Ton & Huckman (2008)	Alternative availability	−0.04	268	Total	0	4	2
	Alternative availability	−0.04	268	Total	0	4	2
	Unemployment rate	−0.03	268	Total	0	4	2
	Unemployment rate	−0.09	268	Total	0	4	2
	Financial performance: Profit margin	−0.07	268	Total	0	4	2
	Financial performance: Profit margin	−0.05	268	Total	0	4	2
	Full-time %	0.17	268	Total	0	4	2
	Full-time %	0.00	268	Total	0	4	2
	Customer satisfaction	−0.01	268	Total	0	4	2
	Customer satisfaction	0.00	268	Total	0	4	2

(*Appendices continue*)

Appendix B (continued)

Appendix B (*continued*)

Reference	Variable	*r*	*N*	Turnover type	W/B org	Industry	Job zone
Trevor & Nyberg (2008)	Commitment	−0.21	267	Voluntary	1	12	
	Average age	−0.55	267	Voluntary	1	12	
	Establishment age	−0.27	267	Voluntary	1	12	
	Female %	0.30	267	Voluntary	1	12	
	Size	−0.17	267	Voluntary	1	12	
	Tenure: Experience concentration	−0.72	267	Voluntary	1	12	
	Unemployment rate	0.34	267	Voluntary	1	12	
	Union %	−0.38	267	Voluntary	1	12	
	Benefits	−0.13	267	Voluntary	1	12	
	Dispute resolution	−0.07	267	Voluntary	1	12	
	Downsizing %	−0.01	267	Voluntary	1	12	
	Internal mobility	−0.03	267	Voluntary	1	12	
	Pay: Relative	0.02	267	Voluntary	1	12	
van der Vegt, Bunderson, & Kuipers (2010)	Cohesiveness	−0.43	47	Voluntary	0	3	2
	Average tenure	−0.28	47	Voluntary	0	3	2
	Workforce diversity: Tenure	−0.17	47	Voluntary	0	3	2
	Participation-enhancing work design	−0.43	47	Voluntary	0	3	2
	Routinization	0.44	47	Voluntary	0	3	2
	Error/loss rates	0.55	47	Voluntary	0	3	2
Van Iddekinge et al. (2009)	Financial performance: Profit margin	−0.18	861	Total	0	9	1
	Selection sophistication	−0.39	861	Total	0	9	1
	Training	−0.47	861	Total	0	9	1
	Customer satisfaction	−0.20	861	Total	0	9	1
Wagner, Pfeffer, & O'Reilly (1984)	Establishment age	0.32	31	Total	1	12	5
	Size	0.11	31	Total	1	12	5
	Workforce diversity: Age	0.08	31	Total	1	12	5
	Workforce diversity: Tenure	0.43	31	Total	1	12	5
Way (2002)	Union %	−0.20	366	Voluntary	1	12	
	Union %	−0.17	390	Total	1	12	
	Sales efficiency	−0.09	366	Voluntary	1	12	
	Sales efficiency	−0.09	390	Total	1	12	
	High-commitment HR system	−0.21	366	Voluntary	1	12	
	High-commitment HR system	−0.20	390	Total	1	12	
	Voluntary–total turnover	0.88	366				
Wiersema & Bird (1993)	Average age	−0.54	40	Total	1	12	5
	Workforce diversity: Age	0.14	40	Total	1	12	5
	Workforce diversity: Tenure	0.29	40	Total	1	12	5
	Financial performance: ROE	−0.02	40	Total	1	12	5
Yanadori & Kato (2007)	Average tenure	−0.53	330	Voluntary	1	12	
	Average tenure	−0.48	301	Voluntary	1	12	
	Female %	0.22	330	Voluntary	1	12	
	Female %	0.21	301	Voluntary	1	12	
	Size	−0.39	330	Voluntary	1	12	
	Size	−0.35	301	Voluntary	1	12	
	Union presence	−0.17	330	Voluntary	1	12	
	Union presence	−0.15	301	Voluntary	1	12	
	Sales efficiency	−0.10	330	Voluntary	1	12	
	Sales efficiency	−0.04	301	Voluntary	1	12	
	Sales growth	0.17	330	Voluntary	1	12	
	Sales growth	0.15	301	Voluntary	1	12	
	Pay: Straight	−0.02	330	Voluntary	1	12	
	Pay: Straight	−0.01	301	Voluntary	1	12	

Note. When reported, multiple effect sizes within the same study for the same variable indicate correlations drawn from independent employee groups. When multiple effect sizes were reported from a single group for the same variable, we averaged them to create a single estimate using Hunter and Schmidt's (1990) formula for linear composites. W/B org: 0 = within, 1 = between. Industry: 1 = natural resources/mining, 2 = construction, 3 = manufacturing, 4 = trade/transportation/utilities, 5 = information, 6 = financial activities, 7 = professional/business services, 8 = education and health services, 9 = leisure and hospitality, 10 = other services, 11 = public administration, 12 = multiple industries. Job zone: 1 = little or no preparation needed, 2 = some preparation needed, 3 = medium preparation needed, 4 = considerable preparation needed, 5 = extensive preparation needed. Weighted averages of job zones were calculated when multiple occupations were represented in the primary study. HR = human resource; OCB = organizational citizenship behavior; ROA = return on assets; ROE = return on equity; W/B org = within/between organization.

(*Appendices continue*)

Appendix C

Appendix C

List of Excluded Studies

Reasons for exclusion:

Did not measure unit-level turnover:

Ashworth (2006)

Aw, Chen, & Roberts (2001)

Bloom & Michel (2002)

Carley (1992)

Chen (2005)

Currall, Towler, Judge, & Kohn (2005)

Elvira & Cohen (2001)

Glisson & James (2002)

Leonard & Levine (2006)

Martinez-Sanchez, Perez-Perez, Vela-Jimenez, & de-Luis-Carnicer (2008)

Moore (2000)

Stolte & Myers (1995)

Thompson et al. (2008)

Vandenberghe (1999)

Correlations not reported:

Aarons & Sawitzky (2006)

Alexander, Bloom, & Nuchols (1994)

Balkin & Gomez-Mejia (1984)

Banaszak-Holl & Hines (1996)

Baron, Hannan, & Burton (2001)

Beadles, Lowery, Petty, & Ezell (2000)

Booth & Hamer (2007)

Brannon, Zinn, Mor, & Davis (2002)

Cappelli & Neumark (2004)

Castle (2005)

Castle & Engberg (2005)

Castle & Engberg (2006)

Dale-Olsen (2006)

Donoghue & Castle (2006)

Donoghue & Castle (2007)

Guthrie, Flood, Liu, & MacCurtain (2009)

Harrington & Swan (2003)

Kahane & Shmanske (1997)

Kash, Castle, & Phillips (2007)

Kesner & Dalton (1994)

Lavender & Marras (1994)

Lucifora (1998)

Meier & Hicklin (2008)

O'Brien-Pallas et al. (2006)

Parsons (1972)

Plomondon et al. (2007)

Powell, Montgomery, & Cosgrove (1994)

Taplin, Winterton, & Winterton (2003)

Walsh (1988)

Woltmann et al. (2008)

Yalabik, Chen, & Kim (2008)

Data reported elsewhere:

Sels, De Winne, Delmotte, et al. (2006)

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