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Keywords

absenteeism, labor market, unemployment, satisfaction

Disciplines

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Comments

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Abstract

Prior research is limited in explaining absenteeism at the unit level and over time. We developed and tested a model of unit-level absenteeism using five waves of data collected over six years from 115 work units in a large state agency. Unit-level job satisfaction, organizational commitment, and local unemployment were modeled as time-varying predictors of absenteeism. Shared satisfaction and commitment interacted in predicting absenteeism but were not related to the rate of change in absenteeism over time. Unit-level satisfaction and commitment were more strongly related to absenteeism when units were located in areas with plentiful job alternatives.

Productivity losses due to employee absence cost organizations millions of dollars each year (Dalton & Mesch, 1991; Mason & Griffin, 2003). A recent national survey of human resource professionals revealed that absenteeism was a “serious problem” at 33 percent of responding organizations (“Unscheduled Absences...,” 2006). Although numerous dispositional, attitudinal, demographic, health, economic, and social factors have been linked with an *individual’s* decision to attend work (Harrison & Martocchio, 1998; Muchinsky, 1977), researchers have also shown that conceptualizing absenteeism as a construct at the *work-unit* level offers novel insights regarding its causes and correlates (e.g., Dineen, Noe, Shaw, Duffy, & Wiethoff, 2007; George, 1990; Markham & McKee, 1995; Mason & Griffin, 2003). In addition, researchers have repeatedly asserted that careful attention to temporal issues in absence research can yield better understanding of absence and its purported causes (Fichman, 1989; Harrison & Martocchio, 1998; Martocchio & Harrison, 1993; Mason & Griffin, 2003).

Our objective is to specify and test a longitudinal model of employee absenteeism at the work-unit level. As used here, “unit” refers to “any definable set of individuals possessing an infrastructure operating within an organization, such as a work group, a department, or a division” (Rentsch & Steel, 2003:186). We conceptualize absenteeism as a unit-level, dynamic construct that changes over time, both within and between work units, and examine unit-level work attitudes and labor market conditions as predictors of absenteeism and its rate of change. Our approach follows a call by Harrison and Martocchio, who stated that “longitudinal studies would be especially welcome if they tracked relationships with these constructs over several intervening years, or measured these constructs repeatedly in panel designs that spanned the same period” (1998: 309).

THEORY AND HYPOTHESES

Absence as a Unit-Level Construct

Absence is commonly studied at the individual level of analysis because it is individuals who behave; thus, many of the hypothesized causes of absence reflect characteristics of individuals, such as illness (Harvey & Nicholson, 1999) and dispositional factors (Iverson & Deery, 2001). Despite a long history of individual-level absence research, there are conceptual, empirical, analytical, and practical reasons to consider absenteeism as a unit- level construct. Conceptually, unit-level absenteeism is closely tied to social and normative expectations particular to work groups (Markham & McKee, 1995; Martocchio & Harrison, 1993; Mathieu & Kohler, 1990a; Nicholson & Johns, 1985). Over time, a group develops an absence culture, a “set of shared understandings about absence legitimacy in a given organization and the established custom and practice of employee absence behavior and its control” (Johns & Nicholson, 1982: 136). Social interactions and identity concerns are thought to condition employees toward an “appropriate” level of absence. Mason and Griffin noted, for example, that “absenteeism is likely to be subject to social influence, dictating how much absence is acceptable, and on what occasions absence is justified” (2003: 668). Given these social-contextual factors, consensus surrounding absence norms, and perhaps more importantly, absence behavior, should emerge among employees within a unit because they work in an environment where the social and physical work context is generally constant. In other words, social influences should restrict within-group variance and promote larger between-group variance (Rentsch & Steel, 2003).

Empirically speaking, cross-level and unit-level studies have shown that unit-level variables explain variability in absenteeism that goes beyond what can be explained by individual-level constructs. For example, estimates or actual values of group absenteeism predict individual-level employee absence (Gellatly, 1995; Harrison & Shaffer, 1994; Markham & McKee; 1995; Mathieu & Kohler, 1990a), supporting conceptual arguments that employees adjust their behavior according to work group norms. In addition, unit-level characteristics such as shared attitudes, labor market conditions, and unit size are associated with unit-level absenteeism (Dineen et al., 2007; George, 1990; Markham, Dansereau, & Alutto, 1982). Many of these studies examine constructs that operate mostly at the unit versus the individual level (e.g., group cohesiveness [Xie & Johns, 2000]) or simply do not exist at the lower level (e.g., group size [Markham et al., 1982]).

Aggregating individual absence behaviors to the unit level overcomes methodological problems that have hampered individual-level studies. Individual absence behavior is typically measured as “time lost” (e.g., average number of days absent over a given period of time) or “frequency” (e.g., number of absence spells, regardless of their duration). These measurement procedures usually yield nonnormal distributions that are positively skewed and truncated by a large number of values at zero (Hammer & Landau, 1981; Zaccaro, Craig, & Quinn, 1991), rendering many traditional statistical procedures (e.g., ordinary least squares regression) inappropriate or, at best, ill-suited to testing the research questions (Sturman, 1999). Aggregating individual absence data to the unit level tends to yield absenteeism measures that are normally distributed, thereby widening researchers’ analytical options (Steel, Rentsch, & Hendrix, 2002).

From a practical perspective, unit-level studies can provide managers with different strategies for addressing absenteeism problems. Interventions to reduce absenteeism applied at the unit level (e.g., group incentives) may be more efficient and less resource intensive than individual performance management strategies such as counseling, retraining, and close employee monitoring (Brown & Red- mon, 1989; Markham, Scott, & McKee, 2002). Additionally, tracking systems such as “balanced scorecards” essentially treat absence and other employee metrics at these broader levels rather than at the individual level. Taken together, a number of potential advantages and opportunities for research and practice recommend studying absenteeism at the unit level.

Explaining Work-Unit Absenteeism

To explain variability in unit-level absenteeism, we focus on units’ shared attitudes (job satisfaction and organizational commitment), prevailing local labor market conditions (unemployment rates), and the temporal patterning of these constructs over time. We begin by considering two commonly studied work attitudes, job satisfaction and organizational commitment, as shared attitudes. Although work attitudes are often examined at an individual level, there are conceptual and often empirical reasons to study the similarity of attitudes among members of a group. Social influence theories hold that members of a work unit develop shared attitudes about their jobs and organization because they have opportunities for information exchange, share similar structural characteristics, and generally experience the same events (e.g., Rentsch, 1990; Rentsch & Steel, 2003; Ryan, Schmit, & Johnson, 1996; Salancik & Pfeffer, 1978; Schneider & Reichers, 1983). In addition, unit supervisors and managers are responsible for the implementation and interpretation of organizational policies, rules, and procedures, and thus may guide employees to respond to organizational events in similar ways (Gellatly, 1995;

Rentsch & Steel, 2003). Situational and social influences tend to create relatively homogeneous attitudes within work units, including shared levels of job satisfaction and organizational commitment.

Job satisfaction. Unit-level job satisfaction is defined as the shared sense of enjoyment that individuals derive from their experiences on the job and within a work unit. In units where there is a collective sense of satisfaction with the quality of supervision, coworkers, and other aspects of the job, these shared positive feelings are generally associated with a variety of benefits, such as stronger ties among members, richer support networks, a greater sense of community and belonging, and stronger norms of cooperation and collaboration (e.g., Dineen et al., 2007; Ostroff, 1992). Collectively, these mechanisms (which are not duplicated at the individual level) are important resources that may facilitate attendance at work (Rentsch & Steel, 2003). For example, some of the common causes of absenteeism (e.g., transportation issues or other life stressors) may be alleviated when workers can rely upon other members of their work unit for support. In addition, unit-level satisfaction may play a buffering role in curbing absenteeism, according to models in which absence taking is conceptualized as a daily choice process (e.g., Harrison, 1995). Higher attendance is expected in high-satisfaction work units because the opportunities for belonging and support are attractive to work-unit members, whereas low-satisfaction units offer no such benefits and may increase the likelihood of absenteeism when employees consider the expected utility of attendance and low reward opportunities that are associated with work unit membership.

In the few studies in which satisfaction and absence were aggregated to the unit level, researchers have found mixed results regarding the direction and magnitude of the variables' relationship. For example, Dineen et al. (2007; Study 2) studied absence over three months among 70 manufacturing teams and found that the relationship between job satisfaction and absenteeism was negative when dispersion (within-team variability in satisfaction) was high. However, they also found that absence was actually lowest when mean job satisfaction and dispersion were both *low*, suggesting that shared negative attitudes may actually create a common in-group identity that promotes attendance at work. Additional findings from unit-level research generally reveal negative relationships between satisfaction and absence (Steel et al., 2002; Terborg, Lee, Smith, Davis, & Turbin, 1982).

Although one must be careful of uncritical generalizations across individual and group levels (i.e., the "atomistic fallacy" [Diez-Roux, 1998]), individual-level theory and research also emphasize job satisfaction as an antecedent of absenteeism (Brooke, 1986; Hulin, Roznowski, & Hachiya, 1985; Rosse & Miller, 1984; Steers & Rhodes, 1978,1984). Despite differences in the scope and focus of individual-level models, research shows that when employees hold positive attitudes, they make positive contributions toward their work roles, including attendance at work (Hackett, 1989; Harrison, Newman, & Roth, 2006; Iverson & Deery, 2001). In sum, drawing on the conceptual and empirical evidence, and following the rationale that higher job satisfaction within a unit is associated with support mechanisms that facilitate attendance, we expect that unit-level job satisfaction is negatively related to unit-level absenteeism.

Hypothesis 1. Unit-level job satisfaction is negatively related to unit-level absenteeism.

Organizational commitment. At the unit level, organizational commitment is defined as a collective sense of affective or emotional attachment to an organization (Meyer & Allen, 1984, 1991). Perhaps the most important conceptual distinction between organizational commitment and job satisfaction lies in the focus of the attitude; unit-level job satisfaction generally refers to a unit's members' shared affective and cognitive feelings about their jobs, whereas organizational commitment primarily reflects shared feelings about attachment to the organization within which the unit exists. Employees are thought to develop organizational attachments via experiences in the unit where they work (van Knippenberg & van Schie, 2000). In high-com- mitment units, employees strive to achieve their organization's goals. For example, employees of high-commitment units may engage in more community maintenance behaviors, including regular attendance at work. Thus, high-commitment work units are likely to be associated with stricter attendance norms (Rentsch & Steel, 2003).

In the only study to date conducted at the unit level, Terborg et al. (1982) examined data from six retail stores and found a weak, negative relationship between store-level commitment and absenteeism. At the individual level, meta-analytic evidence has supported the negative relationship between commitment and absenteeism (Hackett, 1989; Harrison et al., 2006). In view of these findings, and the premise that high commitment reflects a strong collective attachment to organizational values and goals, including attendance at work, we expect that at the unit level of analysis, organizational commitment is negatively related to absenteeism.

Hypothesis 2. Unit-level organizational commitment is negatively related to unit-level absenteeism.

Interactive effects of commitment and satisfaction. In addition to examining the main effects of unit-level job satisfaction and organizational commitment on absenteeism, we also investigate their potential interactive effects. As noted earlier, unit- level job satisfaction represents the aggregate level of satisfaction that individuals feel about their jobs, whereas unit-level commitment reflects collective attachment to their *organization*. Blau and Boal's (1987) theoretical model helps explain how particular combinations of job involvement (which is a strong correlate of job satisfaction [Brown 1996]) and organizational commitment interact to explain absence. We draw upon aspects of their model to explain how unit-level satisfaction and commitment may interact in predicting unit-level absenteeism.

The lowest levels of absenteeism should be found in units where members share both a collective sense of satisfaction with their work and an attachment to their organization and its goals (i.e., high satisfaction/high commitment). Blau and Boal labeled these groups "institutionalized stars" because they should exert a great deal of effort both on job-related and group maintenance activities, both of which offer unit-level benefits that facilitate attendance. In units with members who share feelings of dissatisfaction but are highly committed to their organization (i.e., low satisfaction/high commitment), members would be expected to promote group maintenance via stricter attendance norms but would lack the support functions offered by high-satisfaction units, which would lead to greater absenteeism relative to the high satisfaction/high commitment group. Blau and Boal labeled this group "corporate citizens." The third group is characterized by high satisfaction and low commitment. Absenteeism is expected to be greater than the high-high group's because members of these units ("lone wolves") benefit from the support of other unit members but are not exposed to the group maintenance activities that lead to stricter attendance norms. The final group is characterized by members ("apathetic employees") who share dissatisfaction with most aspects of the job and have a general disregard for their organization and its goals (i.e., low satisfaction/low commitment). Absenteeism is likely to be greatest in these units because affiliating with the group offers minimal benefits in terms of support functions or group maintenance activities.

Empirical support for aspects of the Blau and Boal framework has been found at the individual level (e.g., Blau, 1986; Mathieu & Kohler, 1990b), but unit-level tests have not appeared to date. When the level of analysis is the work unit, organizational commitment may be a necessary but insufficient condition for low absenteeism. Organizational commitment involves attachment to an organization *and* promotion of the organization's goals, including attendance (Zaccaro & Dobbins, 1989). On the basis of the notion that attachment and goal promotion are acted out in the specific units in which employees work, the strength of a unit's organizational commitment should influence the development of norms concerning appropriate levels of attendance (Rentsch & Steel, 2003). Thus, when organizational commitment is low, higher levels of absenteeism may occur regardless of the level of job satisfaction because members take fewer actions to limit the absence of their peers. Put differently, to attain low levels of absenteeism at the unit level, unit members must share a sense of attachment to their organization (high commitment) before job-specific attitudes such as satisfaction can influence attendance.

Hypothesis 3. Unit-level job satisfaction and organizational commitment interact in predicting unit-level absenteeism: The negative relationship between job satisfaction and absenteeism is more evident in units where organizational commitment is high.

Moderating effects of local labor market conditions. Conceptual models of absence (e.g., Steers & Rhodes, 1978) often include links between absence rates and local labor market conditions (i.e., unemployment rates). Having few available opportunities in the external labor market is thought to heighten employees' anxiety around job security and compel them to favor attendance over absence, whereas low regional unemployment and a prosperous economy often translate into greater job opportunities, meaning that employees can find work elsewhere if necessary (Leigh, 1985; Leonard, Dolan, & Arsenault, 1990; Markham & McKee, 1991). Markham (1985) found fairly strong and negative relationships between absenteeism and unemployment rates at the national, regional, and organizational levels, and this finding has been replicated elsewhere (Leigh, 1985).

What is unknown to date, however, is what effect these labor market influences may have on the relationship between work attitudes and absenteeism at the unit level. Markham asserted that "when unemployment is high, the relationship between absenteeism and satisfaction might disappear because absence levels are so depressed" (1985: 233). Although this proposition is conceptually appealing, we could not find any empirical studies testing its merit. Theories of employee turnover (i.e., quitting), which represents an alternate form of withdrawal, offer the similar conceptual rationale that when employment alternatives are scarce, employees may be less likely to quit even when dissatisfied, and there is at least some empirical support for the hypothesis that unemployment moderates satisfaction-turnover relationships (Trevor, 2001). The more general notion that labor market conditions alter the withdrawal mechanisms chosen by dissatisfied employees has received support in the context of employee grievance filing (e.g., Bacharach & Bamberger, 2004; Cappelli & Chauvin, 1991).

Conceptually and empirically, then, we expect the relationship between unit-level work attitudes and absence to be conditional upon local labor market conditions. When opportunities are plentiful in the external labor market for a given work unit (low unemployment), workers should perceive greater ease of movement outside their organization (Larson & Fukami, 1985) and should thus be less concerned about the repercussions of exercising their discontent via absenteeism when they are dissatisfied or lack commitment to the organization. Moreover, the organization may be less likely to enforce absence policies internally when replacements are scarce. On the other hand, difficult economic times (high unemployment) create a scarcity of perceived alternatives and heightened fears of job loss, which should constrain behavior among those in low-satisfaction and low-commitment units because employees do not want to jeopardize their current employment standing by taking unnecessary days off.

Hypothesis 4. Unit-level job satisfaction and local unemployment rates interact in predicting unit-level absenteeism: The negative relationship between job satisfaction and absenteeism is more evident in units where unemployment rates are low.

Hypothesis 5. Unit-level organizational commitment and local unemployment rates interact in predicting unit-level absenteeism: The negative relationship between organizational commitment and absenteeism is more evident in units where unemployment rates are low.

Temporal patterning in unit-level absenteeism. The final goal of this study was to address the temporal patterning of absenteeism. We ground our arguments in dynamic systems theory (Maruyama, 1963) and conceptualize unit-level absenteeism as a long-term, historically dependent phenomenon. Maruyama proposed that feedback loops are created in such a way that a variable eventually relates to itself at a later point in time (see also Monge, 1990). He introduced the terms *deviation amplification,* which refers to a positive feedback loop whereby initial change in a variable leads to further changes in that variable in the same direction, and *deviation counteraction*, which refers to a negative feedback loop whereby initial change in a variable in one direction leads to an eventual change in that variable in the opposite direction. In this study, deviation amplification and deviation counteraction principles helped to characterize types of change in absenteeism and provided a foundation for testing hypotheses concerning variables thought to explain such changes. Even though each unit is subject to the same organizational conditions, absenteeism is likely to increase in some units while it decreases or remains constant in others (Mason & Griffin, 2003). Our goals were to model the overall trend in absence across work units, examine variability in interunit and intraunit change, and test variables that may explain differences in the set of unit-level change trajectories.

We drew upon Blau's (1994) taxonomy of lateness (an employee withdrawal construct that is related to, but distinct from, absence) to develop our arguments concerning the temporal patterning of unit-level absenteeism. In particular, Blau proposed that a particular type of lateness, *increasing chronic lateness*, occurs as a function of negative work attitudes and is characterized by a nonrandom pattern of increasing frequency and duration. Blau (1994) found that employees who exhibited this pattern had significantly lower levels of job satisfaction, organizational commitment, and job involvement than employees in other lateness categories. These findings suggest that withdrawal behaviors such as lateness and absence may indeed be dynamic criteria. Although seasonal, annual, and other temporal fluctuations have been found in past absence research (e.g., Leonard et al., 1990; Steel & Rentsch, 1995), we could locate only one study that tested explanations for these changes at the unit level, where it was found that absenteeism varied over time and was related to the positive affective tone of the studied work groups (Mason & Griffin, 2003). Drawing on the rationale that increasing chronic withdrawal is likely to be a function of negative work attitudes more than of other factors, we predict that satisfaction and commitment may account for between-unit variability in absenteeism trends over time. We expect that units characterized by low levels of job satisfaction and organizational commitment act on this shared discontent and lack of attachment via increasing levels of absenteeism, which follows from Maruyama's (1963) concept of deviation amplification and Blau's (1994) lateness taxonomy.

> *Hypothesis 6. Unit-level job satisfaction is related to the rate of change in unit-level absenteeism: higher levels of satisfaction are associated with decreasing absenteeism, and lower levels of satisfaction are associated with increasing absenteeism.*

> *Hypothesis 7. Unit-level organizational commitment is related to the rate of change in unit-level absenteeism: higher levels of commitment are associated with decreasing absenteeism, and lower levels of commitment are associated with increasing absenteeism.*

Insert Table 1 Here

METHODS

Research Setting

Data were collected at five points over six years (1998-2003) in a large state department of transportation with approximately 12,500 employees nested within 115 work units. Work units included both county maintenance units (with responsibilities for road construction, maintenance, repair, and such operations as brush clearing and snow removal) and office units (with responsibilities such as engineering design, driver licensing, and contract administration). The researchers worked with the organization to develop and administer an annual employee opinion survey, analyze the resulting data, and provide survey feedback reports to the various work units. In 2000, a website was created to permit online survey administration and provide work-unit managers with the capability to design their own customized reports from the multiyear survey database. As part of this process, we linked employee attitude data (aggregated to work units) to outcome variables including employee absenteeism. These linkage results, also available via the survey website, guided managers in diagnosing workplace problems that adversely affected outcomes. These activities yielded the data for this study.

Design and Procedure

For each unit at each of the five time points, we gathered unit-level absenteeism data from organizational records and collected data on job satisfaction and organizational commitment from individual employees using surveys. We aggregated individual-level survey data to the work-unit level by taking the mean value on each construct for each work unit at each time point. The survey used to collect the attitudinal data was anonymous, and the organization provided the absenteeism data at the unit level, so it was not possible to link individual survey responses with absence at the individual level. Thus, the level of analysis in this study is the work unit. In all analyses, predictors were related to absenteeism in the same period (e.g., 1998 unemployment and 1998 job satisfaction to 1998 absenteeism). The time variable included here was interval-coded, beginning with 0 to represent the first wave of data collection in the study (i.e., 1998). Data for the remaining variables were collected from publicly available databases (unemployment rates) and organizational records (controls for work unit size and type).

Table 1 summarizes the survey sampling statistics for each period. Administration of the 2000—01 survey began in December 2000 and continued through February 2001; this period is labeled accordingly. For each period, the upper half of Table 1 shows the (1) number of surveys distributed, (2) number of completed surveys, (3) survey return rate, (4) average number of respondents per work unit, (5) number of work units sampled, and (6) range of number of employees per unit. The total number of work units over all periods was 115, although the number of work units at each period shown in Table 1 is lower than the maximum possible because of fluctuation in units over time (e.g., hiring and attrition, creation of new work units, absorption of work units by larger ones), and because a unit must have had at least three responses to be included in any given period. Similarly, the number of units included in a given analysis was determined by missing data for specific variables in the analysis.

Survey administration methods and procedures changed slightly over the years of this research. For the first two years, 1998 and 1999, scannable paper surveys were distributed to recipients via internal department mail and returned directly to the researchers via U.S. mail in postage-prepaid envelopes. To reduce printing and mailing costs, we chose a random sample of 50 percent of employees to receive the 1998 survey, and the remaining 50 percent of the employee population (plus all newly hired individuals) received surveys in 1999.

Beginning in 2000, online survey administration was available. Given cost savings from online administration, a decision was made to increase sampling to 100 percent. Sufficient quantities of paper surveys and/or online survey passwords were provided to each work unit for all unit employees. Paper surveys were distributed in postage-prepaid return envelopes. Online participants received form letters with instructions and single-use passwords. The number of work units asked to complete online surveys instead of paper surveys increased with each successive year. In 2000-01, 590 employees were provided with survey passwords. In 2002, online survey password recipients increased to 3,772. In 2003 this number was 4,634, or 37.4 percent of the total. Unit-level response rates were not significantly different for online versus paper surveys in the years in which both methods were widely used (2002, $t = 1.73, p > .05$; 2003, $t = 0.99, p > .05$).

Measures

Job satisfaction. Seven items adapted from Warr, Cook, and Wall (1979) assessed intrinsic and extrinsic aspects of job satisfaction (i.e., job challenge, relationship with coworkers, relationship with supervisor, independent thought and action, job security, recognition, and chances for promotion) along a continuum ranging from 1, “very dissatisfied,” to 5 “very satisfied.” We aggregated job satisfaction to the work-unit level by averaging the scale scores of the respondents in each unit. Past research reveals support for the construct validity

(Warr et al., 1979) and predictive validity (Zaccaro et al., 1991) of the Warr et al. satisfaction measure.

Organizational commitment. Six items adapted from Meyer and Allen (1984) assessed six aspects of organizational commitment (i.e., organization has personal meaning, feeling like “part of the family,” commitment reciprocity, pride, attachment, and intention to remain) on a five-point continuum (1, “strongly disagree,” to 5, “strongly agree”). We aggregated organizational commitment to the work- unit level by averaging the scale scores of the respondents in each unit. Meyer, Stanley, Herscovitch, and Topolnytsky (2002) provided construct and predictive validity evidence for the Meyer and Allen measure.

Unemployment rates. Local unemployment rates for each study year were collected from county-specific data gathered from the Bureau of Labor Statistics website (U.S. Department of Labor, 2007). These rates express the number unemployed as a percentage of the labor force by county.

Absenteeism. As in past research (Ilgen & Hollenback, 1977; Lawler & Hackman, 1969), absence was calculated for each employee as the percentage of available work hours missed because of short-term absence, which was then aggregated to the unit level by averaging values for the members of each unit. The organization maintained separate records of short-term and long-term absence for each employee. Short-term absence (studied here) included absences of less than three consecutive work days. Long-term absence of three or more consecutive work days (not studied here) required documentation from a physician and was assumed to be medically rather than motivationally based. Lateness was tracked separately by the organization, as were other forms of time away from work, such as vacation days, holidays, parental leave, and military leave. Employees were credited with short-term leave at a rate of 5 percent of all regular hours worked (e.g., full-time employees could earn up to 13 days per year) and were compensated with their regular pay when absent. The organization had annual goals for reducing short-term absence; employees received a financial incentive to avoid short-term absence (paid at retirement, contingent upon length of service); and work-unit managers received quarterly and annual summary reports on the short-term absence of their employees.

Control variables. The total number of employees in a work unit at each time point, labeled work unit size, was included as a control variable, as researchers have identified size-based effects in previous research (Markham et al., 1982; Markham & McKee, 1991). In addition, given differences in the nature of their work, we included a dummy variable to represent the work-unit type, where 0 represented county maintenance units and 1 represented office units.

Data Analysis Approach

Aggregation statistics. Work-unit consensus was estimated by Brown and Hauenstein's (2005) interrater agreement statistic, a_{wg}. These authors developed a_{wg} to overcome limitations associated with other agreement indices such as r_{wg} (i.e., scale dependency, sample size dependency, and potentially biasing uniform distribution assumptions [see Brown & Hauenstein, 2005:170]). Possible values of a_{wg} range from -1.0 to +1.0, with +1.0 representing perfect agreement, and values of .70 or greater indicating moderate agreement. Table 1 provides average a_{wg} values for job satisfaction and organizational commitment for each period. Average values indicated moderate agreement; 90 percent of the work units achieved at least weak agreement (.60 or greater) according to Brown and Hauenstein's guidelines for interpretation.

We also calculated two types of intraclass correlation coefficients (ICCs) for job satisfaction and organizational commitment using the individual-level data. ICC(1) is a ratio of between-group to total variance (including between- and within-group variance) in scores. ICC(2) indexes the reliability of group means (Bliese, 2000). Thus, for the individual-level satisfaction and commitment data, ICC(1) measures the variability in individual scores that is attributable to work-unit membership, and ICC(2) estimates the reliability of the unit-level satisfaction and commitment mean scores. ICC(1) and ICC(2) were calculated for each of the five waves of job satisfaction and organizational commitment data (see Table 1). Over the five periods, the average ICC(1) value was .04 for both job satisfaction and organizational commitment, and the mean ICC(2) was .62 for job satisfaction and .67 for organizational commitment.[1]

After aggregating the individual-level data to the unit level, we again calculated ICC(1) using the full longitudinal data set. Although the formula is slightly different in the longitudinal context (it is based on a random coefficient model rather than an ANOVA model), interpretation is similarly an estimate of the amount of variance in scores attributable to group membership (Bliese, 2000). However, instead of modeling individual-level variability in satisfaction and commitment (as we did above), the ICC(1) estimates unit-level variability in scores, assigning

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[1] As a check on the appropriateness of our unit-level conceptualization, we also calculated ICC(1) and ICC(2) at the next highest organizational level, which was the district level (units were nested within 1 of 18 districts). Average ICC(1) values for job satisfaction and organizational commitment were .01 and .02, respectively, and average ICC(2) values were .72 and .82. Although the ICC(2) values indicate greater reliability in group means, which is attributable to the larger average group size (see Bliese, 1998), ICC(1) results show that the district-level aggregation explains only a negligible amount of between-group variance. Given the greater ability of the unit-level grouping to explain variance in our data relative to the district level and the empirical support showing acceptable ICC(2) values at the unit level, we focus on the unit rather than the district level in this study.

variance either between units or *within units over time*. The key difference between the two ICC(1) estimates is that in the individual-level data, each work unit contains multiple satisfaction and commitment scores because there are multiple people per unit (and the analysis only addresses one point in time), whereas in the longitudinal data, each work unit contains multiple satisfaction and commitment scores because there are multiple waves of (aggregated) data per unit. The ICC(1) in the longitudinal data was .55 for job satisfaction and .48 for organizational commitment, indicating that approximately half of the variance in unit-level satisfaction and commitment scores is attributable to between-unit differences, and the remainder is attributable to within-unit differences over time.

Random coefficient modeling framework. To analyze the longitudinal unit-level data, we used random coefficient modeling (RCM), which is sometimes also called *hierarchical linear modeling, latent curve analysis, mixed modeling, multilevel modeling*, or *growth modeling* (Bliese & Ploy- hart, 2002; Raudenbush, 2001; Singer & Willett, 2003). RCM accounts for nonindependence of observations, provides tests of intra- and interunit change, allows starting values and rates of change to vary across units, and permits tests of continuous time-varying predictors. Other analytic approaches (e.g., repeated-measures analysis of variance) fail to adequately account for one or more of these data set characteristics and therefore do not allow for appropriate tests of our hypotheses. Time series analysis (Cohen, Cohen, Aiken, & West, 2003) is also less appropriate for our study because it often involves observing a single unit over a large number of time points (e.g., often 50 or more) and is used to forecast future events or examine the effectiveness of a given intervention (Tabachnick & Fidell, 2007).

RCM is well-suited to the properties of longitudinal data. Because longitudinal data represent repeated measurements of the same individual or unit, (1) observations tend to be intercorrelated over time periods, (2) responses gathered closer in time tend be more highly related than responses collected at longer intervals, and (3) responses may be more or less variable at different points in time (Bliese & Ployhart, 2002). Each of these issues either violates the assumption of independent observations that underlies traditional analysis of variance and regression techniques (Bliese, 2000) or fails to maximize the rich information available in the longitudinal data set (or both). RCM allows researchers to explicitly account for the nonindependence of observations and model various error structures to account for different patterns of response correlation. Thus, RCM was adopted here in view of the research questions involved, the nature of the data, and the flexibility of the multilevel analysis framework for analyzing predictors of within- and between-unit change. Recent examples of RCM applications in the organizational literature are available (e.g., Chen, 2005; Day, Sin, & Chen; 2004; Mathieu & Schulze, 2006; Ployhart, Weekley, & Baughman, 2006; Thoresen, Bradley, Bliese, & Thoresen, 2004).

RESULTS

Table 2 displays the descriptive statistics and intercorrelations among study variables. Over the five periods, coefficient alpha (calculated on individual-level data) ranged from .81 to .84 for the job satisfaction measure and from .76 to .78 for the organizational commitment measure. Correlations for the unit-level absenteeism measure (over contiguous periods) ranged from .81 to .88. Mean values of unit-level absenteeism ranged from 2.06 to 2.53 from the start to the end of the study, meaning that for the average work unit, workers missed an average of 2.06

percent of all available work hours at time 1 (i.e., 1998) because of short-term absences, and this value increased to 2.53 percent by time 5 (i.e., 2003).

To examine whether the job satisfaction and organizational commitment scales measured distinct constructs, we conducted confirmatory factor analyses using individual items as indicators. For each wave of data, we fitted a two-factor model in which satisfaction and commitment items loaded on separate factors and a one-factor model specifying all items as loading on a single factor. In all cases, the two-factor model exhibited better fit than the one-factor model (time 1: CFI = .89 vs. .81, TLI = .85 vs. .73, RMSEA = .08 vs. .11; time 2: CFI = .90 vs. .83, TLI = .86 vs. .76, RMSEA = .08 vs. .10; time 3: CFI = .89 vs. .78, TLI = .85 vs. .69, RMSEA = .09 vs. .12; time 4: CFI = .90 vs. .78, TLI = .85 vs. .70, RMSEA = .09 vs. .13; time 5: CFI = .90 vs. .78, TLI = .86 vs. .69, RMSEA = .08 vs. .12). The change in chi-square for the two-factor model was significant at each time (time 1: $\Delta X^2[1]$ = 1,321.19, $p < .01$; time 2: $\Delta X^2[1]$ = 1,195.91, $p < .01$; time 3: $\Delta X^2[1]$ = 3,641.34, $p < .01$; time 4: $\Delta X^2[1]$ = 3,455.43, $p < .01$; time 5: $\Delta X^2[l]$ = 3,571.61, $p < .01$), which also indicates better fit for the two- factor solution.[2]

The unit-level measure of absenteeism was normally distributed, as values of skewness and kur- tosis were not significantly different horn zero at any time (skew_{T1} = -.10, s.e. = .24; skew_{T2} = .02, s.e. = .23; skew_{T3} = .14, s.e. = .23; skew_{T4} = .13, s.e. = .23; skew_{T5} = .14, s.e. = .24; kurtosis_{T1} = .42, s.e. = .47; kurtosis_{T2} = .61, s.e. = .46; kurtosis_{T3} = .28, s.e. = .46; kurtosis_{T4} = .82, s.e. = .46; kurtosis_{T5} = -.10, s.e. = .47; all $p > .05$). Results of Kolmogorov-Smirnov tests, which test the probability that a given sample distribution is different from a normal distribution, were not statistically significant at any period, providing further support for

[2] Detailed results are available from the first author.

the univariate normality of the absence measure (KS_{T1} = .75, KS_{T2} = .93, KS_{T3} = .81, KS_{T4} = .77, KS_{T5} = .49; all $p > .05$).

Modeling Unit-Level Absenteeism

To build the longitudinal model of absenteeism, we followed the sequential model-building steps outlined in Bliese and Ployhart (2002) and Singer and Willett (2003). The recommended approach begins with a regression framework and estimates progressively more complex random coefficient models using deviance tests to contrast alternative models. All models were estimated with SAS "proc mixed" (SAS Institute, 2006).

Estimate intraclass correlation coefficient (between groups). The first step in building the growth model required estimation of the ICC(1) for the dependent variable, absenteeism. As described above, in longitudinal contexts ICC(1) values can be interpreted as the total amount of variance in the dependent variable that is attributable to between- unit rather than within-unit differences over time. Higher values also indicate a nontrivial degree of observation nonindependence that, if found, renders traditional regression approaches inappropriate. The ICC(1) value for absenteeism was .76, meaning that approximately three-quarters of the variance was attributable to between-unit differences and one-quarter was explained by within-unit variability over time. These findings indicated that average levels of absenteeism differed between work units and suggested that estimating more complex models of temporal change (using methods that also account for nonindependence, such as RCM) was warranted.

Insert Table 2 Here

Insert Table 3 Here

Determine the fixed functions for time. The next step in model building tested for changes in absenteeism over time and also tested alternative functional forms of the absenteeism trajectory (i.e., quadratic and cubic). Results shown in Table 3 (model 1) indicated that the estimate of the linear function for time was statistically significant and positive (t = 5.48, $p < .001$). Results also indicated that the estimated intercept for absenteeism was significantly different from zero (t = 45.94, $p < .001$). At the start of the study, the estimated value for the overall level of absenteeism was approximately 2.08 (that is, about 2.08 percent of all available work hours were missed because of short-term absence), which then increased by .10 at each subsequent time point. As shown in Table 3 (models 2 and 3), tests of the parameters for the quadratic and cubic functions were not statistically significant (t = 0.66, $p > .05$, and t = 1.63, $p > .05$, respectively). The bold line in Figure 1 represents the overall linear trend (other elements of Figure 1 are explained below).

Insert Figure 1 Here

Insert Table 4 Here

Determine variability in growth parameters. The model specified to this point implies that growth trajectories are identical across work units, as indicated by the bold line in Figure 1. The next step in the model-building sequence added a random intercept term to test between-unit differences in initial levels of absenteeism (i.e., intercept differences). Instead of testing individual parameters for statistical significance, which was appropriate in the previous step when determining the fixed functions for time, successively more complex growth models were evaluated for improvement in model fit over the baseline model using deviance tests (i.e., the -2 log-likelihood statistic, hereafter "-2LL") based on the chi-square distribution (Bliese & Ployhart, 2002). Specifically, we subtracted the -2LL value associated with the more complex model from the -2LL value associated with the more parsimonious model and tested the difference (i.e, Δ-2LL) for statistical significance using a chi-square test. Although we primarily focus here on model comparisons using these deviance tests, we also report values of AIC (Akaike's information criterion) and BIC (Bayesian information criterion), two additional criteria commonly invoked for model selection purposes (Burnham & Anderson, 2002). Generally speaking, smaller values of these measures indicate better fit. Using the linear fixed-effects model described above as the baseline (see Table 3, model 1), we added a random intercept term to the model to allow work units to vary in initial levels of absenteeism (i.e., intercepts). These results are shown in Table 4 (model 4). Comparison of the random-intercepts model (-2LL = 503.3) with the baseline model (-2LL = 981.9) yielded substantial improvement in model fit (Δ-2LL = 478.6, $p < .001$). The model allowing work units to differ in their initial absenteeism levels fitted the data better than one in which this value was fixed. The gray lines in Figure 1 represent the work units' individual growth trajectories; variability in their intercepts (i.e., starting values) was statistically significant.

The next step determined whether there was significant variability between units in the rate of change in absenteeism (i.e., slope differences). As shown in Table 4 (model 5), allowing for random variability around the slope for the linear component of time yielded an improvement in model fit (-2LL = 463.6) over the random-intercepts model in which the trend was constrained to be fixed (Δ-2LL = 39.7, $p < .001$). Thus, the variability in the slopes (i.e., rate of change) among the gray lines depicted in Figure 1 is statistically significant. In sum, the parameter estimates for the three variance components (i.e., within-unit, intercepts, slopes) were statistically significant. Adding other variables to the model may explain within-unit differences in absenteeism over time, between-unit differences in initial values, and between-unit differences in the rate of change. Our study's focal hypotheses examine shared work attitudes and unemployment rates as predictors of these elements.

Determine the error structure. A final step of the initial model-building sequence identified the appropriate error structure of the random-effects portion of the model to account for potential autocorrelation and nonindependence among observations. The recommended approach is to specify alternative error structures and examine potential improvements in model fit (Bliese & Ployhart, 2002). The error structure of the baseline model was compared against alternative error structures (e.g., first-order autoregressive, autoregressive and heterogeneous, and unstructured). A first-order autoregressive error structure improved model fit (Δ-2LL = 11.7, $p < .001$); estimates of growth parameters were nearly identical to those reported above (initial value of absence = 2.07, rate of change = .10).

Summary. Nonzero levels of absenteeism existed at the beginning of the study and followed an increasing linear function throughout the study window. A model allowing random variability around the intercepts and slopes provided the best fit to the data, revealing that work units differed not only in how much absenteeism was observed at the start, but also in how rapidly (and in what direction) they changed over time.

Insert Table 5 Here

Predictors of Unit-Level Absenteeism

To test our primary hypotheses, we estimated models that included unit-level job satisfaction and organizational commitment as time-varying predictors of absenteeism (Hypotheses 1 and 2), as well as models that included hypothesized interaction effects involving work attitudes and unemployment rates (Hypotheses 3,4, and 5). Finally, we tested job satisfaction and organizational commitment as predictors of the rate of change in absenteeism over time (Hypotheses 6 and 7). All models included controls for unemployment rate, unit size, and unit type. We grand-mean-centered job satisfaction, organizational commitment, unemployment rate, and unit size prior to analysis to facilitate interpretation and cross-model comparisons (Singer & Willett, 2003).

Hypothesis 1 predicted that job satisfaction would be negatively related to absenteeism. To test this hypothesis, we added job satisfaction to the longitudinal model along with the size, unemployment rate, and unit type controls. The coefficient for job satisfaction was negative and statistically significant (-0.24), indicating that higher levels of satisfaction were associated with lower absenteeism (see Table 5, model 6) and supporting Hypothesis 1. Each one-unit increase in job satisfaction was associated with a decrease of approximately .24 in absenteeism. To estimate an effect size for each predictor in our longitudinal model, we computed pseudo-R^2 statistics according to procedures outlined in Singer and Willett (2003: 103-104). This R^2 estimate is based on the proportional reduction in residual variance that occurs as one moves from a baseline model (which includes only the time variable) to the subsequent model (which includes time and the predictor of interest). Results show that adding job satisfaction to the baseline model reduces within-unit residual variance (σ^2) from .0569 to .0553, which translates into an R^2 estimate of .03. In other words, approximately 3 percent of the within-unit variance in absenteeism is explained by unit-level job satisfaction.

Hypothesis 2 predicted that organizational commitment would be negatively related to absenteeism. Organizational commitment was added to the longitudinal model along with the relevant controls. The negative coefficient for organizational commitment was statistically significant (-0.27), indicating that higher levels of commitment were associated with lower absenteeism (see Table 5, model 7). Each one-unit increase in organizational commitment was associated with a decrease of approximately .27 in absenteeism. Hypothesis 2 was supported. Adding organizational commitment to the baseline model reduces within-unit residual variance (σ^2) from .0569 to .0548 (R^2 = .04).

Hypothesis 3 predicted an interaction between job satisfaction and organizational commitment. The satisfaction times commitment interaction term was added to the model after the satisfaction and commitment main effects and controls. As shown in Table 6, model 8, results revealed a statistically significant coefficient for the interaction term (-0.34). Plots of the interaction (Figure 2) revealed that the negative relationship between satisfaction and absenteeism was more evident among work units with high levels of organizational commitment. The lowest amount of absenteeism was found among work units where job satisfaction and organizational commitment were both high. Hypothesis 3 was supported. Adding the interaction term (and lower-order main effects) to the baseline model reduces within-unit residual variance (σ^2) from .0569 to .0546 (R^2 = .04).

Hypothesis 4 predicted that unemployment rate would moderate the negative relationship between satisfaction and absenteeism in such a way that the relationship would be stronger in units with lower unemployment rates. The satisfaction times unemployment interaction term was added to the model after the associated main effects and controls. As shown in Table 6, model 9, results revealed a statistically significant coefficient for the interaction term (.12). Plots of the interaction (Figure 3) revealed that the negative relationship between satisfaction and absenteeism was more evident in units with lower unemployment rates. Absenteeism was highest in units where job satisfaction and unemployment rates were both low. Hypothesis 4 was supported. Adding the interaction term to the baseline model reduces within-unit residual variance (σ^2) from .0569 to .0546 (R^2 = .04).

Insert Table 6 Here

Hypothesis 5 predicted that unemployment rate would moderate the negative relationship between organizational commitment and absenteeism in such a way that the relationship would be stronger in units with lower unemployment rates. The commitment times unemployment interaction term was added to the model after the associated main effects and controls. As shown in Table 6, model 10, results revealed a statistically significant coefficient for the interaction term (.06). Plots of the interaction (Figure 4) revealed that the negative relationship between commitment and absenteeism was more evident in units with lower unemployment rates. Absenteeism was highest in units where organizational commitment and unemployment rates were both low. Hypothesis 5 was supported. Adding the interaction term to the baseline model reduces within-unit residual variance (σ^2) from .0569 to .0544 (R^2 = .04).

Insert Figure 2 Here

To test Hypotheses 6 and 7, which predicted that job satisfaction and organizational commitment would be related to the rate of change in absenteeism (i.e., slopes), we modeled their cross-level interactions involving time. Results shown in Table 7 (models 11 and 12) revealed that none of the parameters were statistically significant (i.e., job satisfaction × time = .00, s.e. = .04, $p > .05$; organizational commitment × time = .03, s.e. = .04, $p > .05$). Hypotheses 6 and 7 were not supported.

Insert Figure 3 Here

Supplemental analyses. Although we modeled the attitudinal variables as time-varying predictors (i.e., different values at each time) in our tests of Hypotheses 6 and 7, one could argue that a work unit's *first* (i.e., earliest) value of satisfaction and commitment might predict the rate of change in absenteeism. This alternative approach is consistent with our hypothesized relationship of shared attitudes as antecedents of absenteeism and essentially treats the variables as time-invariant predictors (Singer & Willett, 2003). Results were not supportive of these hypotheses in either case, as coefficients for the cross-level interactions involving time were not statistically significant (first job satisfaction × time = .04, s.e. = .04, $p > .05$; first organizational commitment × time = .05, s.e. = .04, $p > .05$). Thus, under various modeling strategies, we found no evidence that satisfaction or commitment explained the rate of change in absenteeism over time. We conducted an additional exploratory test to examine whether unemployment rates accounted for variability in change over time. The coefficients for unemployment rates, whether modeled as a time-varying predictor of the rate of change (-.01, s.e. = .01, $p > .05$) or as a time-invariant predictor using the first value (-.01, s.e. = .01, $p > .05$) were not statistically significant.

Insert Figure 4 Here

To probe for higher-order effects involving a three-way interaction among satisfaction, commitment, and unemployment rates, and to assess the relative effects of the predictors included in our earlier models, we ran an additional model that included the three-way interaction and all lower- order interaction terms, main effects, and controls in a single model. The coefficient for the three-way interaction term was not statistically significant (-.04, $p > .05$), and coefficients for all two-way interaction terms were statistically significant and nearly identical in magnitude to those reported above, with one exception: the coefficient for the interaction between unemployment rates and organizational commitment (Hypothesis 5) was no longer statistically significant when these other terms were included in the model. Thus, the results and interpretations concerning this hypothesis should be viewed with caution.

Insert Table 7 Here

Summary. Shared attitudes and unemployment rates interacted in predicting absenteeism, and these effects were constant across the study window. Figure 5 illustrates the joint effects of job satisfaction, organizational commitment, and unemployment rates on absenteeism over time. Plotted values were derived from the full regression equation cited in the previous paragraph. Also included in this figure, for comparison purposes, is the overall absenteeism trend line (in bold). The preeminence of organizational commitment is evident, as the three combinations of predictors that yielded below-average absenteeism all involve high levels of commitment. It is noteworthy also that these high-commitment trend lines are virtually superimposed on one another, revealing that absenteeism was low regardless of levels of job satisfaction and unemployment *if* commitment was high. The exception to the latter observation occurred where commitment was high and *both* satisfaction and unemployment rates were low; this combination yielded higher levels of absenteeism. All other conditions yielding high absenteeism involved low levels of commitment.

DISCUSSION

The overall goal of this study was to propose and test a longitudinal model of absenteeism at the unit level of analysis. We found (1) significant variability among work units in absenteeism rates, (2) an overall absenteeism change trajectory that was linear and positive in slope, (3) significant variance in the absenteeism criterion explained by unit- level predictors including job satisfaction, organizational commitment, and local unemployment rates, (4) significant variance in absenteeism explained by interactions among these predictors, and (5) time invariance in predictor-criterion relationships.

Displaying these results in greater detail, Figure 5 shows that the lowest level of absenteeism occurred in work units with high levels of organizational commitment, regardless of unit-level job satisfaction and local labor market conditions. The highest levels of absenteeism occurred in work units with low levels of all three predictor variables. As plotted in Figure 5, work units with other combinations of high and low values of the predictors generally fell in the higher portion of the absenteeism range (i.e., higher than average absenteeism, but lower than the highest values shown). High-commitment units (with a low level of either satisfaction or local unemployment, but not both) had average absenteeism levels nearly one-quarter percent lower than units with low commitment, satisfaction, and unemployment. These findings establish absenteeism as a unit-level phenomenon with implications for future theory, research, and practice.

Insert Figure 5 Here

Implications for Theory and Research

Unit-level treatments of absence. Unit-level frameworks of absence (Rentsch & Steel, 2003; Xie & Johns, 2000) are based on the assumption that a large portion of absence variance resides between rather than within groups because of differences in group norms and other contextual features of work units. Our findings support this notion in a longitudinal context by showing that meaningful be- tween-unit differences existed in work units belonging to the same organization. Given the wealth of research at the individual level, these findings bolster arguments that absenteeism theory and research must take into account work-unit processes that influence absence behavior.

We found support for conceptualizing satisfaction and commitment as unit-level constructs, and these two variables interacted in predicting absenteeism, providing at least a partial explanation for why interunit differences in absenteeism were observed. With other factors in our models (work-unit size, type, and local unemployment rates) controlled for, results indicate that work units characterized by low commitment tend to exhibit high levels of absenteeism regardless of their level of job satisfaction. In other words, unit-level satisfaction was essentially unrelated to absenteeism levels when commitment was low. High-commitment units, on the other hand, showed the expected satisfaction-absenteeism relationship, in that when commitment was high, satisfaction was negatively related to unit-level absenteeism. Taken together, the findings illustrate the importance of considering both work attitudes when theorizing about the predictors of unit-level absenteeism and show that high organizational commitment is necessary to avoid high levels of absenteeism.

Despite the value of studying unit-level shared attitudes, it is important to test whether group-level dynamics, such as cohesiveness or absence culture (Rentsch & Steel, 2003), mediate these effects. Although the culture-absence relationship has been documented at the individual level (e.g., Markham & McKee, 1995), unit-level tests are needed. In doing so, it is also important to accurately identify the appropriate aggregate-level grouping. For example, researchers have shown that analysis of peer groups may explain more variance in behavior than any formal or structural classification (Bamberger & Biron, 2007). Although there was support for a work-unit-level conceptualization in this study, studies at lower (individual, peer group) and higher (organization, industry) levels are needed.

We also found that unemployment rates interacted with unit-level attitudes in a manner consistent with our theory and hypotheses. Satisfaction and commitment effects were much stronger for work units in regions of low unemployment, but these relationships virtually disappeared in units where unemployment was high. The main effects of unemployment have been documented in past research, but the moderation effects found here have not. These findings identify an important boundary condition for attitude-based accounts of unit-level absenteeism and demonstrate the importance of including labor market information in future research.

Deviation amplification and deviation counteraction. We also found evidence that unit-level absenteeism is a dynamic criterion. Our results partially support the deviation amplification arguments advanced in Maruyama's (1963) dynamic systems theory, as significant linear increases in absenteeism were found over the duration of the study. Recall that deviation amplification refers to increasing (or decreasing) patterns over time, whereas deviation counteraction is characterized by a change from one time to the next in the opposite direction. Strictly speaking, deviation amplification was originally conceptualized as an exponential change process, yet our results revealed more gradual additive linear change. In theory, absenteeism cannot continue to increase indefinitely; at some point there must be a limit to the amount of change that can take place (Monge, 1990). Thus, exponential increases in unit-level absenteeism would fast become untenable from a staffing perspective, and they could perhaps set in motion deviation-counter- acting interventions. Given that the annual changes found in this study were small, interventions designed to counteract rising absenteeism may not have appeared necessary until considered from a longer-term perspective.

Our results did not support the hypothesized effects of satisfaction and commitment on the change in unit-level absenteeism over time. The range of variability in the between-unit slopes and the rate of change overall were fairly small, reducing the likelihood of detecting hypothesized effects. Other constructs could be tested as predictors of slope differences in future research. For example, deviation amplification might reflect a behavioral reaction to individual estimation biases that compound over time. Individuals have a tendency to overestimate the negative behaviors of others while underestimating their own (Agostinelli, Brown, & Miller, 1995) and also report inflated perceptions regarding group absence norms (Harrison & Shaffer, 1994). Thus, they may rely upon upwardly biased estimates to legitimize their own absences. When these estimates compound across group members and over time, one would expect absence rates to increase. Although there is support for normative conformity effects in general (Cialdini & Goldstein, 2004), it would useful to test these theoretical accounts in a dynamic, unit-level absenteeism context.

Implications for Practice

Managers oversee the internal workings of organizations, of course, and unit-level comparisons would probably have diagnostic potential for them. As shown in Figure 5, the absenteeism rates of the best units (those with high satisfaction, commitment, and unemployment) were approximately one-quarter percent lower than the absenteeism rates of the worst units (those with low satisfaction, commitment, and unemployment) at each time period.

The organization might realize substantial financial benefits if the worst units improved (and greater benefits still if the whole organization improved). Of the explanatory variables studied here, organizational commitment appears to hold the most diagnostic potential. As such, managers may want to look closely at the reasons why members of high-absenteeism units express less attachment to their organization and its goals, consider whether unit absence norms can be changed for the better, and examine whether the work practices of the best units can be instilled in the worst units. As a cautionary note to managers, the reliable trends found in this study suggest that, left unchecked, the differences between the best and worst units are likely to continue indefinitely.

These findings are also important from a practical perspective because they highlight the gradual yet meaningful slippage in important employee metrics that can occur over an extended period. Year-to-year comparisons are often used in organizational decision making, but our findings revealed trends that could go unnoticed in annual comparisons. Although the observed effect size for the annual rate of change in absenteeism (.10) was small, its practical implications become more evident when this change is considered across the organization and over time. Assuming a 2,000-hour work year per employee, the cumulative time lost to absenteeism by the final year of the study (+ .40) translates into one additional 8-hour day of absenteeism per member. Given the 12,500 members, and a conservative estimate that each day of absenteeism costs the employer $500 (Chartered Institute of Personnel and Development, 2006), the organization sustained an additional $6.25 million in absence-related losses in the final year alone (as compared to the initial year). Although eliminating absences altogether may be unrealistic, preventing these gradual increases would yield substantial cost savings over time.

As mentioned at the outset, unit-level perspectives on absenteeism suggest interventions that are different from what is commonly practiced in attempts to control individual behavior. For example, an organization might consider adopting group-level targets or incentives as part of an absence management plan. If such practices have the expected effect on absence norms, they may lead to deviation-counteracting processes over the long term. To this end, unit-level incentives, interunit competitions, and the like, are worthy of consideration and evaluation (Mathieu & Kohler, 1990a). Given the powerful nature of referent group (Bamberger & Biron, 2007) and unit-level norms (Markham & McKee, 1995), such interventions seem promising.

Limitations

There are several limitations of this study. First, the work units studied here were embedded within a single organization in a state department of transportation, and they consisted primarily of “nonexempt” workers. The relationships and patterns found in our study may be different when absence is tracked for exempt employees, in different industries, or in other geographic locations, and there may also be unique historical conditions that gave rise to the particular temporal patterns observed here, meaning that our results might not generalize to other periods or to other organizations. Second, we did not have the data available to test all of the underlying mechanisms that contribute to deviation amplification and deviation counteraction. Although our findings regarding shared attitudes and unemployment rates are informative, more complete tests of the social and normative factors that give rise to different patterns of change would be beneficial. Third, although the longitudinal aspects of our study have certain advantages, such a design still does not permit causal inferences. Issues of reverse causality and omitted variables can threaten inferences in longitudinal studies just as they can in cross-sectional designs. Our inclusion of macroeconomic and size-based controls may mitigate some of these concerns, but causality still must not be inferred. Fourth, the only measure of absence available to us in this study was the hours-lost measure of absence that was adjusted by excluding medical absences of three consecutive days or longer. Use of this measure reduced criterion contamination due to involuntary absences (Hammer & Landau, 1981), but it is unclear whether our findings would hold under alternative measurement approaches. Finally, although we could only examine organizational commitment in this study, other foci of commitment (e.g., work group, supervisor, career [Becker, 1992]) may explain additional variance in unit-level outcomes such as absenteeism and lead to a more nuanced understanding of the unit-level effects of shared work-unit perceptions.

Conclusion

In recent years, many absence researchers have called for longitudinal studies and designs that address relationships at higher levels of analysis. Our study begins to answer several important questions about the temporal patterning of unit-level absenteeism. We found meaningful differences between work units in their trajectories of absence rates over time and found support for the interactive effects of shared attitudes and unemployment rates in predicting absenteeism at the unit level.

Table 1

TABLE 1
Survey Sampling and Work-Unit Consensus Statistics

Statistic	Year of Survey Administration				
	1998	1999	2000–2001	2002	2003
Number of surveys distributed	6,578	6,627	12,011	12,344	12,362
Number of completed surveys	3,361	3,713	6,551	5,813	6,117
Return rate	51.1%	56.0%	54.5%	47.1%	49.5%
Average number of respondents per unit	31.71	34.38	61.22	54.33	58.26
Number of work units	106	108	107	107	105
Range of employees per unit	3–448	3–595	3–406	3–215	3–220
Average a_{wg} for job satisfaction	.71	.71	.71	.70	.70
Average a_{wg} for organizational commitment	.72	.73	.73	.71	.73
ICC(1) for job satisfaction	.04	.03	.03	.05	.04
ICC(1) for organizational commitment	.06	.04	.03	.04	.04
ICC(2) for job satisfaction	.55	.49	.63	.73	.70
ICC(2) for organizational commitment	.67	.59	.68	.71	.72

Table 2

TABLE 2
Sample Size, Means, Standard Deviations, and Correlations among Study Variables[a]

Variable	*n*	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Absenteeism																											
1. Time 1	106	2.06	0.56																								
2. Time 2	107	2.24	0.66	.88																							
3. Time 3	108	2.24	0.55	.77	.86																						
4. Time 4	108	2.32	0.63	.73	.80	.88																					
5. Time 5	105	2.53	0.59	.61	.70	.76	.81																				
Job satisfaction																											
6. Time 1	106	3.53	0.28	−.48	−.49	−.35	−.40	−.32																			
7. Time 2	108	3.60	0.25	−.57	−.54	−.35	−.38	−.32	.57																		
8. Time 3	107	3.62	0.22	−.53	−.51	−.47	−.35	−.24	.43	.51																	
9. Time 4	107	3.62	0.28	−.46	−.37	−.34	−.30	−.18	.45	.47	.69																
10. Time 5	105	3.55	0.25	−.33	−.30	−.24	−.20	−.19	.30	.37	.54	.61															
Organizational commitment																											
11. Time 1	106	3.12	0.29	−.35	−.31	−.19	−.26	−.15	.78	.48	.28	.37	.25														
12. Time 2	108	3.17	0.26	−.41	−.40	−.22	−.26	−.23	.49	.79	.26	.22	.19	.52													
13. Time 3	107	3.30	0.24	−.32	−.35	−.32	−.20	−.15	.32	.43	.75	.44	.31	.45	.42												
14. Time 4	107	3.33	0.27	−.40	−.32	−.27	−.27	−.12	.39	.44	.55	.79	.58	.48	.34	.64											
15. Time 5	105	3.30	0.22	−.45	−.42	−.40	−.36	−.31	.38	.45	.55	.58	.75	.41	.35	.59	.71										
Unemployment rate																											
16. Time 1	113	4.72	1.69	.06	.05	−.05	−.07	−.08	−.09	−.11	−.20	−.29	−.20	.14	.08	.09	−.06	.04									
17. Time 2	114	4.71	1.36	−.01	−.05	−.15	−.18	−.14	−.06	−.01	−.06	−.17	−.07	.14	.10	.15	.03	.19	.94								
18. Time 3	109	5.04	1.21	−.10	−.19	−.23	−.27	−.25	.11	.09	.00	−.20	−.15	.20	.20	.17	−.03	.13	.77	.81							
19. Time 4	110	5.69	1.21	−.03	−.11	−.18	−.18	−.21	.09	.01	−.02	−.24	−.21	.16	.14	.21	−.09	.08	.76	.77	.97						
20. Time 5	105	5.81	1.27	−.07	−.13	−.16	−.20	−.20	.08	.06	.00	−.25	−.22	.16	.24	.24	−.10	.06	.75	.75	.93	.97					
Work-unit size																											
21. Time 1	107	108.44	85.78	.16	.07	.01	.06	−.07	−.12	−.15	−.16	−.12	.02	−.21	−.17	−.21	−.18	−.09	.03	.01	−.08	−.04	−.06				
22. Time 2	108	109.00	94.23	.20	.12	.08	.11	.00	−.12	−.15	−.19	−.12	−.01	−.21	−.17	−.22	−.19	−.12	.01	−.02	−.11	−.06	−.08	.99			
23. Time 3	108	111.24	97.35	.13	.06	.08	.06	−.03	−.05	−.05	−.23	−.12	−.05	−.16	−.08	−.25	−.19	−.14	−.01	−.03	−.07	−.06	−.07	.98	.99		
24. Time 4	108	114.34	99.97	.14	.06	.03	.06	−.04	−.11	−.12	−.16	−.16	−.06	−.24	−.18	−.22	−.21	−.15	.00	−.04	−.11	−.05	−.06	.98	.99	.99	
25. Time 5	105	116.59	101.18	.08	.02	.04	.02	−.04	−.09	−.07	−.16	−.15	−.06	−.22	−.15	−.22	−.19	−.14	−.03	−.05	−.10	−.07	−.06	.98	.99	.99	.98

[a] Correlations greater than |.19| are statistically significant at an alpha level of .05, and correlations greater than |.25| are statistically significant at an alpha level of .01.

Table 3

TABLE 3
Results of Fixed Functions for Time Predicting Unit-Level Absenteeism[a]

Variable	Model 1: Linear	Model 2: Quadratic	Model 3: Cubic
Intercept	2.08*** (0.05)	2.10*** (0.06)	2.07*** (0.06)
Time	0.10*** (0.02)	0.06 (0.06)	0.28 (0.15)
Time × time		0.01 (0.01)	−0.14 (0.09)
Time × time × time			0.02 (0.02)
Goodness of fit			
Deviance (−2 log-likelihood)	981.9	988.0	991.8
Akaike's information criterion	983.9	990.0	993.8
Bayesian information criterion	988.2	994.2	998.1

[a] $n = 534$ observations nested within 115 work units. Standard errors are indicated in parentheses.
*** $p < .001$

Table 4

TABLE 4
Results of Fitting Random Coefficient Models to Unit-Level Absenteeism[a]

Parameter	Model 4: Random Intercepts	Model 5: Random Intercepts and Slopes
Fixed effects		
Intercept (initial status)	2.09*** (0.06)	2.08*** (0.06)
Time (rate of change)	0.09*** (0.01)	0.09*** (0.01)
Variance components		
Level 1: Within-unit	0.08*** (0.01)	0.06*** (0.00)
Level 2: In intercept	0.31*** (0.04)	0.30*** (0.04)
In slope		0.01*** (0.00)
Goodness of fit		
Deviance (−2 log-likelihood)	503.3	463.6
Akaike's information criterion	507.3	469.6
Bayesian information criterion	512.8	477.8

[a] n = 534 observations nested within 115 work units. Standard errors are indicated in parentheses.

*** $p < .001$

Table 5

TABLE 5
Results of Main Effect Models Predicting Unit-Level Absenteeism[a]

Variable	Model 6: Job Satisfaction		Model 7: Organizational Commitment	
Intercept	2.10***	(0.06)	2.08***	(0.06)
Unemployment rate[b]	−0.04*	(0.02)	−0.04*	(0.02)
Work-unit size[b]	0.00	(0.00)	0.00	(0.00)
Work-unit type[c]	−0.15	(0.12)	−0.17	(0.12)
Time	0.11***	(0.01)	0.12***	(0.01)
Job satisfaction[b]	−0.24***	(0.07)		
Organizational commitment[b]			−0.27***	(0.07)

[a] $n = 530$ observations nested within 113 work units. Standard errors are indicated in parentheses.

[b] Variable was grand-mean-centered to facilitate interpretation.

[c] Work-unit type was coded 0 for county maintenance units and 1 for office units.

* $p < .05$

*** $p < .001$

Table 6

TABLE 6
Results of Interaction Effect Models Predicting Unit-Level Absenteeism[a]

Variable	Model 8: Satisfaction × Commitment	Model 9: Satisfaction × Unemployment	Model 10: Commitment × Unemployment
Intercept	2.10*** (0.06)	2.10*** (0.06)	2.07*** (0.06)
Unemployment rate[b]	−0.04* (0.02)	−0.03 (0.02)	−0.04* (0.02)
Work-unit size[b]	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Work-unit type[c]	−0.13 (0.12)	−0.12 (0.12)	−0.17 (0.12)
Time	0.12*** (0.01)	0.11*** (0.01)	0.12*** (0.01)
Job satisfaction[b]	−0.08 (0.10)	−0.26*** (0.07)	
Organizational commitment[b]	−0.20* (0.09)		−0.27*** (0.07)
Satisfaction × commitment	−0.34** (0.13)		
Satisfaction × unemployment rate		0.12*** (0.04)	
Commitment × unemployment rate			0.06* (0.03)

[a] $n = 530$ observations nested within 113 work units. Standard errors indicated in parentheses.
[b] Variable was grand-mean-centered to facilitate interpretation.
[c] Work-unit type was coded 0 for county maintenance units and 1 for office units.
* $p < .05$
** $p < .01$
*** $p < .001$

Table 7

TABLE 7
Results of Models Predicting Rate of Change in Unit-Level Absenteeism[a]

Variable	Model 11: Job Satisfaction		Model 12: Organizational Commitment	
Intercept	2.10***	(0.06)	2.08***	(0.06)
Unemployment rate[b]	−0.04*	(0.02)	−0.04*	(0.02)
Work-unit size[b]	0.00	(0.00)	0.00	(0.00)
Work-unit type[c]	−0.15	(0.12)	−0.18	(0.12)
Time	0.11***	(0.01)	0.12***	(0.01)
Job satisfaction[b]	−0.24*	(0.11)		
Satisfaction × time	0.00	(0.04)		
Organizational commitment[b]			−0.31***	(0.09)
Commitment × time			0.03	(0.04)

[a] $n = 530$ observations nested within 113 work units. Standard errors are indicated in parentheses.

[b] Variable was grand-mean-centered to facilitate interpretation.

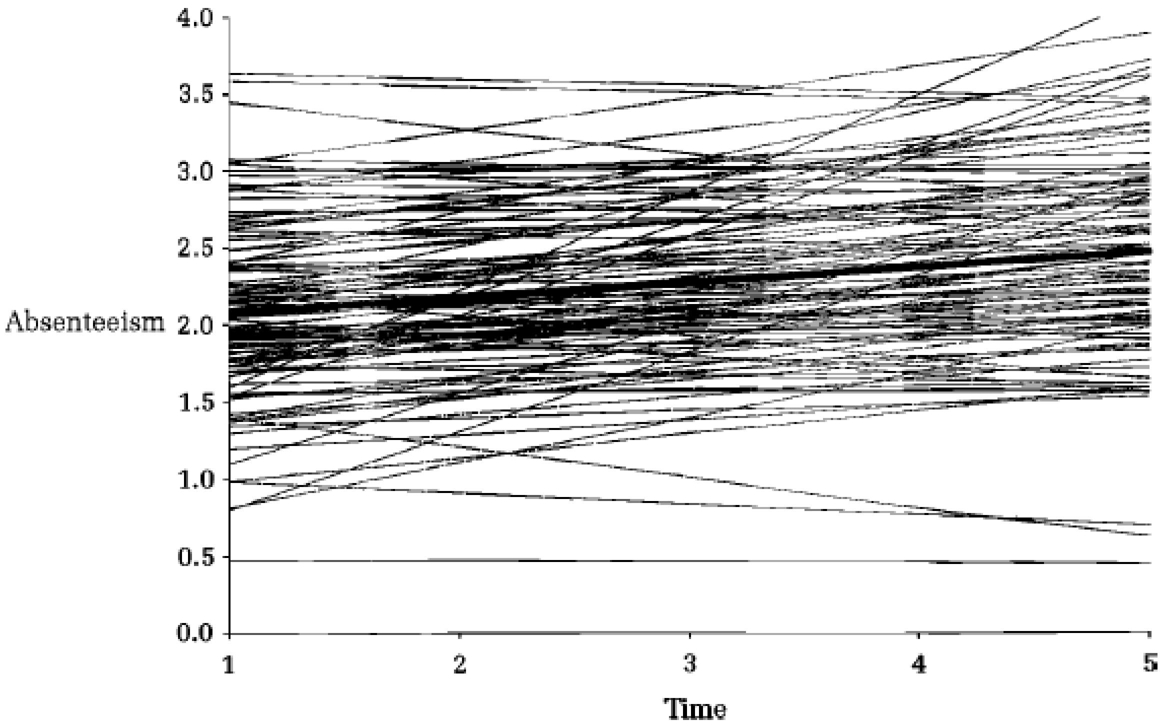
[c] Work-unit type was coded 0 for county maintenance units and 1 for office units.

* $p < .05$

*** $p < .001$

Figure 1

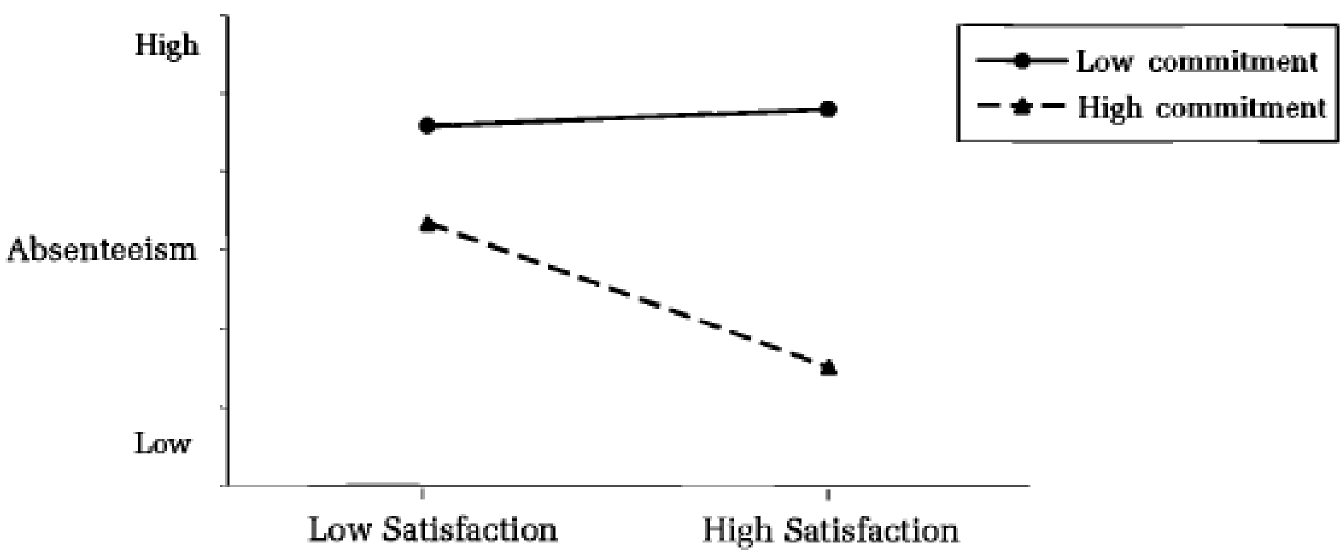
FIGURE 1
Linear Variability in Unit-Level Absenteeism across Five Periods[a]



[a] The solid line represents the fitted average growth trajectory for all work units; the gray lines represent fitted growth trajectories for individual work units.

Figure 2

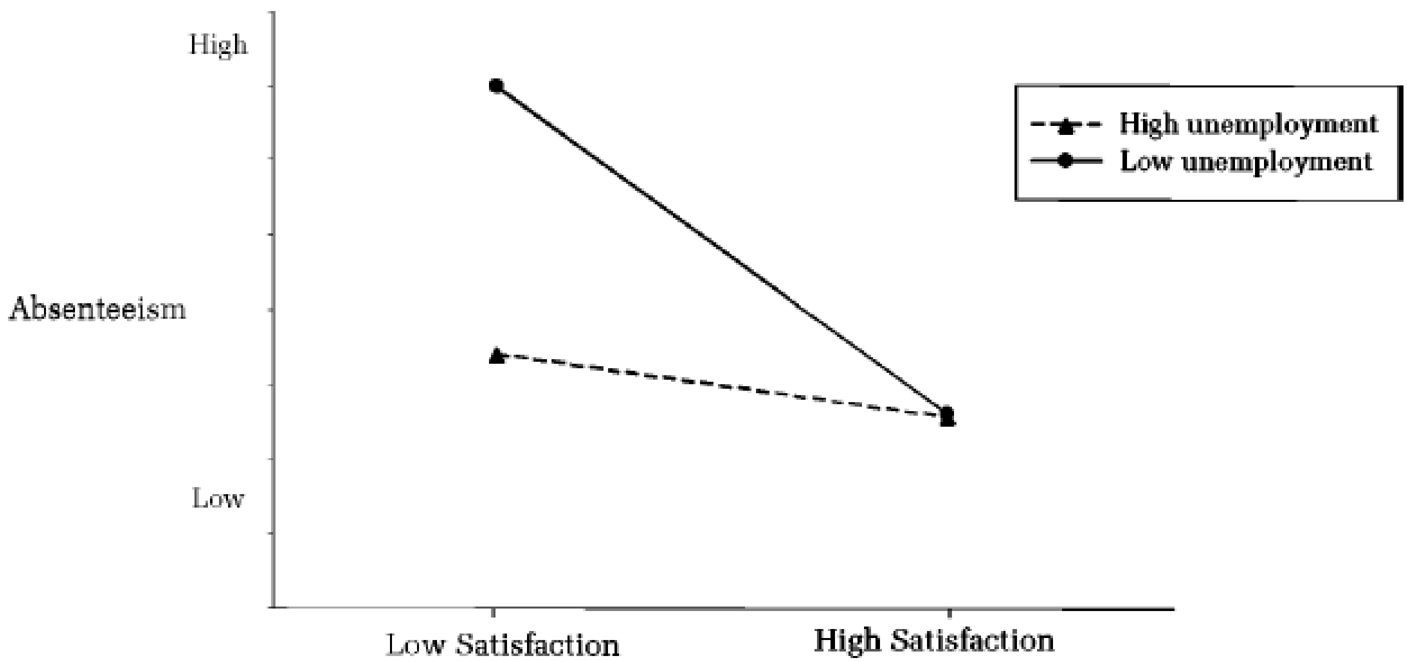
FIGURE 2
Interaction between Job Satisfaction and Organizational Commitment Predicting Absenteeism, with Time Controlled[a]



[a] We operationalized high and low satisfaction and commitment using +/−1 s.d.

Figure 3

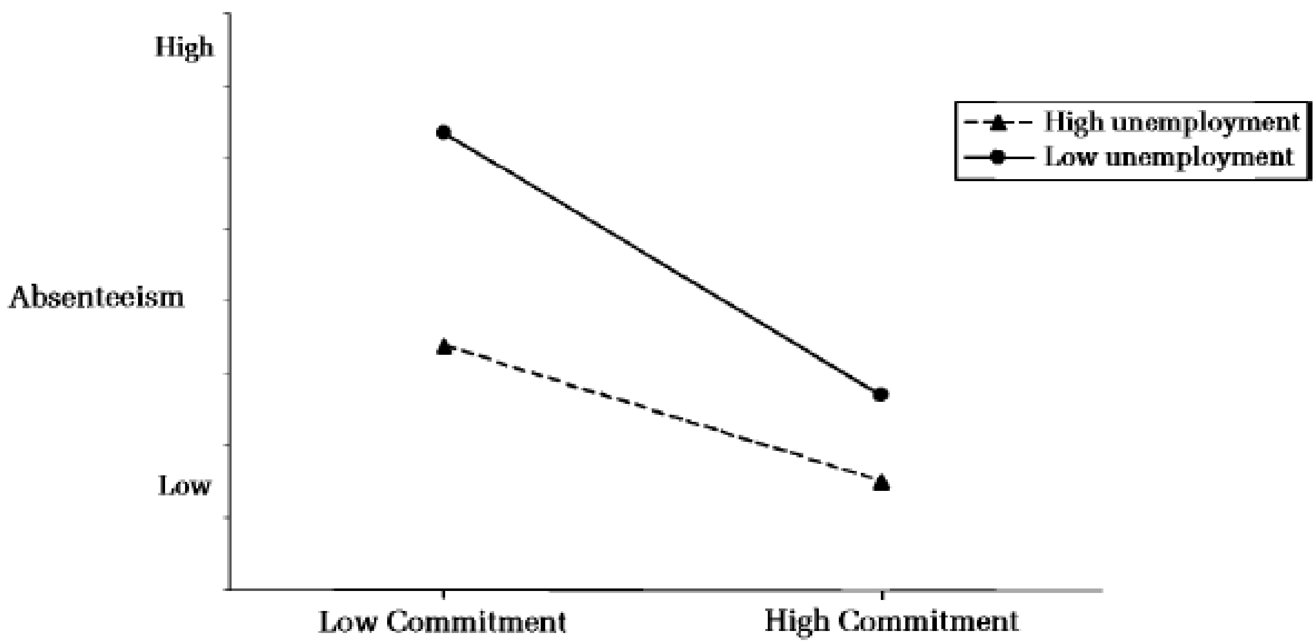
FIGURE 3
Interaction between Job Satisfaction and Unemployment Rate Predicting Absenteeism, with Time Controlled[a]



[a] We operationalized high and low satisfaction and unemployment using +/−1 s.d.

Figure 4

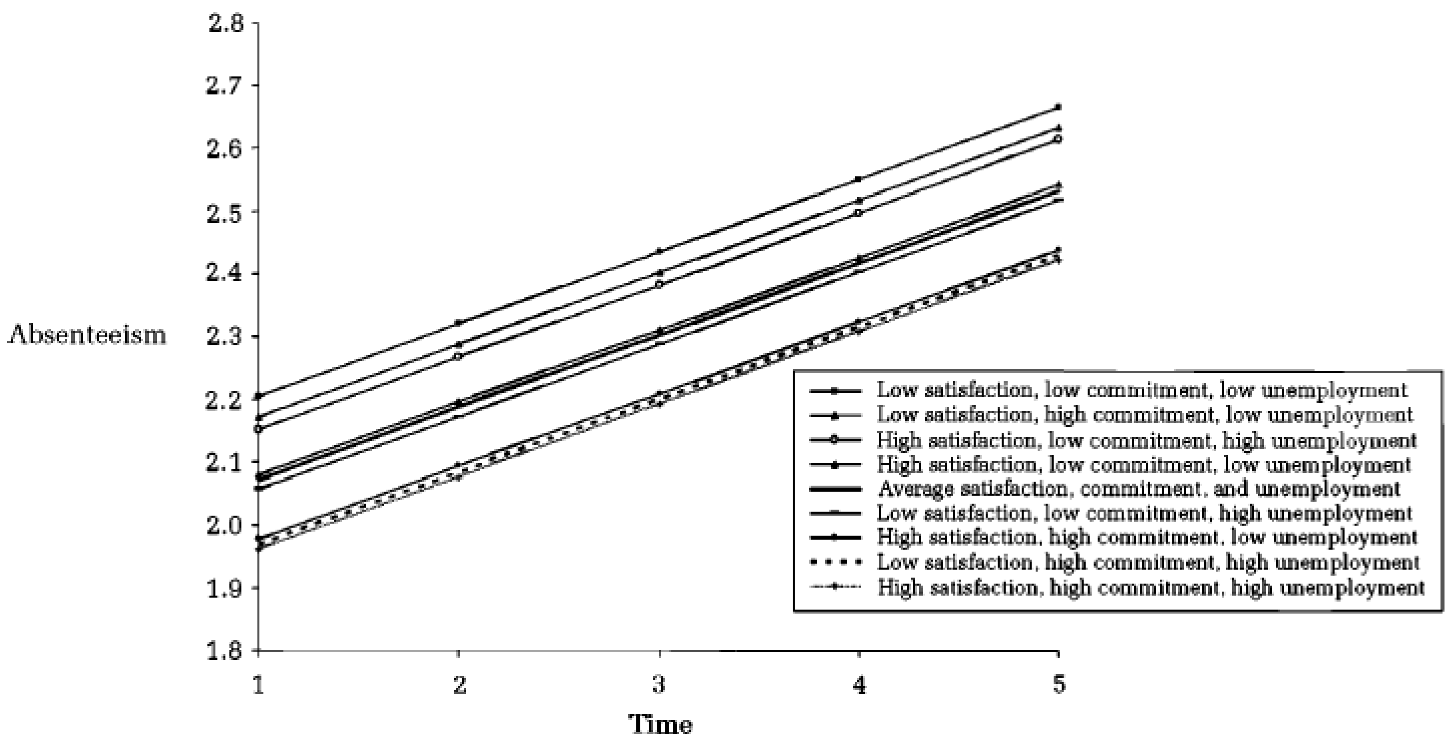
FIGURE 4
Interaction between Organizational Commitment and Unemployment Rate Predicting Absenteeism, with Time Controlled[a]



[a] We operationalized high and low commitment and unemployment using +/−1 s.d.

Figure 5

FIGURE 5
Effects of Job Satisfaction, Organizational Commitment, and Unemployment Rate Predicting Absenteeism over Time[a]



[a] Lines represent fitted average growth trajectories for combinations of job satisfaction, organizational commitment, and unemployment rates using +/−1 s.d. to indicate high and low levels of each construct.

References

Agostinelli, G., Brown, J. M., & Miller, W. R. 1995. Effects of normative feedback on consumption among heavy drinking college students. *Journal of Drug Education*, 25: 31-40.

Bacharach, S., & Bamberger, P. 2004. The power of labor to grieve: The impact of the workplace, labor market, and power-dependence on employee grievance filing. *Industrial and Labor Relations Review*, 57: 518-539.

Bamberger, P., & Biron, M. 2007. Group norms and excessive absenteeism: The role of peer referent others. *Organizational Behavior and Human Decision Processes,* 103: 179-196.

Becker, T. E. 1992. Foci and bases of commitment: Are they distinctions worth making? *Academy of Management Journal*, 35: 232-244.

Blau, G. J. 1986. Job involvement and organizational commitment as interactive predictors of tardiness and absenteeism. *Journal of Management*, 12: 577- 584.

Blau, G. 1994. Developing and testing a taxonomy of lateness behavior. Journal of Applied Psychology, 79: 959-970.

Blau, G. J., & Boal, K. B. 1987. Conceptualizing how job involvement and organizational commitment affect turnover and absenteeism. *Academy of Management Review*, 12: 288-300.

Bliese, P. D. 1998. Group size, ICC values, and group- level correlation: A simulation. *Organizational Research Methods,* 1: 355-373.

Bliese, P. D. 2000. Within-group agreement, non-independence, and reliability: Implications for data aggregation and analyses. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel* *theory, research, and methods in organizations: Foundations, extensions, and new directions*: 349-381. San Francisco: Jossey-Bass.

Bliese, P. D., & Ployhart, R. E. 2002. Growth modeling using random coefficient models: Model building, testing, and illustrations. *Organizational Research Methods,* 5: 362-387.

Brooke, P. P. 1986. Beyond the Steers and Rhodes model of employee attendance. *Academy of Management Review*, 11: 345-361.

Brown, N., & Redmon, W. K. 1989. The effects of a group reinforcement contingency on staff use of unscheduled sick leave. *Journal of Organizational Behavior Management*, 10: 3-17.

Brown, R. D., & Hauenstein, N. M. 2005. Interrater agreement reconsidered: An alternative to the r_{wg} indices. *Organizational Research Methods*, 8: 165-184.

Brown, S. P. 1996. A meta-analysis and review of organizational research on job involvement. *Psychological Bulletin*, 120: 235-255.

Burnham, K. P., & Anderson, D. 2002. *Model selection and multimodel inference: A practical information-theoretic approach* (2nd ed). New York: Springer.

Cappelli, P., & Chauvin, K. 1991. A test of an efficiency model of grievance activity. *Industrial and Labor Relations Review*, 45: 3-14.

Chartered Institute of Personnel and Development. 2006. *Absence management: Annual survey report 2006.* London: Chartered Institute of Personnel and Development.

Chen, G. 2005. Newcomer adaptation in teams: Antecedents and outcomes. *Academy of Management Journal*, 48: 101-116.

Cialdini, R. B., & Goldstein, N. J. 2004. Social influence: Compliance and conformity. In S. T. Fiske, D. L. Schacter, & C. Zahn-Waxler (Eds.), *Annual review of psychology*, vol. 55: 591-621. Palo Alto, CA: Annual Reviews.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. 2003. *Applied multiple regression!correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Erlbaum.

Cropanzano, R., & Mitchell, M. S. 2005. Social exchange theory: An interdisciplinary review of conceptual and definitional issues. *Journal of Management,* 31: 874-900.

Dalton, D. R., & Mesch, D. J. 1991. On the extent and reduction of avoidable absenteeism: An assessment of absence policy provisions. *Journal of Applied Psychology,* 76: 810-817.

Day, D. V., Sin, H.-P., & Chen, T. T. 2004. Assessing the burdens of leadership: Effects of formal leadership roles on individual performance over time. *Personnel Psychology,* 57: 573-605.

Diez-Roux, A. V. 1998. Bringing context back to epidemiology: Variables and fallacies in multilevel analysis. *American Journal of Public Health,* 88: 216-222.

Dineen, B. R., Noe, R. A., Shaw, J. D., Duffy, M. K., & Wiethoff, C. 2007. Level and dispersion of satisfaction in teams: Using foci and social context to explain the satisfaction-absenteeism relationship. *Academy of Management Journal,* 50: 623—643.

Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. 1986. Perceived organizational support. *Journal of Applied Psychology,* 71: 500-507.

Fichman, M. 1989. Attendance makes the heart grow fonder: A hazard rate approach to modeling attendance. *Journal of Applied Psychology,* 74: 325-335.

Gellatly, I. R. 1995. Individual and group determinants of employee absenteeism: Test of a causal model. *Journal of Organizational Behavior,* 16: 469-485.

George, J. M. 1990. Personality, affect, and behavior in groups. *Journal of Applied Psychology,* 75: 107-116.

Hackett, R. D. 1989. Work attitudes and employee absenteeism: A synthesis of the literature. *Journal of Occupational Psychology,* 62: 235—248.

Hammer, T. H., & Landau, J. 1981. Methodological issues in the use of absence data. *Journal of Applied Psychology,* 66: 574-581.

Harrison, D. A. 1995. Volunteer motivation and attendance decisions: Competitive theory testing in multiple samples from a homeless shelter. *Journal of Applied Psychology,* 80: 371-385.

Harrison, D. A., & Martocchio, J. J. 1998. Time for absenteeism: A 20-year review of origins, offshoots, and outcomes. *Journal of Management*, 24: 305- 350.

Harrison, D. A., Newman, D. A., & Roth, P. L. 2006. How important are job attitudes? Meta-analytic comparisons of integrative behavioral outcomes and time sequences. *Academy of Management Journal,* 49: 305-325.

Harrison, D. A., & Shaffer, M. A. 1994. Comparative examinations of self-reports and perceived absenteeism norms: Wading through Lake Wobegon. *Journal of Applied Psychology,* 79: 240-251.

Harvey, J., & Nicholson, N. 1999. Minor illness as a legitimate reason for absence. *Journal of Organizational Behavior,* 20: 979-993.

Hulin, C. L., Roznowski, M., & Hachiya, D. 1985. Alternative opportunities and withdrawal decisions: Empirical and theoretical discrepancies and an integration. *Psychological Bulletin,* 97: 233-250.

Ilgen, D. R., & Hollenback, J. H. 1977. The role of job satisfaction in absence behavior. *Organizational Behavior and Human Performance,* 19: 148-161.

Iverson, R. D., & Deery, S. J. 2001. Understanding the “personological” basis of employee withdrawal: The influence of affective disposition on employee tardiness, early departure, and absenteeism. *Journal of Applied Psychology,* 86: 856-866.

Johns, G., & Nicholson, N. 1982. The meanings of absence: New strategies for theory and research. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior,* vol. 4: 127-172. Greenwich, CT: JAI Press.

Larson, E. W., & Fukami, C. V. 1985. Employee absenteeism: The role of ease of movement. *Academy of Management Journal,* 28: 464-471.

Lawler, E. E., & Hackman, J. R. 1969. Impact of employee participation in the development of pay incentive plans: A field experiment. *Journal of Applied Psychology,* 53: 467-471.

Lee, T. W., & Mitchell, T. R. 1994. Organizational attachment: Attitudes and actions. In J. Greenberg (Ed.), *Organizational behavior: The state of the science:* 83-108. Hillsdale, NJ: Erlbaum.

Leigh, J. P. 1985. The effects of unemployment and the business cycle on absenteeism. *Journal of Economics and Business,* 37: 159-170.

Leonard, C., Dolan, S. L., & Arsenault, A. 1990. Longitudinal examination of the stability and variability of two common measures of absence. *Journal of Occupational Psychology,* 63: 309-316.

Markham, S. E. 1985. An investigation of the relationship between unemployment and absenteeism: a multilevel approach. *Academy of Management Journal,* 28: 228-234.

Markham, S. E., Dansereau, F., & Alutto, J. A. 1982. Group size and absenteeism rates: A longitudinal analysis. *Academy of Management Journal*, 25: 921-927.

Markham, S. E., & McKee, G. H. 1991. Declining organizational size and increasing unemployment rates: Predicting employee absenteeism from within- and between-plant perspectives. *Academy of Management Journal*, 34: 952-965.

Markham, S. E., & McKee, G. H. 1995. Group absence behavior and standards: A multilevel analysis. *Academy of Management Journal*, 38: 1174-1190.

Markham, S. E., Scott, K. D., & McKee, G. H. 2002. Recognizing good attendance: A longitudinal, quasi-experimental field study. *Personnel Psychology*, 55: 639-660.

Martocchio, J. J., & Harrison, D. A. 1993. To be there or not to be there? Questions, theories, and methods in absence research. *Research in Personnel and Human Resource Management*, 11: 259-329.

Maruyama, M. 1963. The second cybernetics: Deviation- amplifying mutual causal processes. *American Scientist*, 51: 164-179.

Mason, C. M., & Griffin, M. A. 2003. Group absenteeism and positive affective tone: A longitudinal study. *Journal of Organizational Behavior*, 24: 667-687.

Mathieu, J. E., & Kohler, S. S. 1990a. A cross-level examination of group absence influences on individual absence. *Journal of Applied Psychology*, 75: 217-220.

Mathieu, J. E., & Kohler, S. S. 1990b. A test of the interactive effects of organizational commitment and job involvement on various types of absence. *Journal of Vocational Behavior*, 36: 33—44.

Mathieu, J. E., & Schulze, W. 2006. The influence of team knowledge and formal plans on episodic team process-performance relationships. *Academy of Management Journal,* 49: 605-619.

Meyer, J. P., & Allen, N. J. 1984. Testing the “side-bet theory” of organizational commitment: Some methodological considerations. *Journal of Applied Psychology,* 69: 372-378.

Meyer, J. P., & Allen, N. J. 1991. A three-component conceptualization of organizational commitment. *Human Resource Management Review,* 1: 61-89.

Meyer, J. P., Stanley, D. J., Herscovitch, L., & Topol- nytsky, L. 2002. Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences. *Journal of Vocational Behavior,* 61: 20-52.

Monge, P. R. 1990. Theoretical and analytical issues in studying organizational processes. *Organizational Science,* 1: 406-430.

Muchinsky, P. M. 1977. Employee absenteeism: A review of the literature. *Journal of Vocational Behavior,*10: 316-340.

Nicholson, N., & Johns, G. 1985. The absence culture and the psychological contract: Who’s in control of absence? *Academy of Management Review*, 10: 397- 407.

Ostroff, C. 1992. The relationship between satisfaction, attitudes, and performance: An organizational level analysis. *Journal of Applied Psychology,* 77: 963- 974.

Ployhart, R. E., Weekley, J. A., & Baughman, K. 2006. The structure and function of human capital emergence: a multilevel examination of the attraction-selection- attrition model. *Academy of Management Journal,* 49: 661-677.

Raudenbush, S. W. 2001. Comparing personal trajectories and drawing causal inferences from longitudinal data. In S. T. Fiske, D. L. Schacter, & A. Kasdin (Eds.), *Annual review of psychology,* vol. 52: 501- 525. Palo Alto, CA: Annual Reviews.

Rentsch, J. R. 1990. Climate and culture: Interaction and qualitative differences in organizational meanings. *Journal of Applied Psychology,* 75: 668-681.

Rentsch, J. R., & Steel, R. P. 2003. What does unit-level absence mean? Issues for future unit-level absence research. *Human Resource Management Review,* 13: 185-202.

Rosse, J. G., & Miller, H. E. 1984. Relationship of absenteeism and other employee behaviors. In P. S. Goodman & R. S. Atkin (Eds.), *Absenteeism: New approaches to understanding, measuring, and managing employee absence:* 194-228. San Francisco: Jossey-Bass.

Ryan, A. M., Schmit, M. J., & Johnson, R. 1996. Attitudes and effectiveness: Examining relations at an organizational level. *Personnel Psychology,* 49: 853-882.

Salancik, G. R., & Pfeffer, J. 1978. A social information processing approach to job attitudes and task design. *Administrative Science Quarterly,* 23: 224-253.

SAS Institute. 2006. *SAS/STAT* (version 9.1). Cary, NC: SAS Institute.

Schneider, B., & Reichers, A. E. 1983. On the etiology of climates. *Personnel Psychology,* 36: 19-39.

Singer, J. D. 1998. Using SAS PROC MIXED to fit multilevel models, hierarchical models, and individual growth models. *Journal of Educational and Behavioral Statistics,* 23: 323-355.

Singer, J. D., & Willett, J. B. 2003. *Applied longitudinal data analysis: Modeling change and event occurrence.* New York: Oxford.

Steel, R. P,, & Rentsch, J. R. 1995. Influence of cumulation strategies on the long-range prediction of absenteeism. *Academy of Management Journal,* 38: 1616-1634.

Steel, R. P., Rentsch, J. R., & Hendrix, W. H. 2002. Cross-level replication and extension of Steel and Rentsch’s (1995) longitudinal absence findings. *Journal of Business and Psychology*, 16: 447-456.

Steers, R. M., & Rhodes, S. R. 1978. Major influences on employee attendance: A process model. *Journal of Applied Psychology,* 63: 391-407.

Steers, R. M., & Rhodes, S. R. 1984. Knowledge and speculation about absenteeism. In P. S. Goodman & R. S. Atkin (Eds.), *Absenteeism: New approaches to understanding, measuring, and managing employee absence:* 229-275. San Francisco: Jossey- Bass.

Sturman, M. C. 1999. Multiple approaches to analyzing count data in studies of individual differences: The propensity for type I errors, illustrated with the case of absenteeism prediction. *Educational and Psychological Measurement*, 59: 414-430.

Tabachnick, B. G., & Fidell, L. S. 2007. *Using multivariate statistics* (5th ed.). Boston: Pearson.

Terborg, J. R., Lee, T. W., Smith, F. J., Davis, G. A., & Turbin, M. S. 1982. Extension of the Schmidt and Hunter validity generalization procedure to the prediction of absenteeism behavior from knowledge of job satisfaction and organizational commitment. *Journal of Applied Psychology,* 67: 440-449.

Thoreson, C. J., Bradley, J. C., Bliese, P. D., & Thoreson, J. D. 2004. The big five personality traits and individual job performance growth in maintenance and transitional job stages. *Journal of Applied Psychology,* 89: 835-853.

Trevor, C. O. 2001. Interaction among actual ease-of- movement determinants and job satisfaction in the prediction of voluntary turnover. *Academy of Management Journal,* 44: 621-638.

Unscheduled absences rising at U.S. workplaces. 2006. *CCH Human Resources Management Ideas & Trends*, 641(October 25): 153-154.

U.S. Department of Labor. 2007. *Local area unemployment statistics, counties and equivalents*, http://www.bls.gov/lau. Accessed June 7.

van Knippenberg, D., & van Schie, E. C. M. 2000. Foci and correlates of organizational identification. *Journal of Occupational and Organizational Psychology*, 73: 137-147.

Warr, P., Cook, J., & Wall, T. 1979. Scales for the measurement of some work attitudes and aspects of psychological well-being. *Journal of Occupational Psychology*, 52: 129-148.

Xie, J. L., & Johns, G. 2000. Interactive effects of absence culture salience and group cohesiveness: A multilevel and cross-level analysis of work absenteeism in the Chinese context. *Journal of Occupational and Organizational Psychology*, 73: 31-52.

Zaccaro, S. J., Craig, B., & Quinn, J. 1991. Prior absenteeism, supervisory style, job satisfaction, and personal characteristics: An investigation of some mediated and moderated linkages to work absenteeism. *Organizational Behavior and Human Decision Processes*, 50: 24-44.

Zaccaro, S. J., & Dobbins, G. H. 1989. Contrasting group and organizational commitment: Evidence for differences among multilevel attachments. *Journal of Organizational Behavior*, 10: 267-273.