The Role of Temporal Shifts in Turnover Processes: It’s About Time

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To better understand the process of organizational withdrawal, a turnover model incorporating dynamic predictors measured at 5 distinct points in time was examined by following a large occupationally and organizationally diverse sample over a 2-year period. Results demonstrated that turnover can be predicted by perceived costs of turnover, organizational commitment, and critical events measured soon after entry into the organization. Occupational unemployment rates, job satisfaction, and search for alternative jobs also become significant predictors when measured over time. Critical events predicted turnover in a manner distinct from the operation of attitudes, consistent with the unfolding model (Lee & Mitchell, 1994). The path to turnover was marked by consistently low perceived costs of turnover and satisfaction, decreases in commitment, and increases in job search over time.

Keywords: turnover, attitudes, withdrawal, satisfaction, events

Behavior in organizations is frequently described in a temporal context, even in models from such disparate theoretical traditions as newcomer adjustment and socialization (Wanous, 1992), commitment formation (Meyer & Allen, 1997; Mowday, Porter, & Steers, 1982), stress and burnout (Maslach, Schaufeli, & Leiter, 2001), career development (Schein, 1978), attraction–selection–attrition (Schneider, 1987), and job matching (Jovanovic, 1979). An array of new statistical tools and theoretical perspectives now further encourages researchers to turn in earnest to the analysis of the temporal dimension of their research (Barkema, Baum, & Mannix, 2002; Kozlowski & Klein, 2000). Unfortunately, despite the ubiquity of temporal talk, organizational studies seldom have time incorporated into their designs.

Employee turnover researchers have been in the vanguard of building temporal theory. The progression of withdrawal model (Hulin, 1991), the unfolding model (Lee & Mitchell, 1994), and Hom and Griffeth’s (1995) integrative model emphasize how different psychological processes play out over time on the way to turnover. Researchers have increasingly considered the time-dependent nature of turnover by using survival analysis to predict not only whether someone will turn over but when (e.g., Dickter, Roznowski, & Harrison, 1996; Hom & Kinicki, 2001; Trevor, Gerhart, & Boudreau, 1997). However, few studies have examined repeated measures of predictors of turnover (for exceptions, see Morita, Lee, & Mowday, 1993; Trevor, 2001). Instead, studies of turnover tend to examine predictors at only one (typically arbitrary) time point (Steel, 2002). Mobley (1982) observed, “if we are to understand the process of turnover more fully, we need repeated measures of multiple antecedents over time and statistical analyses which include the temporal dimension” (pp. 135–136).

With our study, we attempt to meet this call by examining turnover temporally, contributing to the literature in three primary ways. First, we provide the first contrast we are aware of between early entry (i.e., assessing newcomers at a single point soon after hire) and dynamic (i.e., assessing intra-individual variability over time) conceptualizations of turnover processes. We examine both between- and within-persons changes in context, attitudes, and behaviors by contrasting employees who leave (leavers) and employees who stay (stayers).

Second, our study is one of the most comprehensive repeated-measures investigations of turnover to date, including 15 key predictor variables that are theoretically expected to vary with time. We also provide the first predictive test of critical events as turnover antecedents. Our study includes a particularly diverse sample, with nearly 1,000 employees from seven different organizations and a variety of occupations. In addition to enhancing generalizability, dynamic data from this diverse sample allow a more thorough examination of the role of variables such as perceived job alternatives that vary across occupations and time (Steel & Griffeth, 1989).

Third, our participants are all organizational newcomers at Time 1, thereby providing a theoretically meaningful starting point for our analyses. The analyses of survival data are much more tractable when the beginning of analytical time is the same for the entire...
sample, and that should be the point at which individuals come under risk of the event (i.e., turnover) occurring (Singer & Willett, 2003). Steel (2002) emphasized that turnover research needs to begin when employees are at similar stages of understanding and progression in the organization. Tracking newcomers over time permits an examination of the progression of attitudes and perceptions from their formation early after hire until they ultimately result in the employee’s decision to stay or leave.

Predictors of Turnover

The model for our study showing the relationships between our predictors and outcomes is shown in Figure 1. Before introducing the temporal dimension of this study, we first review theoretical predictions regarding the antecedents of turnover. All hypotheses refer to predictors of turnover hazard rather than turnover probability. Turnover hazard, a survival analysis term, reflects not only the probability of turnover but also the expected speed of turnover (Dickter et al., 1996).

Contextual Variables

Context is a critical component of any study of behavior (Ajzen & Fishbein, 1977; Eagly & Chaiken, 1993). Three salient contextual factors in the turnover literature include the employee’s job alternatives outside the organization, the employee’s job alternatives inside the organization, and his or her perceived costs of job change.

External alternatives. Because individuals may form intentions to turn over on the basis of their impressions that they can find a job elsewhere, many researchers in the literature have examined the perception of external alternatives as a predictor of organizational turnover (Arnold & Feldman, 1982; Mitchell, Holton, Lee, Sablynski, & Erez, 2001; Price & Mueller, 1981). However, individuals’ perceptions may not be accurate for their field or skill set. This means the unemployment rate, which indexes job availability, is also a valuable and distinct predictor of turnover (Gerhart, 1990). Indeed, low unemployment rates are related to increased turnover rates (Carsten & Spector, 1987; Trevor, 2001). Our study incorporates measures of both perceived external alternatives and occupational unemployment rates.

Internal alternatives. The literature on job choice increasingly recognizes that job quality is not estimated simply on the basis of the current position but also on an overall organizational context (e.g., Cable & Turban, 2001). Specifically, employees may not leave an organization if they can seek internal transfer to another job they believe will be better than their current job.

Cost of turnover. Traditional theories of turnover have been criticized for failing to recognize factors that inhibit turnover. Current thought suggests that employees who are embedded in their organizational context may be less likely to leave (Mitchell et al., 2001). Embeddedness refers to the difficulty a person would have in changing jobs and may stem from a variety of components, including social relationships or ongoing project commitments. Here, we focus on financial embeddedness because monetary considerations have been viewed as central to the decision to keep a job or leave it (Farrell & Rusbult, 1981). Individuals who feel that leaving the organization would not have a negative impact on their financial situation reflect lower financial embeddedness, referred to here as a lower perceived cost of turnover.

In sum, our expectation is that these contextual variables will be associated with turnover.

![Figure 1. Turnover model in the current study.](image-url)
Hypothesis 1: More external alternatives (as indexed through both perceived external alternatives and occupational unemployment rates), fewer internal alternatives, and lower costs of turnover will be related to increased turnover hazard.

Work Attitudes

Many traditional turnover models have focused on employee attitudes toward their jobs and organizations as antecedents to the turnover process (e.g., Farrell & Rusbult, 1981; Mobley, 1977; Steers & Mowday, 1981). Almost all process models start with the premise that the active consideration of turnover as an option begins with low levels of job satisfaction and low levels of organizational commitment (Hom & Griffeth, 1995).

Job satisfaction. Perhaps the most intuitive attitudinal antecedent to turnover is satisfaction with one’s job. Meta-analytic estimates of the relationship between satisfaction and turnover provide a corrected population average correlation of $-0.27$ (Tett & Meyer, 1993). Although many studies use an aggregated index of satisfaction, results using the Job Descriptive Index (JDI) suggest that satisfaction can be meaningfully understood in terms of relatively distinct dimensions of work, pay, promotions, supervision, and coworkers (Smith, Kendall, & Hulin, 1969). Meta-analytic results show that all five JDI dimensions have significant zero-order relationships with turnover (Kinicki, McKee-Ryan, Schriesheim, & Carson, 2002). In addition, the five dimensions of satisfaction have been shown to be empirically distinct, with an average corrected correlation of only $0.31$ (Kinicki et al., 2002).

Organizational commitment. Besides satisfaction with one’s day-to-day work tasks, one’s commitment toward the organization and its goals may provide an additional reason for employees to remain. Several theories of turnover put a primary emphasis on commitment as a more proximal inhibitor of turnover than satisfaction (e.g., Mowday et al., 1982; Porter, Steers, Mowday, & Boulian, 1974). Meta-analytic estimates of the relationship between commitment and turnover provide a corrected population average correlation of $-0.33$, and multivariate analyses from this meta-analysis demonstrate that commitment provides unique explanatory power even after satisfaction is taken into account (Tett & Meyer, 1993).

On the basis of the literature, we propose the following relationships will be observed between satisfaction, organizational commitment, and turnover:

Hypothesis 2: More negative attitudes (lower satisfaction and organizational commitment) will be related to increased turnover hazard.

Critical Events

The orderly progression from dissatisfaction and a lack of commitment to a search for alternatives culminating in turnover is a central tenet of many traditional models. However, there has been a shift toward recognizing that turnover is not always a “slow burn,” deliberative process. The unfolding model calls attention to cases where a person leaves relatively spontaneously because of a critical event (Lee & Mitchell, 1994; Sheridan & Abelson, 1983). Drawing from Beach’s (1990) work on image theory, the unfolding model proposes that most people keep the same job more as a function of habit than of choice. Critical events, however, may shock people into a thorough reassessment of their situation followed by immediate action.

Research on the unfolding model of employee turnover and the role of events in organizational behavior in general is only beginning to accumulate. Events have been measured retrospectively by prompting individuals who have already turned over to recall how they made their decision to quit (Lee, Mitchell, Holton, McDaniel, & Hill, 1999; Lee, Mitchell, Wise, & Fireman, 1996). Retrospective analysis is an appropriate starting point, but because of recall biases—such as the tendency for discrete events to be more memorable than gradual processes of becoming disaffected or the tendency for people to use events as post hoc justifications for their behaviors (Mitchell, Thompson, Peterson, & Cronk, 1997)—prospective queries before the turnover event are needed. Because previous research has not compared the critical events in the lives of those who leave and those who stay, it is not yet clear that events are predictive of turnover. Such questions can only be addressed by examining events for both those who have turned over as well as those who have not. In addition, models focused exclusively on leavers cannot determine if there are events that bond a person to the organization and increase the likelihood that they will stay. By asking individuals to report critical events and using these reports to predict their later turnover, we examined the following hypothesis:

Hypothesis 3: Critical events reported by employees as likely to increase their likelihood of turnover will be related to an increased turnover hazard, whereas critical events judged as decreasing the likelihood of turnover will be related to decreased turnover hazard.

Organizational Withdrawal

Organizational withdrawal is a construct that captures a variety of behaviors that may substitute for, signal, or precede a turnover decision. Two distinct modes of withdrawal are examined here: work withdrawal and search for alternatives. These two modes are distinguished by their motivation: Work withdrawal behaviors are engaged to seek temporary removal from one’s work situation, whereas a search for alternatives is indicative of a desire for permanent removal from one’s work situation.

Work withdrawal. Hanisch and Hulin (1990) proposed that dissatisfied employees engage in a combination of behaviors—such as failure to attend meetings, work absences, low-quality work performance, or reduced citizenship—to psychologically disengage from work tasks. The premise behind withdrawal research is that these diverse behaviors reflect a common underlying attitudinal aversion to the activities required on the job and that turnover is a possible next step. Support for this research is shown by meta-analytic estimates of a corrected correlation of $0.33$ between absence and turnover (Mitra, Jenkins, & Gupta, 1992).

Search for alternatives. Turnover models commonly mention job search as a potential mediating variable between thinking about quitting and the actual decision to leave a job (e.g., Hom & Griffeth, 1995; Mobley, Griffeth, Hand, & Meglino, 1979). If turnover is a rational process, individuals will seek out as many alternative employment opportunities as possible and then compare each of these alternatives in turn with the utility of the present
job (Jovanovic, 1979; McCall, 1990). Alternative models emphasizing shocks and critical events notwithstanding, a search for alternatives is a relevant part of most turnover processes.

**Hypothesis 4:** Organizational withdrawal, as indexed through work withdrawal and search for alternatives, will be related to turnover.

Our conceptual model shown in Figure 1 proposes a mediating role for organizational withdrawal in predicting turnover. First, organizational withdrawal is hypothesized to mediate the relationship between attitudes and turnover (see Hom & Griffeth, 1995, for a review). This framework is consistent with theory proposing the effect of broad attitudes on behavior is mediated by the formation of specific behavioral plans (e.g., Ajzen & Fishbein, 1977). Work withdrawal and search for alternatives reflect efforts to remove oneself from the job, either temporarily or permanently.

**Hypothesis 5a:** Organizational withdrawal (as indexed by work withdrawal and search for alternatives) will mediate the relationship between attitudes and turnover.

Withdrawal may also mediate the relationship between context variables (perceived external alternatives, perceived internal alternatives, and perceived costs of turnover) and turnover. For example, perceptions of ample external alternatives and low costs of job change could increase the extent to which individuals search for alternatives and withdraw from the organization (Hulin, Roznowski, & Hachiya, 1985). We do not hypothesize that the relationship between unemployment rates and turnover is mediated. A low unemployment rate might result in turnover without a consideration of alternatives or progressive withdrawal (see, e.g., Gerhart, 1990). We propose the following:

**Hypothesis 5b:** Organizational withdrawal (work withdrawal and search for alternatives) will mediate the relationship between contextual factors (i.e., higher external alternatives, lower internal alternatives, and lower perceived costs) and turnover.

As noted earlier, critical events can lead to abrupt turnover without a consideration of alternatives or progressive withdrawal from the organization (Lee & Mitchell, 1994). This suggests no comparable mediating hypothesis should be made for critical events as predictors of turnover.

**Turnover in a Temporal Framework**

Because turnover antecedents are dynamic, measuring them in a temporal context should enhance the understanding of turnover (Steel, 2002). To examine the extent to which measuring data over time aids the prediction of turnover, we compare an entry model that uses only Time 1 data with a dynamic model that incorporates five waves of predictor data. The entry model allows us to examine the extent to which we can predict later turnover with data obtained from new employees within their first month of employment. The comparison to the dynamic model helps us examine the extent to which multiple waves of data and data after the first month of employment improve predictions of turnover. Because attitude researchers note the relationship between attitudes and behaviors will be enhanced if they are measured more closely in time (Ajzen & Fishbein, 1977; Eagly & Chaiken, 1993) and because individuals’ perceptions of turnover-related variables are likely to change over time, we expect the following:

**Hypothesis 6:** A dynamic covariate model (incorporating five waves of predictor data) will better explain turnover hazard than a model using only data from individuals at organizational entry.

Comparing a dynamic model with an entry survival model (using data from Time 1 only) provides insight into the role of time-varying predictors by examining the extent to which more time waves aid in the prediction of employee turnover. If significant effects are found in a dynamic survival model, however, traditional models cannot tell if they reflect (a) differences between leavers and stayers at entry into the organization; (b) a tendency for leavers to change context, attitudes, events, and behavior toward turnover; (c) a tendency for stayers to change their context, attitudes, events, and behavior away from turnover; or (d) a combination of all three. As such, we use hierarchical linear modeling (HLM) to unpack the results of the survival analyses. HLM allows us to more fully portray our results over time.

**Detailed Temporal Comparisons of Leavers and Stayers**

By examining the survey responses of leavers and stayers provided at the time of organizational entry (i.e., the intercept in HLM terms), we can learn soon after they begin work whether leavers and stayers are different. Research from the personality, person–environment fit, and socialization literatures proposes that newcomers enter organizations with attitudinal predispositions and commitment propensities or form them quickly after getting a first impression of the organization (Judge & Larsen, 2001; Lee, Ashford, Walsh, & Mowday, 1992; Schneider, 1987; Wanous, 1992). As such, newcomers who leave within the first few years of their tenure may already be noticeably different from stayers soon after they are hired. We are able to examine this possibility through our survival analyses that incorporate data at time of entry (e.g., our analyses that use Time 1 variables to predict later turnover) as well as through observed intercept differences between leavers and stayers.

Our data also allow us to examine differences in trajectories of critical variables between leavers and stayers (i.e., the slope in HLM terms). Existing studies suggest changes occur over time in leavers in comparison to stayers on both attitudes and withdrawal cognitions. Although they had a small sample size of leavers (n = 19), Sheridan and Abelson (1983) found that leavers (compared with stayers) experienced significantly greater decreases in organizational commitment and greater increases in job tension over the 2-month interval preceding the leaver’s exit date. Youngblood, Mobley, and Meglino (1983) found that military recruits who left during basic training showed declines in their intentions to complete their enlistment. In contrast, recruits that completed their enlistments increased their commitment over time. Rusbit and Farrell (1983) similarly found that leavers had a significantly larger decrease in organizational commitment over time than
Participants were 98 individuals who voluntarily turned over. Contributing data to Round 1 did not respond to all survey rounds. There were 606 respondents for all survey rounds, and 228 individuals who provided sufficient data for inclusion. Of these 932, there were 24 respondents who did not provide sufficient information in their turnover patterns, which eliminated 45 respondents. An additional 24 respondents who worked over 35 hr per week, because part-time workers may differ (65%) responded to the initial survey. Our sample was limited to those national activities of these organizations included manufacturing, food technology, and 8.1% other. The sample was geographically dispersed within the United States, with all but one organization headquartered in Minnesota. The average age of respondents was 33.0 years (SD = 9.7), and the average number of years of professional experience (in any occupation) was 8.74 (SD = 8.67). Fifty-one percent were women and 87% were White.

Measures

Control variables. Because organizational features and work tasks might change the likelihood of turnover for reasons unrelated to our other independent variables, fixed-effect dummy codes were used to control for organization and occupation. Gender, dichotomized as 0 = male, 1 = female, was controlled because of possible differences in job mobility across genders. The number of years of professional experience and education held by newcomers were held constant to control for levels of human capital (e.g., Trevor, 2001). Education was reported in categories ranging from 1 = high school or less to 5 = graduate degree and then recoded to represent years of education completed. Years of professional experience were assessed through the item “How many years of professional work experience do you have, in any occupation?” Age was not incorporated as a control variable because of its high correlation with years of professional experience (r = .89).

Contextual factors. Perceived external alternatives were assessed with two items at each time wave of our study (e.g., “How easy or difficult would it be for you to find a job with another employer at least as good as the one you have now?” rated on a scale of 1 = very difficult to 5 = very easy) from Price and Mueller’s (1986) widely used scale. Reliability over rounds for this scale ranged from α = .74 to α = .77. Occupational unemployment rates were collected from the Current Population Survey’s monthly estimates, at http://ferret.bls.census.gov/cgi-bin/ferret, consistent with other recent work (Trevor, 2001). Perceived internal alternatives were assessed with the item “How easy or difficult would it be for you to find a job with your current employer at least as good as the one you have now?” rated on a scale of 1 = very difficult to 5 = very easy. Cost of turnover was assessed with the item “Considering the total impact on your salary, retirement benefits, health insurance, and so forth, from a financial angle how difficult would it be for you if you left your current job with no alternative lined up?” rated on a scale of 1 = very easy to 5 = very difficult. Although single-item scales are not desirable, for the purpose of maintaining adequate response rates over multiple survey administrations, we determined they were necessary. In addition, research suggests that the reliability of single-item scales is not as poor as sometimes assumed (Wanous, Reichers, & Hud, 1997).

Work attitudes. Job satisfaction was measured with 25 items (5 items per facet) from an abbreviated version of the JDI (Smith et al., 1969; Stanton et al., 2002). For each dimension, respondents indicated the extent to which they believed various aspects of their employment over the past 4 months could be described using terms such as “gives sense of accom-
Reliability over rounds ranged from those described in Lee et al. (1999). First, in each wave of our study, we especially value the benefits or flexibility provided in the current job). This can change for another individual less likely to quit his or her job (e.g., the individual may stay at home with the baby or because the individual may react to the same type of event differently. For example, the birth of a child may make one individual more likely to quit his or her job (e.g., so the individual can stay at home with the baby or because the individual offers from someone other than one's employer; calls from headhunters; or harassment or fights with coworkers), or professional events (e.g., job offers from someone other than one's employer; calls from headhunters; or the completion of a degree, licensing, or certification program) in the last 4 months. Because significant events are highly personal, two individuals may react to the same type of event differently. For example, the birth of a child may make one individual more likely to quit his or her job (e.g., so the individual can stay at home with the baby or because the individual may decide a different job would be more suitable for changed needs) and another individual less likely to quit his or her job (e.g., the individual may now especially value the benefits and flexibility provided in the current job). As such, respondents were then asked to evaluate each event in terms of whether the event made them (a) more likely (continuation event), (b) neither more nor less likely (neutral event), or (c) less likely (discontinuation event) to continue working for their organization. For our analyses, responses were scored to reflect how many continuation events, discontinuation events, or neutral events each respondent reported at each time wave of our study. In all cases, the events and their descriptions were recorded before the respondent turned over. This is an important contrast to past research in which investigators examined critical events by asking individuals about the events they had experienced while they were employed after they had already left their jobs. At the same time, it should be emphasized that these reports are retrospective in that they are taken after the event occurred.

Respondents also evaluated whether the events were, in their estimation, positive, positive, negative, or neutral events and whether the events pertained to their work, personal, or professional life (outside of their workplace) domain. These evaluations were not used in the primary analyses because, as expected, respondents interpreted both positive and negative events as likely to influence their decision to stay or leave the organization. An optional open-ended question also asked individuals to detail the exact nature of the event. Only a portion of our sample responded with detailed explanations of the significant events they had experienced, prohibiting detailed analysis. However, this information provided additional confirmation that two events of the same nature can be interpreted as continuation, neutral, or discontinuation events by different people. This supplemental information supported the tactic of relying on the individuals’ personal interpretation of the critical events as being continuous, neutral, or discontinuous instead of analyzing the specific events or whether these events were positive or negative.

Organizational withdrawal. Work withdrawal was assessed on the basis of self-reports of the frequency with which employees engaged in withdrawal behaviors (e.g., taking long breaks, leaving work early, and missing meetings) on a 5-point scale ranging from 1 = never, 2 = every few months, 3 = about once a month, 4 = more than once a month, and 5 = once a week or more (Hanisch & Hulin, 1990). Reliability ranged from $\alpha = .65$ to $\alpha = .74$. Search for alternatives was assessed using a four-item general effort job search scale from Blau (1993), which asked respondents to indicate to what extent they had engaged in search activities such as “devoted much effort to looking for other jobs.” Reliability ranged from $\alpha = .91$ to $\alpha = .95$.

Turnover. Hire and turnover date were collected from the organizations, with days employed as the underlying measure of duration of employment. Turnover dates and reason for turnover were provided directly from each company’s archival database, on the basis of the last day of paid employment for an employee. Each organization classified turnover as voluntary (employee initiated) or involuntary (initiated by the organization because of poor performance or elimination of the person’s job for budgetary reasons). Consistent with the theories of turnover described earlier, we focused on only voluntary turnover, so respondents who were terminated involuntarily were treated as censored observations. A total of 98 individuals, or 10.5% of the sample of 932 respondents, voluntarily turned over during the 25-month study period. The duration of employment for those who turned over ranged from 99 days to 754 days ($M = 513.4$ days; $Mdn = 600$ days). Any individual who has not quit by the final observation date has an eventual date of turnover that is unknown; some of these individuals may turn over a week after the study is finished, others may not turn over for several years. Because the actual date of turnover is unknown, these individuals are referred to as right censored, meaning that the observation of the individuals stopped (or was censored) prior to the occurrence of the event of interest.

Analyses

Survival analyses. Survival regression, in which the hazard rate for leaving a job is the dependent variable, was used to predict employment duration (Dickter et al., 1996; Morita et al., 1993; Singer & Willett, 2003). This approach allows the researcher to predict both if and when an employee leaves. Job duration was measured in days. Participants who we knew had not left their companies but stopped responding to the surveys were treated as censored at the point at which they stopped responding. All respondents who did not turn over by the fifth survey round were also treated as right-censored.

The survival analysis method calculates survival rates for every single day under consideration as the ratio of people who remain at time $t$ over the number of people who remained at time $t - 1$. This means that the probability of surviving up to day $t$ is the dependent variable. These probability estimates retain information about the time until turnover while still limiting inferences exclusively to the period under which observations were obtained. At the point of censoring, a person is set aside from the data and their conditional probability of survival is retained at the last point on which they were observed (see Morita, Lee, & Mowday, 1993, for further discussion of censoring).

We compared time-constant and time-varying survival models. In the time-constant or entry model, each person contributed 1 response for each predictor soon after being hired (e.g., perceived external alternatives, internal alternatives, costs of job change, and the remainder of the predictor set only at Time 1). In the time-variant or dynamic models, each person contributed 1 data point for the dynamic predictors per survey round, so individuals who did not turn over and responded to all five survey rounds contributed five rounds of data to the analysis. The final repeated-measures data set consisted of 3,667 observations of the predictors, whereas the entry data set consisted of 932 observations of the predictors (1 per person). The only estimation difference is that the entry model uses only Time 1 predictor values, whereas the dynamic model uses all of the survey predictor variables across time, controlling for nonindependence by clustering the errors within person. If there are no intraindividual changes in the predictors over time, the entry model and dynamic model will yield identical results. If attitudes change considerably over time and affect turnover propensity, the dynamic model will differ substantially from the entry model in terms of coefficient sizes and model fit.
To compare goodness of fit across entry and dynamic models, we used a pseudo-$R^2$ statistic based on the Kullback–Leibler information gain (Magee, 1990). The information theoretic index Akaike’s information criterion (AIC), for which lower values indicate more information per estimated parameter (Bozdogan, 1987), was also used. The AIC penalizes highly parameterized models like the adjusted $R^2$ or the root-mean-square error of approximation. Further details of the specification of the survival model are provided in Appendix A.

**HLM.** To supplement our interpretation of significant predictors from the survival analysis, we used HLM (Bryk & Raudenbush, 1992) to examine the patterns of change for each variable over time. The HLM model provides the unique advantage of being able to compare the level and slope of work attitudes for individuals who stay and leave as two distinct outcomes, reflected in the level and slope equations.

HLM equations were computed separately for each repeated-measure variable highlighted in Hypotheses 7 through 9. Level 1 is essentially a within-persons analysis. In the Level 2 equations, we incorporate a leaver-stayer dummy (0 if the person turned over during our study and 1 if the person did not turn over) as a predictor of across-individual intercepts and slopes. This allows us to examine whether leaver-stayer status at the end of the study is associated with Time 1 levels of the study variables (Level 2 intercept equation) and whether leaver–stayer status at the end of the study is associated with the change of our study variables over time (Level 2 slope equation). Further details of the specification of the HLM are provided in Appendix B.

We were able to incorporate data from those who did not respond to all the survey rounds in both the survival analyses and the HLM analyses. Essentially, survival analyses model the censoring of data when new data stop becoming available (Morita et al., 1993), and the HLM empirical Bayes’s weighting procedure also uses data from those who only responded to some waves of the study (Bryk & Raudenbush, 1992). The incorporation of incomplete data may raise concerns about survey nonresponse, given that individuals who remained in the sample but did not respond over time may differ from those who responded to all the surveys. To examine this possibility, we ran alternative survival and HLM analyses that excluded those who did not respond to all surveys but did not turn over. The results for these analyses were very similar to those estimated with the full sample and would result in no changes in interpretation for our hypotheses. As such, differential responding does not appear to be a serious concern for these results, so the full sample results are interpreted.

**Results**

**Descriptive Statistics**

The mean values for the independent variables across time are presented in Table 1. To examine the comparative stability of the independent variables, we estimated intraclass correlations by using a one-way random effects analysis of variance (Bliese, 2000), with all 930 individual identification numbers as independent variables. The intraclass correlation coefficient, or ICC(1), indicates the percentage of variance between persons, with the remainder of the variance being attributable to within-person variability or measurement error. An ICC of 1 indicates each person’s value on the variable in question is completely stable over time (i.e., all variance is between persons), whereas an ICC of 0 indicates that there is no consistency within each person (i.e., all variance is within persons).

As shown in Table 1, for most variables, about 50% of the variance is between persons, which suggests that the core constructs are nearly equally the result of within- and between-person variability. The least stable variables were the critical events and

### Table 1

**Scale Means Over Time**

<table>
<thead>
<tr>
<th>Variable</th>
<th>ICC(1)</th>
<th>Round 1</th>
<th>Round 2</th>
<th>Round 3</th>
<th>Round 4</th>
<th>Round 5</th>
<th>Entry Dynamic</th>
</tr>
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<tr>
<td>Context</td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Perceived external alternatives</td>
<td>.61</td>
<td>0.09</td>
<td>1.07</td>
<td>0.15</td>
<td>0.99</td>
<td>0.01</td>
<td>0.96</td>
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<tr>
<td>Unemployment rate</td>
<td>.13</td>
<td>1.95</td>
<td>0.45</td>
<td>2.13</td>
<td>0.71</td>
<td>2.61</td>
<td>0.91</td>
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<tr>
<td>Internal alternatives</td>
<td>.48</td>
<td>0.14</td>
<td>1.03</td>
<td>0.11</td>
<td>1.00</td>
<td>-0.06</td>
<td>0.97</td>
</tr>
<tr>
<td>Cost of turnover</td>
<td>.61</td>
<td>0.05</td>
<td>1.03</td>
<td>0.01</td>
<td>1.02</td>
<td>-0.04</td>
<td>1.02</td>
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<tr>
<td>Attitudes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Organizational commitment</td>
<td>.62</td>
<td>0.24</td>
<td>0.97</td>
<td>0.03</td>
<td>0.94</td>
<td>-0.13</td>
<td>0.99</td>
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<tr>
<td>Work satisfaction</td>
<td>.46</td>
<td>0.07</td>
<td>0.86</td>
<td>0.04</td>
<td>0.97</td>
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<td>1.08</td>
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<td>Work withdrawal</td>
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<td>-0.05</td>
<td>0.96</td>
<td>0.04</td>
<td>1.03</td>
</tr>
<tr>
<td>Search for alternatives</td>
<td>.41</td>
<td>-0.31</td>
<td>0.60</td>
<td>-0.04</td>
<td>0.90</td>
<td>0.07</td>
<td>1.06</td>
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</tbody>
</table>

*Note.* $n = 930$. ICC(1) is the intraclass correlation coefficient and represents the proportion of variance explained within each individual. Perceived external alternatives, cost of turnover, organizational commitment, work satisfaction, work withdrawal, and search for alternatives were standardized across all time waves prior to analysis. Univariate survival is the coefficient for turnover for individual predictors with no other covariates included in the model.

$p < .05$. **$p < .01$.**
occupational unemployment rates. The matrix of correlations between variables at Time 1 is presented in Table 2. Only Time 1 values are shown to facilitate interpretation, because the entire repeated-measures correlation matrix is 65 rows × 65 columns. The correlation matrices were very similar across time. Because of the large sample size in the current study, a large number of the correlations are statistically significant even when relatively small in magnitude.

**Survival Model Results**

The two columns to the far right in Table 1 portray univariate relationships between each of the predictor variables and turnover. All variables were standardized prior to analysis to facilitate comparison of comparative predictor strength. Two distinct types of models were assessed. The Entry column portrays the relationship between the variable at Time 1 and later turnover hazard. The Dynamic column includes the variable at each time wave. All results are presented as hazard ratios, which are “the ratio of hazard functions that corresponds to unit differences in the value of the associated predictor” (Singer & Willett, 2003, p. 526). Hazard ratios can also be understood as the percentage of change in the likelihood of turnover for a unit change in the predictor by taking $100 \times (\text{hazard ratio} - 1)$. A hazard ratio of 1 for a predictor means that changing the value of that variable has no effect on the likelihood of turnover; that is, $100 \times (1 - 1) = 0\%$ change in hazard. For example, because the hazard ratio for search for alternatives in the dynamic model is 1.58, each unit increase in search makes a person’s hazard of turnover 1.58 times more than that of an average respondent: $100 \times (1.58 - 1) = 58\%$ increase in hazard. Because organizational commitment is 0.58, each unit increase in commitment means that a person is 0.58 times as likely to turn over, $100 \times (0.58 - 1) = 42\%$ decrease in hazard, compared with an average respondent.

The multivariate survival results are presented in Table 3. The first two columns represent entry models, meaning the predictors are from Time 1 only. The second two columns are dynamic models, meaning the predictors are from all five time waves. Because of our mediation hypotheses (Hypotheses 5A and 5B), discussed later, both reduced (all predictors minus the proposed mediators) and full (all predictors) multivariate models are shown.

We examined the full models for Hypotheses 1–4. Hypothesis 1 proposed that more external alternatives (as indexed through both perceived external alternatives and occupational unemployment rates), fewer perceived internal alternatives, and lower costs of turnover would be related to higher turnover hazard. Perceived internal and external alternatives were not significant predictors of the turnover hazard. Cost of turnover was negatively related to turnover in both the entry and the dynamic models. In contrast, occupational unemployment rates were only significant in the dynamic model. In these models, a 1-standard-deviation increase in unemployment rates reduced the turnover hazard by over 50%. Hypothesis 2 examined the relationship between work attitudes and the turnover hazard. Only organizational commitment was significantly negatively related to turnover in the full entry model. No attitudinal variables were significant in the full dynamic model, due to mediation processes described in the next section.

Hypothesis 3 predictions regarding events were partially supported: In both the entry and the dynamic models, a 1-standard-deviation increase in discontinuation events increased turnover hazard by 20% to 28%, but continuation and neutral events were not significantly related to turnover hazards. Finally, Hypothesis 4 was partially supported with respect to the organizational withdrawal factors. Work withdrawal was not a significant predictor in either model. Search for alternatives was not a significant predictor in the entry model, but each standard-deviation increase in search increased turnover hazard by 28% in the dynamic model.

### Table 2

**Scale Correlations at Time 1**

| Variable                        | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   |
|---------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1. Gender                       | 1.00 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 2. Experience                   | 0.02 | 1.00 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 3. Education                    | −0.01| 0.08 | 1.00 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 4. Perceived external alternatives |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 5. Unemployment rate (T1)       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 6. Internal alternatives (T1)   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 7. Cost of turnover (T1)        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 8. Organizational commitment (T1) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 9. Work satisfaction (T1)       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 10. Pay satisfaction (T1)       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 11. Promotion satisfaction (T1) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 12. Supervisor satisfaction (T1)|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 13. Coworker satisfaction (T1)  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 14. Continuation events (T1)    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 15. Neutral events (T1)         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 16. Discontinuation events (T1) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 17. Work withdrawal (T1)        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 18. Search for alternatives (T1)|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

*Note.* $n = 930$. Correlations greater than .07 are significant at $p < .05$; correlations greater than .09 are significant at $p < .01$. The average internal consistency reliabilities for the scales across time waves are presented in italics on the diagonal. The full correlation matrix over time is available from John D. Kammeyer-Mueller on request. T1 = Time 1.
To examine the mediation hypotheses (Hypotheses 5A and 5B), we compared results across the full and reduced models to determine whether the full model’s inclusion of the withdrawal variables reduces the significance of any of the other predictor variables (Kenny, Kashy, & Bolger, 1998). Hypothesis 5A predicted that organizational withdrawal would mediate the relationship between context and turnover. In no case was this supported, as the significant coefficients for cost of turnover (in both the entry and the dynamic models) and occupational unemployment rates (in the dynamic model) did not become insignificant when organizational withdrawal was included.

Hypothesis 5B predicted that organizational withdrawal would mediate the relationship between work attitudes and turnover. In the dynamic model, the substantial effects of both organizational commitment, work satisfaction, and promotion satisfaction were included, meeting the traditional standard for mediation. The coefficients from the full model for both of these variables were closer to 1.00 (no effect) than they were in the reduced model, although it should be noted that the magnitude of change in coefficients was not large. Withdrawal was not supported as a mediator of attitudes in the entry model, suggesting that time plays an important role in the ability of withdrawal to act as a mediator of attitudes in the prediction of later turnover.

One reason for including critical events in the analyses is that they are expected to be much different than traditional turnover predictors, with no mediation by organizational withdrawal. Although there are conceptual and statistical problems with suggesting support for a null hypothesis of this sort (Cortina & Folger, 1998), it is worth noting that consistent with the unfolding model of turnover, there were only small shifts in the coefficients for critical events when organizational withdrawal was included. This supports the distinction between the traditional, attitudinal models of turnover and critical events–based models.

Hypothesis 6 proposed that the dynamic data would increase the predictive accuracy of the model overall. To contrast the fit between models, note that the pseudo-$R^2$ values for the dynamic model are double the comparative value in the entry model and the AIC for the dynamic model is lower than the AIC for the entry model. Both indicate that the dynamic model fits better. The models differ in terms of effect sizes and significance levels: Education, occupational unemployment rate, work satisfaction, and search for alternatives were significant predictors only in the dynamic model. In other words, although no formal statistical test is applicable to contrast the models, clear evidence shows that taking time into account considerably improves model fit and changes the magnitude of several parameters.

The analyses reported in Table 3 included 13 organizational and occupational dummies as control variables that were not reported in the table because occupational and organizational effects are not our primary focus and their addition is a distraction from the variables of interest. However, we note that Wald tests run on the joint significance of the organization variables showed no significant effects ($p = .27$). A similar Wald test showed strongly significant results for the set of occupational indicator variables ($p = .003$). Such results call for future studies that allow the examination of occupational predictors of turnover in an HLM context where individuals are nested within occupation. Our study, with only seven organizations and eight occupational groups, had an insufficient number of groups to allow such a detailed analysis.

### Hierarchical Linear Model Results

Table 4 presents the results of our HLM analyses. The Level 2 intercept results are shown in the first four columns. The label $\gamma_{00}$ portrays stayers’ mean level of each variable $Y$ at Time 1 of our study, the point of hire, holding other control variables constant. The label $\gamma_{0i}$ (leaver) can be interpreted as the difference from this mean value for leavers. Significant values for the $\gamma_{0i}$ (leaver) coefficient mean that leavers had different levels of the outcome variables than stayers did at organizational entry. The results shown in Table 4 and portrayed graphically in Figure 2 suggest that leavers had significantly lower costs of turnover, organizational commitment, work satisfaction, and promotion satisfaction than stayers did at time of entry.

The slope of each variable $Y$ was predicted by time, $\gamma_{10}$, as well as the difference from this slope value for those who turned over, $\gamma_{1i}$ (leaver). The days metric was scaled to years by dividing days by 365, so coefficients for time represent the change in the stan-
The standardized value of the dependent variable in 1 year. The values in Table 4 for $\gamma_{01}$ indicate that there is no significant change over time on the variables for the respondents as a whole, with the exception of pay satisfaction, where there was a slight decline over the duration of our study. The $\gamma_{11}$ (leaver) coefficients portray whether leavers had different trajectories on study variables in comparison to stayers. There were no significant slope differences for perceptions of external alternatives, perceptions of internal alternatives, or costs of job change that differentiated leavers and stayers, contrary to Hypothesis 7. As shown in Figure 2 and in partial support of Hypothesis 8, leavers became progressively less committed over time in comparison to the stayers, whose trajectory of commitment was mostly stable over time. Although there was a trend for work satisfaction to also decline among leavers in comparison to stayers, this comparison was only marginally significant ($p = .07$). The trends for the other facets of satisfaction were all nonsignificant. Contrary to Hypothesis 8, there were no significant differences between leavers and stayers in terms of pay, supervision, or coworker satisfaction in terms of either intercepts or slopes. Finally, in support of Hypothesis 9, there were significant

<table>
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<th>Variable</th>
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<th>$\gamma_{01}$ (leaver)</th>
<th>SE</th>
<th>$\gamma_{11}$ (leaver)</th>
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<td>.18</td>
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<td>.15</td>
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<td>.17</td>
<td>.02</td>
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<td>.20</td>
<td>.16</td>
<td>.13</td>
<td>-.22</td>
<td>.20</td>
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</table>

Note. Group-level $n = 930$. Coefficients for organization and occupation dummy variables, as well as controls for gender, experience, and education, are not depicted but are available from John D. Kammeyer-Mueller on request. Each variable was standardized prior to analysis.

* $p < .05$. ** $p < .01$.

![Figure 2. Hierarchical linear modeling (HLM) graphical results.](image-url)
slope differences for leavers and stayers in the variables of work withdrawal and search for alternatives. Leavers increased levels of work withdrawal and search over time and had pronounced increases in their search for alternatives (see Figure 2), while stayers remained essentially constant on both variables. Additionally, the size of the $\gamma_{11}(\text{leaver})$ coefficients is consistent with progression of withdrawal. Most specifically and consistent with theory, the variable that most strongly differentiated those who did and did not turn over was the search for alternatives.

**Additional Post Hoc Investigations**

Of the leavers, 26 (26.5%) experienced discontinuation events in the round immediately prior to their turnover, which serves as an approximate estimate for the proportion of turnover in this sample that may have been triggered by a specific event. Events that increased the likelihood of turnover among those who turned over fell into several categories. Seven individuals indicated negative work events precipitated turnover (e.g., interpersonal conflicts with coworkers or supervisors), 6 individuals indicated positive extraorganizational events precipitated turnover (e.g., headhunter calls), 8 individuals indicated life events precipitated turnover (e.g., pregnancy), and 5 individuals had a mixture of positive personal and extraorganizational events that facilitated turnover.

Consistent with previous unfolding model research (Lee et al., 1996) positing those who experienced critical events follow different turnover paths prior to quitting, post hoc descriptive analyses using data from the round before turnover occurred show that those who experienced critical events prior to turnover were more committed, $d = 1.11$, 90% confidence interval (CI) = .59, 1.63; slightly more satisfied, $d = .47$, 90% CI = -.04, .96; and engaged in less search for alternatives, $d = -.68$, 90% CI = -1.16, -.19, relative to others who turned over but did not report a critical event. In other words, leavers who experienced critical events prior to turning over were dissimilar to those who went through the more traditional progression of withdrawal turnover process. Comparing events along the dimensions of positive, negative, and neutral and the domains of work, personal, and professional life, certain classes of events were more likely to be seen as discontinuation or continuation events. A contingency table with these dimensions classified according to their perceived effects on turnover probability was significant, $\chi^2(16, N = 2,913) = 1,183, p < .01$. First, only 12% of the 2,913 events were coded by our respondents as discontinuation events, whereas 39% of the events were coded continuation events and 49% were seen as neutral. Concentrating on the categories of events that had the strongest tendency to be differentially coded, we found 58% of the 267 negative events at work were coded as discontinuation events. However, 75% of the 636 positive events at work were labeled continuation events. Events from participants’ personal and professional lives outside of the current job were much more likely to be viewed, overall, as neutral.

**Discussion**

The importance of time in the prediction of turnover is increasingly recognized. By investigating how turnover can be predicted at organizational entry and over time and by including critical events as a predictor, the current study helps to resolve several questions while suggesting questions for future research.

**Contributions**

The contrast of an entry model to a dynamic model revealed the powerful role of additional time waves in improving the prediction and understanding of turnover. Indeed, the pseudo-$R^2$ from the entry to the dynamic (full) model increased by over 100% from .11 to .24. Key predictions of the progression of withdrawal model, including the importance of search for alternatives as a mediator of the relationship between attitudes and turnover, were supported only in the dynamic results. This is similar to structural models derived from static results, which also do not show significant relationships between job search and turnover (e.g., Hom, Caranikas-Walker, Prussia, & Griffeth, 1992). It is therefore possible that the lack of a relationship between search and turnover in previous studies may have been an artifact of the use of static predictors.

Further supporting Mobley’s (1982) admonition for the use of temporal data in turnover research, our HLM analyses showed that there were often considerable within-individual shifts between leavers and stayers over the 2-year period under consideration. Although previous research has demonstrated that commitment and satisfaction are important to turnover (e.g., Tett & Meyer, 1993), our study provides a unique glimpse into the process of how this occurs. Specifically, leavers in our study experienced decreases over time in comparison to stayers on organizational commitment and work satisfaction (at $p < .07$) but did not have significant changes in other measures of satisfaction. In addition, we found increases over time on work withdrawal and search for alternatives among leavers. These findings suggest that although data at entry on some of our study variables predict whether newcomers will later leave the organization, these variables change over time, and that the closer the measurement to leavers’ departure dates, the more informative these variables are in differentiating between leavers and stayers. This result is consistent with findings from Cohen (1993), who found that organizational commitment was more strongly related to turnover when the lag between measures of commitment occurred close in time to the behavioral consequence.

Despite these intriguing results, it is notable that our ability to predict turnover with 15 repeated measures was modest and that the static model was by itself quite informative even when compared with the dynamic model. Our results demonstrate that within the first few months of tenure with their organization, newcomers’ reports of several turnover-relevant variables, including perceived cost of turnover, organizational commitment, and search for alternatives, were predictive of later turnover. These findings are congruent with the finding that organizational commitment levels surveyed within days after arrival at the U.S. Air Force Academy were related to turnover 4 years later (Lee et al., 1992). Preemployment attitudes toward an organization are also predictive of attitudes several months later (Hom, Griffeth, Palich, & Bracker, 1999). Thus, although we observed changes in attitudes over time, these changes were not always dramatic, likely because employees form their initial attitudes and subsequently seek out or attend to information that is consistent with those attitudes.
Another contribution of this study was the inclusion of critical events as predictors of turnover. Because we used a predictive technique (rather than asking individuals to recall critical events after their turnover), our results showed that reported critical events were related to later turnover. Supporting the unfolding model, these effects were not mediated by work attitudes or deliberative search processes (Lee & Mitchell, 1994; Lee et al., 1996, 1999). Our post hoc investigation of significant events showed that there were no broad classes of events that were universal predictors of turnover, because events both inside of work and outside of work and events that were both positive and negative could increase turnover propensity. Instead, it was the individual’s judgment that turnover was more likely because of the event(s) that was associated with turnover. Our dynamic model including critical events also helped to shed light on critical events not previously possible in studies that examined events only retrospectively among job leavers. For example, our finding that individuals most often perceive events as continuous or neutral is supportive of Path 3 in the Lee and Mitchell (1994) model. Specifically, people may actively think about the quality of their jobs but ultimately do not leave because the consideration does not rise to the level of eliciting a change in employment situation. Further research directly assessing this possibility is worth undertaking. Consistent with Gerhart (1990) and Lee and Mitchell (1994), these findings suggest that the progression of withdrawal model is not appropriate for a sizable proportion of decisions to quit. The strong relationship between the occupational unemployment rate and the turnover hazard is also consistent with the unfolding model because lower occupational unemployment rates may have increased the incidence of critical events such as unsolicited job offers.

Our results also contribute to the understanding of the relative roles of key variables included in many past studies of turnover. For example, although our method includes many of the suggestions provided by Steel (2002), such as incorporating time and examining individuals from the beginning of their employment experience, we found the role of perceived alternatives in the turnover experience to be minimal. Even when the full model was computed without occupational unemployment rate in the equation, perceived alternatives were still not predictive of turnover. These weak relationships are consistent with meta-analytic results using other study designs (Griffeth, Hom, & Gaertner, 2000), suggesting that the weak relationships between perceived alternatives and turnover found in previous research were probably not due to methodological problems. In contrast, our results portrayed occupational unemployment rates as having a substantial relationship with the turnover hazard, a finding that is inconsistent with expectations stemming from traditional turnover models but consistent with Gerhart’s (1990) argument that unemployment rates may affect turnover without the mediating effect of work attitudes. Trevor (2001) also found a main effect for repeated measures of unemployment rates on turnover even with satisfaction held constant. These findings suggest that the traditional progression of withdrawal model is incomplete.

**Future Directions and Limitations**

The dynamic nature of this study, along with its inclusion of critical events, helps to stimulate movement in several future research directions. First, our findings suggest the need for more empirical examinations of the role of critical events in unplanned turnover. In our study, individuals coded significant events they had experienced in the last 4 months in regard to whether they felt the event made them more, neither more or less, or less likely to stay with their organization. Although our measures of significant events were collected prior to turnover, they still were retrospective reports in that participants had to summarize the events that had taken place over the previous 4 months. In future studies, researchers may want to experiment with alternative coding and measurement of critical events to expand the understanding of role of critical events in the turnover experience, and they can aim to give more insight into why two individuals may sometimes evaluate the same event differently. In this research, it would be informative to examine ideas from cognitive psychology about nondecisions and habits (see Bargh, 1997; Beach, 1990). According to these writers, people seldom make choices about their behavior unless an event occurs that signals to them that there is a need to reconsider their actions. A focused analysis might examine how intensely people are thinking about whether to stay in their current jobs. The importance of events may actually be greater for employees with higher tenure who are more likely to be rooted in their habits, as opposed to newcomers who are more carefully evaluating their current jobs for match quality (Jovanovic, 1979; McCall, 1990).

Another area for future research is the development of models to predict cases in which withdrawal is an alternative to departure. Specifically, the current study found that work withdrawal was negatively related to both satisfaction and commitment, like turnover, but was comparatively unrelated to turnover. Instead, the results suggest that turnover and work withdrawal may be independent forms of organizational withdrawal. One complication to this result is that the relationship between alternatives and work withdrawal was very small, even in supplemental analyses (not reported here) using all of the context variables and interactions between context and satisfaction. It appears that withdrawal may have an adaptive function of removing one from a negative work situation, but the conditions under which a low level of satisfaction leads to turnover as opposed to withdrawal remain to be seen. Research should also investigate how situational constraints may result in different specific forms of withdrawal behaviors (Hulin, 1991) and investigate why these behaviors are so distinct from turnover.

We had no data collected prior to the point of organizational entry, but our results suggest that this may be an important direction for future studies. Because of the results supporting the entry model, there should be more research that looks at perceptions at entry or even preentry to investigate when these early perceptions of cost of job change and attitudes are formed. Because our measures of early attitudes are gathered after entry, it is not possible to say whether people walked in the door with these attitudes or if something happened early on to push them in that direction. Given the strong impetus for investigation of impressions formed of an organization before one starts a job provided by research on socialization stage models (e.g., Schein, 1978; Wanous, 1992), researchers should look deeper into how people conceptualize jobs before the first day. New research is especially warranted given the evidence against the met expectations hypothesis (Irving & Meyer, 1994), which was
the dominant model for how preentry experiences might affect subsequent attitudes. One possible direction includes incorporating information about a worker’s knowledge about the occupation as a whole (as opposed to just knowledge of the job), as research has shown that those with less occupational knowledge are more likely to turn over (McCall, 1990). Future studies should also continue to examine whether socialization efforts and relationship embeddedness can arrest a downward slide in attitudes and behavior among individuals that may have otherwise left the organization.

Several studies have already examined the important role that job performance has on an individual’s decision to stay or leave an organization, including evidence that an organization’s failure to adequately increase compensation to reflect performance levels longitudinally leads to increased turnover (Trevor, Gerhart, & Boudreau, 1997). The current study did not include measures of performance, but the dynamic nature of performance as a turnover antecedent is an important applied direction for future research. As noted in research on organizationally functional turnover, if a disproportionate number of leavees are low performers, turnover may not necessarily be a bad outcome (Hollenbeck & Williams, 1986). Such research might also add a new dimension to models showing the relationship between performance and satisfaction by revealing how one leads to another in a way that has not been possible in cross-sectional studies (Judge, Thoresen, Bono, & Patton, 2001).

Three final caveats must be considered regarding the results of this study. First, with the exception of unemployment rate, the predictor data were all self-reported. Although there is a strong argument to be made in favor of the use of self-report data for attitudes and behaviors (e.g., work withdrawal or job search) that one might deliberately hide from supervisors and coworkers (Sackett & Larson, 1990), future studies might examine variables more directly amenable to organizational control and observation measured by coworker or supervisor surveys, such as provision of social support, working conditions, or pay and benefits. Second, the spacing of the data collections were somewhat broader than we would have liked. We believe that surveys conducted at a weekly or monthly rate might provide even greater increases in predictive accuracy. One concern with the critical events variable is that there may have been some individuals who had an event (e.g., a call from a headhunter) and then departed rapidly in the period between survey administrations, making it impossible to detect events for these individuals. This would correspond to Paths 1 and 2 in the Lee and Mitchell (1994) model, where either the individual had an engaged script for leaving or an event at work was so negative that he or she left without considering alternatives. Because of this consideration, we must acknowledge that our estimate for events is potentially downwardly biased. That events were significant despite this conservative test suggests that events are truly important and need to receive greater attention. Future researchers should endeavor to find methods to measure these variables with greater frequency. Third, although the study involved a much more diverse sample than many turnover studies do, our sample was confined to white-collar workers. These workers may have a different process of turnover because they have more human capital, increased mobility, and lower costs of turnover due to savings (Trevor, 2001). Future research exploring the generalizability of these results to workers with comparatively fewer options could illustrate theoretical propositions not considered here.

References


### Appendix A

**Survival Model Specifications**

Using *i* subscripts to indicate individuals and *j* subscripts to indicate time, the entry survival model was

\[
\log h(t_{ij}) = \log h_0(t_j) + B_0 e_i + B_1 d_{ij}
\]

where \( h_0(t_j) \) is the natural logarithm of the baseline hazard as it varies over time, \( e_i \) is the vector of individual characteristics that do not change over time (gender, experience, and education), with associated regression coefficient \( B_0 \) and \( d_{ij} \) as the contextual, attitudinal, and organizational withdrawal predictors measured at Time 1, with associated regression coefficient \( B_1 \). By contrast, the dynamic survival model was

\[
\log h(t_{ij}) = \log h_0(t_j) + B_0 X_i + B_1 d_{ij}
\]

with the only difference being that in the dynamic model, the \( d_{ij} \) vector contains multiple observations on each independent variable for each person and the regression coefficients in \( B_1 \) that will result from including dynamic data. The coefficients in \( B_1 \) may also change as a result of including dynamic data in \( d_{ij} \).

The hazard function was determined using the Cox partial likelihood method (Singer & Willet, 2003), which allows the baseline hazard to take on any form. These methods require proportional hazards, meaning that the effect of the independent variables on turnover does not change over time (Dickert et al., 1996). Maximum likelihood tests developed by Grambsch and Therneau (1994) demonstrated that the proportional hazards assumption was not violated for any of the models.

### Appendix B

**HLM Specifications**

With *i* subscripts again indicating individuals and *j* subscripts again indicating time, the specification of the HLM was

**Level 1 equation:**

\[
Y_{ij} = \beta_{0i} + \beta_{1i}\text{time} + e_{ij}
\]

**Level 2 intercept equation:**

\[
\beta_{0i} = \gamma_{00} + \gamma_{01}\text{leaver} + \gamma_{02}\text{gender} + \gamma_{03}\text{education} + \gamma_{04}\text{experience} + \Omega(\text{occ, org}) + u_{0i}
\]

**Level 2 slope equation:**

\[
\beta_{1i} = \gamma_{10} + \gamma_{11}\text{leaver} + \gamma_{12}\text{gender} + \gamma_{13}\text{education} + \gamma_{14}\text{experience} + \Omega(\text{occ, org}) + u_{1i}
\]

One HLM analysis was computed for each repeated-measures variable (*Y*) highlighted in Hypotheses 7 through 9 (i.e., perceived external alternatives, internal alternatives, cost of turnover, organizational commitment, the facets of job satisfaction, work withdrawal, and search for alternatives). \( \beta_{0i} \) is the intercept, or each respondent’s estimated value of variable *Y* at Time 1 of our study. \( \beta_{1i} \) represents the slope or the trajectory of the variable for individual *i* over time *j*. At Level 2, we incorporate a leaver-stayer dummy (0 if the person turned over during our study and 1 if the person did not turn over) as a predictor of across-individual intercepts \( \gamma_{0i} \) and slopes \( \gamma_{1i} \). The remaining predictors in the Level 2 equations (demographic variables and \( \Omega \) representing the vector of regression coefficients associated with the set of dummy variables for occupation [occ] and organization [org]) act as control variables.

received July 7, 2003

Revision received July 20, 2004

Accepted July 27, 2004