RUNNING HEAD: Temporal Shifts in Turnover Processes

Turnover Processes in a Temporal Context: It's About Time

John D. Kammeyer-Mueller
Warrington College of Business
University of Florida

Connie R. Wanberg
Industrial Relations Center
University of Minnesota

Theresa M. Glomb
Industrial Relations Center
University of Minnesota

Dennis Ahlburg
Industrial Relations Center
University of Minnesota

This research project was supported through the Human Resources Research Institute at the University of Minnesota Department of Human Resources and Industrial Relations. This study used data collected as part of the University of Minnesota Project on New Organizational Employees. Different research questions based on this data set were examined in Kammeyer-Mueller, J.D., & Wanberg, C.R. (in press). Unwrapping the organizational entry process: Disentangling multiple antecedents and their pathways to adjustment. *Journal of Applied Psychology* and in Glomb, T. M., Kammeyer-Mueller, J. D., Wanberg, C. R., Ahlburg, D., & Chuang, A. (in preparation) Longitudinal examination of multiple dimensions of person-environment fit.

We would like to thank Andrew Miner, Ronald F. Piccolo, Steven J. Smela, and Zhaoli Song for their suggestions and assistance on this paper. Dennis Ahlberg wishes to thank the Fesler-Lampert Endowment for financial support.

Correspondence regarding this article should be addressed to: John Kammeyer-Mueller, Warrington College of Business Administration, Department of Management—206 Stuzin Hall, P.O. Box 117165 University of Florida, Gainesville, FL 32611-7165, e-mail: kammeyjd@ufl.edu, Phone: 352-392-0108

RUNNING HEAD: Temporal Shifts in Turnover Processes

Turnover Processes in a Temporal Context: It's About Time

Abstract

To better understand the process of organizational withdrawal, a turnover model incorporating dynamic predictors measured at five distinct points in time was examined by following a large, occupationally diverse sample over a two 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, and unemployment rates, job satisfaction, and search for alternative jobs also become significant predictors when measured over time. Critical events also predicted turnover in a matter 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.

Turnover Processes in a Temporal Context: It's About Time

Behavior in organizations is frequently described in a temporal context, including 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 models (Jovanovic, 1979). The importance of time in understanding behavior is further underscored by the nearly constant call for increased use of longitudinal designs. 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 incorporate time in their designs.

Employee turnover researchers have been in the vanguard of building temporal theory, owing to the fact that turnover is an event that occurs at a specific moment in time. 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. While researchers recognize that turnover decisions unfold over time in conjunction with work attitudes and opportunities, studies of turnover tend to examine these predictors at only one (typically arbitrary) time point (Steel, 2002). This mismatch between theoretical models and the data used to test them is not specific to the turnover field (Hulin & Ilgen, 2000), but is particularly problematic given the presumed importance of dynamics in this literature. Researchers have increasingly considered the time-

dependent nature of turnover by using survival analysis to predict not only *whether* someone will turnover, but *when* (e.g., Dickter, Roznowski, & Harrison, 1996; Hom & Kinicki, 2001; Trevor, Gerhart, & Boudreau, 1997). In comparison to studies that take a dynamic perspective on when turnover occurs, few studies have examined repeated measures of predictors as antecedents of turnover (for exceptions, see Morita, Lee, & Mowday, 1993; Trevor, 2001). The problem was cogently summarized by Mobley (1982), who observed that, "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).

Our study attempts to meet this call by examining turnover via a temporal framework, contributing to the literature in three primary ways. First, we use data gathered from a large number of employees over the course of two years to test predictions regarding several core variables related to employee turnover. We use this data in survival modeling to 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 also examine both between- and within-persons changes in context, attitudes, and behaviors by contrasting individuals who leave (leavers) and individuals who stay (stayers) using hierarchical linear modeling (HLM) techniques.

Second, our study is one of the most comprehensive repeated measures investigations of turnover to date, including 11 key predictor variables that are theoretically expected to be time varying. We also provide the first predictive test of critical events as a turnover antecedent. 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 allows a more thorough examination of the role of variables such as perceived job alternatives that vary across occupations and time (Steel & Griffeth, 1989).

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

Predictors of Turnover

The model for our study is shown in Figure 1. This model incorporates several variables that influence turnover, including contextual variables (external alternatives, internal alternatives, and costs of job change), work attitudes (work satisfaction and organizational commitment) and critical events (continuation events, neutral events, and discontinuation events) as antecedents to organizational withdrawal (work withdrawal and search for alternatives) and later turnover. Before introducing the temporal dimension of this study, we first review the major theoretical predictions regarding the antecedents of turnover.

Contextual Variables

The consideration of 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, alternatives inside the organization, and his or her perceived costs of job change.

External alternatives. Because people are more likely to leave their organizations when they have somewhere to go, the literature has examined perception of external alternatives as a predictor of organizational turnover (Arnold & Feldman, 1982; Michaels & Spector, 1982; Mitchell, Holtom, Lee, Sablynski, & Erez, 2001; Price & Mueller, 1981). While individuals may form intentions to turnover based on subjective impressions of the labor market, they may be more likely to actually change jobs when these perceptions are correct and they have secured a new job (Hulin et al., 1985; Muchinsky & Morrow, 1980). This means the unemployment rate, which indexes job availability, is also a valuable, and distinct, predictor of turnover (Gerhart, 1990). Research does indicate low unemployment rates are related to increased turnover rates (Carsten & Spector, 1987; Trevor, 2001). As such, our study incorporates measures of both perceived external alternatives and occupational unemployment rates.

Internal alternatives. The literature on job choice and attraction increasingly recognizes that for many employees, the quality of a job is not estimated simply based on the current position, but also on an overall organizational context (e.g., Cable & Turban, 2001). One important element of this organizational context is the alternatives within the organization. The availability and quality of jobs that can be acquired in the current organization may be used to index the utility of turnover, in addition to the perception of external alternatives. Employees may not turn over from 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. Besides the effect of alternatives that pull a person out of

the organization, 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, even if good alternatives were available. While embeddedness is a complex construct, we focus on financial aspects, because these monetary considerations may be the most central aspect of the decision to keep a job or turnover (Farrell & Rusbult, 1981). Factors likely to increase the cost of turnover include health insurance and deferred financial benefits (e.g., pensions, bonuses, etc.). This financial link is also related to continuance commitment, which is an employee's awareness that turnover will be financially costly (Meyer & Allen, 1997).

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

Hypothesis 1: More external alternatives, 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 towards 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 is begun with low levels of job satisfaction and low levels of organizational commitment (Hom & Griffeth, 1995). To emphasize the distinction between satisfaction and commitment (cf. Porter, Steers, Mowday, & Boulian, 1974), we focus specifically on work satisfaction and belief in organizational values to avoid problems with conceptual overlap between more global measures of both constructs (cf. Meyer, Stanley, Herscovitch, & Topolnytsky, 2002; Reichers, 1985).

Work satisfaction. Perhaps the most intuitive attitudinal antecedent to turnover is satisfaction with one's work. Meta-analytic estimates of the relationship between satisfaction and

turnover provide a corrected population average correlation of $\hat{\rho}_c$ =-.27 (Tett & Meyer, 1993). Work satisfaction, as compared to other satisfaction facets (e.g., supervisor, pay), is a broader measure which correlates well with overall measures of satisfaction (Wanous, Reichers, & Hudy, 1997). In addition, meta-analytic results show that work satisfaction is more highly correlated with pre-withdrawal cognitions, intention to leave, and actual turnover than other facets of satisfaction (Kinicki, McKee-Ryan, Schriesheim, & Carson, 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., Porter, Steers, Mowday, & Boulian, 1974; Mowday, Porter, & Steers, 1982). Meta-analytic estimates of the relationship between commitment and turnover provide a corrected population average correlation of $\hat{\rho}_c$ =-.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).

Based on the literature, we propose the following relationships will be observed between work satisfaction, organizational commitment, and turnover:

Hypothesis 2: More negative attitudes (lower work 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, and culminating in turnover, is a central tenant of many traditional models. However, there has been a shift towards 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 seldom consider whether they should remain in their current job or not, and keep the same job more as a function of habit than choice. Critical events, however, may provide a strong enough shock to the cognitive system that people will engage in a thorough reassessment of their situation followed by immediate action. Examples of such events range from personal events like marriage, divorce, illness or death of a loved one, or birth of a child, to work-related events like being passed over for a promotion, receiving a call from a headhunter, or hearing about a job opportunity. Not all events are created equal, of course; Lee and Mitchell's (1994) unfolding model noted that an event could be perceived as either increasing or decreasing the likelihood of turnover, or even that events could have no net effects on the likelihood of turnover.

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, Holtom, McDaniel, & Hill, 1999; Lee, Mitchell, Wise, & Fireman, 1996). Retrospective analysis is an appropriate starting point, but because of recall biases—such as a tendency for discrete events to be more memorable than would gradual processes of becoming disaffected, or a tendency for people to use events as post hoc justifications for their behaviors— research incorporating more prospective designs is needed. Because previous research has not compared the critical events in the lives of those who turnover and those who stay, it is not yet even 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 do not (Singer & Willett, 2003). 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. Nonetheless, results of these retrospective analyses suggest a strong temporal role for events. We propose the following:

Hypothesis 3: Critical events judged ex ante as increasing the likelihood of turnover will be related to increased turnover hazard, while 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 relevant to the withdrawal process that may substitute for, signal, or precede a turnover decision. Two distinct modes of withdrawal are examined here. The first mode is work withdrawal, or reducing time spent on work activities. The second mode is a search for alternatives, or acting to find alternative employment. These two modes are also distinct in that 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, performing low quality work, or reducing 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 to further remove oneself. Support for this research is shown by meta-analytic estimates of a corrected correlation of $\hat{\rho}_c$ =.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, & Melgino, 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 to the utility of the present job (Jovanovic, 1979). 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 meditate 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 formation of specific behavioral plans (e.g., Ajzen & Fishbein, 1979). Work withdrawal and search for alternatives reflect these plans to remove oneself from their 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.

The relationship between context (i.e., external alternatives, internal alternatives, and perceived costs) and turnover may also be mediated by withdrawal behaviors. Conceptually, perceptions of few alternatives and high costs of job change could reduce the extent to which they might search for alternatives (Hulin, Roznowski, Hachiya, 1985). Prior empirical work has supported the link between perceived alternatives and intentions to quit or search for another job, but there is less evidence regarding a mediating role for work withdrawal and search for

alternatives (e.g., Arnold & Feldman, 1982; Price & Mueller, 1981). Based on the current theory, we propose:

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

As noted earlier, critical events are expected to often lead to abrupt turnover without a consideration of alternatives or progressively withdrawing 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

As noted earlier, because turnover antecedents are dynamic, measuring them in a temporal context should enhance our understanding of turnover (Steel, 2002). Because attitudinal theories are dynamic, with attitude changes linked to behavior changes, one time assessments of these constructs correspond poorly to their underlying theoretical bases (Eagley & Chaiken, 1993). Attitude researchers further note that because behaviors occur in a temporal context, the relationship between attitudes and behaviors will be enhanced to the extent that these elements correspond in time (Ajzen & Fishbein, 1977; Eagly & Chaiken, 1993). Thus, the best predictors of turnover should take into account a particular employment context, and consider attitudes that are as proximally close to the time at which the behavior will be engaged in as possible.

To examine the extent to which measuring data over time aids the prediction of turnover, we compare an “early entry” model that uses only Time 1 data to a dynamic model that incorporates five waves of predictor data. The early entry model allows us to examine to what extent we can predict later turnover with data obtained from new employees within their first

month of employment. The comparison to the dynamic model helps to examine to what extent multiple waves of data and data after the first month of employment improves prediction of turnover. Based on the dynamic theories of attitudes and context described earlier, we expect:

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

Comparison of a dynamic survival model (incorporating the five waves of predictor data) to 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 prediction and reduce the standard errors around the estimated coefficients. If such effects are found in a dynamic survival model, it is not possible to tell if they reflect (a) differences at entry, (b) a tendency for leavers to change context, attitudes, events, and behavior towards 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 HLM to more fully portray our variables over time, or to "unpack" the results of the survival analyses.

Detailed Temporal Comparisons of Leavers and Stayers

To assess intra-individual changes over time, researchers have increasingly turned to HLM, using each respondent as a level-two variable, with repeated measures of these individuals over time as a level-one variable (Singer & Willet, 2003). Differences can be captured by looking at differences between leavers and stayers in predictors at the point of organizational entry (i.e. intercept differences), and by examining differences between leavers and stayers in the changes in attitudes over time (i.e. slope differences). Previous empirical support has suggested differences between leavers and stayers in trajectories of attitudes, with less attention given to dynamic differences in context and withdrawal behaviors. However, traditional approaches

compare univariate difference scores to assess changes across groups, despite problems of unreliability and arbitrary effect sizes based primarily on the researchers' choice of time frame (Rogosa, Brandt, & Zimowski, 1995). The HLM procedure also offers distinct advantages over other longitudinal methods, such as repeated measures MANOVA or latent growth modeling, which require a balanced design with all participants completing all surveys at exactly spaced intervals. Since employees who turn over early in the study cannot complete all the surveys, they are excluded from these other types of analyses, effectively losing all information on a critical portion of the sample. HLM incorporates data from those who leave early or late as well as from those who remain, enabling a more accurate comparison.

Research is available to support both the possibility that there are differences between leavers and stayers at time of organizational entry and that there is a tendency for leavers to display changes in context, attitudes, and withdrawal as time passes toward the turnover event. Regarding differences at entry, research from the personality, person-environment fit, and socialization literatures is suggestive that newcomers who leave within the first few years of their tenure with an organization may already reflect differences from stayers at time of organizational entry. Specifically, these literatures propose that newcomers may enter organizations with attitudinal predispositions and commitment propensities or form them quickly after making a "first impression" (Judge & Larson, 2001; Lee, Ashford, Walsh, & Mowday, 1992; Schneider, 1987; Wanous, 1992). We should be 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 in our HLM analyses.

HLM uniquely, however, allows us to examine slope differences between leavers and stayers on our study variables. Existing studies, although based predominantly on small samples and only a few time waves of data, suggest changes occur over time in leavers in comparison to stayers on both attitudes and withdrawal cognitions. Sheridan and Abelson (1983) produced one of the first repeated measures investigations of turnover-related variables. Although the sample size of leavers was small (n = 19), these authors found that leavers (when compared to stayers) experienced greater decreases in organizational commitment and greater increases in job tension over the two-month interval preceding the leaver's exit date. In a larger study, Youngblood, Mobley, and Meglino (1983) found that military recruits that left during basic training or after being assigned to a duty station showed declines in their intentions to complete their enlistment. In contrast, recruits that either completed their enlistment or reenlisted showed increases in their intentions to complete.

Rusbult and Farrell (1983) similarly found that leavers had a significantly larger decrease in organizational commitment over time than stayers. Although their study had four time waves, the sample size was very small, including 9 leavers at Time 1 of the study, 6 at Time 2, 9 at Time 3, and 4 at Time 4. Finally, repeated measures ANOVA results for a sample of nurses (Hom & Griffeth, 1991) showed that both leavers and stayers had steadily falling job satisfaction over the first year of employment, with leavers having consistently lower satisfaction, which would be represented by an intercept difference. In addition, leavers developed increasingly higher turnover cognitions over time while stayers' levels remained stable.

These empirical findings are consistent with progression of withdrawal theory (Hulin, 1991), which proposes that withdrawal increases prior to turnover. If this theory is correct, an employee who is likely to turnover can be recognized not just because that they are engaging in

work withdrawal or job search, but also because they are displaying higher levels of these behavioral and attitudinal manifestations than in the past.

There is less theoretical and empirical support for slope differences for stayers and leavers for contextual variables. It is possible, however, that relative to stayers, leavers will experience increases in perceived external alternatives and decreases in costs of turnover over time relative to stayers, suggesting that they are now more mobile than they were before, and can therefore more actively seek a new job. Leavers also may experience comparatively greater declines in perceived internal alternatives over time, and use these changes as signals that they are not giving up future career opportunities if they leave.

Based on the theoretical expectations for how critical events function in the turnover process, leavers would not be expected to display an increase in critical events over time in comparison to stayers. In fact, Lee and Mitchell's (1994) unfolding model specifically introduced critical events to suggest alternatives to theories proposing a slow, accumulative process of attitudes and behavior leading to turnover. Events should instead occur randomly and have fairly quick effects on turnover. Because of this, the unfolding model of voluntary turnover is not supportive of a slope hypothesis relevant to leavers versus stayers for critical events. Based upon this literature, we expect that the leavers in our sample will show greater declines in perceived internal alternatives, costs of job change, and attitudes, and increases in both perceived external alternatives and organizational withdrawal over time in comparison to stayers, but we do not form a slope hypothesis for significant events. We suggest:

Hypothesis 7: Leavers will have a decline over time in perceived internal alternatives and costs of job change, and an increase over time in perceived levels of external alternatives in comparison to stayers.

Hypothesis 8: Leavers will have a decline over time in attitudes (both organizational commitment and work satisfaction) in comparison to stayers.

Hypothesis 9: Leavers will have an increase over time in organizational withdrawal (as indexed by work withdrawal and search for alternatives) in comparison to stayers.

Method

Participants

The initial pool of participants consisted of 1,532 exempt employees recently hired into seven organizations. The primary operational activities of these organizations included manufacturing, food distribution, healthcare, and education. A total of 1,002 individuals responded to the initial survey. Our sample was limited to those who worked over 35 hours per week since part time workers may differ in their turnover patterns, which eliminated 45 respondents. An additional 24 respondents did not provide sufficient information in their surveys to be included in the study. Thus, there were 932 participants with sufficient data to be included. Of these 932, there were 606 respondents for all survey rounds, with 98 respondents voluntarily turning over, and there were 228 individuals who contributed data to round 1 who did not respond to all survey rounds.

The first survey was distributed to newcomers within their first month of employment. Additional surveys were distributed every four months over the course of 20 months, for a total of 5 possible surveys. Allowing for a four month lag from the last survey to the last observation of turnover, and since respondents were working for a month before the first survey, the overall study period was 25 months. Every survey round included questions regarding contextual factors (perceived external alternatives, perceived internal alternatives, and cost of turnover); work attitudes (satisfaction and commitment); critical events (continuation events, neutral events, and

discontinuation events); and organizational withdrawal (work withdrawal and search for alternatives). At Time 1 questions related to occupation and demographics were also asked.

Participants represented a variety of white-collar occupations. Of the initial respondents the occupational breakdown was: 16.4% administration, 7.3% faculty members, 21.7% marketing or advertising, 10.9% service, 15.0% engineering, 9.0% research and development, 11.6% information technology, and 8.1% other miscellaneous occupations. All organizations studied had multiple locations and divisions, so the sample was geographically dispersed within the United States. The average age of respondents was 33.0 years (SD=9.7). Of respondents, 51% were female 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*. Organization was known based on the organization that originally supplied the contact information. All other control variables were assessed at Time 1 as reported by respondents. *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, which have previously been shown to be important predictors of turnover (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?”

Contextual factors. *Perceived external alternatives* were assessed with the items, "How easy or difficulty would it be for you to find a job with another employer at least as good as the one you have now," (1=very difficult to 5=very easy) and "How would you describe the number of comparable jobs, with all types of employers, for a person with your qualifications," (1=a very small number of comparable jobs to 5=a very large number of comparable jobs) from Price and Mueller's (1986) widely used scale. Reliability over rounds for the external alternatives scale ranged from α=.74 to α=.77, with an average $\bar{\alpha}$ =.75. *Occupational unemployment rates* were collected from the U.S. Census Bureau Current Population Survey's monthly estimates of the national occupational unemployment rate, at http://ferret.bls.census.gov/cgi-bin/ferret, and matched to each individual's surveys based on the month in which they completed each survey, 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" (1=very difficult to 5=very easy). *Costs of job change* was assessed with the item "Considering the total impact on your salary, retirement benefits, health insurance, etc., from a financial angle how difficult would it be for you if you left your current job with no alternative lined up" (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 they were determined to be necessary; additionally research suggests that the reliability of single item scales is not as poor as sometimes assumed (Wanous et al., 1997).

Work attitudes. Work satisfaction was measured with five items from an abbreviated version of the job diagnostic inventory (Stanton, Sinar, Balzer, Julian, Thoresen, Aziz, Fisher, & Smith, 2002; Smith, Kendall, & Hulin, 1969). Respondents were asked to indicate the extent to which they believed their work over the past four months could be described by the following

terms: “gives sense of accomplishment,” “dull,” “satisfying,” “uninteresting,” and “challenging” using the response scale “Yes,” “?,” or “No.” Responses ranged from no=0, ?=1 and yes=2. Responses for “dull” and “uninteresting” were reverse coded. Reliability over rounds ranged from α=.79 to α=.84, with an average $\bar{\alpha}$ =.82.

Organizational commitment was measured via Mowday, Steers, and Porter’s Organizational Commitment Questionnaire (1979). This measure has shows good convergent validity as a measure of affective commitment (Meyer & Allen, 1997). The nine-item version of the scale, which has higher internal consistency and less overlap with intention to turnover, was selected. Respondents indicated their agreement with statements such as, “I find that my values and this organization’s values are very similar” and “I really care about the fate of this organization” on a five-point scale with anchors ranging from “strongly disagree” to “strongly agree.” Reliability ranged from α=.89 to α=.91, with an average $\bar{\alpha}$ =.90.

Critical events. Our measures of critical events were derived from those described in Lee et al. (1999). We instructed respondents to indicate if they had experienced personal (e.g., marriage, divorce, birth of a child, death or serious illness of a close family member, and a spouse/partner finding a new job), work related (promotion or transfer, completion of a major project, a change in your supervisor or coworkers, or involvement in a negative experience such as harassment), and professional events (job offers from someone other than your employer, calls from headhunters, or the completion of a degree, licensing, or certification program), giving them the examples listed above for each category. To differentiate the nature of events, respondents were asked to judge if, “as a result of the event you will be **more** or **less** likely to continue working for this organization” with a three point scale corresponding to continuation events (more likely), discontinuation events (less likely), or neutral events (neither more nor less

likely). For each round, the number of events in each category was summed to produce a count in each category. Respondents also provided open-ended descriptions of the events. In all cases, the events and their descriptions were recorded *before* the respondent turned over.

Organizational withdrawal. Work withdrawal was assessed based on self-reports of the frequency with which employees engaged in withdrawal behaviors (i.e., 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 α=.65 to α=.74, with an average $\bar{\alpha}$ =.69. *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 since the last survey period they had engaged in search activities such as, "spent a lot of time looking for a job alternative," or, "devoted much effort to looking for other jobs." Reliability ranged from α=.91 to α=.95, with an average $\bar{\alpha}$ =.94.

Turnover. Hire and turnover date were collected from the organizations, with days employed as the underlying measure of duration of employment. Each organization classified turnover as voluntary (employee initiated) or involuntary (initiated by the organization due to poor performance or elimination of the person's job due to budgetary reasons). Consistent with the theories of turnover described earlier, we focused only on 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 study period of 25 months. The duration of employment for those who turned over ranged from 99 days to 754 days (M=513.4 days; median=600 days).

Analyses

Two distinct analytical methods were used in this study. First, to examine the time to turnover using the full predictor set, survival regression analysis was used. To unpack the results of the survival regression analyses, HLM was used to further portray the relationships over time. The longitudinal analyses employed in this study fully incorporate data from those who turned over or who only responded to some survey rounds. This is because proportional hazard models model the censoring of data when new data stops becoming available (Morita et al., 1993). HLM empirical Bayes' weighting procedure also uses data from those who only responded to some waves of the study (Bryk & Raudenbush, 1992).

Predicting turnover. Survival regression, in which the hazard rate for leaving a job is the dependent variable, was used to assess employment duration (Dickter et al., 1996; Morita et al., 1993; Singer & Willett, 2003). As noted frequently in turnover studies, this approach allows the researcher to predict both if and when an employee leaves. Job duration was measured in days. Participants who stopped responding to the surveys were treated as censored observations, so they were included in the survival model as "stayers" until such time as they discontinued responding, at which point they were treated as no longer under observation. All respondents who did not turn over by the fifth survey round were also treated as right-censored. Because all respondents are new hires, there is no left censoring (i.e. the sample includes all members of the relevant risk set before they had an opportunity to leave).

As noted earlier, we compared time-constant and time-varying survival models. In the time-constant or entry model, each person contributed one response for each predictor soon after being hired (i.e. reported external alternatives, internal alternatives, costs of job change, and etc. only at Time 1). In the time-variant or dynamic models each person contributed one 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, while the entry data set consisted of 932 observations of the predictors (one per person). The only estimation difference between the entry and dynamic models is that the entry model uses only Time 1 predictor values, while the dynamic model uses all of the survey predictor variables across time, while controlling for non-independence by clustering the errors within person. If there are no intra-individual 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.

The hazard function was determined using the Cox partial likelihood method (Singer & Willet, 2003), which is the least statistically restrictive method of survival analysis because it allows the baseline hazard to take on any form. Research examining different shapes for the survivor function suggest that such a flexible form is probably needed for an accurate estimation of turnover (McCall, 1990). These methods require proportional hazards, meaning that the effect of the independent variables on turnover does not change over time (Dickter 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.

Using *i* subscripts to indicate individuals and *j* subscripts indicating time, the early entry hazard model is:

$$\log h(t_{ij}) = \log h_0(t_j) + \mathbf{B_c c_i} + \mathbf{B_d d_{i1}}$$

where log $h(t_{ij})$ is the natural logarithm of the hazard rate, log $h_0(t_j)$ is the baseline hazard as it varies over time, $\mathbf{c_i}$ is the vector of individual characteristics which do not change over time (gender, experience, and education) , with associated regression coefficient $\mathbf{B_c}$, and $\mathbf{d_{i1}}$ are the

contextual, attitudinal, and organizational withdrawal predictors measured at time one, with associated regression coefficient $\mathbf{B_d}$. By contrast, the dynamic hazard model is:

$$\log h(t_{ij}) = \log h_0(t_j) + \mathbf{B}^*_{\mathbf{c}}\mathbf{c_i} + \mathbf{B}^*_{\mathbf{d}}\mathbf{d_{ij}}$$

with the only difference being that in the dynamic model, the $\mathbf{d_{ij}}$ vector contains multiple observations on each independent variable for each person, and the regression coefficients in $\mathbf{B}^*_{\mathbf{d}}$ that will result from including dynamic data.

To compare goodness of fit across entry and dynamic models, a pseudo-R^2 statistic based on the Kullback-Leibler information gain was used (Magee, 1990). This statistic is preferable to other pseudo-R^2 measures because it is more readily compared across models. 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 RMSEA.

Intercept and slope analyses. To supplement our interpretation of significant predictors from the survival analysis we use HLM (Bryk & Raudenbush, 1992) to examine the patterns of change for each variable over time. The basic specification of the maximum likelihood estimation HLM was as follows:

Level 1:

$$outcome_{ij} = \beta_{0i} + \beta_{1i}(time) + \varepsilon_{ij}$$

Level 2 intercept:

$$\beta_{0i} = \gamma_{00} + \gamma_{01}leaver + \gamma_{02}gender + \gamma_{04}education + \gamma_{05}experience + \mathbf{\Omega}(occ, org) + u_0$$

Level 2 slope:

$$\beta_{1i} = \gamma_{10} + \gamma_{11}leaver + \gamma_{12}gender + \gamma_{14}education + \gamma_{15}experience + \mathbf{\Omega}(occ, org) + u_1$$

With Ω representing the vector of regression coefficients associated with the set of dummy variables for occupation and organization. Results provide a comparison between leavers and stayers based on the coefficients associated with the indicator variables for leavers.

For the Level 1 model, the changes in the critical constructs are measured as a function of time. The intercepts for this model identify differences between leavers and stayers at the point of hire, while the slopes identify differences in changes in the hypothesized variables between leavers and stayers during their employment. 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.

This HLM analysis may raise concerns about survey non-response, since individuals who remained in the sample but did not respond over time may differ from those who responded to all the surveys. Unlike survival modeling, HLM has no method to explicitly incorporate censoring into the design. To guard against this possibility, alternative HLM analyses were run using only those who either turned over or responded to all survey rounds. Because these results were identical to the third decimal place for almost all analyses and would result in no changes in interpretation, 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 demonstrate the comparative stability of the independent variables, intraclass correlations were estimated by using a one-way random effects ANOVA (Bliese, 2000), with all 932 individual IDs as independent variables. The ICC(1) estimated in this way indicates the percentage of

variance between-persons, with the remainder of the variance being attributable to either within-person variability or measurement error. An ICC of one indicates each person's value on the variable in question is completely stable over time and each person's score could be predicted perfectly if their scores at a previous time were known (i.e. all variance is between-persons), while an ICC of zero indicates that there is no consistency within each person and knowing each person's previous scores would provide no assistance in predicting future scores (i.e. all variance is within-persons). Dynamic models suggest ICC should be low, reflecting changes in attitudes and behavior over time within each person as a result of continual evaluation of the environment, while early entry models suggest ICC should be high, reflecting stability in attitudes in behavior over time within each person as a result of consistency in how one evaluates the environment and reacts to these evaluations.

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-persons variability. The least stable variables were the critical events, which is consistent with the general premise of the unfolding model that these events are random.

The matrix of correlations between variables at Time 1 is presented in Table 2. Only Time 1 values are shown to facilitate interpretation, since the entire repeated measures correlation matrix is 65 rows × 65 columns. The correlation matrices were very similar across time. The data suggest little reason for concern regarding collinearity. Additionally, the results also show low correlations between the measures of events and work attitudes, with the exception of the significant relationships between discontinuation events and both commitment and satisfaction. This is consistent with the unfolding model's prediction that events provide unique information not captured in typical attitudinal measures used in turnover studies.

Survival model results

The two columns to the far right in Table 1 portray univariate relationships between the each of the predictor variables and turnover. All variables were standardized prior to analysis to facilitate comparison of comparative predictor strength. These univariate results allow comparison to previous studies that have not included the full set of variables included in this study. 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 included the variable at each time wave. All coefficients are interpretable as the change in the log turnover hazard for a unit change in the predictor as described earlier. The univariate results for the entry and dynamic models were usually similar in significance (with two exceptions). However, the effect sizes for the dynamic model were larger than the comparable coefficients from the entry model, indicating that there was an increase in the predictive power of these constructs when intra-individual variability was taken into account.

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. Due to our mediation hypotheses (Hypothesis 5a-5b), both reduced (all predictors minus the proposed mediators) and full (all predictors) multivariate models are presented.

We examine the full models to assess the results for Hypotheses 1-4. Consistent with Hypothesis 1 regarding the contextual factors, cost of turnover was negatively related to turnover in both the entry and dynamic models. However, unemployment rates were only significant in the dynamic model. There was no support for a relationship between perceived internal or external alternatives and turnover. Regarding Hypothesis 2, which was related to work attitudes,

while organizational commitment was significantly negatively related to turnover in the entry model, work satisfaction was not related to turnover. Neither attitudinal variables were significant in the full dynamic model, due to mediational processes described in the next section. Hypothesis 3 predictions regarding events were partially supported, as in both the entry and dynamic model discontinuation events had strong relationships with turnover, but continuation and neutral events did not affect 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 it was in the dynamic model.

Mediation. To examine the mediation hypotheses (Hypotheses 5a-5b), we can compare results across the full and reduced models to examine 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 dynamic models) and unemployment rates (in the dynamic model) did not become insignificant when organizational withdrawal variables were included.

Hypothesis 5b predicted that organizational withdrawal would mediate the relationship between work attitudes and turnover. In the dynamic model the highly significant effects of both organizational commitment and work satisfaction on turnover hazard (see reduced model) became non-significant when withdrawal variables were included, meeting the traditional standard for mediation. There was not support for withdrawal 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 inclusion of events 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.

Overall model comparisons. Hypothesis 6 proposed that the dynamic data would increase the predictive accuracy of the model overall. To contrast the fit between models, the pseudo-R^2 values for the dynamic models are double the comparative value in the entry model, while the AIC for the dynamic model is lower than the AIC for the entry model, both indicating that the dynamic model fits better. There are few major differences between the models in terms of effect sizes, but precision of estimates of the dynamic model is greater, leading to more significant effect sizes—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, there is clear evidence that taking time into account in the survival model considerably improves model fit by increasing the precision of the estimates, and changing the magnitude of several parameters.

Hierarchical linear model results

The HLMs comparing leavers to stayers are presented in Table 4. To aid in interpretation of these results, Figure 2 uses parameter estimates from the HLM models to develop predicted

values for leavers and stayers over time for models with significant effects, representing the expected values for predictors over the course of one and one-half years, which is close to the average tenure of leavers. As was noted earlier, significant effects in a dynamic survival model could reflect a) differences at entry, b) a tendency for leavers to change towards turnover propensity, c) a tendency for stayers to change away from turnover propensity, or d) some combination of two or more. The analyses suggest that most effects fall into categories a) and b).

The intercept for each model is the mean level for stayers at the point of hire, γ_{00}, as well as the difference from this mean value for leavers, γ_{01}(leaver). Significant values for the γ_{01}(leaver) coefficient mean that leavers had different levels of the outcome variables than stayers 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, and work satisfaction than stayers at time of entry. As we should expect, these results largely mimic the results of the entry survival model using Time 1 data only to predict later turnover, with the exception that work satisfaction did not predict later turnover in the entry survival model. The difference in findings between the two statistical methods is likely due to the fact that the entry survival model is a multivariate model (e.g., other correlated variables, such as both organizational commitment and work satisfaction, were included simultaneously in the model), plus the survival model examines both probability and time to turnover while in HLM turnover status at the end of the study is treated as a dichotomous variable.

The slope of the outcome variable is predicted by time, γ_{10}, as well as the difference from this slope value for those who turned over, γ_{11}(leaver). The days metric was scaled to years by dividing days by 365, so coefficients for time represent the change in the standardized value of the dependent variable in one year. The non-significant values in Table 4 for γ_{10} indicate that

there is no significant change over time on the variables for individuals that did not turnover during the duration of our study. Significant values for the γ_{11} (leaver) coefficient mean that leavers had different trajectories for some of the outcome 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. 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). Finally, in support of Hypothesis 9, there were significant slope differences for leavers and stayers in the variables of work withdrawal and search for alternatives. Leavers increased levels of work withdrawal 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 $\gamma_{11}(leaver)$ coefficients also is consistent with progression of withdrawal. Most specifically, and consistent with theory, the variable that most strongly differentiated those who did and did not turnover was 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 was triggered by a specific event. Events that increased the likelihood of turnover among those who turned over fell into several categories. There were seven individuals who indicated negative work events precipitating turnover (e.g., interpersonal conflicts with co-workers or supervisors), six individuals who indicated positive extra-organizational events precipitating turnover (e.g.,

headhunter calls), eight individuals who indicated life events that precipitated turnover (e.g., pregnancy), and five individuals who had a mixture of positive personal and extra work events that facilitated turnover.

Consistent with previous unfolding model research (Lee et al., 1996) positing those who experienced critical events followed 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% C.I.=(.59 to 1.63), slightly more satisfied *d*=.47, 90% C.I.=(-.04 to .96), and engaged in less search for alternatives *d*= -.68, 90% C.I. =(-1.16 to -.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.

Discussion

The importance of time in the prediction of turnover, and in organizational behavior research in general, is increasingly recognized. By investigating how turnover can be predicted using surveys at organizational entry and surveys over time, the current study helps to resolve several questions related to turnover while suggesting several more questions for future research. The discussion below will highlight the contributions provided by a) the comparative support for early entry and dynamic models of turnover, b) critical events as antecedents of turnover, c) the difference in intercepts and trajectories highlighted in the HLM results. This is followed by limitations and an assessment of areas for future study suggested by the current investigation.

Contributions

The contrast of early entry models to dynamic models revealed that turnover propensities can be measured soon after hire, but that continual measurement is needed to show how early attitudinal perceptions lead to behaviors that ultimately result in turnover. The pseudo R^2 from the initial entry to the dynamic model increased by over 100% from .10 to .21, and standard errors for the significant predictors in the dynamic model were smaller than in the entry model. Critical 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. Also, the data from the HLM analyses showed that there were often considerable within-individual shifts between leavers and stayers over time. This suggests that Mobley's (1982) admonition for the use of temporal data to investigate dynamic process was indeed prescient.

On the other hand, our results also 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 highly predictive of later turnover. These findings are supportive of the contention that newcomers may arrive with a commitment propensity, based on a finding that organizational commitment levels surveyed within days after arrival at the U.S. Air Force Academy were related to turnover four years later (Lee et al., 1992). Other related literature includes evidence that pre-employment attitudes towards an organization are strongly predictive of attitudes several months later (Hom, Griffeth, Palich, & Bracker, 1999), and evidence that interviewers active efforts to find evidence consistent with their first impressions of applicants (Dougherty, Turban, & Callender, 1994). Thus, although we predicted changes in attitudes over time, they may not be dramatic, as employees form their initial attitudes and more frequently seek out or attend to information that

is consistent with those attitudes. The ability of the entry model to predict subsequent turnover, albeit not as well as the dynamic model, may not be surprising given the literature on attitude consistency and dispositions. Many individuals may know quite a bit about their new jobs before they begin work, so there will be comparatively little new information to change their attitudes once they actually start. Attitudinal selectivity, either through selective perception or confirmation bias, may drive the persistence of attitudes (Eagly & Chaiken, 1993). Also, dispositional approaches to attitudes (see Judge & Larsen, 2001 for review) would suggest some stability in attitudes due to a person's innate disposition or characteristics; such a disposition would result in relative stability in job attitudes. However, personality data taken from a five-factor model (FFM) personality survey were available in the data for all respondents and none of the global dimensions assessed were predictive of turnover at even the $p<.10$ level of significance for either the univariate or multivariate models. This suggests that if dispositions do affect turnover, they may lie outside of the FFM, or be more specific facets thereof.

Critical events, which have not been studied as predictors of turnover in previous studies, were especially strong antecedents of turnover. This study represents the first study of the role of critical events in the prediction of turnover that is not retrospective in nature. By using a prospective technique, our results suggest that critical events are predictive of turnover, and that consistent with the unfolding model, these effects were not mediated by work attitudes or deliberative search processes (Lee & Mitchell, 1994; Lee et al., 1996; Lee et al., 1999). Our post-hoc investigation of significant events showed that there were no broad classes of events that were universal predictors of turnover, since 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 events that was associated with turnover.

Finally, the results from HLM demonstrate that leavers became progressively more negative in their attitudes over time, while stayers remained, on average, about as satisfied and committed over the two year period under consideration as they were at entry. Specifically, leavers experience increases over time in perceptions of external alternatives and job withdrawal relative to stayers. Leavers also experience declines in perceived costs to turnover, organizational commitment, and work satisfaction relative to stayers. These findings are intriguing. They suggest that while data at initial entry on some of our study variables predict whether newcomers will later leave the organization, that there is change in the values of some of these variables, and that the closer the measurement to leaver's 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 the organizational commitment was more strongly related to turnover when the lag between measures of commitment occurred close in time to the behavioral consequence.

Future Directions and Limitations

Our study leaves us with several unanswered questions. While we were able to investigate the relationship between turnover and dynamic measures of turnover antecedents, we did not have a large enough sample of job leavers to create a model that could investigate how the relationship between predictor variables and turnover might change over time. It would be highly informative to see if the relative importance of context, attitudes, events, and organizational withdrawal changes after the initial entry period. Preliminary analyses conducted by Dickter et al. (1996) using the much larger NLSY sample demonstrated that early entry job

satisfaction became progressively worse as a predictor of subsequent turnover over time, although these results do not necessarily indicate that satisfaction becomes less important, but rather, could also indicate that early attitudes are less important as they shift over time, as was found in the current study. Their study specifically called for research examining how changes in turnover behavior required dynamic treatment of core constructs. A study that combines the methodology of the current study with the methodology of Dickter et al. could help to resolve questions about whether there is a change in the factors that drive turnover over time, or if the relationship between work attitudes and turnover is comparatively similar regardless of tenure.

In general, the results suggest that areas of context like perceived alternatives are not good predictors of turnover even when measured longitudinally across several occupations, while actual job alternatives as indexed by the unemployment rate are much better predictors. Even when the full model is run without unemployment rate included as a predictor, perceived alternatives are still not predictive of turnover. While the test of the theory of perceived alternatives does correspond closely to the methods advocated by turnover researchers (Steel, 2002), and would therefore seem to minimize the importance of subjective impressions of the labor market, the relationship between context and turnover may actually be more complex than that depicted in Figure 1. Context features may also influence attitudes about ones job in addition to withdrawal. Many job choice and attitude theories include notions of comparisons with alternatives and frames of reference, suggesting that satisfaction with one's job is influenced by perceptions about better (or worse) options available (Jovanovic, 1979; Thibaut & Kelley, 1959; Smith, Kendall, & Hulin, 1969; Hulin, 1991). Thus, perceiving superior job options may engender job dissatisfaction as well as withdrawal behaviors. This means that changes in perceptions of alternatives should affect changes in attitudes. Studies concentrating on dynamic

estimation of alternatives and perceived alternatives in the formation of attitudes would also be highly informative.

Another future direction 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. As it relates to Hulin's (1991) withdrawal and turnover typologies, this is not supportive of the alternate forms, spillover, compensatory, or progression-of-withdrawal models, all of which suggest a significant relationship between withdrawal and turnover. Instead, the results suggest that turnover and work withdrawal may be independent forms of organizational withdrawal. One complication to this result is that while the independent forms model implicitly assumes that employees who are dissatisfied but fail to turnover are those who do not have good options, 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. Instead, withdrawal had consistent, strongly negative relationships with work satisfaction over time. It appears that withdrawal may have an adaptive function of removing one from a negative work situation, but the conditions under which satisfaction leads to turnover as opposed to withdrawal remain to be seen.

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 early entry model, there should be more research that looks at perceptions at entry, or even pre-entry to investigate when these early perceptions of cost of job change and attitudes are formed. As noted earlier, pre-entry expectations regarding a job are predictive of subsequent satisfaction (Hom et al., 1999). 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 research on 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 pre-entry experiences might affect subsequent attitudes. One possible direction includes incorporating information about a workers' 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 turnover (McCall, 1990).

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 failure for an organization 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 leavers 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 showing how one leads to another in a way that has not been possible in cross sectional studies (Judge, Thoresen, Bono, & Patton, 2001).

A final area for future research is increased investigation of significant events. Because this study is the first prospective examination of critical events as antecedents of turnover, we

were primarily concerned with demonstrating the magnitude of possible effects. Our division of events into judgments of continuation events, discontinuation events, or neutral events is consistent with the unfolding model's focus on a phenomenological approach to how the same events affect each person differently, but we cannot answer what lead some people to conclude why events were likely to increase or decrease the likelihood of turnover. At present, there is not a specific theory of turnover related events that could guide us in understanding these judgmental processes, but the development of a typology of events and how they could be construed is a fascinating direction for future research.

The use of events studies also should examine the dynamics of events and turnover more closely. Our measurement periods were necessarily far apart in order to maintain our response rate, but more focused event-based studies could be important. The increasing use of event analysis, following from Weiss and Cropanzano (1996), has clearly demonstrated that there is much we could gain in our understanding of behavior in organizations by moving away from the treatment of attitudes as fixed properties and moving towards the treatment of discrete emotional events. Studies exploring discrete emotional reactions at work suggest that there may be substantial shifts within a person over time (Fisher, 2002; Grandey, Tam, & Brauburger, 2002; Illies & Judge, 2002). The current results demonstrate that such dynamic analyses may yield important insights if incorporated into the process of decisions to act, either in terms of turnover, or other behaviors. In addition, we need to take ideas from cognitive psychology about non-decisions and habit much more seriously if we want to understand organizational behavior (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 take more time to examine how intensely people are thinking

about whether to stay in their current jobs or not. The importance of events may actually be greater for employees with higher tenure, who are more likely to have formed initial impressions, as opposed to organizational newcomers who are more carefully evaluating their current jobs for match quality (Jovanovic, 1979; McCall, 1990).

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. While 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 co-workers (Sackett & Larson, 1990), future studies might examine variables more directly amenable to organizational control and observation measured by co-worker or supervisor surveys, such as provision of social support, working conditions, or pay and benefits. Second, the spacing of data was somewhat broader than we would have liked. We believe that surveys conducted every four months are informative, but a more detailed investigation that includes surveys conducted at the weekly or monthly level might provide even greater increases in predictive accuracy. Discrete events may, in the extreme, lead to quitting within days or weeks of their occurrence, making it even more important to get finer grained data over time. Third, although the study involved a much more diverse sample than many turnover studies, 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, 2002). Future research exploring the generalizability of these results to workers with comparatively fewer options could illustrate theoretical propositions not considered here.

References

Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin, 84*, 888-918.

Arnold, H.J., & Feldman, D.C. (1982). A multivariate analysis of the determinants of job turnover. *Journal of Applied Psychology, 67,* 350-360.

Bargh, J.A. (1997). The automaticity of everyday life. In R.S. Wyer (Ed.). *Advances in social cognition: Vol. 10* (pp. 1-61). Mahwah, NJ: Lawrence Erlbaum.

Barkema, H.G., Baum, J.A.C., & Mannix, E. A. (2002). Management challenges in a new time. *Academy of Management Journal, 45,* 916-930.

Beach, L.R. (1990). *Image theory: Decision making in personal and organizational contexts*. Chichester, UK: John Wiley and Sons.

Blau, G. (1993). Further exploring the relationship between job search and voluntary individual turnover. *Personnel Psychology, 46,* 313-330.

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

Bozdogan, H. (1987). Model selection and Akaike's information criterion (AIC): The general theory and its analytical extensions. *Psychometrika, 52,* 345-370.

Bryk, A.S., & Raudenbush, S.W. (1992). *Hierarchical linear models*. Newbury Park, CA: Sage.

Cable, D.M., & Turban, D.B. (2001). Establishing the dimensions, sources, and value of job seekers' employer knowledge during recruitment. In G. R. Ferris (Ed.). *Research in*

Personnel and Human Resources Management (Vol. 20, pp. 115-163). Greenwich, CT: JAI Press.

Carsten, J. M., & Spector, P. E. (1987). Unemployment, job satisfaction and employee turnovers*:* A meta-analytic test of the Muchinsky model. *Journal of Applied Psychology, 72*, 374-381.

Cohen, A. (1993). Organizational commitment and turnover: A meta-analysis. *Academy of Management Journal, 36,* 1140-1157.

Cortina, J.M., & Folger, R.G. (1998). When is it acceptable to accept a null hypothesis: No way, Jose? *Organizational Research Methods, 1*, 334-350.

Dickter, D.N., Roznowski, M., & Harrison, D.A. (1996). Temporal tempering: An event history analysis of the process of voluntary turnover. *Journal of Applied Psychology, 81,* 705-716.

Dougherty, T.W., Turban, D.B., & Callender, J.C. (1994). Confirming first impressions in the employment interview: A field study of interviewer behavior. *Journal of Applied Psychology, 79*, 659-665.

Eagly, A.H., & Chaiken, S. (1993). *The psychology of attitudes.* Orlando, FL: Harcourt College Publishers.

Farrell, D., & Rusbult, C. E. (1981). Exchange variables as predictors of job satisfaction, job commitment, and turnover: The impact of rewards, costs, alternatives, and investments. *Organizational Behavior and Human Performance, 28*, 78-95.

Fisher, C.D. (2002). Antecedents and consequences of real-time affective reactions at work. *Motivation and Emotion, 26,* 3-30.

Gerhart, B. (1990). Voluntary turnover and alternative job opportunities. *Journal of Applied Psychology, 75*, 467-476.

Grambsch, P. M., & Therneau, T. M. (1994). Proportional hazards tests and diagnostics based on weighted residuals. *Biometrika, 81*, 515-526.

Grandey, A.A., Tam, A.P., & Brauburger, A.L. (2002). Affective states and traits in the workplace: Diary and survey data from young workers. *Motivation and Emotion, 26*, 31-55.

Hanisch, K. A., & Hulin, C. L. (1990). Job attitudes and organizational withdrawal: An examination of retirement and other voluntary withdrawal behaviors. *Journal of Vocational Behavior, 37*, 60-78.

Hollenbeck, J.R., & Williams, C.R. (1986). Turnover functionality versus turnover frequency: A note on work attitudes and organizational effectiveness. *Journal of Applied Psychology, 71*, 606-611.

Hom, P.W., & Griffeth, R.W. (1991). Structural equations modeling test of a turnover theory: Cross-sectional and longitudinal analyses. *Journal of Applied Psychology, 76*, 350-366.

Hom, P.W., & Griffeth, R.W. (1995). *Employee turnover*. Cincinnati, OH: South-Western.

Hom, P.W., Griffeth, R.W., Palich, L.E., & Bracker, J.S. (1999). Revisiting met expectations as a reason why realistic job previews work. *Personnel Psychology, 52*, 97-112.

Hom, P.W., & Kinicki, A.J. (2001). Toward a greater understanding of how dissatisfaction drives employee turnover. *Academy of Management Journal, 44*, 975-987.

Hulin, C. L. (1991). Adaptation, persistence, and commitment in organizations. In M. D. Dunnette (Ed.), *Handbook of industrial organizational psychology: Vol 2* (2nd ed., pp. 435-505). New York: Wiley.

Hulin, C.L., & Ilgen, D.R. (2000). Introduction to modeling in organizations: The good modeling does. In D.R. Ilgen & C.L. Hulin (Eds.), *Computational modeling of behavioral processes in organizational research* (pp. 3-18). Washington, DC: American Psychological Association.

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.

Ilies, R., & Judge, T.A. (2002). Understanding the dynamic relationship among personality, mood, and job satisfaction: A field experience sampling study. *Organizational Behavior and Human Decision Processes, 89,* 1119-1139.

Irving, P. G., & Meyer, J. P. (1994). Reexamination of the met-expectations hypothesis: A longitudinal analysis. *Journal of Applied Psychology, 79,* 937-949.

Jovanovic, B. (1979). Job matching and the theory of turnover." *Journal of Political Economy, 87,* 972-990.

Judge, T. A., & Larsen, R. J. (2001). Dispositional affect and job satisfaction: A review and theoretical extension. *Organizational Behavior and Human Decision Processes, 86,* 67-98.

Judge, T. A., Thoresen, C. J., Bono, J. E., & Patton, G. K. (2001). The job satisfaction-job performance relationship: A qualitative and quantitative review. *Psychological Bulletin, 127,* 376-407.

Kenny, D. A., Kashy, D. A., & Bolger, N. (1998). Data analysis in social psychology. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology: Vol. 1* (4th ed., pp. 233-265). Boston, MA: McGraw-Hill.

Kinicki, A. J., McKee-Ryan, F. M., Schriesheim, C. A., & Carson, K. P. (2002). Assessing the construct validity of the Job Descriptive Index: A review and meta-analysis. *Journal of Applied Psychology, 87,* 14-32.

Kozlowski, S. W. J., & Klein, K. J. (2000). A multilevel approach to theory and research in organizations: Contextual, temporal, and emergent processes. In K.J. Klein & S.W.J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 3-90). San Francisco, CA: Jossey-Bass.

Lee, T.W., Ashford, S.J., Walsh, J.P., & Mowday, R.T. (1992). Commitment propensity, organizational commitment, and voluntary turnover: A longitudinal study of organizational entry processes. *Journal of Management, 18,* 15-32.

Lee, T. W., & Mitchell, T. R. (1994). An alternative approach: The unfolding model of voluntary employee turnover. *Academy of Management Review, 19,* 51-89.

Lee, T. W., Mitchell, T. R., Holtom, B. C.; McDaniel, L. S., Hill, J. W. (1999). The unfolding model of voluntary turnover: A replication and extension. *Academy of Management Journal, 42,* 450-462.

Lee, T. W., Mitchell, T. R., Wise, L., & Fireman, S. (1996). An unfolding model of voluntary employee turnover. *Academy of Management Journal, 39,* 5-36.

Magee, L. (1990). R^2 measures based on Wald and likelihood ratio joint significance tests. *The American Statistician, 44,* 250-253.

Maslach, C., Schaufeli, W.B., & Leiter, M.P. (2001). Job burnout. *Annual Review of Psychology, 52,* 397-422.

McCall, B.P. (1990). Occupational matching: A test of sorts. *Journal of Political Economy, 98,* 45-69.

Meyer, J.P., & Allen, N.J. (1997). *Commitment in the workplace: Theory, research, and application.* Thousand Oaks, CA: Sage.

Meyer, J. P., Stanley, D. J., Herscovitch, L., & Topolnytsky, 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.

Mitra, A., Jenkins, G. D., & Gupta, N. (1992). A meta-analytic review of the relationship between absence and turnover. *Journal of Applied Psychology, 77*, 879-889.

Mitchell, T. R., Holtom, B. C., Lee, T. W.; Sablynski, C. J., Erez, M. (2001). Why people stay: Using job embeddedness to predict voluntary turnover. *Academy of Management Journal, 44*, 1102-1121.

Mobley, W. H. (1977). Intermediate linkages in the relationship between job satisfaction and employee turnover. *Journal of Applied Psychology, 62*, 237-240.

Mobley, W.H. (1982). *Employee turnover: Causes, consequences, and control*. Reading, MA: Addison-Wesley.

Mobley, W. H., Griffeth, R. W., Hand, H. H., & Meglino, B. M. (1979). Review and conceptual analysis of the employee turnover process. *Psychological Bulletin, 86*, 493-522.

Morita, J. G., Lee, T. W., & Mowday, R. T. (1993). The regression-analog to survival analysis: A selected application to turnover research. *Academy of Management Journal, 36*, 1430-1464.

Mowday, R. T., Porter, L. W., & Steers, R. M. (1982). *Employee-organization linkages.* New York: Academic Press.

Mowday, R. T., Steers, R. M., & Porter, L. W. (1979). The measurement of organizational commitment. *Journal of Vocational Behavior, 14*, 224-247.

Muchinsky, P. M., & Morrow, P. C. (1980). A multidisciplinary model of voluntary employee turnover. *Journal of Vocational Behavior, 17*, 263-290.

Porter, L. W., Steers, R. M., Mowday, R. T., & Boulian, P. V. (1974). Organizational commitment, job satisfaction, and turnover among psychiatric technicians. *Journal of Applied Psychology, 59*, 603-609.

Price, J. L., & Mueller, C. W. (1981). A causal model of turnover for nurses. *Academy of Management Journal, 24*, 543-565.

Raudenbush, S. W., Bryk, A. S., Cheong, Y. F., & Congdon, R. T. (2001). *HLM 5: Hierarchical linear and nonlinear modeling*. Lincolnwood, IL: Scientific Software International.

Reichers, A. E. (1985). A review and reconceptualization of organizational commitment. *Academy of Management Review, 10*, 465-476.

Rogosa, D.R., Brandt, D., & Zimowski, M. (1982). A growth curve approach to the measurement of change. *Psychological Bulletin, 92*, 726-748.

Rusbult, C.E., & Farrell, D. (1983). A longitudinal test of the investment model: The impact on job satisfaction, job commitment, and turnover of variations in rewards, costs, alternatives, and investments. *Journal of Applied Psychology, 68*, 429-438.

Sackett, P. R., and Larson, J. (1990). Research strategies and tactics in I/O psychology. In M. D. Dunnette and L. Hough (Eds.) *Handbook of Industrial and Organizational Psychology: Vol. 1* (2nd Ed., pp. 419-490). Palo Alto, CA: Consulting Psychologists Press

Schein, E.H. (1978). *Career dynamics: Matching individual and organizational needs*. Reading, MA: Addison-Wesley.

Schneider, B. (1987). The people make the place. *Personnel Psychology, 40,* 437-453.

Shadish, W.R., Cook, T.D., Campbell, D.T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston, MA: Houghton Mifflin.

Sheridan, J.E., & Abelson, M.A. (1983). Cusp catastrophe model of employee turnover. *Academy of Management Journal, 26,* 418-436.

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

Smith, P. C., Kendall, L., & Hulin, C. L. (1969). *The measurement of satisfaction in work and retirement*. Chicago: Rand McNally.

Stanton, J. M., Sinar, E.F., Balzer, W.K., Julian, A.L., Thoresen, P., Aziz, S., Fisher, G.G., & Smith, P.C. (2002). Development of a compact measure of job satisfaction: The abridged Job Descriptive Index. *Educational & Psychological Measurement. 62,* 173-191

Steel, R. P. (2002). Turnover theory at the empirical interface: Problems of fit and function. *Academy of Management Review, 27,* 346-360.

Steel, R. P., & Griffeth, R. W. (1989). The elusive relationship between perceived employment opportunity and turnover behavior: A methodological or conceptual artifact? *Journal of Applied Psychology, 74,* 846-854.

Steel, R. P., & Ovalle, N. K. (1984). A review and meta-analysis of research on the relationship between behavioral intentions and employee turnover. *Journal of Applied Psychology, 69,* 673-686.

Steers, R., & Mowday, R. (1981). Employee turnover and post-decision accommodation processes. In L.L. Cummings & B.M. Staw (Eds.). *Research in Organizational Behavior: Vol. 3,* (pp. 235-281). Greenwich, CT: JAI Press.

Tett, R. P., & Meyer, J. P. (1993). Job satisfaction, organizational commitment, turnover intention, and turnover: Path analyses based on meta-analytic findings. *Personnel Psychology, 46*, 259-293.

Thibaut, J. W., & Kelley, H. H. (1959). *The social psychology of groups*. New York: Wiley.

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

Trevor, C.O., Gehart, B., & Boudreau, J.W. (1997). Voluntary turnover and job performance: Curvilinearity and the moderating influences of salary growth and promotions. *Journal of Applied Psychology, 82,* 44-61.

Wanous, J.P. (1992). *Organizational Entry: Recruitment, Selection, Orientation, and Socialization of Newcomers*. Reading, MA: Addison-Wesley.

Wanous, J.P., Reichers, A.E., & Hudy, M.J. (1997). Overall job satisfaction: How good are single-item measures? *Journal of Applied Psychology, 82*, 247-252.

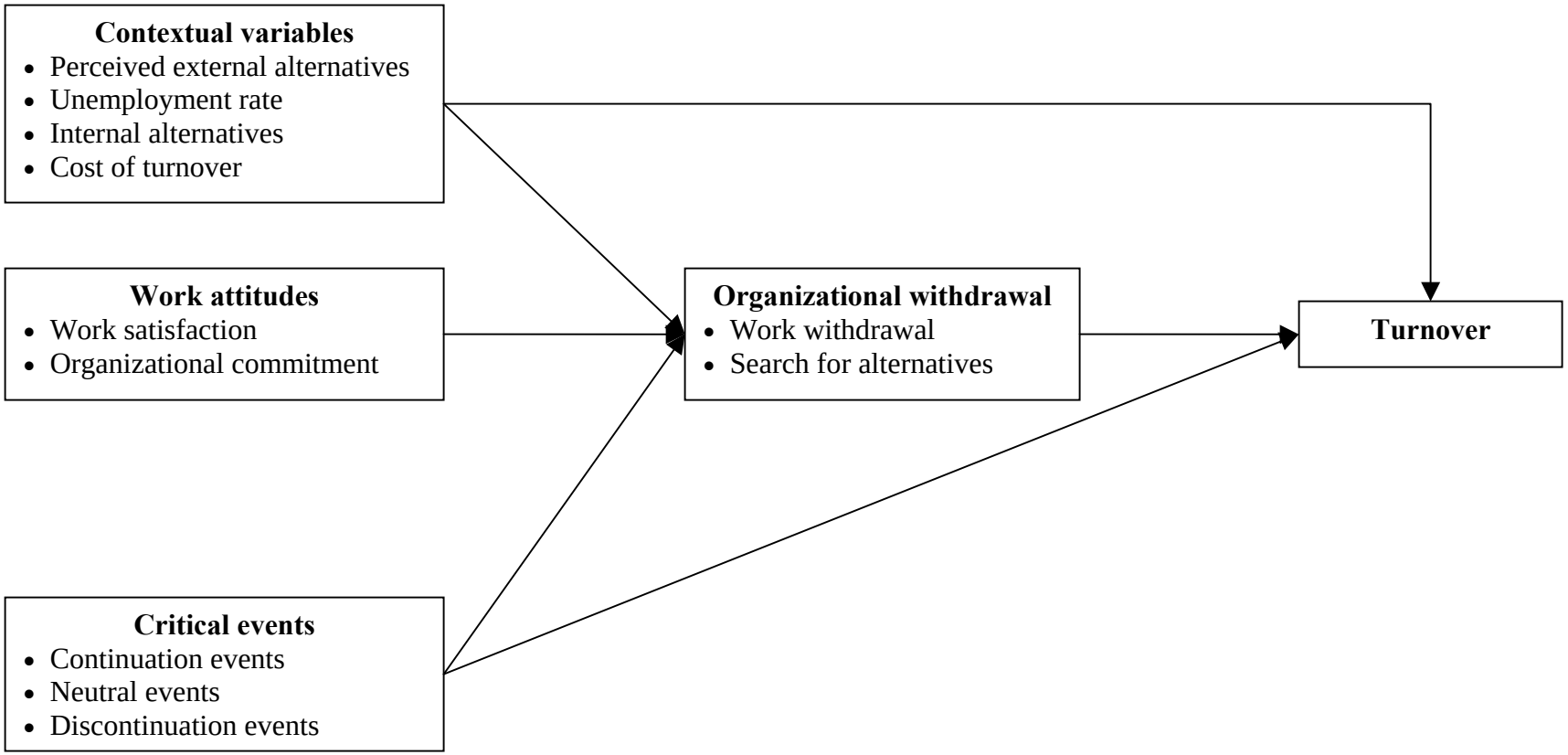
Weiss, H.M.& Cropanzano, R. (1996). Affective events theory: A theoretical discussion of the structure, causes and consequences of affective experiences at work. In B.M. Staw and L.L. Cummings (Eds.), *Research in Organizational Behavior: Vol. 19* (pp. 1-74). Greenwich, CT: JAI Press.

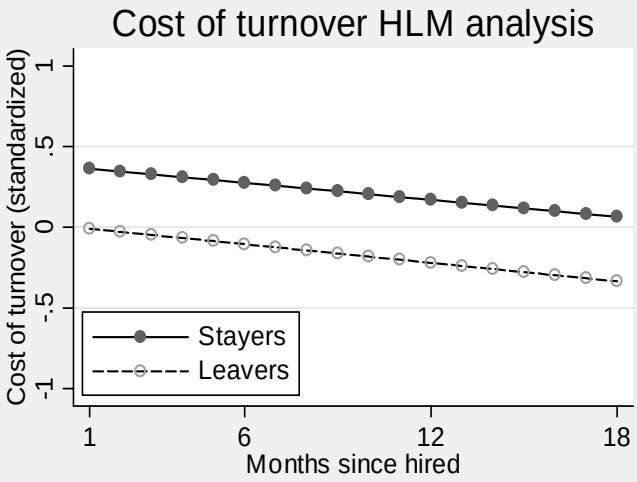
Youngblood, S., Mobley, W., & Meglino, B. (1983). A longitudinal analysis of the turnover process. *Journal of Applied Psychology, 68*, 507-516.

Figure Captions

Figure 1. Turnover model in the current study

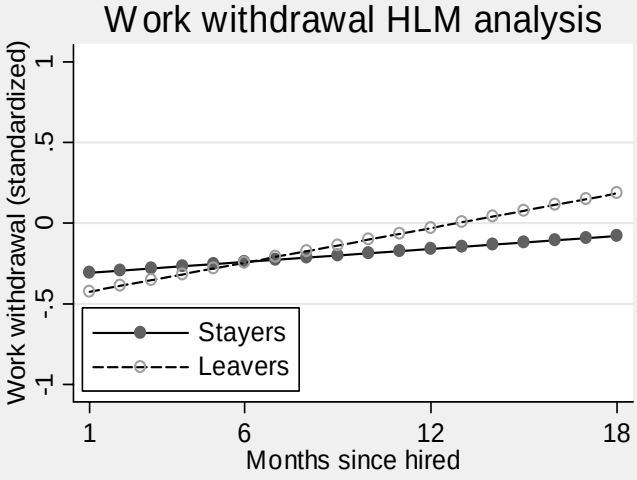
Figure 2. HLM Graphical Results


Contextual variables
Perceived external alternatives
Unemployment rate
Internal alternatives
Cost of turnover
Work attitudes
Work satisfaction
Organizational commitment
Organizational withdrawal
Work withdrawal
Search for alternatives
Turnover
Critical events
Continuation events
Neutral events
Discontinuation events


Cost of turnover HLM analysis
Cost of turnover (standardized)
-1
-.5
0
.5
1
Stayers
Leavers
1
6
12
18
Months since hired


Commitment HLM analysis
Commitment (standardized)
-1
-.5
0
.5
1
Stayers
Leavers
1
6
12
18
Months since hired


Work satisfaction HLM analysis
Work satisfaction (standardized)
-1
-.5
0
.5
1
Stayers
Leavers
1
6
12
18
Months since hired


Work withdrawal HLM analysis
Work withdrawal (standardized)
-1
-.5
0
.5
1
Stayers
Leavers
1
6
12
18
Months since hired

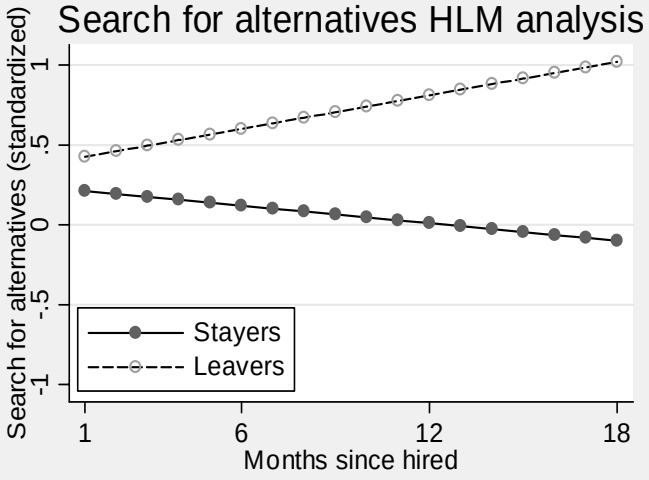

Search for alternatives HLM analysis
Search for alternatives (standardized)
-1
-.5
0
.5
1
Stayers
Leavers
1
6
12
18
Months since hired

Table 1.
Scale means over time.

	ICC(1)	Round 1		Round 2		Round 3		Round 4		Round 5		Univariate survival	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Entry	Dynamic
Context													
External alternatives	.61	.09	1.07	.15	.99	.01	.96	-.17	.97	-.21	.91	.27*	.37**
Unemployment rate	.14	1.95	.45	2.13	.71	2.61	.91	3.11	1.09	3.56	1.08	-.15	-.34**
Internal alternatives	.48	.14	1.03	.11	1.00	-.06	.97	-.11	.99	-.17	.96	.15	.15
Cost of turnover	.61	.05	1.03	.01	1.02	-.04	1.02	.01	.95	-.02	.98	-.30**	-.37**
Attitudes													
Org. commitment	.62	.24	.97	.03	.94	-.13	.99	-.13	1.04	-.13	1.03	-.36**	-.54**
Work satisfaction	.46	.07	.86	.04	.97	-.03	1.08	-.10	1.07	-.06	1.06	-.30**	-.43**
Critical events													
Continuation events	.10	.58	.75	.18	.43	.18	.46	.25	.54	.22	.47	-.24	-.07
Neutral events	.16	.48	.68	.37	.60	.29	.56	.38	.64	.34	.58	.00	-.01
Discontinuation events	.20	.06	.30	.09	.33	.11	.34	.10	.36	.09	.35	.88**	1.03**
Organizational withdrawal													
Work withdrawal	.70	-.02	.94	-.05	.96	.04	1.03	.07	1.10	.04	1.03	.02	.22*
Search for alternatives	.41	-.31	.60	-.04	.90	.07	1.06	.18	1.13	.24	1.23	.31**	.45**

n=932. * p < .05. ** p < .01
ICC(1) is the intraclass correlation coefficient and represents the proportion of variance explained within each individual.
External alternatives, internal 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.

Table 2.

Scale correlations at Time 1.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Gender	1.00													
2. Experience	.02	1.00												
3. Education	-.02	.09	1.00											
4. External alternatives (T1)	-.05	-.16	-.12	1.00										
5. Unemployment rate (T1)	.14	.11	-.08	-.04	1.00									
6. Internal alternatives (T1)	-.02	-.18	-.21	.41	-.12	1.00								
7. Cost of turnover (T1)	.15	.03	.00	-.38	.04	-.21	1.00							
8. Org. commitment (T1)	-.02	.03	-.06	-.13	-.05	.04	.08	1.00						
9. Work satisfaction (T1)	.02	.11	.14	-.24	.00	-.15	.15	.34	1.00					
10. Continuation events (T1)	-.06	.01	.08	-.14	-.04	-.04	.08	.11	.11	1.00				
11. Neutral events (T1)	.04	.04	.08	.11	-.04	.08	-.01	-.11	-.03	-.26	1.00			
12. Discontinuation events (T1)	.07	.00	.00	.10	.02	.07	-.05	-.19	-.20	-.09	.00	1.00		
13. Work withdrawal (T1)	-.08	-.15	-.11	.05	-.02	.08	-.03	-.19	-.26	-.04	.09	.08	1.00	
14. Search for alternatives (T1)	.02	-.01	.02	.13	.05	.06	-.13	-.26	-.31	-.08	.06	.27	.14	1.00

n=932. Correlations > .07 are significant at p<.05, correlations > .09 are significant at p<.01.

The full correlation matrix over time is available from the first author on request.

Table 3.

Proportional hazards regression models

	Entry Model		Dynamic Model	
	Reduced	Full	Reduced	Full
Demographic controls				
Gender	.17	.17	.18	.18
Experience	-.05	-.05	.03	.09
Education	-.22	-.25	-.29*	-.34**
Context				
External alternatives	.10	.10	.10	.13
Unemployment rate	-.22	-.21	-.76**	-.78**
Internal alternatives	.06	.05	.10	.10
Cost of turnover	-.31**	-.32**	-.29**	-.27**
Attitudes				
Org. commitment	-.25*	-.24*	-.27*	-.17
Work satisfaction	-.16	-.14	-.30**	-.20
Critical events				
Continuation events	-.16	-.14	.15	.13
Neutral events	-.12	-.08	-.04	-.01
Discontinuation events	.20**	.18**	.25**	.22**
Organizational withdrawal				
Work withdrawal		-.12		.06
Search for alternatives		.12		.25**
Model degrees of freedom	25	27	25	27
Model chi-square	101	102	187	223
AIC	1153	1154	1093	1088
pseudo R^2	.10	.10	.18	.21

Note: *n*=932. * p < .05. ** p < .01
Coefficients for organization and occupation dummy variables are not depicted but are available from the first author on request.
AIC= Akaike's information criterion, pseudo-R^2=1-exp(-÷^{2}/n)
The entry model used Time 1 values of all predictors, while the dynamic model used repeated measures of all predictors.
All predictors were standardized prior to analysis.

Table 4.

Hierarchical linear models for changes over time

	Intercepts				*Slopes*			
Outcome variable	γ_{00}	*s.e.*	$\gamma_{01}(leaver)$	*s.e.*	γ_{10}	*s.e.*	$\gamma_{11}(leaver)$	*s.e.*
Context								
External alternatives	.13	.19	.12	.13	-.12	.15	.14	.12
Internal alternatives	-.24	.19	.18	.13	.01	.16	-.13	.13
Cost of turnover	.38	.20	-.37*	.13	-.21	.15	-.02	.11
Attitudes								
Org. commitment	.29	.19	-.26*	.13	-.04	.16	-.38**	.12
Work satisfaction	.25	.20	-.30*	.14	-.07	.18	-.25	.14
Organizational withdrawal								
Work withdrawal	-.32	.18	-.14	.12	.16	.13	.27*	.10
Search for alternatives	.23	.20	.16	.13	-.22	.20	.64**	.15

Note: Group-level *n*=932. * p < .05. ** p < .01
Coefficients for organization and occupation dummy variables, as well as controls for gender, experience, and education are not depicted but are available from the first author on request. All outcome variables were standardized prior to analysis.