Predictors of Staff Turnover and Turnover Intentions within Addiction Treatment Settings: Change Over Time Matters

Bryan R. Garner[1] and Brooke D. Hunter[2]

[1]Chestnut Health Systems, Normal, IL, USA. [2]Minnesota Department of Human Services, Saint Paul, MN, USA.

ABSTRACT: This study examined the extent to which changes over time in clinicians' responses to measures of work attitude (eg, job satisfaction) and psychological climate (eg, supervisor support) could predict actual turnover and turnover intentions above and beyond absolute levels of these respective measures. Longitudinal data for this study were collected from a sample of clinicians ($N = 96$) being trained to implement an evidence-based treatment for adolescent substance use disorders. Supporting findings from a recent staff turnover study, we found job satisfaction change was able to predict actual turnover above and beyond average levels of job satisfaction. Representing new contributions to the staff turnover literature, we also found that change over time in several other key measures (eg, job satisfaction, role manageability, role clarity) explained a significant amount of variance in turnover intentions above and beyond the absolute level of each respective measure. A key implication of the current study is that organizations seeking to improve their ability to assess risk for staff turnover may want to consider assessing staff at multiple points in time in order to identify systematic changes in key employee attitudes like turnover intentions and job satisfaction.

KEYWORDS: turnover, retention, staff, workforce

CORRESPONDENCE: brgarner@chestnut.org

Introduction

Each year, approximately one in three clinicians and one in five clinical supervisors turnover within addiction treatment organizations,[1,2] with other research reporting that staff turnover rates range from approximately 19[3] to 50%.[4] Although recent research has suggested clinician and supervisor turnover may not have the adverse consequences on client outcomes that has been commonly assumed,[2,5] turnover undoubtedly has other costs, including financial costs (eg, hiring costs, training costs).[6–8] Given that many addiction treatment organizations operate on tight budgets, staff turnover consequently represents an issue of significant concern. Thus, research that will help better understand the factors that contribute to staff turnover not only represents an important area of research,

but one that has the potential to help inform the development of new strategies or interventions to help improve retention of clinical staff.

Within the field of industrial–organizational (I–O) psychology, there is a large body of research on the predictors of turnover and turnover intentions.[9–13] Additionally, although small in comparison to the broader I–O literature, there is a rapidly growing body of literature on staff turnover and turnover intentions within the field of addiction treatment.[1–5,14–26] However, as recently noted by Chen and colleagues,[27] the existing staff turnover literature has not yet addressed the extent to which turnover and turnover intentions can be explained by changes in job satisfaction (ie, job satisfaction change). For example, Chen and colleagues noted that current

turnover theories do not explain "why job satisfaction change might uniquely influence turnover decisions, going above and beyond absolute levels of job satisfaction, or the unique mechanisms triggered by job satisfaction change" (p. 160). Similarly, they noted that prior research "has not examined whether job satisfaction change is related to turnover intentions change, or whether the changes in job satisfaction exert unique influences that go above and beyond the influence of average (static) levels of job satisfaction" (p. 160). In order to help illustrate the importance of this distinction, Chen and colleagues noted that while conventional turnover theory would hypothesize two employees from an organization who have identical levels of job satisfaction (eg, a rating of 4 on a 5-point Likert-type scale) have an equal likelihood of leaving the organization, conventional theories have yet to address the extent to which job satisfaction change (ie, systematic increase or decrease over time) would help explain turnover decisions above and beyond the absolute level of job satisfaction. That is, if one of these employee's job satisfaction had increased from 3 to 4 on the 5-point scale, while the other employee's job satisfaction had decreased from 5 to 4 on the same scale, would we still hypothesize that the two employees had an equal likelihood of leaving the organization?

Guided by a new theoretical framework that integrated and built upon several existing theories, Chen and colleagues[27] used data from three diverse samples (eg, British Army, Consulting Firm, U.S. Army) to attempt to address this question and better understand the function of job satisfaction change. Chen and colleagues'[27] "integrative theoretical framework" draws heavily from the prospect theory,[28,29] which suggests decision making is determined in large part by whether individuals frame decision choices as gain or losses and that in general individuals place greater weight on losses than gains, as well as spirals theory,[30,31] which similarly suggests individuals' decisions are influenced by systematic and sustained changes over time (ie, spirals). Overall, Chen and colleagues' results indicated that even after controlling for an average level of job satisfaction, increases in job satisfaction were significantly associated with decreases in turnover intention, and that decreases in job satisfaction were associated with increases in turnover intention.[27] Although these results were consistent with spirals theory,[30,31] which proposes that both absolute level and changes over time are important, the findings did not support prospect theory's proposition that individuals value losses more than gains. Additionally, using data from the one of these three studies that also had data on actual turnover (ie, British Army sample), Chen and colleagues examined whether changes in turnover intentions were a significant predictor of actual turnover. Although results did not support average turnover intentions as a predictor of actual turnover, results did suggest that turnover intentions change had a significant positive relationship with actual turnover.

Building upon Chen and colleagues'[27] research, a primary aim of the present study was to examine the extent to which the findings of Chen and colleagues generalize to a sample of addiction treatment clinicians. An exploratory secondary aim of the study was to expand upon Chen and colleagues' model by exploring the extent to which changes in other measures shown to be related to turnover intentions and actual turnover (eg, supervisor support, coworker support, role clarity) are able to predict actual turnover and turnover intentions above and beyond the average level of these measures.

Method

Data source. Data for the current study were collected as part of a larger project focused on improving implementation of evidence-based treatment for adolescent substance use disorders. Detailed descriptions of this parent project have been reported previously.[32,33] Briefly, however, as part of the parent project, clinicians completed confidential surveys regarding the organizational climate of their institution at study entry as well as at three and six months post entry. Informed consent was obtained from each clinician prior to survey completion, and clinicians were instructed that their participation was strictly voluntary and that they could opt out at any time. Clinicians received $50 compensation for completing each survey. Approval was granted for all study procedures by Chestnut Health Systems' institutional review board.

Clinicians who participated in the parent project were employed by one of the 29 treatment organizations that had received a federal grant from the Substance Abuse and Mental Health Services Administration to implement the Adolescent Community Reinforcement Approach for the treatment of substance use disorders. Twenty-seven organizations received approximately $900,000 and two organizations received approximately $1.5 million across a three-year period to implement the treatment and serve clients. These organizations are located across the US and serve diverse communities.

Participants. Of the 105 clinicians who were eligible and agreed to participate (88% participation rate) in the parent project, 96 (91% follow-up rate) had completed at least one follow-up survey and were included in the current study. At baseline, participants had an average age of 36 (SD = 11) and were 73% female, 14% African American, 55% Caucasian, 24% Hispanic, and 7% reported other race. Clinicians reported having an average of 4.2 (SD = 5.5) years of experience in substance use disorder treatment, with 5% having some college or an Associate's degree, 40% having a Bachelor's degree, 53% having a Master's degree, and 2% having a doctoral degree. Thus, the current sample of clinicians is highly similar to other samples of addiction treatment clinicians that have been reported in the literature.[17,20,34] One notable difference was that relative to these other studies, where approximately half of the clinicians reported being in recovery, a much lower percentage of clinicians in our sample reported being in recovery (5%).

Measures. *Work attitudes.* The work attitude measures were created from several different instruments including the

short form of the Minnesota Satisfaction Questionnaire,[35] the pay satisfaction questionnaire,[36] the job involvement scale,[37,38] and the turnover intentions scale, which was based on items used by Walsh et al.[39] Using the same sample as reported in this article, Garner and Hunter[24] factor analyzed the items from these instruments, which resulted in the creation of five scales: (1) job satisfaction (17 items; alpha = 0.93), (2) pay satisfaction (10 items; alpha = 0.95), (3) benefit satisfaction (4 items; alpha = 0.94), (4) turnover intentions (4 items; alpha = 0.79), and (5) job involvement (3 items; alpha = 0.70). The job satisfaction, pay satisfaction, and benefits satisfaction scales all range from 1 to 5, and the turnover intentions and job involvement scales range from 1 to 7.

Psychological climate. The psychological climate measures were created from items included in the Psychological Climate Questionnaire[40] and the organizational climate domain of the Organizational Readiness for Change instrument.[41] Using the same sample as reported in this article, Garner and Hunter[24] factor analyzed the items from both instruments, which resulted in the creation of five scales: (1) supervisor support (19 items; alpha = 0.96), (2) coworker support (12 items; alpha = 0.94), (3) role overload (13 items; alpha = 0.92), (4) role clarity (5 items; alpha = 0.87), and (5) job challenge and autonomy (7 items; alpha = 0.68). All items included in the psychological climate sub-scales have a 7-point Likert response scale. For the purpose of easing interpretation of the results, role overload has been reverse scored to create a scale called role manageability.

Each of the models reported in this study included transformations of the original work attitude and psychological climate scales. Because change is relative to each participant's frame of reference, a "static" or absolute value of the independent variable was created by computing an average of all available time points for each scale. The change score was created by subtracting the last available follow-up measurement (the 6-month assessment was used [$n = 85$] unless the participant had turned over prior, then the 3-month assessment was used [$n = 11$]) from the baseline measurement. Because prospect theory posits that losses are perceived as more salient than gains, a dichotomous indicator was created where all clinicians who experienced negative change or "worsening" for the scale were coded as 1 and all other clinicians were coded as 0. Finally, an interaction term was created from the change score and the worsening indicator to test whether the direction of change moderated the relationship between the magnitude of change and the dependent variables.

Outcomes. The employment status of each of the clinicians who participated in the parent study was tracked during the course of the parent study. The date of actual staff turnover was recorded for all clinicians whose employment was terminated from their organization for any reason. The dates and turnover status were then used to create discrete-time intervals for survival analysis: 4–6, 7–9, 10–12, and 13–18 months post baseline. Turnover intention was utilized as a dependent measure, where the last wave of available data served as the outcome (six months post baseline assessment [$n = 85$] unless participant had turned over prior [$n = 11$]).

Analytic plan. Two series of analyses were conducted for this study, with the first series modeling actual turnover as the dependent measure. Using multilevel discrete-time survival analyses with proportional odds assumptions of the hazards of the event (ie, turnover), four models were analyzed for each of the psychological climate scales and the four remaining work attitude scales: (1) Model 1 included the average scale measure as the independent variable; (2) Model 2 included the change score as the independent variable; (3) Model 3 included both the average scale measure and the change score as independent measures; and (4) Model 4 included the average scale measure, the change score, the worsening indicator, and the interaction as independent measures. A discrete-time survival analysis was chosen because turnover could have happened at any time during the follow-up or observation period, and thus a survival analysis allowed for these events to be right censored. Clinicians were represented in level-1 of the model and were nested within treatment sites at level-2 of the model. While we did not have site level data to predict variance at level-2 of the model, we chose to use a multilevel design in order to control for possible violations of the assumption of independence of observations.

A second series of analyses used multilevel (clinicians nested within treatment agency) regression analysis to model turnover intentions from the last wave of observation as the dependent measure. Again, each of the four models described above were analyzed with each of the work attitude and psychological climate scales as independent measures. For all four models, the measure of turnover intentions from study entry was included as a covariate.

Results

Twenty-one (22%) of the 96 clinicians included in this study turned over during the course of observation. Of the clinicians who did turnover, the average length of time from their baseline assessment to their event date was 9.8 months (SD = 4.5; Range = 4.0–18.6).

The role of change in predicting actual turnover. *Measures of work attitude.* Table 1 summarizes the results of the multilevel discrete-time survival analyses conducted to investigate the predictive ability of the work attitudes scales on actual turnover. The average measures of job satisfaction and turnover intentions significantly predicted turnover in models 1, 3, and 4. Higher average job satisfaction was associated with the decreased likelihood of turnover (0.31 times as likely to turnover for each 1-unit increase in static job satisfaction), and higher average turnover intentions were associated with the increased likelihood of turnover (2.07 times more likely to turnover for each 1-unit increase in static turnover intentions). Average job involvement significantly predicted turnover in models 1, 3, and 4, indicating that higher average job

Table 1. Work attitude changes as a predictor of turnover.

	MODEL 1				MODEL 2				MODEL 3				MODEL 4			
	b	*SE*	*P*	*e^b*	*b*	*SE*	*P*	*e^b*	*b*	*SE*	*P*	*e^b*	*b*	*SE*	*P*	*e^b*
Job Satisfaction (n = 96)																
Average job satisfaction	**–1.10**	**0.47**	**0.02**	**0.33**	–	–	–	–	**–1.14**	**0.48**	**0.02**	**0.32**	**–1.16**	**0.47**	**0.01**	**0.31**
Job satisfaction change	–	–	–	–	0.11	0.47	0.81	1.12	0.31	0.47	0.52	1.36	0.81	0.84	0.34	2.24
Worsening	–	–	–	–	–	–	–	–	–	–	–	–	0.79	0.50	0.11	2.21
Change * worsening	–	–	–	–	–	–	–	–	–	–	–	–	0.10	1.09	0.93	1.10
R²		0.13				0.00				0.13				0.15		
Pay Satisfaction (n = 96)																
Average pay satisfaction	–0.09	0.31	0.76	0.91	–	–	–	–	–0.13	0.32	0.67	0.87	–0.23	0.36	0.53	0.80
Pay satisfaction change	–	–	–	–	0.43	0.44	0.33	1.53	0.46	0.47	0.34	1.58	1.24	0.67	0.06	3.46
Worsening	–	–	–	–	–	–	–	–	–	–	–	–	1.04	0.70	0.14	2.83
Change * worsening	–	–	–	–	–	–	–	–	–	–	–	–	–0.54	1.15	0.64	0.58
R²		0.00				0.03				0.03				0.07		
Benefit Satisfaction (n = 94)																
Average benefit satisfaction	–0.25	0.29	0.38	0.78	–	–	–	–	–0.25	0.29	0.38	0.78	–0.21	0.25	0.40	0.81
Benefit satisfaction change	–	–	–	–	0.04	0.29	0.88	1.04	0.04	0.29	0.89	1.04	**–1.09**	**0.55**	**0.05**	**0.34**
Worsening	–	–	–	–	–	–	–	–	–	–	–	–	–1.33	0.98	0.18	0.27
Change * worsening	–	–	–	–	–	–	–	–	–	–	–	–	0.82	0.96	0.39	2.27
R²		0.02				0.00				0.02				0.09		
Turnover Intention (n = 96)																
Average turnover intention	**0.54**	**0.15**	**0.00**	**1.71**	–	–	–	–	**0.61**	**0.18**	**0.00**	**1.84**	**0.73**	**0.21**	**0.00**	**2.07**
Turnover intention change	–	–	–	–	0.22	0.15	0.15	1.24	**0.29**	**0.15**	**0.05**	**1.34**	0.08	0.21	0.71	1.08
Worsening	–	–	–	–	–	–	–	–	–	–	–	–	1.13	1.36	0.41	3.09
Change * worsening	–	–	–	–	–	–	–	–	–	–	–	–	2.33	1.99	0.24	10.29
R²		0.13				0.02				0.18				0.24		
Job Involvement (n = 96)																
Average job involvement	**–0.46**	**0.23**	**0.04**	**0.63**	–	–	–	–	**–0.46**	**0.23**	**0.05**	**0.63**	**–0.56**	**0.24**	**0.02**	**0.57**
Job involvement change	–	–	–	–	–0.08	0.25	0.75	0.92	–0.08	0.24	0.75	0.93	**1.14**	**0.49**	**0.02**	**3.11**
Worsening	–	–	–	–	–	–	–	–	–	–	–	–	1.10	1.00	0.28	2.99
Change * worsening	–	–	–	–	–	–	–	–	–	–	–	–	**–1.25**	**0.60**	**0.04**	**0.29**
R²		0.05				0.00				0.05				0.12		

Notes: *b*, unstandardized coefficient. *e^b*, hazard odds (antilog of *b*). Significant results (*P* < 0.05) are presented in bold.

involvement was associated with the decreased likelihood of turnover (0.57 times as likely to turnover for each 1-unit increase in static job involvement). Job involvement change had a significant positive relationship with turnover (3.11 times more likely to turnover for each 1-unit increase in job involvement change). In model 4, the interaction for job involvement was significant, indicating that as the magnitude (gain or loss) of job involvement change worsened, the likelihood of turnover increased, thus moderating the relationship between job involvement change and turnover.

Measures of psychological climate. Table 2 summarizes the results of the multilevel discrete-time survival analyses conducted to investigate the predictive ability of the psychological climate scales on turnover. Average supervisor support and coworker support significantly predicted turnover in models 1, 3, and 4, indicating that higher average supervisor support or coworker support were associated with the decreased likelihood of turnover (0.62 times as likely to turnover for every 1-unit increase in average supervisor support and 0.65 times as likely to turnover for every 1-unit increase in average coworker support). In model 4, the interaction for role manageability was significant, indicating that as the magnitude (gain or loss) of change in role manageability worsened, the likelihood of turnover increased, thus moderating the relationship between role manageability change and turnover.

The role of change in predicting turnover intentions. *Measures of work attitude.* Table 3 summarizes the results of the multilevel regression analyses conducted to investigate the

Table 2. Measures of psychological climate change as predictors of actual turnover.

	MODEL 1				MODEL 2				MODEL 3				MODEL 4			
	b	SE	P	e^b	b	SE	P	e^b	b	SE	P	e^b	b	SE	P	e^b
Supervisor Support (n = 96)																
Average supervisor support	**−0.51**	**0.22**	**0.02**	**0.60**	−	−	−	−	**−0.50**	**0.24**	**0.03**	**0.60**	**−0.48**	**0.24**	**0.04**	**0.62**
Supervisor support change	−	−	−	−	−0.23	0.25	0.37	0.80	−0.04	0.26	0.88	0.96	0.74	1.02	0.47	2.09
Worsening	−	−	−	−	−	−	−	−	−	−	−	−	−0.02	0.72	0.98	0.98
Change * worsening	−	−	−	−	−	−	−	−	−	−	−	−	−0.92	1.04	0.38	0.40
R^2		0.08				0.02				0.08				0.12		
Coworker Support (n = 96)																
Average coworker support	**−0.41**	**0.19**	**0.03**	**0.66**	−	−	−	−	**−0.44**	**0.19**	**0.02**	**0.64**	**−0.43**	**0.20**	**0.04**	**0.65**
Coworker support change	−	−	−	−	0.15	0.38	0.69	1.17	0.23	0.34	0.49	1.26	−0.08	0.57	0.89	0.92
Worsening	−	−	−	−	−	−	−	−	−	−	−	−	−0.93	0.67	0.16	0.39
Change * worsening	−	−	−	−	−	−	−	−	−	−	−	−	−0.18	0.77	0.82	0.84
R^2		0.04				0.01				0.05				0.09		
Role Manageability (n = 96)																
Average role manageability	−0.27	0.17	0.10	0.76	−	−	−	−	−0.30	0.17	0.08	0.74	−0.27	0.17	0.11	0.76
Role manageability change	−	−	−	−	0.27	0.32	0.41	1.30	0.30	0.29	0.31	1.34	**1.12**	**0.44**	**0.01**	**3.07**
Worsening	−	−	−	−	−	−	−	−	−	−	−	−	0.68	0.71	0.34	1.97
Change * worsening	−	−	−	−	−	−	−	−	−	−	−	−	**−1.13**	**0.49**	**0.02**	**0.32**
R^2		0.03				0.02				0.06				0.09		
Role Clarity (n = 96)																
Average role clarity	**−0.48**	**0.23**	**0.04**	**0.62**	−	−	−	−	−0.43	0.25	0.08	0.65	**−0.32**	0.31	0.31	0.73
Role clarity change	−	−	−	−	−0.33	0.23	0.15	0.72	−0.15	0.21	0.47	0.86	0.45	0.40	0.25	1.57
Worsening	−	−	−	−	−	−	−	−	−	−	−	−	1.17	0.73	0.11	3.23
Change * worsening	−	−	−	−	−	−	−	−	−	−	−	−	−0.42	0.71	0.56	0.66
R^2		0.06				0.03				0.06				0.12		
Job Challenge and Autonomy (n = 95)																
Average job challenge & autonomy	−0.28	0.27	0.30	0.76	−	−	−	−	−0.02	0.34	0.95	0.98	0.02	0.33	0.96	1.02
Job challenge & autonomy change	−	−	−	−	**−0.77**	**0.38**	**0.04**	**0.46**	−0.77	0.45	0.09	0.47	0.18	0.98	0.86	1.19
Worsening	−	−	−	−	−	−	−	−	−	−	−	−	0.58	0.76	0.45	1.78
Change * worsening	−	−	−	−	−	−	−	−	−	−	−	−	−0.90	1.11	0.42	0.41
R^2		0.01				0.08				0.08				0.09		

Notes: b, unstandardized coefficient. e^b, hazard odds (antilog of b). Significant results ($P < 0.05$) are presented in bold.

predictive ability of each of the work attitude scales on turnover intentions. Job satisfaction was the only work attitude scale where the change score predicted turnover intentions above and beyond the average score (model 3) such that as change worsened, turnover intentions increased. In model 4, both the job satisfaction average and the interaction significantly predicted turnover intentions, which indicates that clinicians with lower static job satisfaction had higher turnover intentions and that clinicians experiencing a worsening of job satisfaction had even higher turnover intentions above and beyond clinicians with low-static job satisfaction.

Measures of psychological climate. Table 4 summarizes the results of the multilevel regression analyses conducted to investigate the predictive ability of each of the psychological climate scales on turnover intentions. Average supervisor support and coworker support significantly predicted turnover intentions in multiple models, indicating that higher static levels were related to decreased turnover intentions. Role manageability and role clarity were the only two psychological climate measures where the change score predicted turnover intentions above and beyond the average score (model 3) such that as change worsened, turnover intentions increased. Also, both of these measures had significant interaction, indicating that negative change was more salient than positive change (see model 4).

Discussion

Contributing to the staff turnover literature within the field of addiction treatment[1–5,14–26] and the broader base of staff

Table 3. Measures of work attitude change as predictors of turnover intentions at last observation.

	MODEL 1			MODEL 2			MODEL 3			MODEL 4		
	b	*SE*	*P*	*b*	*SE*	*P*	*b*	*SE*	*P*	*b*	*SE*	*P*
Job Satisfaction (n = 96)												
Turnover intentions at first wave	**0.49**	**0.09**	**0.00**	**0.64**	**0.06**	**0.00**	**0.52**	**0.08**	**0.00**	**0.53**	**0.08**	**0.00**
Average job satisfaction	**−0.62**	**0.25**	**0.02**	–	–	–	**−0.48**	**0.20**	**0.02**	**−0.45**	**0.20**	**0.02**
Job satisfaction change	–	–	–	**−0.69**	**0.20**	**0.00**	**−0.59**	**0.17**	**0.00**	−0.07	0.25	0.77
Worsening	–	–	–	–	–	–	–	–	–	−0.12	0.28	0.67
Change * worsening	–	–	–	–	–	–	–	–	–	**−0.96**	**0.39**	**0.01**
R^2		0.494			0.51			0.54			0.56	
Pay Satisfaction (n = 96)												
Turnover intentions at first wave	**0.55**	**0.07**	**0.00**	**0.65**	**0.06**	**0.00**	**0.56**	**0.07**	**0.00**	**0.56**	**0.08**	**0.00**
Average pay satisfaction	**−0.34**	**0.15**	**0.03**	–	–	–	**−0.33**	**0.16**	**0.03**	−0.35	0.18	0.05
Pay satisfaction change	–	–	–	−0.13	0.14	0.35	−0.10	0.14	0.48	0.00	0.22	1.00
Worsening	–	–	–	–	–	–	–	–	–	−0.02	0.32	0.94
Change * worsening	–	–	–	–	–	–	–	–	–	−0.24	0.47	0.61
R^2		0.47			0.45			0.48			0.48	
Benefit Satisfaction (n = 94)												
Turnover intentions at first wave	**0.43**	**0.05**	**0.00**	**0.64**	**0.06**	**0.00**	**0.59**	**0.07**	**0.00**	**0.42**	**0.05**	**0.00**
Average benefit satisfaction	−0.12	0.07	0.10	–	–	–	−0.17	0.11	0.11	−0.12	0.08	0.10
Benefit satisfaction change	–	–	–	−0.15	0.12	0.20	−0.15	0.11	0.18	−0.01	0.15	0.96
Worsening	–	–	–	–	–	–	–	–	–	0.00	0.23	0.99
Change * worsening	–	–	–	–	–	–	–	–	–	−0.17	0.20	0.40
R^2		0.45			0.45			0.46			0.46	
Job Involvement (n = 96)												
Turnover intentions at first wave	**0.62**	**0.06**	**0.00**	**0.65**	**0.06**	**0.00**	**0.62**	**0.06**	**0.00**	**0.62**	**0.06**	**0.00**
–	−0.23	0.17	0.17	–	–	–	−0.23	0.17	0.17	−0.23	0.16	0.16
Job involvement change	–	–	–	−0.08	0.09	0.38	−0.07	0.09	0.43	−0.06	0.26	0.83
Worsening	–	–	–	–	–	–	–	–	–	−0.01	0.30	0.98
Change * worsening	–	–	–	–	–	–	–	–	–	−0.02	0.32	0.94
R^2		0.46			0.45			0.47			0.47	

Notes: *b*, unstandardized coefficient. Significant results ($P < 0.05$) are presented in bold.

turnover research,[9–13] the present study sought to build upon recent research by Chen and colleagues[27] that offered a new theoretical perspective on the relationship between job satisfaction change and turnover intentions. With regard to predicting actual turnover, using data collected from soldiers in the British Army,[42] Chen and colleagues[27] found turnover intentions change, but not average turnover intentions, predicted actual turnover, as well as that adding average level of job satisfaction and job satisfaction change did not significantly predict actual turnover above and beyond turnover intentions change. Consistent with these findings, the present study, which used data collected from clinicians implementing evidence-based treatment for adolescents with substance use disorders, found turnover intention change had a significant positive relationship with actual turnover. Moreover, in contrast to the results presented by Chen and colleagues,[27] the

present study also found that average turnover intention was a significant predictor of actual turnover, which is consistent with the larger body of turnover research.[12]

Another important contribution of the present study is that it represents the first known study to examine the extent to which changes in other work attitude (eg, job involvement, pay satisfaction) and psychological climate (eg, supervisor support, coworker support, role manageability) scales predict turnover above and beyond average levels of these respective measures. Consistent with prior turnover research,[9–13] higher levels of average job satisfaction were significantly associated with a lower likelihood of turnover. Additionally, consistent with the findings of Chen and colleagues,[27] we did not find evidence of job satisfaction change as a significant predictor of actual turnover. Providing support for both spirals/velocity theory[30,31] and prospect theory,[28,29] we also found that not only

Table 4. Measures of psychological climate change as predictors of turnover intentions at last observation.

	MODEL 1			MODEL 2			MODEL 3			MODEL 4		
	b	*SE*	*P*	*b*	*SE*	*P*	*b*	*SE*	*P*	*b*	*SE*	*P*
Supervisor Support (n = 96)												
Turnover intentions at first wave	**0.52**	**0.09**	**0.00**	**0.63**	**0.06**	**0.00**	**0.52**	**0.08**	**0.00**	**0.52**	**0.08**	**0.00**
Average supervisor support	**−0.39**	**0.14**	**0.01**	–	–	–	**−0.32**	**0.12**	**0.01**	**−0.33**	**0.13**	**0.01**
Supervisor support change	–	–	–	−0.30	0.16	0.06	−0.23	0.14	0.10	−0.10	0.18	0.59
Worsening	–	–	–	–	–	–	–	–	–	0.32	0.23	0.17
Change * worsening	–	–	–	–	–	–	–	–	–	−0.05	0.31	0.87
R^2		0.51			0.49			0.53			0.54	
Coworker Support (n = 96)												
Turnover intentions at first wave	**0.52**	**0.10**	**0.00**	**0.67**	**0.06**	**0.00**	**0.55**	**0.09**	**0.00**	**0.56**	**0.09**	**0.00**
Average coworker support	**−0.38**	**0.18**	**0.03**	–	–	–	**−0.33**	**0.16**	**0.04**	−0.30	0.16	0.06
Coworker support change	–	–	–	−0.26	0.18	0.17	−0.18	0.16	0.27	0.39	0.30	0.19
Worsening	–	–	–	–	–	–	–	–	–	0.55	0.31	0.08
Change * worsening	–	–	–	–	–	–	–	–	–	−0.52	0.43	0.23
R^2		0.49			0.46			0.50			0.52	
Role Manageability (n = 96)												
Turnover intentions at first wave	**0.48**	**0.08**	**0.00**	**0.74**	**0.04**	**0.00**	**0.63**	**0.06**	**0.00**	**0.64**	**0.06**	**0.00**
Average role manageability	**−0.36**	**0.10**	**0.00**	–	–	–	**−0.22**	**0.09**	**0.02**	−0.18	0.10	0.07
Role manageability change	–	–	–	**−0.54**	**0.09**	**0.00**	**−0.49**	**0.10**	**0.00**	−0.11	0.20	0.58
Worsening	–	–	–	–	–	–	–	–	–	−0.21	0.21	0.31
Change * worsening	–	–	–	–	–	–	–	–	–	**−0.68**	**0.23**	**0.00**
R^2		0.50			0.60			0.63		0.66		
Role Clarity (n = 96)												
Turnover intentions at first wave	**0.55**	**0.08**	**0.00**	**0.66**	**0.06**	**0.00**	**0.59**	**0.07**	**0.00**	**0.64**	**0.06**	**0.00**
Average role clarity	**−0.34**	**0.16**	**0.04**	–	–	–	−0.23	0.14	0.09	−0.01	0.14	0.93
Role clarity change	–	–	–	**−0.38**	**0.14**	**0.01**	**−0.32**	**0.11**	**0.00**	0.16	0.16	0.31
Worsening	–	–	–	–	–	–	–	–	–	−0.09	0.23	0.68
Change * worsening	–	–	–	–	–	–	–	–	–	**−0.92**	**0.30**	**0.00**
R^2		0.48			0.51			0.53			0.56	
Job Challenge & Autonomy (n = 95)												
Turnover intentions at first wave	**0.60**	**0.07**	**0.00**	**0.64**	**0.06**	**0.00**	**0.60**	**0.07**	**0.00**	**0.60**	**0.07**	**0.00**
Average job challenge & autonomy	−0.29	0.18	0.10	–	–	–	−0.26	0.17	0.13	−0.26	0.18	0.15
Job challenge & autonomy change	–	–	–	−0.17	0.21	0.41	−0.11	0.20	0.57	0.02	0.62	0.98
Worsening	–	–	–	–	–	–	–	–	–	−0.31	0.32	0.32
Change * worsening	–	–	–	–	–	–	–	–	–	−0.45	0.77	0.56
R^2		0.46			0.44			0.45			0.47	

Notes: *b*, unstandardized coefficient. Significant results ($P < 0.05$) are presented in bold.

did job involvement change predict actual turnover above and beyond average job involvement, but that as the magnitude of change in job involvement worsened, the likelihood of turnover significantly increased. Similar results were found for role manageability, with change in role manageability predicting actual turnover above and beyond average role manageability, as well as that as role manageability worsened, the likelihood of turnover increased significantly.

Consistent with Chen and colleagues'[27] findings, we found job satisfaction change to be a significant predictor of turnover intentions change above and beyond average job satisfaction; however, in contrast to their results, which did not find a significant interaction between job satisfaction change and the direction of change, analyses of our data found evidence that as job satisfaction change worsened, the turnover intentions significantly increased. This finding provides

additional support not only for spirals/velocity theory, but also prospect theory. Similar results were found for role manageability and role clarity, with changes in each of these measures predicting changes in turnover intentions above and beyond the average level of each respective measure, as well as finding that as each of these measures got worse, turnover intentions significantly increased. Importantly, this provides even further evidence supporting both spirals/velocity theory and prospect theory.

General conclusion and implications. Overall, this study found evidence that both the absolute level and the level of change in a measure can account for a significant amount of variance in actual staff turnover, as well as in changes in turnover intentions. Thus, important implications of this study are that it significantly extends theories of staff turnover[9–13] as well as theories of spirals/velocity[30,31] and prospect theory.[28,29] Additionally, an important practical implication is that this study further highlights that one-time organizational surveys that assess employees' attitudes at a single point do not sufficiently capture the likelihood of staff turnover. Thus, organizations seeking to improve their ability to assess risk for staff turnover are encouraged to consider assessing employees at multiple points in time in order to identify systematic changes in key employee attitudes (eg, turnover intentions, job satisfaction, role manageability, role clarity). This may be particularly important for addiction treatment organizations, which as noted previously have been consistently shown to have relatively high rates of staff turnover.[1–4]

Strengths and limitations. The inclusion of actual turnover data and use of an advanced analytic approach (ie, multilevel discrete-time survival analysis) represent important strengths of the current study. There also were important limitations. First, because the data for this study was collected in the context of both a large federally funded dissemination and implementation project and a cluster-randomized pay-for-performance experiment, the extent to which our findings generalize to other settings is not known. However, given the increasing efforts to implement evidence-based practices (EBPs) within practice settings, we argue that the study's context has the strength of reflecting clinicians in usual practice settings attempting to implement EBPs. Second, although participants were assured all responses were confidential, it remains possible that their self-reported responses to the survey scales (eg, turnover intentions) were underestimates of their actual turnover intentions. Another important limitation is that we did not assess employees' perceptions of their probability of finding an acceptable alternative, which has been suggested as an important predictor of staff turnover.[43] Finally, in spite of the longitudinal nature of this study, it is not possible to draw causal inferences.

Directions for future research. In addition to examining the extent to which findings from this study generalize to other samples and settings, future research is needed to develop valid and reliable methods for assessing employees' psychological climate and work attitudes. That is, although the protection of confidentiality offered as part of research studies appears to promote honest responses to sensitive questions, such as job satisfaction and turnover intentions, it is not yet known to what extent equally honest response can be obtained when not conducted as part of research, but rather as part of everyday practice. This is a critically important issue, given the ability to accurately assess employees' level of job satisfaction or turnover intentions is central to proactively preventing staff turnover. Relatedly, although the present study helps highlight a relatively new and exciting area of turnover research (ie, the role of change), there is a lack of research that has used the extant turnover literature to develop and test strategies or interventions that may help decrease annual rates of staff turnover. Additionally, because staff turnover is not only a common occurrence, but is in fact an inevitable event (because of retirement or death), research is needed to develop and test strategies for helping to reduce the extent to which staff turnover has adverse impacts (eg, increased stress) on remaining staff. It is hoped that the present study will help stimulate this and other research that addresses the important issue of staff turnover.

Author Contributions

Conceived and designed the experiments: BRG. Analyzed the data: BRG, BDH. Wrote the first draft of the manuscript: BRG. Contributed to the writing of the manuscript: BRG, BDH. Agree with manuscript results and conclusions: BRG, BDH. Jointly developed the structure and arguments for the paper: BRG, BDH. Made critical revisions and approved final version: BRG, BDH. Both authors reviewed and approved of the final manuscript.

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