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Comparison of Intent-to-Leave With Actual Turnover Within the FAA

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16. Abstract INTRODUCTION. Human capital planning in the federal sector relies upon past losses to estimate future turnover. Since the historical loss rate is a lagging indicator, an alternative estimate of future turnover might be derived from information about employee intent-to-leave. However, results from studies of the relationship between intent-to-leave and actual behavior have been mixed. Given the conflicting research findings, we investigated the correspondence between intent-to-leave and actual aggregate turnover rates in the Federal Aviation Administration (FAA). METHOD. Data describing intent-to-leave in the next 12 months were obtained in Employee Attitude Surveys of employees in the last quarters of fiscal years 1997 (N=25,004), 2000 (N=24,469), and 2003 (N=22,720). Actual turnover rates for the following fiscal years (FY1998, 2001, 2004) were calculated from data extracted from the Agency's official system of personnel records. The proportions of employees indicating intent-to-leave on each survey were compared with actual turnover using a Z-test of proportions. RESULTS. Intent-to-leave expressed in each survey year significantly overestimated actual turnover in the year following the survey (1997 versus 1998, $Z = 37.77$, $p < .001$; 2000 versus 2001, $Z = 13.74$, $p < .001$; and 2003 versus 2004, $Z = 3.46$, $p < .001$). When analyzed by gender, intent-to-leave significantly overestimated actual turnover for both men and women. Analysis by minority status indicated that intent-to-leave overestimated actual turnover for minorities and non-minorities for the 1997/1998 and 2000/2001 but not for the 2003/2004 comparisons. DISCUSSION. While overall intent-to-leave expressed in surveys of employees does not appear to be of much use in predicting future turnover for the FAA, other variables (i.e., reasons for that intent, employee engagement, or organizational commitment) might prove beneficial in the agency's human capital planning. We recommend that future research focus on analyses of those variables.			
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COMPARISON OF INTENT-TO-LEAVE WITH ACTUAL TURNOVER WITHIN THE FAA

INTRODUCTION

One component of human resources planning (now, called human capital planning) in the federal sector is estimation of future losses due to retirement, transfer, involuntary separation, and voluntary resignation. Estimates of future losses are generally based on historical losses. That is, the turnover rate in past years is used to estimate expected losses in future years. However, the employee loss rate is, by its nature, retrospective, an indicator of what *has* happened. Within the framework of a balanced scorecard (a system that enables organizations to clarify their vision and strategy and translate them into action developed by Kaplan & Norton, 1996), the historical loss rate is a lagging indicator. As an alternative, information about employee *intent* to leave might be used as a leading indicator for future turnover in a balanced scorecard. For example, a rise in the proportion of employees expressing an intention to leave an agency or major component within an agency in one year might presage a rise in actual turnover the next year. The utility of intent to leave as a leading indicator of future turnover depends on its correlation with actual turnover.

Intent to leave can be very simply defined as a person's stated intention to leave the organization within some specific time period. Employee intent to leave has been the focus of substantial research in applied psychology, with intent conceptualized as a precursor to actual turnover (van Breukelen, van der Vlist, & Steensma, 2004). However, the results of studies of relationship between intent to leave and actual behavior have been mixed. For example, Kirschenbaum & Weisberg (1990) found that intent to leave was a poor predictor of turnover in a study of 477 employees. In contrast, Steel and Ovalle (1984) concluded that turnover intentions were "superior" to affective variables in the prediction of turnover. Given the conflicting research findings, this study was conducted to investigate the degree to which intent to leave corresponds to actual turnover rates in the Federal Aviation Administration (FAA). On one hand, if intent correlates reasonably well with actual turnover, then the FAA could use the intent data, collected via an employee survey, as a component in its human capital planning process. On the other hand, a finding that intent does not correspond reasonably well with actual turnover would argue against using the intent to leave data in the agency human capital planning process or in organizational balanced scorecards.

METHOD

Data

Intent to leave. The source for intent to leave data was a periodic survey of FAA employees. The FAA conducts the Employee Attitude Survey (EAS) every two or three years. The EAS is a broad survey of employee perceptions of, and attitudes toward, a number of organizational issues, including job satisfaction, supervisory effectiveness, and intent to leave (Thompson, Hilton, Twohig, Pagnini, Park, King, et al., 2000). Survey data from the years 1997 (N=25,004), 2000 (N=24,469) and 2003 (N=22,720) were used in this analysis. Intent to leave was assessed with a single item in each survey. In 1997, the question was phrased in terms of the employee's intent to leave the agency within the next 12 months, as shown in Table 1. In the 2000 and 2003 iterations of the EAS, the item was phrased in terms of the likelihood of not leaving the agency or leaving in the next year, within two years, and so on, as shown in Table 1. However, to compare responses across surveys, this analysis focused on the proportion of employees expressing an intent to leave within one year (12 months) on each EAS.

Turnover. Separation data for fiscal years 1998 through 2004 were extracted from the FAA Consolidated Personnel Management Information System (CPMIS), the official system of personnel records for the agency. Turnover was calculated as the ratio of persons who left the agency for any reason to the total number of persons employed by the agency for each fiscal year. For example, 1,705 persons retired, separated, resigned, or were otherwise terminated from the agency in fiscal year (FY) 2000. A total of 1,363 persons were hired by the agency in that fiscal year. Including those losses and gains, the FAA employed 50,663 persons in FY 2000. The turnover rate for FY 2000 was 1,705 out of 50,663, or 3.4%.

Analysis procedure

Because the EAS is anonymous, intent to leave responses could not be linked to turnover at the individual level of analysis. Therefore, the analysis was conducted at the aggregate level for the agency overall. As the intent items in the EAS were phrased prospectively, we compared the proportion intending to leave in the next year with actual turnover in the next year (relative to the survey year). For example, the 1997 EAS was conducted in FY 1997, so we compared the proportion of respondents

intending to leave, based on survey responses, to actual turnover in FY 1998. Similarly, the proportion of respondents intending to leave within one year based on EAS data from FY 2000 were compared to actual turnover in FY 2001, etc. The proportions intending to leave and actual turnover in the following FY were compared using the standard χ^2 -test of proportions (Kanji, 1999). The χ^2 -test macro¹ was used to perform the calculations in SPSS 12.0.1 (SPSS, 2003).

RESULTS

Intent to leave

As shown in Table 2, 3,082 respondents (out of 24,514, or 12.6%) from the 1997 survey indicated that they intended to leave the agency within the next 12 months. In 2000, 1,233 respondents (out of 24,469, or 5.0%) indicated that they intended to leave the agency within the next year (12 months). In the 2003 EAS, 1,057 participants out of 20,493 (5.2%) indicated that they intended to leave the agency within the next year. Retirement was cited as the most frequent reason for intending to leave

the agency across the three administrations of the EAS. Incentives for early retirement (e.g., “buy-outs”) were offered in 1997 throughout the federal government as part of the shrinking of the federal workforce under the Clinton administration (National Performance Review, 1993). It is possible that incentives for early retirement inflated the expressed intent to leave in the 1997 EAS; of the 3,082 participants indicating their intent to leave the FAA in the next 12 months, 806 (26.2%) indicated “buy-out” as the primary reason. The FAA did not offer incentives for early retirement in 2000 through 2004.

Actual turnover

The actual turnover rate, as computed from CPMIS data, for the FAA by fiscal year is illustrated in Figure 1. From FY 1998 through FY 2002, the actual turnover rate in the FAA was low, at 4% (of approximately 47,000 employees) or less. The overall federal government civilian employee turnover rate (excluding the U.S. Postal Service and uniformed military) in 2000 was about 6% (Friel, 2003). The FAA turnover rate in FY 2003 increased to 5.8% (of 52,504 employees). This increase was largely

Table 1: The Intent-to-Leave Item in FAA Employee Attitude Surveys

1997 EAS	2000 EAS	2003 EAS
During the next months, it is mostly likely that I will:	It is likely that I will leave the FAA in the next:	It is likely that I will leave the FAA in the next:
Continue in my current job	1 year	Not planning to leave the FAA
Seek a transfer to another job within my facility/organization	2 years	1 year
Seek a transfer within the FAA	3 years	2 years
Look for a job outside the FAA	4 years	3 years
Look for a job outside the government	5 years	4 years
Take the next early out offer	Not planning to leave the FAA	5 years
Take the next early retirement buyout		
Take normal retirement		

Table 2: Statistical Comparison of Intent-to-Leave to Actual Turnover

Comparison	Intent-to-Leave			Actual Turnover			χ^2 -Test
	# Intend	# EAS	% Intend	# Actual	# Employees	% Actual	
1997 Intent to 1998 Actual	3,082	24,514	12.6%	2,072	52,420	4.0%	37.77 p < .001
2000 Intent to 2001 Actual	1,233	24,469	5.0%	1,501	52,281	2.9%	13.74 p < .001
2003 Intent to 2004 Actual	1,057	20,493	5.2%	2,275	50,177	4.5%	3.46 p < .001

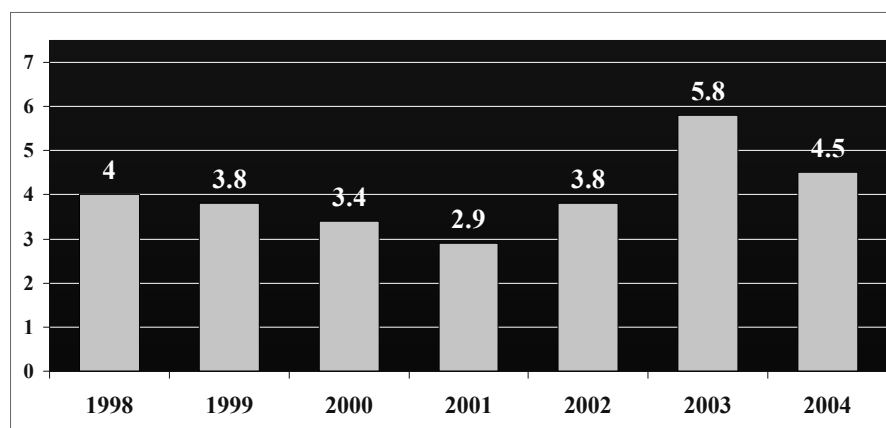


Figure 1: Percentage of Employees That Left Employment With the FAA, by Year.

due to the transfer of security functions out of FAA with the creation of the Office of Homeland Security. The turnover rate declined to 4.5% in FY 2004, slightly higher than the baseline rate for the period FY 1998 through FY 2002. One factor that might explain the increase is the aging of the approximately 15,000-person air traffic controller workforce (FAA, 2004). Controllers may retire when they have accumulated at least 25 years of service as a controller without regard to age, when they reach age 50 with at least 20 years of service as a controller, or upon reaching age 56. Retirement eligibility in the controller workforce is increasing; thus, retirements from this large workforce are also increasing.

Comparison of intent-to-leave with actual turnover.

The proportions of respondents indicating their intent to leave within the next 12 months on the 1997, 2000, and 2003 employee surveys were compared with the proportions of employees actually leaving the agency for any reason in FY 1998, FY 2001, and FY 2004. The results of the comparison are presented in Table 2. The proportion of employees indicating their intent to leave the agency in the next year on the 1997 EAS (12.6%) was significantly greater than the actual turnover rate in FY 1998 (4.0%; $Z = 37.77$, $p < .001$). Similarly, a significantly higher proportion of employees expressed intent to leave in both the 2000 and 2003 EASs as compared to those who left the following year (5% versus 2.9%, $Z = 13.74$, $p < .001$ and 5.2% versus 4.5%, $Z = 3.46$, $p < .001$, respectively).

Results within demographic groups

Intent to leave and actual turnover were also analyzed by two demographic groups (gender and ethnicity). The purpose of those analyses was to determine if there were subgroups for whom intent to leave predicted (or not) actual turnover. For example, it might be the case that for employees overall, the intent to leave is greater than

actual turnover, but that for women only, the intent corresponds well to actual turnover.

By gender. When intent to leave employment by gender comparisons were made, females reported less intent to leave than males in 1997 and slightly more during the following administration of the EAS (see Table 3). The differences shown were significantly different in the 1997 (13.1% versus 10.4%, $Z = 5.74$, $p < .001$) and 2000 (4.8% versus 5.5%, $Z = -2.00$, $p < .05$) administrations of the EAS. As with the overall sample, actual turnover rates for each gender were relatively low, ranging from 2.7% of the males in 2001 to 5.0% of the females in 2003. Table 3 shows that females had consistently higher rates than males of leaving the agency in 1998 (4.9% versus 3.7%, $Z = -5.16$, $p < .001$) as well as in 2001 (3.3% versus 2.7%, $Z = -3.65$, $p < .001$) and 2004 (5.0% versus 4.5%, $Z = -2.55$, $p < .01$).

Table 3 further illustrates that when intent to leave by gender was contrasted with turnover for the year following each EAS survey, results followed the same pattern as that of the overall sample. Once again the actual turnover rate was lower than the expressed intent for each previous year, with all Z -tests showing significant differences except for the intent of females in 2003 as compared with turnover for that gender in 2004 ($Z = 0.49$, NS). All other Z values ranged from 3.05 to 34.22 and were significant at $p < .01$.

By minority status. As depicted in Table 4, the percentages of respondents with intent to leave in 2000 and 2003 by ethnic category were similar, with the percent for 1997 likely inflated due to the “buy-out” response choice. No significant differences in percentages for intent were found between the minorities and non-minority employees in any of the EAS survey years.

As with the overall sample, the rates of employees who eventually left the agency in either ethnic grouping were low, ranging from 1.9% for minorities in 2001 to

Table 3: Statistical Comparison of Intent-to-Leave to Actual Turnover, by Gender

Comparison	Intent-to-Leave			Actual Turnover			<u>Z</u> -Test
	# Intend	# EAS	% Intend	# Actual	# Employees	% Actual	
Male 1997 Intent to 1998 Actual	2285	17,462	13.1 %	1,427	38,144	3.7%	34.22 p < .001
Female 1997 Intent to 1998 Actual	595	5,747	10.4%	595	12,237	4.9%	12.30 p < .001
Male 2000 Intent to 2001 Actual	830	17,140	4.8%	1,038	38,854	2.7%	11.85 p < .001
Female 2000 Intent to 2001 Actual	337	6,112	5.5%	425	12,791	3.3%	6.60 p < .001
Male 2003 Intent to 2004 Actual	750	14,667	5.1%	1,658	37,116	4.5%	3.06 p < .01
Female 2003 Intent to 2004 Actual	269	5,153	5.2%	618	12,264	5.0%	0.49 N.S.

Table 4: Statistical Comparison of Intent-to-Leave to Actual Turnover, by Minority

Comparison	Intent-to-Leave			Actual Turnover			<u>Z</u> -Test
	# Intend	# EAS	% Intend	# Actual	# Employees	% Actual	
Minority 1997 Intent to 1998 Actual	410	3410	12.0%	391	9,224	4.2%	13.08 p < .001
Non-minority 1997 Intent to 1998 Actual	2206	18,264	12.1%	1,616	40,608	4.0%	33.16 p < .001
Minority 2000 Intent to 2001 Actual	199	3,941	5.0%	194	9,975	1.9%	8.27 p < .001
Non-minority 2000 Intent to 2001 Actual	893	18,090	4.9%	1,154	41,259	2.8%	11.86 p < .001
Minority 2003 Intent to 2004 Actual	196	3,693	5.3%	462	9,912	4.7%	1.52 N.S.
Non-minority 2003 Intent to 2004 Actual	789	15,524	5.1%	1,808	39,358	4.6%	2.38 N.S.

4.7% for that same group three years later. The only significant difference between the groups occurred in 2000, with the turnover rate for non-minorities being greater (2.8%) than the rate for minorities (1.9%, $Z = -5.31$, $p < .001$).

Table 4 also reports results of Z tests comparing turnover with intent across survey year separately for each of the demographic groups. There was significantly more intent in 1997 than turnover in 1998 for each group (minorities=4.2% actual turnover versus 12.0% intent, $Z = 13.08$, $p < .001$ and non-minorities=4.0% actual versus 12.1% intent, $Z = 33.16$, $p < .001$). A significantly higher percentage of minorities in 2000 expressed their intent to leave as compared to 2001 turnover (1.9% actual versus 5.0% intent, $Z = 8.27$, $p < .001$) and non-minorities (2.8% versus 4.9%, $Z = 11.86$, $p < .001$). However, the proportions of minorities and non-minorities expressing an intent to leave on the 2003 EAS were comparable to actual turnover rates in 2004. Thus, Table 4 shows non-significant values for the Z tests performed on those comparisons.

DISCUSSION

The purpose of this report was to see if intent to leave as reported by survey responses might give FAA management an idea of what to actually expect, so that plans could be made to intervene in the loss of employees or train new personnel to offset the loss of persons who terminate employment. The findings of the current research indicate that employees' responses to EAS questions about intent to leave are not good indicators of actual turnover at the aggregate level. This result corresponds to those of Kirschenbaum & Weisberg (1990). Moreover, intent to leave overestimated actual turnover in 9 of 12 comparisons (by demographic group). This pattern suggests that intent is not a good predictor of future turnover for demographic subgroups.

One of the confounding issues in the current analysis is that intent to leave in 1997 might have been inflated by the "take the next buyout" response choice that was unique to that EAS survey only. However, if "take the next buyout" responses are excluded, the expressed intent to leave on the 1997 EAS still over-predicts (not shown) actual turnover in 1998 (8.2% versus 4.0%, $Z = 21.97$, $p < .001$).

While intent-to-leave may not be an accurate predictor of actual turnover, it still might be an indicator of employee disengagement. An intent to voluntarily leave might suggest that an individual is withdrawing

or disengaging psychologically from the organization and its work. Identifying organizational factors that drive that psychological disengagement (and conversely, engagement) can provide a rational basis for developing targeted, focused organizational interventions (Corporate Leadership Council, 2004). Moreover, analyses by demographic subgroups could aid in the identification of both barriers to, and facilitators of, engagement and organizational commitment specific to those employee sub-populations. Interventions can then be designed at the "macro-" and "micro-organizational" levels to address the drivers of employee engagement and organizational commitment and thereby to contribute to improved organizational performance.

REFERENCES

- Corporate Leadership Council (2004). *Engaging the workforce: Focusing on critical leverage points to drive employee engagement*. Washington, DC: Corporate Executive Board.
- Federal Aviation Administration (2004). *A plan for the future: The Federal Aviation Administration's 10-year strategy for the air traffic control workforce*. Washington, DC: Author.
- Friel, B. (May 2, 2003). *Data shows 'human capital crisis' maybe overstated*. Retrieved June 22, 2005 from www.govexec.com/story_page.cfm?articleid=25526.
- Harter, J.K., Schmidt, F.L., & Hayes, T.L. (2002). Business-unit level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis. *Journal of Applied Psychology*, 87, 268-79.
- Kanji, G. (1999). *100 statistical tests*. Thousand Oaks, CA: Sage.
- Kaplan, R. & Norton, D. (1996). *The balanced scorecard: Translating strategy into action*. Cambridge, MA. President and fellows of Harvard College.
- Kirschenbaum, A. & Weisberg, J. (1990). Predicting worker turnover: An assessment of intent on actual separations. *Human Relations*, 43, 829-47.
- National Performance Review (1993). *From red tape to results: Creating a government that works better and costs less*. Washington, DC: Government Printing Office.
- SPSS, Inc. (2003). *SPSS Release 12.0.1* [Computer program]. Chicago, IL: Author.

Steel, R. & Ovalle, N. (1984). A review and meta-analysis of research on the relationship between behavioral intentions and employee turnover. *Journal of Applied Psychology*, 69, 259-93.

Thompson, R.C., Hilton, T.F., Twohig, P., Pagnini, C., Park, H., King, S.J., Malone, M.T., Thompson, D., & Thompson, J. (2000). *Results of the 1997 Employee Attitude Survey*. (Memorandum Report). Oklahoma City, OK: Federal Aviation Administration Civil Aeromedical Institute Human Resources Research Division.

van Breukelen, W., van der Vlist, R., & Steensma, H. (2004). Voluntary employee turnover: Combining variables from the 'traditional' turnover literature with the theory of planned behavior. *Journal of Organizational Behavior*, 25, 893-914.

End Note

¹The SPSS macro (Z-test.sps) for conducting a Z-test of proportions is no longer available directly from SPSS. However, it is available from the University of Southern California Information Technology Services SPSS web site at www.usc.edu/isd/doc/statistics/spss/macros/