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Patrick Lee
Nanyang Business School

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THE IMPACT OF ROLE VARIABLES ON TURNOVER INTENTIONS OF INFORMATION TECHNOLOGY PROFESSIONALS: AN EXAMINATION OF MODERATING EFFECTS

Patrick C. B. Lee
Nanyang Business School
acblee@ntu.edu.sg

Abstract

Results from prior studies indicate that role conflict and role ambiguity are sometimes directly related to turnover intentions of computer professionals, but sometimes they are not. The purpose of this research is to provide possible explanations for these discrepant results. This study hypothesized that the relationship between role variables and turnover intentions are moderated by (a) achievement need strength and (b) organizational tenure. These hypotheses were tested using data from a questionnaire survey. The results showed that achievement need strength moderates the relationship between role variables and turnover intentions, and organizational tenure moderates the relationship between role ambiguity and turnover intentions. One implication of these results is that moderating variables may help to clarify inconsistent findings in prior research. Another implication is that employers should take into consideration the effects of moderating variables when designing retention strategies.

Introduction

Researchers who studied turnover propensity of information technology professionals often proposed that role conflict and role ambiguity are among the driving forces leading to turnover (Igbaria and Greenhaus 1992; Gupta et al. 1992; Baroudi 1985). This is not surprising because early research has shown that system designers' positions are associated with high levels of role conflict and role ambiguity (Bostrom 1980), and that the two role variables are negatively correlated with outcomes such as job satisfaction and general satisfaction (Goldstein and Rockart 1984). Although results from a few empirical studies have shown that role conflict and role ambiguity are directly related to turnover intentions (Igbaria and Greenhaus 1992), some have found that they are only related indirectly (Baroudi 1985). In the latter instance, job satisfaction and organizational commitment mediate the relationship between role variables and turnover intentions.

The purpose of this research is to investigate the inconsistent results obtained in prior research. The objective is to clarify why a direct relationship between role variables and turnover intentions sometimes exists, while sometimes it does not. Although role conflict and role ambiguity have been acknowledged as variables that significantly impact turnover intentions among information technology professionals, researchers have not understood exactly how these variables work. The inconsistent results create uncertainties in understanding the turnover phenomenon. This research aims to fill the gaps in our understanding.

Hypothesis Development

The persistently high turnover among information technology professionals has been a major concern among industry practitioners. A high level of turnover increases an organization's operating costs and renders an organization less competitive. A number of studies have been carried out to determine the organizational and psychological reasons that lead to turnover. The primary objective of these studies is to help organizations implement strategies to reduce turnover. While most studies attributed turnover to factors similar to those in other occupations, such as lack of job satisfaction and organizational commitment, findings from prior research suggest that there may exist factors unique to computer professionals. According to prior research, computer professionals form a distinct occupational group. They are different from staff in other professions because on average, they have a stronger need for growth and achievements compared to staff in other professions (Couger et al. 1979; 1992; Wynekoop and

Walz 1998). They have a high need for learning and self-development, and a stronger desire to be stimulated and challenged. It is possible that these motivational characteristics have an impact on the way computer professionals respond to turnover.

In light of the peculiar characteristics of computer professionals, it is interesting to note that several organizational behavior studies have found that personality characteristics could impact the relationship between role variables and work outcomes differently. For instance, there is evidence that indicate people who score high on achievement need strength or people with Type A personality are more sensitive to role ambiguity and role conflict than people who score low on achievement need strength or people with Type B personality (Jackson and Schuler 1985). Role ambiguity refers to the clarity of the role while role conflict occurs when there is incongruency or incompatibility in the demands and requirements of the role (Rizzo et al. 1970). Role ambiguity and role conflict are likely to have an adverse impact on high achievement-oriented people because they impede and hinder their achievements. These role variables, therefore, may cause those with high achievement need to withdraw from their jobs. On the other hand, the role variables may have little or no effect on those with low achievement need strength. Thus, Cooper and Marshall (1976) have pointed out that not all individuals react the same way to different levels of role conflict and role ambiguity.

Recall, some prior studies on turnover of IT personnel have found that role variables have a direct, positive effect on turnover intentions, while others have not. Based on our foregoing argument, one possible explanation for the discrepant results could be that achievement need strength moderates the relationship between role variables and turnover intentions. If this argument is true, it means that prior studies that found direct, positive effects between role variables and turnover intentions might comprise respondents with high achievement need strength, whereas those that did not might comprise respondents with low achievement need strength. The purpose of this research, therefore, is to test the hypothesis that achievement need strength moderates the relationship between role variables (role ambiguity and role conflict) and turnover intentions. The hypotheses are stated as follows:

H1: Achievement need strength moderates the positive relationship between role ambiguity and turnover intentions, such that the relationship is strengthened by achievement need strength.

H2: Achievement need strength moderates the positive relationship between role conflict and turnover intentions, such that the relationship is strengthened by achievement need strength.

Besides achievement need strength, another variable that could explain the inconsistent relationship between role variables and turnover intentions is organizational tenure. The effect of organizational tenure can be explained as follows. When computer professionals experience role ambiguity and role conflict in the early part of their tenure, they are likely to have higher turnover intentions than those who experience the same problems but have worked in the organization for a longer period of time. The reason is because those who have a longer organizational tenure will find it easier to identify appropriate persons who have the authority or resources to help them resolve their role difficulties. Unlike new employees who usually need support and guidance, those who have been in the organization longer would feel more confident about how they can go about getting their role problems resolved. If the problems continue to remain unsolved, those who remain in the organization may rationalize by thinking that the same problems exist in other organizations. The third and fourth hypotheses, therefore, state that the relationship between role variables and turnover intentions differs as a function of organizational tenure.

H3: Organizational tenure moderates the positive relationship between role ambiguity and turnover intentions, such that the relationship is weakened by organizational tenure.

H4: Organizational tenure moderates the positive relationship between role conflict and turnover intentions, such that the relationship is weakened by organizational tenure.

Method

Procedures

Data for this research were gathered from a questionnaire survey that tests several determinants of turnover. The questionnaire survey was distributed to 1,900 readers of a publication called E-Week (Singapore edition). E-Week is a fortnightly publication that contains articles related to technology news. The readers were shortlisted for the survey based on the criteria that they were working in an information technology job. They comprised systems executives, computer programmers, systems analysts, systems engineers, and computer managers. The respondents completed the questionnaires anonymously.

Measures

All constructs used in this research were measured at the individual level of analysis. *Achievement need strength* was measured using seven items developed by Spence et al. (1987). The instrument was developed to measure an individual's achievement strivings. The items used a seven-point likert scale. Respondents were asked for the extent of agreement with statements such as 'I consider myself to be hard driving', and 'I often set deadlines and quotas in my work'. This instrument has high reliability and has been widely used in prior research.

Organizational tenure was measured based on an interval scale. Respondents were given four response options: less than two years, two to five years, six to ten years, and more than ten years.

Role conflict and *role ambiguity* were measured using the instrument developed by Rizzo et al. (1970). This instrument was chosen because it has been subject to extensive validation. Although there has been some concerns regarding its content validity, wording biases, and factor structure, the instrument has generally been accepted for its psychometric integrity and reliability (Smith et al. 1993). The scores for role conflict were measured based on eight items while those for role ambiguity were based on six items. Both the role variables were scored on a seven-point Likert scale.

Turnover intentions were measured using four items. Three items were adapted from Peters and Jackofsky (1979) and one item from Mobley et al. (1978). According to results from prior research, intentions are more likely to lead to behavior if they were measured within a reasonable time frame. The shorter the time frame, the more accurate the prediction of behavior linked to the intentions (Ajzen and Fishbein 1980). All four items for measuring turnover intentions, therefore, incorporate a six-month period for exercising intentions. All items were measured on a seven-point scale.

Results

Among the 1,900 questionnaires distributed, thirty were returned because the addressees have left their workplace. Three hundred and seventeen complete responses were received for the survey. Thus, the response rate was about 17 percent. To ascertain whether there was a response bias, data from the last thirty respondents were used as proxies for non-respondents and they were compared with those for the first thirty respondents. The results indicate there were no differences in response.

Demographics

Table 1 shows the demographics of the respondents. The table shows that more than half the respondents were under 31 years of age. The sample, therefore, reflects the youthfulness of the information technology workforce in Singapore, where more than 80 percent are less than 35 years of age (National Computer Board 1998).

Descriptive Statistics

A factor analysis was first performed for the measurement items. The results showed four factors that fall neatly into the constructs used for this study—achievement need strength, role ambiguity, role conflict, and turnover intentions. Table 2 shows the descriptive statistics. The table shows all constructs have high reliabilities, i.e., they are above 0.80. Among the correlation coefficients shown in the table, they indicate that role conflict and role ambiguity are both positively related to turnover intentions. There is also a positive correlation between role conflict and role ambiguity. There is no correlation, however, between the hypothesized moderator variables—namely, achievement need strength and organizational tenure—and turnover intentions.

Hypothesis Testing

The hierarchical regression analysis was used to test the hypotheses. The analysis involved two steps. In the first step, a role variable and a moderating variable were loaded as independent variables into the equation. The dependent variable is turnover intentions. In the second step, the cross-product between the role variable and the moderating variable was added as an independent variable into the equation. Data for the role variables and moderating variables were centered and the product variable was formed using the centered data. Using the centered data helps to address the problems of multicollinearity among the independent variables (Cronbach 1987)—the regression diagnostics indicate that the VIFs are less than 1.10. The procedures for hierarchical regression were repeated for different sets of role variables and moderating variables.

Tables 3 to 6 show the results of hierarchical analyses. Among the four sets of analyses, three showed there were moderating effects. The results show that achievement need stress moderates the relationship between role variables and turnover intentions and organizational tenure moderates the relationship between role ambiguity and turnover intentions. Organizational tenure did not moderate the relationship between role conflict and turnover intentions.

The next step of analyses is to determine the nature of interactions. The respondents were grouped under low achievement need strength (minus one standard deviation from the mean), mean achievement need strength, and high achievement need strength (plus one standard deviation from the mean). Figures 1a and b show the results of regression for these subgroups. They show that higher role ambiguity and role conflict are associated with higher turnover intentions, and that the relationships are strengthened with achievement need strength. Hence, hypotheses one and two are supported.

Figure 1c shows the moderating effect of organizational tenure on the relationship between role ambiguity and turnover intentions. The figure shows that higher role ambiguity is associated with higher turnover intentions, and that the relationship is weakened by organizational tenure. Thus, hypothesis three is supported.

Discussion and Conclusion

This research has examined the moderating effects for relationships between role variables and turnover intentions. The results provide clues to explain the inconsistent findings in prior research—why sometimes there exists a direct effect between role variables and turnover intentions, while sometimes the effect does not exist. The results show that the inconsistent findings may be attributed to the moderating effects of achievement need strength and organizational tenure. This explanation offers richer insights on how variables interact and impact on turnover intentions.

It should be noted that the focus of this research is different from those of prior turnover research. Prior research has focused on determining predictors of turnover intentions. The purpose of this research, however, is to examine variables that modify relationships identified in earlier studies. The results of this research showed that both achievement need strength and organizational tenure are pure moderators. They are not predictors of turnover intentions, i.e., they do not predict turnover intentions (Sharma et al. 1981).

Among the four hypotheses proposed in this research, one was not supported – i.e., organizational tenure does not moderate the role conflict-turnover intentions relationship. Although this research has assumed that both role conflict and role ambiguity react in similar ways, it is possible that organizational tenure impact each role variable differently. One potential area for future research, therefore, is to examine in finer detail, how each role variable affects turnover intentions.

The results of this research are useful to employers in managing the turnover of computer professionals. Employers should recognize that: (i) computer professionals with high achievement need strength are particularly vulnerable to role ambiguity and role conflict and (ii) computer professionals with short tenure are sensitive to role ambiguity. To reduce turnover, employers should seek to reduce role ambiguity and role conflict, particularly among the new hires and those with high achievement need strength. Employers should gather regular feedback from their employees and try to resolve role issues promptly. In the rapidly developing computer industry, however, role conflict and role ambiguity are sometimes inevitable. Employers, therefore, should consider hiring staff with high tolerance for role ambiguity and role conflict. This can be done by examining the prospective employee's employment record or by conducting a series of psychological tests. With respect to achievement need strength, employers should consider the fit between the employees and the job. They should consider less achievement-oriented employees for jobs that are of a routine or maintenance nature. This could help to alleviate staff turnover.

It should be borne in mind that the results of this research have a few limitations. First, the data used for the study are based on one sample of Singaporean information technology professionals. The results, therefore, may not be generalizable to computer professionals in other countries. Future research could replicate this study to test the generalizability of the results. Second, this study used cross-sectional data. The results, therefore, indicate only relationships and not causality. Longitudinal research is needed to show cause and effect.

To conclude, this research makes two contributions. First, this research extends prior research on information technology professionals. While prior research has shown that information technology professionals have high growth and achievement needs, this research has shown that their achievement needs have a moderating impact on turnover intentions. Second, this research has offered possible explanations for the inconsistent results obtained for the relationship between role variables and turnover intentions. Overall, therefore, this research extends our knowledge about information technology professionals, and adds to our knowledge about their high turnover phenomenon.

Table 1. Demographics of Respondents

a. Sex		
Males	224	(71%)
Females	93	(29%)
b. Age		
Under 26	54	(17%)
26 to under 31	117	(37%)
31 to under 35	78	(25%)
36 to under 41	42	(13%)
Over 41	26	(8%)
c. Organizational Tenure		
Under 2 years	128	(41%)
2 to 5 years	121	(38%)
6 to 10 years	41	(13%)
Over 10 years	26	(8%)

Table 2. Descriptive Statistics

	Mean	SD	Alpha	(1)	(2)	(3)	(4)
1. Achievement need strength	5.02	0.85	0.83				
2. Organizational tenure[a]	NA			0.01			
3. Role ambiguity	3.06	1.02	0.83	-0.31**	-0.01		
4. Role conflict	4.63	1.04	0.87	0.20**	0.10	0.13*	
5. Turnover intentions	3.95	1.80	0.97	-0.02	0.03	0.30**	0.36**

[a]In interval scales: 1 for < 2 yrs; 2 for 2-5 yrs, 3 for 6-10 yrs, 4 for > 10 yrs
*$p < 0.05$ **$p < 0.01$

Table 3. Summary of Hierarchical Regression Analysis: The Moderating Effects of Achievement Need Strength between Role Ambiguity and Turnover Intentions

Step	Predictor Entered	Beta Coefficient	R^2	ΔR^2
1.	Role ambiguity	0.578**		
	Achievement need strength	0.147	0.087	
2.	Role ambiguity	0.603**		
	Achievement need strength	0.115		
	Role ambiguity × Achievement need strength	0.194*	0.110	0.023*

*$p < 0.05$ **$p < 0.01$

Table 4. Summary of Hierarchical Regression Analysis: The Moderating Effects of Achievement Need Strength between Role Conflict and Turnover Intentions

Step	Predictor Entered	Beta Coefficient	R^2	ΔR^2
1.	Role conflict	0.682**		
	Achievement need strength	-0.170	0.138	
2.	Role conflict	0.655**		
	Achievement need strength	-0.161		
	Role conflict × Achievement need strength	0.136#	0.146	0.008#

*$p < 0.05$ #$p < 0.01$

Table 5. Summary of Hierarchical Regression Analysis: The Moderating Effects of Organizational Tenure between Role Ambiguity and Turnover Intentions
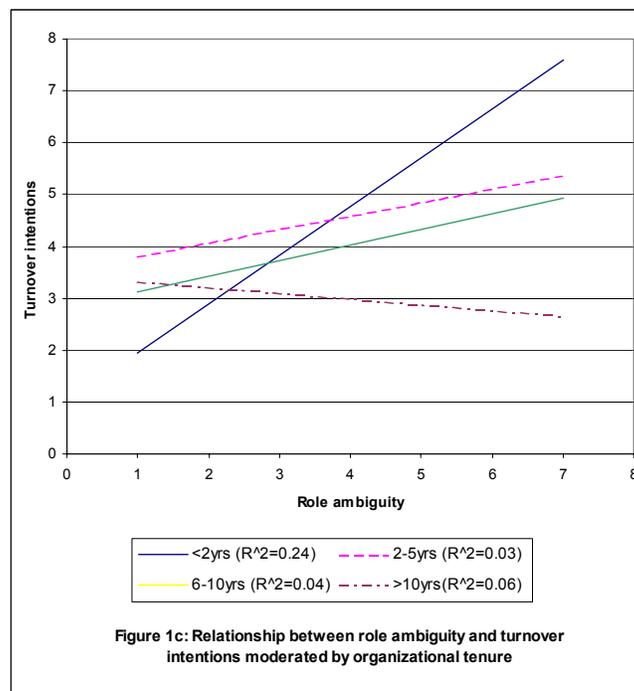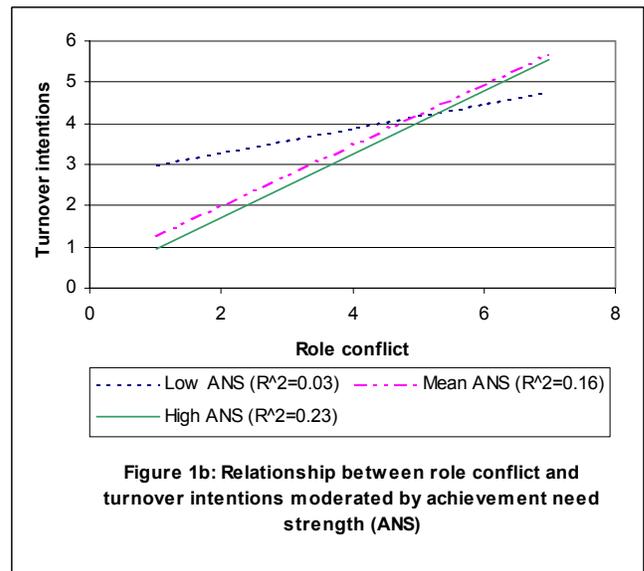
Step	Predictor Entered	Beta Coefficient	R^2	ΔR^2
1.	Role ambiguity	0.523**		
	Achievement need strength	-0.101	0.089	
2.	Role ambiguity	0.518**		
	Achievement need strength	-0.129		
	Role ambiguity × Achievement need strength	-0.301**	0.114	0.025**

**$p < 0.01$

Table 6. Summary of Hierarchical Regression Analysis: The Moderating Effects of Organizational Tenure between Role Conflict and Turnover Intentions
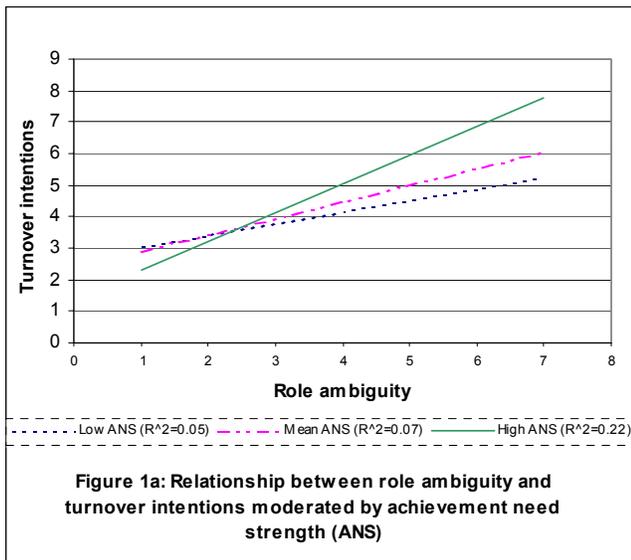
Step	Predictor Entered	Beta Coefficient	R^2	ΔR^2
1.	Role conflict	0.645**		
	Achievement need strength	-0.139	0.133	
2.	Role conflict	0.628**		
	Achievement need strength	-0.143		
	Role conflict × Achievement need strength	-0.139	0.138	0.005

**p < 0.01

Figure 1a: Relationship between role ambiguity and turnover intentions moderated by achievement need strength (ANS)

Figure 1b: Relationship between role conflict and turnover intentions moderated by achievement need strength (ANS)

Figure 1c: Relationship between role ambiguity and turnover intentions moderated by organizational tenure

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