

December 2001

The Threat-Rigidity Model of Professional Obsolescence and Its Impact on Occupational Mobility Behaviors of IT Professionals

Damien Joseph
Nanyang Technological University

Soon Ang
Nanyang Technological University

Follow this and additional works at: <http://aisel.aisnet.org/icis2001>

Recommended Citation

Joseph, Damien and Ang, Soon, "The Threat-Rigidity Model of Professional Obsolescence and Its Impact on Occupational Mobility Behaviors of IT Professionals" (2001). *ICIS 2001 Proceedings*. 73.
<http://aisel.aisnet.org/icis2001/73>

This material is brought to you by the International Conference on Information Systems (ICIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ICIS 2001 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

THE THREAT-RIGIDITY MODEL OF PROFESSIONAL OBSOLESCENCE AND ITS IMPACT ON OCCUPATIONAL MOBILITY BEHAVIORS OF IT PROFESSIONALS

Damien Joseph

Nanyang Business School
Nanyang Technological University
adjoseph@ntu.edu.sg

Soon Ang

Nanyang Business School
Nanyang Technological University
asang@ntu.edu.sg

Abstract

This study examines how IT professionals cope with the threat of professional obsolescence. We adopt the threat rigidity model to explain the relationship between threat of professional obsolescence and occupational mobility. In addition, we argue that professional commitment moderates the relationship between the consequent cognitive coping mechanisms of threat and occupational mobility. We collected data from 192 IT professionals using a survey methodology for data collection. Initial results of the field study provide strong support for the threat-rigidity hypotheses with professional commitment moderating the relationship between the cognitive coping mechanisms and occupational mobility.

Keywords: Threat, obsolescence, professional commitment, turnover, occupational mobility, managing IT professionals.

INTRODUCTION

One of the greatest career challenges facing IT professionals is the threat of rapid professional obsolescence. Unlike other professionals where basic knowledge remains enduring, the half-life of knowledge and skills in the IT profession is estimated at less than two years (Ang and Slaughter 2000; Dubin 1990). In response to these environmental pressures, the Information Technology Association of America (1999) urges IT professionals to keep abreast with new knowledge and skills to avoid the prospect of having their IT careers shortened prematurely.

To be successful in the IT profession, individuals need to possess competencies that help organizations compete in the forefront of the technology curve (Information Technology Association of America 1999). Consequently, IT professionals must remain technologically current and continuously acquire new knowledge and skills. These new competencies, however, bear little relation to past competencies (Ross et al. 1996). Therefore, an IT professional's stock of competencies erodes and comes under the continuous threat of professional obsolescence (Dubin 1990; Pazy 1996).

Although IT professionals constantly face the threat of professional obsolescence, little research has focused on how they cope with it. Although IT research consistently points to professional obsolescence as a critical issue (Lee et al. 1995; Nelson 1991), limited theoretical and empirical research has directly examined the threat of professional obsolescence, its etiology, structure, or consequences. Hence, we begin a program of research by asking: how do IT professionals cope with the threat of obsolescence? We draw on the threat-rigidity model and examine the relationship between the cognitive coping mechanisms that IT professionals adopt and their subsequent mobility behaviors.

THEORETICAL MODEL AND HYPOTHESES

In this section, we set the framework for our paper by identifying the linkages between the threat of professional obsolescence and its cognitive coping mechanisms. Subsequently, we discuss the relationship between the cognitive coping mechanisms and occupational mobility as behavioral consequences of the threat of professional obsolescence. Intra-occupational mobility (turnover) involves individuals holding the same or similar jobs in different organizations (Zabusky and Barley 1996) while inter-occupational mobility (turnaway) is defined as the intent to change one's profession or occupation (Rhodes and Doering 1993). We conclude this section by examining the moderating role of professional commitment in the relationship between the cognitive coping mechanisms and occupational mobility.

Threat of Professional Obsolescence

Professional obsolescence is typically defined as the erosion of professional competencies required for successful performance (e.g., Dubin 1990; Ferdinand 1966; Glass 2000). It is essential that IT professionals possess up-to-date competencies because it affects their employability, career development, and compensation. Therefore, the erosion of competencies constitutes a potential threat to IT professionals, i.e., the threat of not being up-to-date with the rapidly changing technology environment.

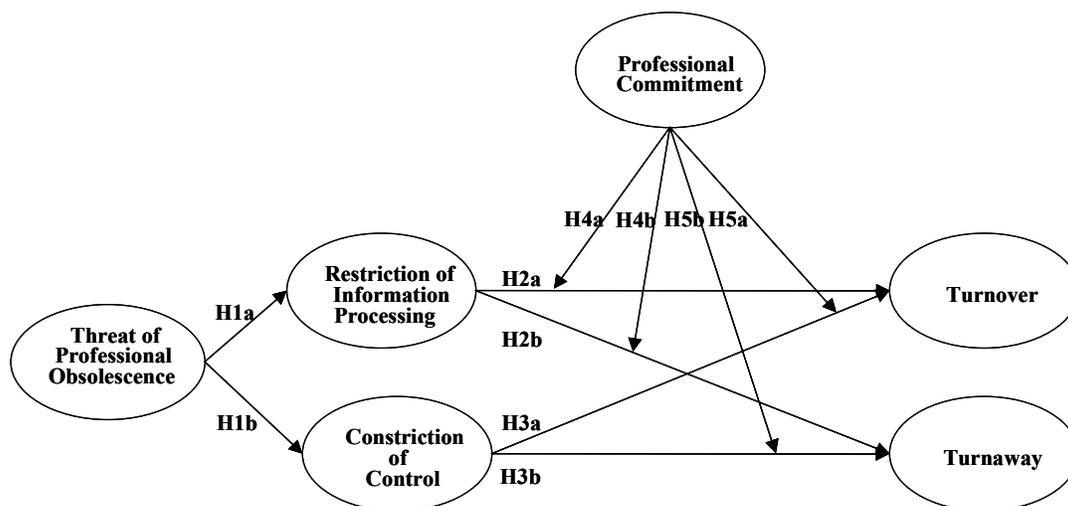


Figure 1. Theoretical Model of Individual Response to Threat of Professional Obsolescence

The threat-rigidity model posits that a threat perceived by an individual elicits behavioral responses that tend to be less varied or more rigid (Staw et al. 1981). These responses are the result of restricting information processing and constricting control (Figure 1). In restricting information processing, individuals narrow their field of attention, reduce the sources of information, or depend on prior experiences. They cognitively cope with the threat of professional obsolescence by adopting schemas that narrow the scope of knowledge and information processing to their area of specialization at the expense of the breadth of professional knowledge (Derber 1983; Kozlowski and Farr 1988; Pazy 1994; Steiner and Farr 1986). Hence:

Hypothesis 1a: When faced with an increasing threat of professional obsolescence, IT professionals will tend to cope by restricting information processing.

In constricting control, individuals attempt to control the threat of obsolescence by shortening the time horizon to the present and moving the focus of social comparison to immediate reference groups such as colleagues or others in an organization (Pazy 1994). Shortening the time horizon alleviates the threat by providing a sense of security and protection within a temporarily unchanging bubble (Pazy 1996). Having mastered a set of competencies, professionals might not feel the pressure to continuously pick up new competencies, especially those not directly related to the task.

By focusing on the dominant reference group, professionals reduce the threat by closing the psychological distance and making one seem less obsolete (Pazy 1994). It also allows professionals to share the burden of obsolescence with others (Kronus 1976). In essence, the coping mechanisms act as cognitive filters through which certain aspects of reality are emphasized and others selectively ignored (Thompson 1981). Hence:

Hypothesis 1b: When faced with an increasing threat of professional obsolescence, IT professionals will tend to cope by constricting control.

Cognitive Coping Strategies and Mobility Behavior

The threat-rigidity model goes on to posit that the cognitive coping mechanisms lead to behavioral responses which are either adaptive or maladaptive. The model argues that individuals will exhibit adaptive behaviors when threats arise from common or routine situations. Maladaptive behaviors are exhibited when threat arises from radical environmental changes.

Therefore, the threat-rigidity model suggests that IT professionals in a rapidly changing technology environment are likely to exhibit maladaptive behaviors, which further the erosion of IT competencies. Further erosion of competencies is also likely when individuals are not motivated to update their professional competencies (Aryee 1991; Farr et al. 1983) or when organizations do not support updating efforts (Kozlowski and Farr 1988; Kozlowski and Hults 1987).

IT professionals tend not to update competencies in concert with the profession but rather according to organizational or job demands (Kozlowski and Hults 1987; Pazy 1996). Such restrictions tend to reduce the scope of competencies to a manageable range (Pazy 1994), resulting in IT professionals specializing within an occupational niche (Ferdinand 1966; Fossum et al. 1986). Organizational circumstances further aid specialization by defining professional development in narrower and narrower domains (Wallace 1995). The strength of tie to the organization is further increased when organizations value firm specific human capital over general human capital (Becker 1975) and when professionals are dependent on the organization for resources to do the job. Hence:

Hypothesis 2a: The more IT professionals restrict their information processing, the less likely they will turnover (intra-occupational mobility).

Hypothesis 2b: The more IT professionals restrict their information processing, the less likely they will turnaway (inter-occupational mobility).

Similarly, constrictions in control may lead IT professionals to exhibit maladaptive behaviors. Close referent groups face similar ecological pressures and tend to react cohesively as a group (Griffin et al. 1995; Staw et al. 1981). Hence, bringing one's focus of time and context closer to work erects boundaries on salient in-groups, shared common values, norms and perspectives (Van Maanen and Barley 1984). The in-group provides an IT professional with stability and security in the face of a turbulent technological environment and is, therefore, less likely to leave the in-group. Eventually, the primary identity of a professional is built around the immediate work context and an eventual withdrawal from broader professional activities (Thompson 1981). Hence:

Hypothesis 3a: The more IT professionals constrict their control, the less likely they will turnover (intra-occupational mobility).

Hypothesis 3b: The more IT professionals constrict their control, the less likely they will turnaway (inter-occupational mobility).

Moderating Role of Professional Commitment

While the threat-rigidity model suggests that IT professionals are likely to exhibit maladaptive behaviors, the model goes on to mention that central or dominant cues provide impetus for the individual to exhibit adaptive behaviors. Hence, we argue that professional commitment may help IT professionals exhibit adaptive behaviors by moderating the relationship between the cognitive coping mechanisms and occupational mobility. Professional commitment is defined as the relative strength of identification with and involvement in one's profession (Morrow and Wirth 1989). It enables professionals to cope with the uncertainties and complexities of work motivating the individual to remain current with the profession at large (Blau 1999; Wallace 1995).

Research consistently finds that professional commitment may facilitate turnover when an organization does not fulfill the individual's aspirations or goals (Ginzberg and Baroudi 1988) and that professional commitment is negatively related to turnaway (e.g., Blau 1999; Blau and Lunz 1998; Breeden 1993). Therefore, we would expect professional commitment to play a pivotal role in the threat-rigidity model by moderating the relationship between the coping mechanisms and occupational mobility.

We argue that turnover and turnaway are adaptive behaviors because they either arrest further erosion of competencies or remove the threat altogether. While turnover is generally thought to be dysfunctional, it can be a means of reducing the threat of obsolescence because it provides IT professionals with an opportunity to acquire new and up-to-date competencies from another organization (Glass 2000). Research suggests that intent to turnover is high, especially when organizations do not provide opportunities for employees to develop their human capital (Becker 1975; Kozlowski and Farr 1988). IT professionals may also choose to turnaway from the profession in response to the threat of obsolescence. However, leaving the profession is an expensive option because advancement, employability, and quality of alternative jobs are jeopardized (Crepeau et al. 1992; Rhodes and Doering 1993). Although expensive, turning away from the profession may be an adaptive response because it eliminates the perceived threat of professional obsolescence altogether.

Nevertheless, a professional's identity tends to be based on the mastery of specific occupational competencies (Von Glinow 1988). Typically, IT professionals achieve mastery of their competencies through participation in IT projects. The more projects an organization embarks on, the less likely an IT professional will turnover (Igarria and Siegel 1992). Therefore, IT professionals threatened with obsolescence but committed to professional development would move to other organizations where they can develop their competency portfolio (Greenhaus and Collins 1997). IT professionals would tend to seek opportunities to develop within their profession rather than devalue their competencies by exiting the profession. Therefore, the opportunity to specialize within a profession and the perceived opportunities of practicing within an organization may motivate IT professionals to remain within the profession. Hence:

Hypothesis 4a,b: The relationship between restriction of information processing and mobility is moderated by professional commitment such that, if the professional commitment of an IT professional is high, restricting information processing will lead to turnover but not to turnaway.

While constricting control reduces the strains of high work demands (Lease 1998), IT professionals with stronger attachments to the profession may become dissatisfied with their current situation (Lee et al. 1996). Information about imagined referent outcomes are typically obtained through interactions with others in the profession. Such comparisons between the reported outcomes and the existing reality would more likely lead to turnover. For the IT professional, turnover is made easier by chronic shortage of skilled IT professionals (Information Technology Association of America 1999). The opportunities available in the labor market would more likely retain individuals rather than to lose them to other professions (McDuff and Mueller 2000). Hence:

Hypothesis 5a,b: The relationship between constriction of control and mobility is moderated by professional commitment such that, if the professional commitment of an IT professional is high, constricting control will lead to turnover but not turnaway.

METHODOLOGY

Data Collection

The approach taken to empirically test the hypotheses was a field study using a survey methodology for data collection. We collected data from 192 IT professionals using a snowballing approach (Babbie 1992; Lopes et al. 1996). The 29 participants enrolled in a part-time MBA program were asked to distribute the questionnaire to 10 IT professionals in their respective organizations. Of the 290 questionnaires distributed, we achieved a response rate of 66.2% with 192 questionnaires returned.

Sample

The respondents were on average 30.2 years old with an average working experience of 6.4 years. Their average organization tenure was 3.3 years and job tenure was 2.5 years. The IT professionals surveyed held job roles in both systems development (e.g., applications development managers, systems analyst, and programmers) as well as IT infrastructure (e.g., data center managers, network managers, and database administrators).

Construct Measurement

The questionnaire completed by the respondents contained multiple measurement items relating to each of the constructs in the research model. Wherever possible, we used scales validated in previous studies. For the remaining constructs, we used sets of items generated based on reviews of prior relevant literature. For all items, respondents were asked to indicate the extent to which they agreed or disagreed with the statements on a seven-point Likert-type scale, anchored by “1” = “Strongly disagree” and “7” = “Strongly agree.”

Threat of professional obsolescence was measured with five items based on research by Pazy (1990, 1994, 1996). We developed two items to reflect restriction of information processing and another three items to reflect constriction of control from Pazy’s (1994) qualitative study on cognitive coping schemata of professional obsolescence. Professional commitment was measured using four items adapted from Morrow and Wirth (1989). The five items measuring the intent to turnover and another five items measuring the intent to exit the profession (turnaway) were adapted from Rusbult et al. (1988).

The covariates in the model were organizational tenure, education levels, and gender. Prior research has shown that organizational tenure, educational levels, and gender are related to intentions to turnover or turnaway (Blau and Lunz 1998; Hom et al. 1992; Tett and Meyer 1993).

Data Analysis

We use partial least squares (PLS) to analyze the measurement and structural models. PLS is suited for this study because it combines principal component analysis, path analysis, and regression to simultaneously evaluate theory and data (Chin 1998; Hulland 1999). Data analysis with PLS starts with the assessment of the measurement model followed by the assessment of the structural model. In assessing the measurement model, we examine the construct validity in terms of convergent and discriminant validities. The measurement model is evaluated by examining the predictive and explanatory powers of the model (Gefen et al. 2000).

RESULTS

Assessment of Measurement Model

Descriptive statistics for the main research constructs are shown in Table 1. Overall, the results obtained in this study suggests convergent and discriminant validity of our measurement model.

Table 1. Descriptive Statistics of the Research Constructs (N = 192)

Constructs	Mean	Standard Deviation
Threat of Professional Obsolescence	3.71	1.41
Restriction in Information Processing	4.20	1.43
Constriction of Control	2.75	1.37
Professional Commitment	4.92	1.35
Turnover	3.62	1.35
Turnaway	2.96	1.50

Assessment of the Structural Model

In summary, we find support for the threat-rigidity model and limited support for the subsequent behavioral consequences and moderating role of professional commitment. Specifically, we find support for hypothesis 1 and partial support for hypotheses 2, 4, and 5. Contrary to our arguments, results for hypothesis 3a suggests that constricting control leads to turnover. In addition, the results for hypothesis 4 suggest IT professionals with high levels of professional commitment and who restrict information processing are more likely to turnover than turnaway.

CONCLUSION

The results obtained in this study provide an answer as to how IT professionals cope with professional obsolescence. It seems that IT professionals will more likely leave the organization than leave the profession when faced with the threat of professional obsolescence. The findings from this study may help the IT profession and organizations develop strategies aimed at keeping the IT professionals current and effective contributors to the organization's objectives. Finally, this study also provides a theoretical and empirical guide for future research by elaborating on the relationship of IT professionals to their profession and organization.

References

- Ang, S., and Slaughter, S. "The Missing Context of Information Technology Personnel: A Review and Future Directions for Research," in *Framing the Domains of IT Management: Projecting the Future From the Past*, R. W. Zmud (ed.), Pinnaflex Educational Resources, Cincinnati, OH, 2000.
- Aryee, S. "Combating Obsolescence: Predictors of Technical Updating Among Engineers," *Journal of Engineering and Technology Management* (8), 1991, pp. 103-119.
- Babbie, E. *The Practice of Social Research*, Wadsworth, Inc, Belmont, CA, 1992.
- Becker, G. *Human Capital*, University of Chicago Press, Chicago, 1975.
- Blau, G. "Early-Career Job Factors Influencing the Professional Commitment of Medical Technologists," *Academy of Management Journal* (42:6), 1999, pp. 687-695.
- Blau, G., and Lunz, M. "Testing the Incremental Effect of Professional Commitment on Intent to Leave One's Profession Beyond the Effects of External, Personal, and Work-Related Variables," *Journal of Vocational Behavior* (52), 1998, pp. 260-269.
- Breeden, S. A. "Job and Occupational Change as a Function of Occupational Correspondence and Job Satisfaction," *Journal of Vocational Behavior* (43), 1993, pp. 30-45.
- Chin, W. "Issues and Opinion on Structural Equation Modeling," *MIS Quarterly* (22:1), 1998, pp. 7-16.
- Crepeau, R. G., Crook, C. W., Goslar, M. D., and McMurtrey, M. E. "Career Anchors of Information Systems Personnel," *Journal of Management Information Systems* (9:2), 1992, pp. 145-161.
- Derber, C. "Managing Professionals: Ideological Proletarianization and Post-Industrial Labor," *Theory and Society* (12), 1983, pp. 309-314.
- Dubin, S. S. "Motivational Factors in Professional Updating," in *Professional Obsolescence*, S. S. Dubin (ed.), The English Universities Press, London, 1971, pp. 35-48.
- Dubin, S. S. "Maintaining Competence Through Updating," in *Maintaining Professional Competence*, S. L. Willis and S. S. Dubin (eds.), Jossey-Bass, San Francisco, 1990, pp. 44-48.
- Farr, J. L., Dubin, S. S., Enscoe, E. E., Kozlowski, S. W. J., and Cleveland, J. N. "Relationships Among Individuals Motivations, Work Environment, and Updating in Engineers," *Psychological Documents* (13), 1983, Ms. No. 2563.
- Ferdinand, T. N. "On the Obsolescence of Scientists and Engineers," *American Scientist* (54), 1966, pp. 46-56.
- Fossum, J. A., Arvey, R. D., Paradise, C. A., and Robbins, N. E. "Modeling the Skills Obsolescence Process: A Psychological/Economic Integration," *Academy of Management Review* (11), 1986, pp. 362-374.
- Gefen, D., Straub, D., and Boudreau, M.-C. "Structural Equation Modeling and Regression: Guidelines for Research Practice," *Communications of the Association for Information Systems* (4), 2000 (<http://Cais.lsworld.org/Articles/Default.Asp?Vol=4&Art=71>).
- Ginzberg, M. J., and Baroudi, J. J. "MIS Careers: A Theoretical Perspective," *Communications of the ACM* (31), 1988, pp. 586-594.
- Glass, R. "On Personal Technical Obsolescence," *Communications of the ACM* (43:7), 2000, pp. 15-17.
- Greenhaus, J. H., and Collins, K. M. "Work and Family Influences on Departure from Public Accounting," *Journal of Vocational Behavior* (50), 1997, pp. 249-270.
- Griffin, M. A., Tesluk, P. E., and Jacobs, R. R. "Bargaining Cycles and Work-Related Attitudes: Evidence for Threat-Rigidity Effects," *Academy of Management Journal* (38:6), 1995, pp. 1709-1725.
- Hom, P. W., Caranikas-Walker, F., and Prussia, G. E. "A Meta-Analytic Structural Equation Analysis of a Model of Employee Turnover," *Journal of Applied Psychology* (77:6), 1992, pp. 890-909.
- Hulland, J. "Use of Partial Least Squares (PLS) in Strategic Management Research: A Review of Four Recent Studies," *Strategic Management Journal* (20), 1999, pp. 195-204.
- Igarria, M., and Siegel, S. R. "The Reasons for Turnover of Information Systems Personnel," *Information & Management* (23:6), 1992, pp. 321-331.
- Information Technology Association of America. "Upgrading the IT Skills of the Current Workforce," 1999 (<http://www.itaa.org/Workforce/Studies/Upgrade.Htm>).

- Kozlowski, S. W. J., and Farr, J. L. "An Integrative Model of Updating and Performance," *Human Performance* (1), 1988, pp. 5-29.
- Kozlowski, S. W. J., and Hulst, B. M. "An Exploration of Climates for Technical Updating and Performance," *Personnel Psychology* (40), 1987, pp. 539-563.
- Kronus, C. L. "Occupational Versus Organizational Influences on Reference Group Identification: the Case of Pharmacy," *Work and Occupations* (3), 1976, pp. 303-330.
- Lease, S. H. "Annual Review, 1993-1997: Work Attitudes and Outcomes," *Journal of Vocational Behavior* (53), 1998, pp. 154-183.
- Lee, D. M. S., Trauth, E. M., and Farwell, D. "Critical Skills and Knowledge Requirements of IS Professionals: A Joint Academic/Industry Investigation," *MIS Quarterly* (19:3), 1995, pp. 313-340.
- Lee, T. W., Mitchell, T. R., Wise, L., and Fireman, S. "An Unfolding Model of Voluntary Employee Turnover," *Academy of Management Journal* (39:1), 1996, pp. 5-36.
- Lopes, C. S., Rodrigues, L. C., and Scichieri, R. "The Lack of Selection Bias in a Snowball Sampled Case-Control Study on Drug Abuse," *International Journal of Epidemiology* (25:6), 1996, pp. 1267-1270.
- McDuff, E. M., and Mueller, C. W. "The Ministry as an Occupational Labor Market: Intentions to Leave an Employer (Church) Versus Intentions to Leave a Profession (Ministry)," *Work and Occupations* (27:1), 2000, pp. 89-116.
- Morrow, P. C., and Wirth, R. E. "Work Commitment Among Salaried Professionals," *Journal of Vocational Behavior* (34), 1989, pp. 40-56.
- Nelson, R. R. "Educational Needs as Perceived By IS and End-User Personnel: A Survey of Knowledge and Skill Requirements," *MIS Quarterly* (15:4), 1991, pp. 503-525.
- Pazy, A. "The Threat of Professional Obsolescence: How Do Professionals at Different Career Stages Experience It and Cope with It?," *Human Resource Management* (29), 1990, pp. 251-269.
- Pazy, A. "Cognitive Schemata of Professional Obsolescence," *Human Relations* (47), 1994, pp. 1167-1199.
- Pazy, A. "Concept and Career-Stage Differentiation in Obsolescence Research," *Journal of Organizational Behavior* (17:1), 1996, pp. 59-78.
- Rhodes, S., and Doering, M. "Intention to Change Careers: Determinants and Process," *Career Development Quarterly* (42), 1993, pp. 76-92.
- Ross, J. W., Beath, C. M., and Goodhue, D. L. "Develop Long-Term Competitiveness Through IT Assets," *Sloan Management Review* (Fall), 1996, pp. 31-42.
- Rusbult, C. E., Farrell, D., Rogers, G., and Mainouss, A. G. "Impact of Exchange Variables on Exit, Voice, Loyalty, and Neglect: an Integrative Model of Responses to Declining Job Satisfaction," *Academy of Management Journal* (31:3), 1988, pp. 589-599.
- Schambach, T. P. "Maintaining Professional Competence: an Evaluation of Factors Affecting Professional Obsolescence of Information Technology Professionals," University of South Florida, 1994.
- Staw, B. M., Sandelands, L. E., and Dutton, J. E. "Threat-Rigidity Effects in Organizational Behavior: A Multilevel Analysis," *Administrative Science Quarterly* (26), 1981, pp. 501-524.
- Steiner, D. D., and Farr, J. L. "Career Goals, Organizational Reward Systems and Technical Updating in Engineers," *Journal of Occupational Psychology* (59), 1986, pp. 13-24.
- Tett, R. P., and Meyer, J. P. "Job Satisfaction, Organizational Commitment, Turnover Intention and Turnover: Path Analysis Based on Meta Analytic Findings," *Personnel Psychology* (46), 1993, pp. 259-293.
- Thompson, S. C. "Will It Hurt Less If I Can Control It? A Complex Answer to a Simple Question," *Psychological Bulletin* (90), 1981, pp. 89-101.
- Van Maanen, J., and Barley, S. R. "Occupational Communities: Culture and Control in Organizations," in *Research in Organizational Behavior*, B. Staw and L. Cummings (eds.), JAI Press, Greenwich, CT, 1984, pp. 287-365.
- Von Glinow, M. A. *The New Professionals: Managing Today's High-Tech Employees*, Ballinger Publishing Company, Cambridge, MA, 1988.
- Wallace, J. E. "Organizational and Professional Commitment in Professional and Nonprofessional Organizations," *Administrative Science Quarterly* (40), 1995, pp. 228-255.
- Zabusky, S., and Barley, S. R. "Redefining Success Ethnographic Observations on the Careers of Technicians," in *Broken Ladders: Managerial Careers in the New Economy*, P. Osterman (ed.), Oxford University Press, New York, 1996, pp. 185-214.

