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A STUDY TO EXAMINE PERCEIVED ROLE AMBIGUITY, ROLE CONFLICT, PARTICIPATION IN DECISION MAKING, ABILITY AND JOB SATISFACTION AMONG INTELLECTUAL PROPERTY LICENSING PROFESSIONALS

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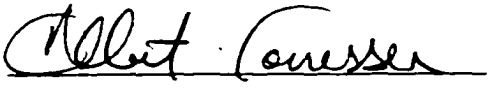

Albert M. Torressen
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DEDICATION

To my family with love and gratitude

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Albert Michael Torressen

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CHAPTER I

INTRODUCTION AND PROBLEM STATEMENT

The threefold purpose of this chapter is to a) provide an introduction to an issue faced by managers in selected academic and industrial organizations; b) elaborate on a problem associated with this issue; and c) introduce the research questions pursued in this study.

Overview

As the twentieth century draws to a close, American businesses and universities must continue to find solutions to the many challenges associated with a rapidly changing and highly competitive global environment, which is sure to continue into the new millennium. Of paramount concern in both settings is the issue of improving the organization's financial outlook. In response to this challenge, industry and academia alike are recognizing and exploiting their intellectual property, i.e. patents, copyrights, trademarks, and technology, to generate revenue (Collins, 1997; Gupta, 1994; Christensen & Philbrick, 1993).

Intellectual property licensing (IPL) professionals, who work in these complex business and academic environments, have the responsibility for transferring intellectual property from inventors to product makers and service providers. Since IPL professionals represent their organizations when negotiating

licenses with external parties, IPL professionals generally possess a high level of formal education as well as a firm understanding, typically gained through practical work experience, of the organization and subject matter they are representing. Licenses are the contractual agreements that define the terms and conditions, including financial consideration, which serve as the blueprint for transferring intellectual property from supplier to user.

As evidence of the celerity in creativity of business and academia, the rapidly growing pool of intellectual property has become a concern for those who manage the process. According to Bruce A. Lehman, the former United States Commissioner of Patents and Trademarks, the United States Patent and Trademark Office faces a significant challenge in adapting their operations to cope with the ever increasing number of patent application filings. Filings of patent applications over the past decade have increased at an average rate of approximately five percent per year. This steady growth of intellectual property has resulted in a rapid increase in licensing revenue. As the new millennium approaches, overall U.S. intellectual property revenue was expected to exceed $100 billion annually compared to $3 billion in 1980 (Lehman, 1997).

As the intellectual property generated by industry and universities grows, so do the opportunities for licensing and financial gain for the owners of the intellectual property. According to the 1998 Association of University Technology Managers Survey (available at www.autm.net), the licensing of university

developed inventions adds more than $33 billion to the economy and supports an estimated 280,000 jobs each year. In 1998 alone, academic licensing led to the formation of 364 new companies. Since 1980 at least 2,578 new companies have been formed based on intellectual property licenses granted by academic institutions. This increase in academic licensing activity is the direct result of the 1980 Bayh-Dole Act, which enabled universities to own and patent inventions developed under federally-funded research programs. Prior to the Act, fewer than 250 patents were issued to U.S. universities each year. In 1998 academic institutions were issued 3,224 U.S. patents, up by 22% from the 2,645 in 1997. A specific example of university-based intellectual property which has been successfully exploited commercially through licensing is Lycos, a registered trademark of the Carnegie Mellon University (CMU). The Lycos trademark, along with CMU technology, was licensed to Lycos Inc., a company which develops and provides on-line guides to the Internet's World Wide Web. As consideration for their intellectual property CMU owns 1.15 million shares of Lycos stock (Mulqueen, 1996). Lycos stock, which trades on the Nasdaq Stock Market, was recently priced at $70 per share, according to the February 15, 2000 Lycos website (www.lycos.com), adding $80.5M to the CMU balance sheet.

The intellectual property and licensing revenue generated by industrial companies is equally as impressive. Consider the IBM Corporation which was awarded a record 2,756 US patents in 1999. Based on its considerable intellectual

property portfolio, IBM generated more than $1 billion in licensing revenue in 1999 (Foremski, 2000). Like IBM, a growing number of companies including Proctor & Gamble, Ford Motor Company, and BellSouth are exploiting their intellectual property portfolios, including their once untouchable trade secrets, to generate new, and much needed, revenue. For example, Ford Motor has recently licensed its switch that drivers can use to deactivate an air bag, as well as its adjustable pedals designed for short drivers, to some of its competitors (Sherrid, 1999). The driving force behind this growing phenomena of intellectual property portfolio exploitation, by academic and industrial organizations alike, is the simple fact that nearly all of the licensing revenue is pure profit to the organization.

However, while the recent literature highlights much of the wealth created through intellectual property licensing (Flynn, 1998), it also points to the organizational problems associated with licensing (Walshok, 1997; Collins, 1997; Gupta, 1994). For example, organizing the licensing function within the university environment so as to deal with the rapidly expanding amount of intellectual property and associated number of licensing opportunities, was a significant challenge for the University of California (UC) system in the early 1990s. The UC system's size and complexity, and rapid growth of intellectual property and licensing opportunities resulted in increased faculty dissatisfaction with the service provided by the University's centralized intellectual property

function. This situation forced the University of California to decentralize and expand the intellectual property department in order to better serve the individual campus constituencies and the associated business communities (Maitkin, 1997).

In addition to grappling with how best to organize the intellectual property and licensing department, universities must also answer the question of what is the purpose of licensing intellectual property (Litster, 1996). In contrast to industrial organizations who generally license intellectual property for financial gain, universities can license research results for a variety of reasons, including to:

- facilitate technology/product development for the public good;
- attract industrial research funding;
- induce closer ties to industry;
- motivate and reward faculty;
- provide employment opportunities for graduates and students;
- foster economic development; and
- generate income.

How best to organize the licensing function can be equally challenging for industrial companies as well. Should companies work alone or should they team with other organizations in order to maximize profits? For example, Allied Signal, Boeing, DuPont and Dow Chemical recently agreed to make intellectual property available to potential licensees through an Internet startup company

yet2.com (Sherrid, 1999). One reason these companies take this approach to marketing their intellectual property is to minimize the administrative costs. However, if by taking this approach these companies must share revenues with the partner, they might then potentially be reducing the profits they could have earned had they undergone the licensing effort on their own.

Therefore, unless the structure and purpose of licensing is expressed clearly by the organization for which they work, IPL professionals may perceive their roles to be ambiguous to varying degrees. Also, any lack of clarity with regard to the expected results of intellectual property licensing may result in role conflict for the IPL professional with other individuals within the organization's divisions and/or departments. If present, these ambiguities and conflicts may have an adverse affect on employee job satisfaction, which may subsequently affect the health of the IPL professional and the performance of the organization.

With regard to the relationship between employee health and job satisfaction, Herzberg, Mausner and Snyderman (1959) found that individuals reported physical symptoms, such as headaches, loss of appetite, indigestion, and nausea following dissatisfying job incidents. As for organizational performance, reductions in job satisfaction have been tied to increases in employee absenteeism and turnover (Crampton & Wagner, 1994). On the positive side, employee job satisfaction is important to study because it has been shown to correlate positively with organizational citizenship behavior (Organ & Ryan, 1995). This type of

organizationally desirable behavior by employees includes such traits as being courteous and helpful to coworkers. Thus, monitoring and finding ways to improve employee job satisfaction, and its antecedents, is important to IPL professionals and their organizations. Therefore, job satisfaction of IPL professionals was measured as the dependent variable in this study.

The decision of whether, and to what degree, academic organizations should pursue intellectual property licensing opportunities is further complicated by the need to protect the academic freedom of the faculty. A special and unique responsibility of university faculty members is the self-directed pursuit of research that will substantively expand the human knowledge base. However, partnering with industrial organizations through intellectual property licensing agreements can create problems, vis-a-vis academic freedom, for faculty members. Specifically, industrial partners, as consideration for the funding they provide, often expect academic research results to be kept secret, or at a minimum divulged only with their permission. This issue is of great concern to faculty members and university administrations.

For example, the University of Indiana (IU), following a lengthy debate, has recently issued principles and policy statements regarding intellectual property and licensing. These principles and policies, which were approved by the IU trustees in May of 1997, were developed over a five year period by a special task force established by the university. This task force included scientists and

humanists from several campuses, representatives from the medical school and other professional schools, and an attorney specializing in intellectual property law. Among the policies approved by the trustees was the requirement that faculty members be free to discuss their ideas with whomever they wish without fear of reprisal from anyone. Also, it was decided that the university may not transfer intellectual property to a third party without the permission of the creator/faculty member (Scott, 1998). Such principles and policies, which are not unique to Indiana University, can make the pursuit of licensing opportunities by IPL professionals in academic organizations problematic.

In addition to coping with potential internal role ambiguity and conflict problems, IPL professionals in both academic and industrial organizations, by the very nature of their work, must transcend organizational boundaries. Kahn, Wolfe, Quinn, Snoek and Rosenthal (1964) refer to roles which require individuals to work between two or more social systems as boundary spanning positions. Ancona and Caldwell (1988) define three types of boundary spanning activity. Mapping the external environment is referred to as scout activity. Opening communication channels with other organizations is considered an ambassador activity. Work which monitors the flow of information is called a sentry activity. Understanding the internal organization as well as the external environment is a responsibility of individuals in boundary spanning roles (Tushman, 1977). To perform their jobs effectively, IPL professionals must map

the external environment, open communication channels, and monitor the flow of information between their organization and external parties, and are therefore, by definition, boundary spanners. Boundary spanning is an important job characteristic, vis-a-vis job satisfaction, as it has been suggested that individuals in boundary spanning positions are susceptible to higher levels of role ambiguity and role conflict than individuals whose role activities keep them within the boundaries of one social system (Miles, 1976). Thus, boundary spanning is an important dimension of the job performed by IPL professionals in both the academic and the industrial environment.

Role ambiguity occurs when the employee receives too little information with regard to job expectations. The types of information needed by employees include the rights, duties and responsibilities of their office; information regarding the best way to fulfill these role requirements; and information regarding the consequences of these activities both when successful and when not. According to Kahn et al. (1964), there are many orgainizational factors which can contribute to an increase in role ambiguity. For example, role ambiguity may result from: organizational size and complexity which exceed the individual's span of comprehension; rapid organizational growth; reorganizations of personnel which disturb interdependencies among workers; and/or changes in technology which in turn require associated changes in social structure. Finally, managerial philosophies which foster restriction on information flow throughout the

organization (e.g. disseminating information on a "need to know" basis) can lead to an increase in role ambiguity. Each of these organizational characteristics impacting role ambiguity can be found to varying degrees within academic and industrial IPL organizations. Role ambiguity has been studied and has been negatively correlated to job satisfaction, with a demonstrated average correlation across 56 studies of r = -.46 (Jackson & Schuler, 1985).

Rizzo, House and Lirtzman (1970) defined role conflict as the degree to which expectations of a role are incompatible with the reality of the role. The job of the IPL professional frequently involves trying to negotiate with and satisfy clients and third parties who may have conflicting needs and demands. These various constituencies include faculty members, administration, technical professionals, management, government agencies and external third parties. As administrators, the role of the IPL professional often places them in the middle of conflicting groups, persons, or factions. With regard to the academic environment, Carroll (1974) stated,

> One of the major difficulties in academic organizations is that role definitions and perceptions vary considerably from one person to the next. For example, the faculty member may not consider himself a subordinate of administration, and any attempt to imply or suggest a role of superordination for the departmental chairman or some higher administrator and a role of subordination for the faculty member may likely lead to a conflict situation. The complexities of the educational institution, then, become apparent (p. 53).

The presence of role conflict is certainly not unique to academic organizations. Within industry, various types of conflict occur as well. When the expectations of one organizational group are in conflict with the responsibilities of another organizational faction, inter-role conflict occurs (Hellriegel & Slocum, 1979). For example, imagine that the marketing team of a large company was about to land a sales contract with a valued customer. However, just prior to the sale being executed the customer insists on a royalty-free license to the company's patents. The marketing team then goes back to the intellectual property department and communicates the need for a no-money grant of patent rights to the potential customer. Such a request could be in conflict with the intellectual property department's responsibility of generating revenue directly from patent licensing. While this issue is resolvable, the incompatibility of the request with the intellectual property department's objectives can result in inter-role conflict for the IPL professional. In addition to inter-role conflict, Hellriegal and Slocum (1979) discuss other sources of role conflict. These will be presented in the next chapter. In their meta-analysis, Jackson and Schuler (1985) found role conflict to be negatively correlated with job satisfaction, with $r = -.48$ across 37 studies. Thus, IPL professionals, acting in their capacity as boundary spanners, may perceive role ambiguity and/or role conflict to varying degrees, which may in turn adversely impact their job satisfaction. Therefore, this study examined the degree

of role ambiguity and role conflict perceived by IPL professionals working in academic and/or industrial organizations.

However, there are certain organizational and individual characteristics which may help to reduce the adverse effects, vis-a-vis job satisfaction, of role ambiguity and role conflict. Employee participation in decision making is one such organizational factor. Using Vroom's (1964) expectancy theory of work motivation, Mitchell (1973) argued that an employee will likely perceive the effort-performance expectancy relationship more readily and clearly when he or she is allowed to participate in the decision making process. Schuler's (1977a) results indicate that the more communication and feedback available to an employee, the better he or she should be able to cope with role ambiguity and conflict. Employee participation in decision making is assumed to be positively related to the amount of information and feedback given to the employee. Thus, participation should be positively correlated with effort-performance expectancy because participation allows the employee a chance to verify the actual performance contingencies in the organization with his or her supervisor and fellow employees. Also, the more participation that an employee has with his or her supervisor and fellow workers, the more chances there are for role clarification and even role conflict awareness and resolution. In addition, it is generally found that the lower the perceived levels of role conflict and ambiguity, the higher the levels of job satisfaction (Schuler, Aldag & Brief, 1977). Thus, an

increase in the clarity of an employee's effort-performance expectancy, via increased participation, should result in a reduction in the correlation between each of the role constructs and job satisfaction.

Given the potential benefits provided by participation (i.e. clarity of expectations through communication and feedback) it was the premise of this study that as the level of participation in decision making increased, the correlation between each of the role constructs and job satisfaction would be reduced. Therefore, this study examined the IPL professional's perceptions of effort-performance expectancy and participation in decision making to test the validity of this premise.

As for an individual factor, employee ability, which was operationalized in this study as the sum of IPL work experience and formal education, is considered by Kahn et al. (1964) to be negatively correlated with role ambiguity and conflict. That is, the more formal education and job-related experience possessed by the employee, the greater the role clarification. Therefore, one would reason that the benefits provided by ability, vis-a-vis role ambiguity and conflict, would also help to boost employee job satisfaction. However, studies have shown that the nature of the job influences not only the magnitude but also the sign of the relationship between ability and job satisfaction. That is, employees with high ability levels are sometimes *less* satisfied with their jobs than individuals with lesser abilities who are working on the same tasks (Barrett, Forbes, O'Connor, & Alexander,

1980). The practical implication of this relationship between employee ability and the nature of the job is that employees tend to gravitate toward jobs that are compatible with their abilities (Wilk, Desmarais, & Sackett, 1995). It was the premise of this study that IPL professionals' abilities generally match well with their work requirements and therefore the benefits of increased ability levels would accrue to the individual in the form of a reduction in the correlation between each of the role constructs and job satisfaction. Therefore, this study examined the IPL professional's level of ability to test this premise.

An examination of academic and industrial IPL professionals was interesting because of the similarities and differences found in their respective organizations. For example, while IPL professionals in each environment recognize the importance of licensing, they do not always engage in it for the same reasons. This is due, in part, to the variation found in the goals and objectives of the organization's constituent members. Also, there are clear differences in the structure and decision making style of each type of organization. That is, with regard to structure, industrial organizations are typically bureaucratic in nature, whereas academic organizations strive for a collegial environment. This fundamental difference in structure fosters a difference in the decision making style between academic and industrial organizations.

It was therefore theoretically meaningful and of practical importance to have examined the relationships between employee ability, participation in

decision making, role ambiguity, role conflict, and job satisfaction of IPL professionals. Further, the nature of their work, i.e. boundary spanning, made IPL professionals a particularly intriguing group to examine in that their perceived levels of role stress and job satisfaction were generally higher than the role stress and job satisfaction levels of individuals who work primarily within traditional organizational boundaries.

Statement of the Problem

Global competition and the accompanying rapid growth of intellectual property, i.e. patents, copyrights, trademarks and know-how, has resulted in an increasing number of revenue-generating licensing opportunities for academic and industrial organizations. Intellectual property licensing (IPL) professionals are employed in each of these environments and are responsible for the transfer of intellectual property and the execution of licensing agreements. According to Kahn et al. (1964), the characteristic of rapid organizational growth, as well as factors associated with individuals who span organizational boundaries, can give rise to an increase in the level of role conflict and/or role ambiguity, which may in turn adversely affect employee job satisfaction and organizational productivity.

However, there are certain organizational and individual characteristics which are believed to be effective in helping to reduce the adverse effects, vis-a-vis job satisfaction, of role ambiguity and role conflict. Participation in

decision making is one such organizational factor. Schuler's (1977a) results suggest that employee expectations about effort and performance, and employee participation in decision making are inversely related to employee perceptions of role conflict and ambiguity. Specifically, the greater the participation in decision making, the lower the levels of role conflict and ambiguity. In addition, it is generally found that the lower the perceived levels of role conflict and ambiguity, the higher the level of employee job satisfaction (Schuler et al., 1977).

Employee ability, which in this study was comprised of job-related experience and formal education, is an individual characteristic which has been shown to correlate with employee job satisfaction. Both theory (Kahn et al., 1964) and empirical evidence (Schuler, 1977b) suggest that the more ability the employee has, the better equipped he or she is to cope with role ambiguity and conflict. Therefore, the purpose of this study was to examine the relationships between perceived role conflict, role ambiguity, effort-performance expectancy, participation in decision making, ability and job satisfaction of IPL professionals. Specifically, this study attempted to examine the degree to which participation in decision making moderated the relationship between the role constructs and job satisfaction. Also, this study examined the degree to which ability moderated the relationship between the role constructs and job satisfaction. The conceptual framework for exploring these variables was job satisfaction and Schuler's (1980)

role and expectancy perception model of participation in decision making. A diagram of the variables used in this study is shown in Figure 1.

Role conflict and role ambiguity were measured in this study with the 14 item Role Conflict and Ambiguity Scale developed by Rizzo, House and Lirtzman (1970). Satisfaction with work was measured by the 18 item Work Satisfaction Scale of the Job Descriptive Index (Smith, Kendall & Hulin, 1969). Participation in decision making was measured by the five item scale used by Vroom (1959). Effort-performance expectancy was measured by the two item scale used by Schuler and Kim (1978). IPL professional ability was operationalized as the sum of the respondent's formal educational level plus his or her years of IPL work experience.

The following research questions were addressed in this study.

Research Questions

Descriptive Data

1. What is the job satisfaction level for respondents?
2. What is the role ambiguity level for respondents?
3. What is the role conflict level for respondents?
4. What is the effort-performance expectancy level for respondents?
5. What is the participation in decision making level for respondents?
6. What is the ability level (i.e. years of IPL experience and formal education) for respondents?

Relationship Data

7. To what degree is role ambiguity related to job satisfaction?

8. To what degree is role conflict related to job satisfaction?

9. To what degree is participation in decision making related to job satisfaction?

10. To what degree is participation in decision making related to effort-performance expectancy?

11. To what degree is participation in decision making related to role ambiguity?

12. To what degree is participation in decision making related to role conflict?

13. To what degree is IPL professional ability related to job satisfaction?

14. To what degree is IPL professional ability related to role ambiguity?

15. To what degree is IPL professional ability related to role conflict?

Moderating Data

16. To what degree does participation in decision making moderate the relationship between role ambiguity and job satisfaction?

17. To what degree does participation in decision making moderate the relationship between role conflict and job satisfaction?

18. To what degree does IPL professional ability moderate the relationship between role ambiguity and job satisfaction?

19. To what degree does IPL professional ability moderate the relationship between role conflict and job satisfaction?

A diagram of the variables explored in this study is presented in Figure 1.

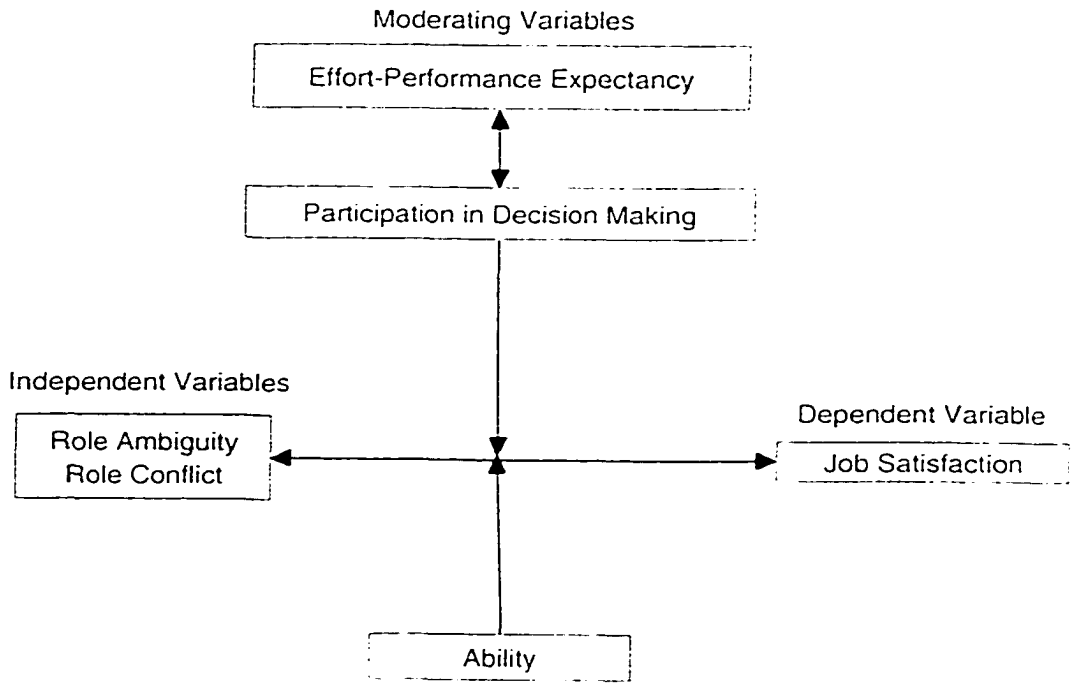

Figure 1: Diagram of the Variables

Definitions

Ability, as used in this study, is defined as the sum of an individual's years of intellectual property licensing experience plus years of formal education. This definition of ability has been used by Schuler (1977b).

Effort-Performance Expectancy is defined as the degree to which the employee perceives a positive relationship between effort and performance (Mitchell, 1973). As used in this study, effort-performance expectancy was measured with a two item scale used by Schuler and Kim (1978).

Intellectual Property is defined as an idea or invention which is embodied and protected in the form of a patent, copyright, trademark, trade secret or know-how. The terms know-how and technology are synonymous (Smith & Parr, 1994).

Job Satisfaction is a pleasurable or positive emotional state resulting from one's job or job experiences (Locke, 1976). As used in this study, job satisfaction was measured by one element of the Job Descriptive Index (JDI) (Smith, Kendall, & Hulin, 1969).

Role Ambiguity is the predictability of the outcomes of one's behavior, and the existence of environmental guidelines to provide knowledge that one is behaving

appropriately (Cook, Hepworth, Wall and Warr, 1989). As used in this study, role ambiguity was measured by the Role Ambiguity Scale developed by Rizzo, House and Lirtzman (1970).

Role Conflict is the degree to which expectations of a role are incompatible with the reality of the role (Rizzo, House and Lirtzman, 1970). As used in this study, role conflict was measured by the Role Conflict Scale developed by Rizzo, et al. (1970).

Significance of the Study

The rapidly changing and highly competitive global economy is forcing companies to reduce costs and generate new sources of revenue like never before. Due to the rising costs of product development, as well as the increasing complexity of innovations, companies are looking beyond their own internal organizations for new technologies. More and more, companies are expanding their intellectual property portfolios through a variety of acquisition techniques. One of the techniques which is widely used to gain access to the innovations of another party is the intellectual property license. As a result, organizations are scrambling to identify, value, and license-out their own intellectual property portfolios. If done successfully, creating and exploiting intellectual property can result in significant financial gains for the organization. Intellectual property

licensing (IPL) professionals have the responsibility of identifying the organization's intellectual property and developing an appropriate exploitation strategy. IPL professionals are also responsible for negotiating and executing intellectual property agreements with parties beyond the boundaries of the organization. Thus, many factors come into play which impact the work, and job satisfaction, of the IPL professional.

A rigorous examination of the results of this study provided a greater understanding of the interaction among specific organizational and individual factors pertaining to the job satisfaction of IPL professionals. Specifically, perceived levels of role ambiguity, role conflict, participation in decision making, ability and job satisfaction of IPL professionals was examined. Insights resulting from this study allowed for recommendations to be made which should be useful to practitioners and researchers interested in the management of IPL professionals.

Summary

This chapter described a broad issue and a specific problem faced by managers in academic and industrial organizations. The issue concerns the rapidly developing and complex academic and industrial environments in which intellectual property licensing (IPL) professionals work. The work of the IPL professional, namely generating much needed revenue for the organization, is critical to the success of the organization. The problem is that the nature of the

environment in which the IPL professional works manifests itself in certain undesirable characteristics. Specifically, role conflict and role ambiguity, which can negatively impact the job satisfaction of the IPL professional, can thrive in such environments.

However, two variables, i.e. participation in decision making and employee ability, are believed, theoretically, to be negatively correlated with the role constructs. Therefore, the purpose of this study was to examine perceived role ambiguity, role conflict, participation in decision making, ability, and job satisfaction among IPL professionals in order to determine the degree to which participation and/or ability moderate the relationship between the role constructs and job satisfaction.

The following chapter explores these variables in greater detail and reviews the relevant literature. Job satisfaction and Schuler's (1980) role and expectancy perception model of participation in decision making will be discussed as the conceptual framework for this study. Job satisfaction, role conflict, role ambiguity, participation in decision making, ability and the current literature in intellectual property licensing will also be discussed. Finally, the hypotheses that were pursued in this study will be presented.

CHAPTER II

CONCEPTUAL FRAMEWORK AND RELATED LITERATURE

This chapter will provide an overview of the conceptual framework and a review of the related literature of the variables used in this study. The first section is concerned with the conceptual framework for this study and will discuss job satisfaction and Schuler's (1980) role and expectancy model of participation in decision making. The second section will present selected related literature on job satisfaction, role ambiguity, role conflict, participation in decision making, ability and intellectual property licensing. The final section will present the hypotheses pursued in this study.

Conceptual Framework

Job satisfaction, which constituted the dependent variable of this study, serves as the foundation for the conceptual framework and is discussed below. Schuler's (1980) role and expectancy model of participation in decision making, which discusses the antecedent variables of this study, further serves to support the conceptual framework and is also discussed in this section.

Job Satisfaction

Optimizing employee job satisfaction should be a priority for organizations competing in today's highly competitive global marketplace. Since

job satisfaction relates to the well-being of the individual, and ultimately to the efficiency of the organization, it is a concept worthy of continuous scrutiny. Many examples of adverse individual and organizational consequences resulting from workers dissatisfied with their jobs can be found in the literature. Herzberg, Mausner and Snyderman (1959) found that individuals reported physical symptoms, such as headaches, loss of appetite, indigestion, and nausea following dissatisfying job incidents. With regard to adverse organizational consequences, consistent significant relationships between job dissatisfaction, and absenteeism and turnover can be found in the literature (Brayfield & Crockett, 1955; Vroom, 1964; Schuh, 1967; Crampton & Wagner, 1994).

Many models of job satisfaction have been developed and tested over the last fifty years identifying various factors associated with the concept. Each model has had its share of advocates in the literature, and most have received favorable reviews in the form of supportive empirical evidence. These models, which will be discussed in greater detail in the literature review section, generally can be classified in one of three categories including: a situational, or job characteristics, model which posits that job factors are responsible for worker satisfaction; a dispositional model which argues that personal dispositions, or traits, influence job satisfaction; and an interactional model which views job satisfaction as the result of an interaction between the person and the situation. One type of interactional model is the person-environment (P-E) fit model which

views satisfaction as the result of the fit between dispositional traits and the work environment. The P-E fit model of job satisfaction serves best as the conceptual rationale for this study. The reason for selecting this model begins with an understanding of the definition of job satisfaction.

Argyris (1957) defined job satisfaction as the congruence between what an employee expects from a job and what the job actually offers. In other words, the employee's degree of job satisfaction will increase as the degree of agreement (*or fit*) between his or her expectations and organizational offerings increases. Conversely, the greater the discrepancy between expectations and offerings the greater the degree of job dissatisfaction. The Argyris definition of job satisfaction, like the P-E fit model, takes into account the interaction between the worker and the workplace. The suitability of the P-E fit model, vis-a-vis this study, is discussed in greater detail in the review of literature section of this chapter.

Antecedents of job satisfaction can be classified into two major categories. First, the job environment itself and factors associated with the job are important influences on job satisfaction. For example, included in these factors would be how people are treated, the nature of job tasks, relations with other people in the workplace, and rewards. Role ambiguity and role conflict are two such environmental factors, and each was measured in this study

Second, there are individual characteristics that the person brings to the job. This includes an individual's personality as well as his or her prior experiences. Relevant work skills gained through prior experiences contributes to an individual's ability to perform his or her current job. Dealing with role ambiguities and conflicts are job requisites and it would be logical to think that experience would make a difference in how individuals respond. Therefore, ability was chosen as an individual factor in this study in order to examine the relationship between it, the role constructs, and job satisfaction. Specifically, ability was operationalized as the sum of level of education and years of intellectual licensing experience. For this study, job satisfaction of IPL professionals served as the dependent variable. The unit of analysis was the individual IPL professional. The following sections will discuss the other variables examined in relation to job satisfaction.

Role and Expectancy Model of Participation in Decision Making

Schuler's (1980) role and expectancy model of participation in decision making builds upon the earlier work of Mitchell (1973), Schuler (1977a), Morris, Steers and Koch (1979), and Schuler, Aldag and Brief (1977). This model was developed to illustrate *how* participation in decision making works. Schuler (1980) makes the argument for a model in which role (conflict and ambiguity) and

expectancy perceptions act as intervening variables between participation and employee job satisfaction.

The rationale for Schuler's role and expectancy perception model of participation in decision making is derived in part from earlier studies. Mitchell's (1973) work integrated the rational model of expectancy theory (Vroom, 1964), and the "caring for people" philosophy of the participative approach to employee motivation, where participation implies that there is shared decision making. Mitchell argued that under a participative system employee perceptions of the effort-performance relationship become clearer. Also, participation provides the employee with a better understanding of which behaviors will be rewarded. Therefore, for Mitchell, participation enables improvement of employee's expectancies which in turn increases job satisfaction.

Schuler (1977a) argued that the more communication and feedback available to an employee, the better the employee should be able to cope with role ambiguity and conflict. Participation in decision making is assumed to be positively related to the amount of information and feedback given to the employee. Schuler's results suggest that participation is also related to employee perceptions of role conflict and ambiguity: the more the participation in decision making, the lower the levels of role conflict and ambiguity.

In addition to supporting the theoretical formulation of Kahn, Wolfe, Quinn, Snoek and Rosenthal (1964) which views structural properties as

important components of role perceptions, the findings of Morris et al. (1979) suggest that individuals who are afforded participation will be less likely to experience uncertainty about their roles. This is due to the increased information and feedback which typically accrue from the participation process. The authors collected data from nonacademic employees of a university who worked in one of three occupational groupings, either professional (n=55), secretarial/clerical (n=127), or blue-collar (n=70). In the context of this study, an interesting result of Morris et al. (1979) is that both role ambiguity and role conflict levels were higher for the professional grouping than for the other occupational groupings. The significance of this finding is that the professional occupational grouping were employees occupying boundary spanning positions in various service divisions of the university, e.g. accountants and computer analysts. Also contributing to the rationale behind Schuler's (1980) role and expectancy model was the work of Schuler, Aldag and Brief (1977). In their study Schuler et al. (1977) collected data from 1,573 employees in six samples in four different organizations. In general, the results of their study suggest that role ambiguity and role conflict are valid constructs in organizational behavior research and are usually associated with negatively valued states, e.g. absenteeism, low expectancies, and low job satisfaction. In other words, the lower the perceived levels of role conflict and role ambiguity, the higher the level of employee job satisfaction.

Thus, based in part on these earlier findings, Schuler (1980) hypothesized that certain job related variables, including role conflict and role ambiguity, intervene in the participation-satisfaction relationship. The model's rationale is that input into the decision-making process allows employees to verify certain expectations they may have about the job. Participation in decision making also permits the employee to engage in role clarification and conflict resolution activities. The end result in both cases should be increased worker job satisfaction. Schuler also incorporated potential organizational moderators (size, level, task) and individual moderators (personality, ability) into his model, but did not examine their effects in the data.

Therefore, using Schuler's (1980) model as a component of the conceptual rationale, this study examined role ambiguity and role conflict as perceived by the IPL professional as the independent variables. Also, participation in decision making, as well as IPL professional ability, were examined as potentially moderating variables.

Literature Review

While an exhaustive review of the literature pertaining to the variables examined in this study is virtually impossible, the following section presents some of the more relevant and recent findings.

Job Satisfaction

Job satisfaction has been a subject of great interest to practitioners and scholars since the 1930s. Systematic attempts to study job satisfaction began when Hoppock (1935) published the first intensive study of job satisfaction. Hoppock discussed a number of factors which he believed affected the job satisfaction of workers. These factors include fatigue, monotony, working conditions, supervision and achievement. Taylor and Mayo had done research on worker attitudes prior to Hoppock's work, but their primary emphasis had been in the areas of fatigue reduction and productivity (Locke, 1976).

Locke (1976) defined job satisfaction "as a pleasurable or positive emotional state resulting from the appraisal of one's job or job experience" (p. 1300). Locke believed job satisfaction had a major influence on overall life satisfaction and would contribute to the individual's self-confidence, as well as have effects on physical health and longevity. Locke (1976) and Kahn et al. (1964) believed role conflict and role ambiguity should be minimized to avoid job dissatisfaction. According to Locke, job dissatisfaction resulted in a negative effect on an individual's attitudes and physical health. Locke also believed that absences, turnover and grievances would increase as job satisfaction decreased.

On the positive side, job satisfaction has been shown to be a consistent correlate of many forms of organizational citizenship behavior (OCB) (Organ & Ryan, 1995). Organizational citizenship behaviors represent those behaviors that

are not part of the individual's formal job description. Helping a coworker who has been absent, and being courteous to others are two examples of OCB. Refraining from certain forms of behavior, such as not complaining about trivial matters, is considered to be within the realm of organizational citizenship. Although such behaviors are not required, they are needed in order for work groups and organizations to be effective (George & Bettenhausen, 1990).

Historically, there have been three approaches to the study of job satisfaction. The first of these is the situational, or job characteristics approach. Essentially, this approach maintains that specific job characteristics, such as autonomy and variety, are responsible for worker satisfaction. Hackman and Oldham's (1980) job characteristic theory recognize that these specific job characteristics along with certain individual factors, such as growth need strength, impact employee job satisfaction. There is consistent empirical evidence in support of job characteristic theory (Fried & Ferris, 1987; Stone, 1986; Loher, Noe, Moeller & Fitzgerald, 1985). Specifically, with regard to the impact of job autonomy, Bacharach and Mitchell (1983), for example, in their study of 46 New York State school district superintendents report a correlation coefficient of .24 between low autonomy and job dissatisfaction.

The second approach to job satisfaction, the dispositional approach, takes into account certain individual characteristics or traits. This approach argues that there are relatively stable characteristics of the person (i.e., core characteristics or

traits) that affect job satisfaction independently of the attributes of the job or situation (Judge, Locke & Durham, 1997). Smith (1955) observed that factory workers exhibited monotony both in the workplace and at home, and noted that "feelings of monotony are not merely a function of the task performed, but are related to more general factors in the individual worker" (Smith, 1955, p. 329). Also, the results of a longitudinal study by Staw, Bell and Clausen (1986) found that people characterized by the trait of positive affectivity remained happy with their jobs across a span of many years, despite life and job changes.

The third approach argues that job satisfaction is the product of an interaction between the environment and the individual. There are two popular variations of the interactionist approach . The first believes that worker satisfaction is derived from the interaction of job characteristics and situationally specific wants of the individual. Basically, this model reasons that workers will be more satisfied when the job provides the values or rewards the worker is seeking. The models of Smith, Kendall and Hulin (1969) and Locke (1976) exemplify this reasoning.

The other popular variation of the interactionist approach believes that worker satisfaction results from the fit between the job environment and certain dispositional characteristics of the individual. Holland's (1985) theory is representative of this view. Recent work by Judge, Locke and Durham (1997) has focused on a dispositional model of job satisfaction which is based on value

judgments, or core evaluations, which individuals make about themselves, the world, and other people.

Relationships between job satisfaction and each of the variables examined in this study are discussed next.

Role Ambiguity

Kahn, Wolfe, Quinn, and Snoek (1964) defined role ambiguity as "a direct function of the discrepancy between information available to the person and that which is required for adequate performance of his role" (p. 73). These authors noted that role ambiguity is costly for the individual and for the organization in which he or she works. Their findings indicate that role ambiguity leads to increased emotional tension and to decreased satisfaction with one's job. In their study of 53 supervisors from the oil, automobile, electronics, and machine parts industries, Kahn et al. found role ambiguity correlations of .51 ($p<0.01$) and -.32 ($p<0.01$) for tension and job satisfaction, respectively. With regard to sources of role ambiguity, the authors recognized three general organizational conditions as significant.

The first condition pertains to the complexity of the organization. As size and complexity of the organization exceed the individual's span of comprehension, the result is increased role ambiguity. Familiarity with the organization can become virtually impossible in companies of even a few hundred

individuals. Organizations ranging from several individuals to several hundred thousand were represented by the respondents in this study. Thus, a broad spectrum of complexity levels were represented as well.

The second significant determinant of role ambiguity is rate of organizational change. Growth and interdependence among organizational units is critical for success. However, as organizations grow there is a tendency to reorganize personnel, and reorganizations can disturb established interdependencies. Again, a negative byproduct of rapid organizational change is role ambiguity. Every organization competing in today's global economy is faced with the need to replace key individuals as they move on to other jobs and/or other organizations. The days of an employee staying with one company for his or her entire career are, for better or worse, long gone. Turnover of employees, especially key executives, is higher today than it was ten years ago, and this trend is likely to continue. Thus, organizations, including those represented in this study, must cope with rapid organizational change for the foreseeable future.

The third potential source of role ambiguity can be found in the managerial philosophy of the organization. A restriction on the flow of information to the worker which is relevant to the performance of his or her job can cause role ambiguity. For example, a common practice is to disseminate information only to those individuals with "a need to know." Clearly, this intended restriction of information has the consequence of having overlooked an

individual possessing the need. Unintended sharing of information is frequently caused simply by the hectic daily routines of the executives or managers holding the information. Kahn et al. (1964) summarized their work in a theory of role dynamics. This theory is articulated in the form of a model (p. 378) which highlights the organizational factors impacting the individual and his or her adjustment to role conflict and ambiguity. This model recognizes and includes personality characteristics, i.e. dispositional traits of the individual.

Building on the role theory of Kahn et al. (1964), a study by Rizzo, House, and Lirtzman (1970) described the development and testing of a questionnaire designed to measure role conflict and ambiguity. An initial questionnaire of 30 items was administered to 290 managerial and technical employees. A factor and item analysis led to the establishment of a six-item role ambiguity scale and an eight-item role conflict scale. The Rizzo et al. role conflict and ambiguity scales have been used extensively. The results of Schuler, Aldag and Brief (1977) and House, Schuler, and Levanoni (1983) indicate that the Rizzo et al. scales are satisfactory measures of role conflict and role ambiguity, and continued use of the scales is recommended by the authors.

The study by Rizzo, House, and Lirtzman (1970) found a -.36 ($p<.05$) correlation between role ambiguity and job satisfaction for 199 managerial and technical employees. Their results also yielded a -.60 ($p<.05$) correlation between role ambiguity and job satisfaction for 91 research and engineering personnel.

Rizzo et al. point out that the group of 199 had a higher percentage of respondents near the top of the organization, while the group of 91 was slightly better educated with 80 percent having bachelor's and master's degrees compared to 67 percent in the group of 199.

There are also two other interesting findings from the Rizzo et al. study. First, there was a -.57 ($p<.05$) correlation for both samples between role ambiguity and formalization of the organization. Formalization is defined as the importance of rules and procedures. Second, the study showed correlations of .39 ($p<.05$) for the group of 199, and .30 ($p<.05$) for the group of 91, between role ambiguity and violations in the chain of command. Each of these findings relates to the structure and practices of the organization, and has implications for the present study which examined role ambiguity in academic and industrial environments.

Hamner and Tosi (1974) surveyed 61 high-level managers from various industries in the Midwest United States, and found a -.25 ($p<.05$) correlation between role ambiguity and job satisfaction. Their results also indicated a correlation of .33 ($p<.01$) between role ambiguity and job threat and anxiety. Hamner and Tosi concluded that managerial jobs involve solving unstructured problems and therefore the primary problems faced by managers may arise from a lack of clarity in their jobs.

A study by Nicholson and Goh (1983) surveyed 42 supervisors from public utility and manufacturing organizations. Their results include a correlation

of -.60 ($p<.01$) between role ambiguity and participation in decision making, and a correlation of -.61 ($p<.01$) between role ambiguity and formalization. Formalization is defined as the importance of rules and procedures. Again, the findings of Nicholson and Goh provide insight to the present study which investigated participation in decision making in two types of organizations.

A meta-analysis by Jackson and Schuler (1985) examined 96 articles involving research on role ambiguity and role conflict in work settings. Their findings, which have implications for the present study, include: satisfaction with work is significantly and negatively related to role ambiguity; very low positive correlations between educational level and role ambiguity; a slightly negative correlation between job tenure and role ambiguity; formalization has a tendency to reduce role ambiguity; no relationship between organizational level and role ambiguity; and a negative correlation between participation in decision making and role ambiguity.

A meta-analysis of 39 studies by Abramis (1994) also confirmed the negative relationship between role ambiguity and job satisfaction with a -.27 correlation between the two variables.

Role Conflict

Like role ambiguity, role conflict has been the subject of a large quantity of research. Role conflict is defined by Rizzo, House and Lirtzman (1970) as the

degree to which expectations of a role are incompatible with the reality of the role. The incompatibility may be due to conflicts between organizational demands and one's own values, problems of personal resource allocations, or conflicts between obligations to several different people. Four types of role conflict, which stem from incompatible messages and expectations originating in an employee's role set, were described by Hellriegel and Slocum (1979). The employee's role set, as discussed by Hellriegel and Slocum, typically includes an employee's manager, perhaps the manager's immediate supervisor, and subordinates or other employees with whom the person works closely. Intra-sender conflict, inter-sender conflict, inter-role conflict, and person-role conflict constitute the four types of role conflict.

Intra-sender conflict is present when messages and expectations from a single person of the role set may be incompatible. Inter-sender conflict occurs when messages and expectations from one role sender are contrary to messages and expectations from one or more other senders. When role expectations associated with the responsibilities of one organizational faction are in conflict with the expectations of another organizational faction, inter-role conflict occurs. Finally, person-role conflict stems from role requirements which are contrary to an employee's ethical values or beliefs.

Kahn et al. (1964) refers to roles which require individuals to work between two or more social systems as boundary spanning positions. One of the

characteristics of any social system is that it is bounded or, in some recognizable way, set off from the larger environment. IPL professionals, whether in academic or industrial organizations, transcend the boundaries of their own organization when they negotiate with external parties. Given the role they serve and the description of boundary spanning positions found in the literature, it is evident that IPL professionals occupy such positions.

The significance of identifying the work of the IPL professional as a boundary spanning position for this study is that it has been suggested that individuals occupying boundary spanning positions are susceptible to higher levels of role conflict than individuals whose role activities keep them within the boundaries of one social system. For example, Miles (1976) studied the relationship between boundary spanning activities and role conflict for 202 research and development personnel. Boundary relevance of the role occupied by the individual was found to be the best predictor of experienced role conflict, especially inter-sender role conflict. Miles' study found a correlation of .36 ($p<.0001$) between boundary spanning activities and role conflict.

As with role ambiguity, role conflict has been shown to be negatively correlated with job satisfaction. With regard to the impact of organizational level on the relationship between these variables, Schuler (1977), in his survey of 391 employees of a large manufacturing firm, found that at the lower level of the organization, role conflict had a stronger negative relationship with job

satisfaction ($r = -.43$, $p<.05$) than role ambiguity had with job satisfaction ($r = -.23$, $p<.05$). At the higher level of the organization, role ambiguity and job satisfaction are more negatively related ($r = -.43$, $p<.001$) than are role conflict and job satisfaction ($r = -.16$).

Fisher and Gitelson's (1983) meta-analysis of 42 studies further supports the negative consequences of role conflict. They found a correlation of -.31 ($p<.01$) between role conflict and satisfaction with work itself. This meta-analysis also showed the following correlations for role conflict: .29 ($p<.01$) with propensity to leave the organization; .28 ($p<.01$) with tension and anxiety; and -.28 ($p<.05$) with participation in decision making.

Participation in Decision Making

Participation in decision making has been a subject of intense interest for more than sixty years (Barnard, 1938; Lewin, 1947; March & Simon, 1958; Lowin, 1968; Miller & Monge, 1986; Bacharach, Bamberger, Conley, & Bauer, 1990). Thus, the research and literature pertaining to participation in decision making (PDM) is vast. This section will discuss several studies which have examined participation in decision making as it relates to the variables of interest in this study.

Before reviewing the PDM literature, let us first define participation in decision making. According to Locke and Schweiger (1979), participation in

decision making is defined as joint decision making. According to Lowin (1968), PDM means "a mode of organizational operations in which decisions as to activities are arrived at by the very persons who are to execute those decisions" (p.69). Further, participation in decision making is the mechanism which allows the worker to express his or her views (Argyris, 1955). Thus, PDM is a technique, or a method, which can be used to help reach decisions within an organization. Significant correlations have been reported between participation in decision making and job satisfaction, role ambiguity and role conflict. With regard to job satisfaction, according to Mitchell (1973), allowing participation in decision making will increase the likelihood that the employee will get what he or she wants. At a minimum, participation permits employees to compare their expectations against the expectations of the organization. Miller and Monge's (1986) meta-analysis considered 41 estimates of the relationship between participation and satisfaction. After cumulation of estimates of effects, the weighted mean correlation was .34, supporting the earlier findings of Locke and Schweiger (1979). Specifically, participation has a positive effect on satisfaction.

Locke and Schweiger's (1979) review considered well over 50 empirical research reports on participation in decision making. They reviewed laboratory studies, correlational studies, multivariate field studies, and univariate field studies in which satisfaction and productivity were the criterion variables. Locke and Schweiger concluded that little could be said about the effects of participation

from multivariate field studies because too many other variables, including differences in training, reward systems and education, could account for effects often attributed to participation. They did, however, make generalizations based on correlational, laboratory, and univariate field studies.

Locke and Schweiger (1979) classified the conclusions of studies in one of three ways. The first classification was reserved for studies in which participation had a superior impact, i.e. participation was significantly and positively related to job satisfaction. The second classification was for studies in which the participation variable was found to be inferior, i.e. participation was related to satisfaction but not in a significantly positive manner. The third classification was reserved for studies in which participation had no impact on the satisfaction variable. Having found a consistency in the results of laboratory, correlational, and univariate field studies, Locke and Schweiger concluded, with respect to satisfaction, that the results generally favored a participative rather than a directive method of decision making. That is, a participative approach to decision making tends to enhance job satisfaction.

A study of 382 employees of a large manufacturing firm by Schuler (1980) reports a correlation of -.41 ($p<.01$) between PDM and role conflict; a correlation of -.47 ($p<.01$) between PDM and role ambiguity; and a correlation of .51 ($p<.05$) between PDM and satisfaction with work. Schuler's (1980) study also surveyed 429 employees of a large public utility firm. For this population, there was a

correlation of -.37 ($p<.01$) between PDM and role conflict; a correlation of -.49 ($p<.01$) between PDM and role ambiguity; and a correlation of .46 ($p<.01$) between PDM and satisfaction with work. Based, in part, on these findings, Schuler's (1980) paper presented a role and expectancy perception model of participation in decision making. This model described *how* participation, through its interaction with role constructs and employee expectancy perceptions, might impact job satisfaction. This model is derived, in part, on the earlier work of Mitchell (1973), Schuler (1977a), Schuler, Aldag and Brief (1977), Schuler and Kim (1978), and Morris, Steers and Koch (1979).

Smith and Brannick (1990) tested Schuler's (1980) model using a path analytic approach. Their sample consisted of 345 social service caseworkers and clerical workers from a large public service agency in the southwestern United States. The results support Schuler's model in that a) participation in decision making has both direct and indirect effects on job satisfaction, and b) role conflict and role ambiguity each appear to mediate the relationship between participation and job satisfaction.

Ability

Ability is a term which is often used in a broad manner to denote an individual's physical and/or mental capability. In this study, ability was operationalized as an individual's level of education and prior job experience.

Each of these components have received considerable research attention. This section presents some of the literature pertaining to ability and the variables examined in this study.

With regard to ability and the role stress variables, it was proposed by Kahn et al. (1964) that the more ability and skills the employee has, the better able the employee may be to cope with role ambiguity and role conflict. Building on the work of Kahn et al. (1964), Schuler (1975) proposed that an "ability/adaptability phenomenon" may explain why the performance of employees at the higher level of an organization seem to be less impacted by role conflict and role ambiguity, compared to employees in lower levels of the organization. Schuler's reasoning is that employees acquire skills of coping with role conflict and role ambiguity as they are promoted within the organization. Further, the employee possesses the cognitive ability to adapt to the requirements of higher level work and to take advantage of ambiguous task situations. Schuler's (1977) study partially supported his earlier reasoning vis-a-vis employee ability and role ambiguity. In Schuler's study, which surveyed 391 employees of a large manufacturing firm, high-ability employees were less affected by the level of role ambiguity than were low-ability employees.

A positive correlation between ability and job satisfaction is supported by the dispositional model of job satisfaction (e.g., Staw, Bell, & Clausen, 1986). This model argues that factors which improve the individual's affective

well-being, should be positively related to the individual's job satisfaction. In the case of ability, according to the dispositional model, as ability, and cognitive performance, of the individual increases so too should the job satisfaction of the individual increase.

Interestingly enough however, several studies have produced results indicating a negative relationship between ability and job satisfaction. For example, Barrett et al. (1980) examined the relationship between ability and job satisfaction for 29 male naval enlisted sonar and radar operators. Naval test battery ability measures, along with the work satisfaction sub-scale of the job descriptive index (Smith, Kendall, & Hulin, 1969), were administered to the individuals. Each of the seven ability measures were found to be negatively correlated with job satisfaction. Verbal aptitude, for example, had a -.43 ($p<.05$) correlation with job satisfaction. The authors also surveyed 60 undergraduate students from the University of Akron. In a laboratory setting, the students were asked to respond to questions involving geometric shapes. For this sample as well, significant negative correlations of -.69 ($p<.001$) and -..49 ($p<.01$) were found between ability and job satisfaction for simple and demanding tasks, respectively.

Ganzach (1998) analyzed data collected from 5,423 Americans for the relationship between intelligence and job satisfaction. Respondent's test score from the Armed Forces Qualifying Test (AFQT) served as the measure of

intelligence. The measure of job satisfaction was derived from the respondent's answer to a single question, "How much do you like your job?" expressed on a four-level response scale ranging from "dislike it very much" to "like it very much." The results produced a negative, but not significant, correlation between intelligence and job satisfaction ($r = -.02$, $p>.2$).

The fit between the individual and the job, and thus the interactional model of job satisfaction, may shed light on the inverse correlation between ability and job satisfaction. According to the person-environment (P-E) fit model (e.g. Holland, 1985), a type of interactional model, job satisfaction depends on the fit between an individual's personality, i.e. their needs and values, and the environment in which he or she works. Thus, individuals who are working in environments in which there is not a good match between their ability and the job requirements will exhibit low levels of satisfaction. Further, individuals who experience this mismatch will tend to leave the organization in search of a job with a better fit.

The gravitational hypothesis (McCormack, DeNisi, & Shaw, 1979) posits that individuals will, over time, gravitate into jobs commensurate with their abilities. Support for this gravitational hypothesis is provided by Wilk, Desmarais and Sackett (1995) who conducted a longitudinal study which examined the cognitive ability and job complexity levels of 3,887 individuals whose names were obtained from the National Longitudinal Survey - Youth Cohort 1987

database. Their results indicate that an individual's cognitive ability was a significant predictor of his or her job complexity level.

The P-E fit model is also supported by the goal-choice literature which states that the higher an individual's ability, the more difficult the chosen goal, i.e. job (Locke & Latham, 1990). The goal-choice literature also suggests that people desire environments that fit their characteristics, and in particular their intellectual characteristics (Gottfredson, 1986). Thus, those individuals who are working in environments which are not sufficiently challenging, or not making use of their ability, may exhibit less satisfaction with their jobs.

It was the premise of this study that IPL professionals have gravitated into jobs which are sufficiently challenging and therefore ability will be positively correlated with job satisfaction. In this study, ability of the individual was defined as the sum of level of education and years of intellectual property licensing experience. Further, it was anticipated in this study that the negative correlation between each of the role constructs and job satisfaction would be reduced as the individual's ability increased.

Intellectual Property Licensing

Intellectual property (IP) licensing is a subject of great interest in the disciplines of marketing, management, international business, economics, and law, and thus a considerable body of literature on this subject exists. Since this

study was concerned essentially with the management and marketing, i.e. licensing, of intellectual property, this section will present some of the literature written in that context.

Edwin Land, inventor and founder of Polaroid, said, " I must emphasize that the kind of company I believe in cannot come into being and cannot continue its existence except with the full support of the patent system." Land later said, "The only thing that keeps us alive is our brilliance. The only way to protect our brilliance is our patents" (Banner, 1987). By "brilliance" Land was referring to the ideas or inventions created by the minds of individuals. These "products of the mind" are collectively known today as intellectual property. The importance of the patent system in protecting ideas and inventions, as pointed out by Land, cannot be overstated. By receiving patents for their inventions, inventors are granted ownership rights and assured legal protection of those rights by the country issuing the patent. In addition to patent laws, there are many other forms of legal protection, such as copyright, trademark, and trade secret laws, which are important to inventors (Gregory, Saber & Grossman, 1994). Once the intellectual property has been properly protected by the inventor it then becomes a valuable and strategic asset. For organizations with large intellectual property portfolios like the IBM Corporation, organizing and managing the portfolio effectively is critical to the organization's success. In 1999, IBM was awarded 2,756 patents, the most patents ever received in a single year by an organization. Based on its

intellectual property portfolio, IBM reported more than $1 billion in licensing revenue, and said that its intellectual property portfolio was key in striking more than $30 billion in components and product deals in 1999 (Foremski, 2000). Summarizing the importance of intellectual property, Barry Bayus, professor of marketing for the University of North Carolina's Kenan-Flagler Business School said, "More patents tend to lead to better products. Better products lead to more sales and market share" (Smith, 2000).

Patents have been granted to inventors since the Middle Ages in Europe, and in the United States since 1790. In 1980 approximately $3 billion in revenue was attributed to the licensing, litigation, and settlements associated with US patents and other intellectual property. In 1998 that number soared to a staggering $100 billion. There are several reasons for this extraordinary growth in intellectual property licensing revenue. First, the rapid growth in high tech and low tech companies as evidenced by the emergence of the Internet and the thousands of companies conducting their business primarily through electronic interaction with their customers. Second, the recent World Trade Organization (WTO) intellectual property provisions signed into law in 1995. Under these laws, countries who are members of the WTO are required to establish a defined baseline of intellectual property protection in their own country. The rationale is that this allows new businesses and industries to emerge and develop with the assurance that key strategic assets, i.e. intellectual property, will be afforded legal protection. This

protection lowers the risk of doing business and in turn attracts new investors. Finally, the high growth rate of intellectual property licensing revenue stems in part from the creation of a separate appellate court designed for the appeal of all patent decisions. By facilitating patent decisions this court expedites the pursuit of licensing revenue opportunities by patent owners (Rappaport, 1997).

In addition to patents, copyrights are an important form of intellectual property protection. Wagner (1998) discusses the implications of intellectual property copyrights for higher education institutions. She points out that research universities are both producers and consumers of intellectual property, and as such have constituencies with varying interests. Copyright protection is important because producers must be assured that their intellectual property will not be stolen and consumers must be assured that they are obtaining authentic products. However, while copyright law was created to protect ownership rights, it is widely viewed as permitting others to copy parts of a work without permission. U.S. copyright laws were revised in 1976 to accommodate a "fair use" provision which, under specific guidelines, grants users the right to freely make copies of copyrighted works. One of the guidelines, for example, used in making a determination as to whether a use is fair involves a judgment of whether the potential market for the work was diminished by the copying. With the advent of the Internet and the desire to establish a National Information Infrastructure, and ultimately a Global Information Infrastructure, copying works electronically will

become much easier. Copyright laws will need to evolve in order to insure protection to producers and consumers in this new paradigm.

Many of the benefits and costs associated with intellectual property licensing have been examined in the literature. With regard to benefits, IP licensing frequently allows the licensee to reduce time-to-market by overcoming technical product barriers more rapidly. For example, licensing a complex, but proven, semiconductor manufacturing process can save the licensee a great deal of technical research and development effort. There is also the legal benefit of gaining access to a patented process. That is, any patents covering the licensed intellectual property, which the licensor has a right to grant licenses to, would typically be included in the license. In this regard intellectual property licensing can have a positive influence on product life-cycles by allowing an organization to achieve rapid market penetration (Lei & Slocum, 1991). Frequently, licensees can catch up to, or sometimes beat, their competitors with a new product (Gold, 1987). Through licensing, companies can, sometimes, gain exclusive access to the trade secrets of others resulting in a proprietary new product and/or process. Non-exclusive licenses, in which the inventor reserves the right to license others, can at a minimum help to reduce the product and/or process development costs (Lowe & Crawford, 1983). Thus, IP licensing is a technique which provides companies with an opportunity to reduce the investment necessary for product development (Tang & Yu, 1990). Gaining access to new markets and new

countries can also be achieved through intellectual property licensing. As Smith and Parr (1994) observe, "Intangible assets (i.e. intellectual property) are a major force behind direct foreign investment. New market opportunities may be the motivation, but intangible assets are the basis for success abroad." (p. 17).

However, intellectual property licensing does involve certain costs. In addition to the financial consideration paid to the licensor, licensees must be prepared to pay for the cost of adapting and/or developing the licensed technology for use in commercial products (Ford, 1985). This is often the case when embryonic technology is being licensed which needs further refinement before being sold to customers. An example of this might be a software program which successfully solves certain problems, but is in need of a user-friendly graphical interface.

The morale of internal research and development personnel also needs to be considered when licensing-in the intellectual property developed by another party. If licensing the intellectual property of another party is construed by the home team as a lack of confidence by top management in their ability to develop new products and/or processes, then adverse effects on morale may result (Sen & Rubenstein, 1989). Other costs associated with intellectual property licensing can include restrictive conditions imposed by the licensor, such as grant-back provisions which require the licensee to provide the licensor access to any

improvements (Parry, 1988). Such a provision can impair the ability to stay ahead of their competition with next generation products.

Other studies have examined the use of intellectual property licensing as a means of establishing standards (Hagedoorn, 1993), a method of amortizing research and development costs (Ohmae, 1990), and in the development of global product strategy (Kotabe, Sahay & Aulakh, 1996). Differences in management characteristics and perceptions between licensee and nonlicensee firms (Atuahene-Gima, 1993), and the process of licensing negotiations (Contractor, 1985) has also been examined.

Clearly, the driving force behind the extraordinary rise, and interest, in intellectual property is the rapid emergence of global competition for products and services. Consider that in the late 1980s, the United States, Japan, Germany, Great Britain and France spent a total of US$ 630 million per day on research and development. By 1993, that figure had grown to as much as US$ 1 billion (von Braun, 1997). The insatiable appetite of consumers for new products and services, combined with escalated spending by industrial and academic organizations on research and development, will continue to fuel increases in intellectual property and licensing opportunities for some time to come.

Summary

This chapter provided an overview of the conceptual framework and selected literature related to this study. Job satisfaction and Schuler's (1980) role and expectancy model of participation in decision making were presented in the first section of this chapter as the conceptual framework. Literature pertaining to the variables examined in this study, i.e. job satisfaction, role ambiguity, role conflict, participation in decision making and ability, was discussed in section two of this chapter. Also discussed was literature relating to the field of intellectual property licensing.

Presented below are the hypotheses of this study. The following chapter will discuss the method used. Included will be a discussion of the subjects, instruments, data collection, data treatment, and data analysis techniques.

Hypotheses

As a result of the prior discussion, the following hypotheses, based on research questions 7 through 19, were tested:

Hypothesis 1: There will be a negative relationship between role ambiguity and job satisfaction.

Hypothesis 2: There will be a negative relationship between role conflict and job satisfaction.

Hypothesis 3: There will be a positive relationship between participation in decision making and job satisfaction.

Hypothesis 4: There will be a positive relationship between participation in decision making and effort-performance expectancy.

Hypothesis 5: There will be a negative relationship between participation in decision making and role ambiguity.

Hypothesis 6: There will be a negative relationship between participation in decision making and role conflict.

Hypothesis 7: There will be a positive relationship between ability and job satisfaction.

Hypothesis 8: There will be a negative relationship between ability and role ambiguity.

Hypothesis 9: There will be a negative relationship between ability and role conflict.

Hypothesis 10: Participation in decision making will moderate the role ambiguity - job satisfaction relationship such that as participation increases the negative impact of role ambiguity on job satisfaction will be reduced.

Hypothesis 11: Participation in decision making will moderate the role conflict - job satisfaction relationship such that as participation increases the negative impact of role conflict on job satisfaction will be reduced.

Hypothesis 12: Employee ability will moderate the role ambiguity - job satisfaction relationship such that as ability increases the negative impact of role ambiguity on job satisfaction will be reduced.

Hypothesis 13: Employee ability will moderate the role conflict - job satisfaction relationship such that as ability increases the negative impact of role conflict on job satisfaction will be reduced.

CHAPTER III

METHOD

The purpose of this study was to examine perceived role ambiguity, role conflict, job satisfaction, participation in decision making, and ability of intellectual property licensing (IPL) professionals. This chapter will discuss the subjects, data collection, instruments, treatment of the data, and data analysis techniques used in this study.

Subjects

The population of this study consisted of intellectual property licensing (IPL) professionals who work in United States academic or industrial organizations. The sample was taken from the 1999 International Licensing Executives Society membership directory. There are 3719 U.S. members listed in the directory. Of the 3719 U.S. members, all 216 members employed in U.S. academic organizations were surveyed. These 216 academic IPL professionals are employed across approximately 110 research universities.

In addition, a systematic sampling of 700 IPL professionals employed by U.S. industrial organizations were surveyed. Since the sampling frame was an alphabetized list, every fifth U.S. industrial IPL professional was selected from the list making the selection process equivalent in style to random sampling. Members who were listed as students, or employees of National laboratories or

law firms were excluded from the survey. The goal was to achieve the highest response rate possible following Dillman's (1978) total design method approach. The level of significance was set at .05 and the power at .80, as suggested by Cohen (1969). The unit of analysis was the individual IPL professional. Many industrial categories were represented by this diverse group, including, but not limited to, information technology, biotechnology, pharmaceutical, and electronic industries.

Data Collection

A cover letter (Appendix A) along with a survey booklet which included the instruments and the demographic questionnaire (see Appendices E through I) was mailed to each of the 916 selected IPL professionals. The instruments included in the survey were the Job Descriptive Index (JDI) Work Satisfaction Scale (Appendix E), the Role Conflict and Ambiguity Scale (Appendix F), the Effort-Performance Expectancy Scale (Appendix G), and the Participation in Decision Making Scale (Appendix H). The demographic questionnaire (Appendix I) inquired about the respondent's age, gender, level of education, intellectual property licensing related work experience, type of present organization, size of present organization, and number of colleagues in present organization.

The cover letter briefly stated the purpose of the study, explained why the individual was chosen to participate, and assured confidentiality of the subject. For follow-up purposes, however, the instrument contained an identification number. Only the researcher knew the identity to whom the number related and all such references were to be destroyed at the conclusion of the study. Recipients were asked to follow instructions on the instruments and were asked to return the completed instrument by a certain date. One week after the mailing a reminder postcard (Appendix J) was sent to all 916 IPL professionals. This first follow-up served as both a thank you for those who had responded and as a friendly reminder for those who had not. This first mailing resulted in 224 completed questionnaires returned.

Three weeks after the initial mailing, a second follow-up mailing was made to those who had not responded. This second follow-up included a revised cover letter (Appendix K) and a replacement survey booklet. This shorter cover letter informed non respondents that their survey had not been received, and appealed for its return. This second letter request resulted in 121 questionnaires being completed and returned.

Seven weeks after the initial mailing a final mailing (Appendix L) was sent to non respondents. This mailing was similar to the second follow-up except that it was sent by certified mail to emphasize its importance (Dillman, 1978). Another 93 completed questionnaires were returned as a result of this final

request. Thus, overall, a total of 438 completed questionnaires were returned. Since 114 questionnaires were undeliverable, the overall response rate for this study was 54.6% (438/802).

Instruments

Data for this study were collected using four instruments: a) the Job Descriptive Index Work Satisfaction Scale; b) the Role Conflict and Ambiguity Scale; c) the Effort-Performance Expectancy Scale; and d) the Participation in Decision Making Scale. A demographic and organizational questionnaire was also used to gather data. Information relating to the questionnaire, and each of the instruments, is presented in the following sections.

Job Descriptive Index

The Job Descriptive Index (JDI) was developed by Smith, Kendall & Hulin (1969) over a ten year period. It is one of the most recognized, reliable and valid measures of worker satisfaction. The JDI, which uses a multiple facet rather than a global approach to job satisfaction, was designed to assess an individual's satisfaction on the following dimensions of a job: the work itself; pay; promotions; supervision; and coworkers. Smith et al. (1969) argue that a facet rather than a global approach to job satisfaction would be more likely to increase our substantive understanding of the antecedents and consequences of worker satisfactions and dissatisfactions with their jobs.

A total of 72 descriptor items, which may be positive or negative in nature, corresponding to different facets of the job are presented to the respondent. These facets are categorized into five areas, or sub-scales, including the work itself, pay, promotions, supervisor, and co-workers. The 72 descriptors are divided among the five sub-scales in the following manner; 18 items for the work itself, 9 items for pay, 9 items for promotions, 18 items for supervision, and 18 items for coworkers. The respondent may answer "Y" for yes if a certain descriptor is reflective of the job, or "N" for no if that descriptor is not present. If a respondent is unsure of an answer then a response of "?" is acceptable.

The JDI authors present extensive data regarding the validation of this instrument in their work, Measurement of Satisfaction in Work and Retirement (Smith et.al., 1969, pp. 38-68). Making a case for the validity of the JDI as a measure of distinct facets, Smith et al. wrote that "subscales are discriminably different, have loaded on separate group factors with no general factor in repeated factor analysis studies, and do not intercorrelate highly despite their high reliabilities" (p.25). Internal consistency for the JDI is also reported to be very good. Spearman-Brown coefficients are reported to range from .80 to .88 with an average of .85. The correlation of random split-halves also yielded an impressive figure ranging from .67 to .78 with an average of .74 (Smith et al., 1969).

Other researchers report test-retest reliability to be high as well. Over a seven month interval, it was found that the correlation was .82 for the work scale,

.77 for supervision, and .79 for co-workers (Schuler, 1979). Downey, Sheriden and Slocum (1976) found similar results over a 12-month period for a sample of managers (.70, .73, .70 respectively). These data would suggest the JDI is a reliable measure of job satisfaction.

Further, in their study, and critique of the JDI, Leong and Vaux (1990) state, "Overall, the JDI is an excellent measure of job satisfaction. It is simple to administer, easily understood by workers with limited education, and is applicable to a wide range of occupations. Moreover, it appears to retain measurement equivalence over widely different occupations. A key feature of the measure is that it was carefully designed to assess five facets of job satisfaction. There is considerable evidence that it does so, certainly that the items reflect five relatively independent dimensions. The five scales show excellent internal consistency and stability. The dimensional structure of the measure is stable, robust, and congruent over a wide range of occupational types and levels. The five facets scales have consistently shown very good convergent and discriminant validity with related satisfaction measures and also predicted relationships with theoretically related variables. In sum, the widespread use of the JDI is justified by its simplicity and robust psychometric quality" (p.330).

Since this research is concerned with measuring employee satisfaction with work, only that specific JDI sub-scale (Appendix E) was used in this study.

Role Conflict and Ambiguity Scale

Role conflict and role ambiguity are constructs that refer to situations in which an individual is faced with incompatible role expectations, or insufficient information to perform effectively in one's organizational role. In this study, role conflict and role ambiguity were measured using the Role Conflict and Ambiguity Scale developed by Rizzo, House and Lirtzman (1970).

The Role Conflict and Ambiguity Scale (Rizzo et al., 1970), modified through factor analysis, is described in Schuler, Aldag and Brief (1977). The fourteen items used consist of a 6-item role ambiguity scale and an 8-item role conflict scale (Schuler et al., 1977). Items in the scale which represent ambiguity are stated in terms of the absence of ambiguity (Kelloway & Barling, 1990), where on a 7-point Likert scale, 1 indicates greatest ambiguity and 7 indicates least ambiguity. Thus, items which represent role ambiguity require reverse scoring procedures such that a response of 7 becomes 1, 6 becomes 2, etc. (House, Schuler & Levanoni, 1983; Rizzo et al., 1970).

Reliabilities for the 6 role ambiguity items were reported to be 0.78 and 0.81 (Cook et al., 1989). The items in Appendix F which address role ambiguity are 1, 3, 5, 8, 10, and 13. The sum of the values across these 6 items represents the role ambiguity scale score (Cook et al., 1989).

Items in the scale which represent role conflict are stated in terms of the presence of conflict (Kelloway & Barling, 1990), where least conflict is indicated

by 1 and greatest conflict is indicated by 7 (Rizzo et al., 1970). Rizzo reported reliabilities of 0.82 for the 8 role conflict items 2, 4, 6, 7, 9, 11, 12, and 14 of Appendix F. The sum of the values across these 8 items constitutes the scale score (Cook et al., 1989).

Construct validity of the Role Conflict and Ambiguity Scale is supported by the results of Kelloway and Barling (1990). Extensive psychometric information is available for this scale (Cook, Hepworth, Wall & Warr, 1989), and at least two meta-analytic studies summarize the correlates of role conflict and role ambiguity (Fisher & Gitelson, 1983; Jackson & Schuler, 1985). Also, the study by Kelloway and Barling (1990) offered little empirical support for the hypothesis that the confound between item wording and item content (i.e., the issue of negatively-worded conflict items and positively-worded ambiguity items raised by McGee et al., 1989) limits the interpretability of the Role Conflict and Ambiguity Scale.

Effort-Performance Expectancy Scale

Perceived effort-performance expectancy was measured with a two item scale used by Schuler and Kim (1978), which is an adaptation of House and Dessler's (1974) instrument. Internal reliability of the effort-performance expectancy scale (Cronbach's alpha coefficient) for a sample of 383 employees of a Midwestern U.S. public utility company was reported to be 0.62 by Schuler and

Kim (1978). While the purpose of this study was to examine the potentially moderating effects of participation and ability on the role construct and job satisfaction relationship, measuring the effort-performance expectancy variable provided additional input into how participation in decision making moderated the relationship between job satisfaction and each of the role constructs. Construct validity for the effort-performance expectancy instrument is supported by the findings of House and Dessler (1974) and Schuler and Kim (1978).

Participation in Decision Making Scale

Participation in decision making was measured using the five item scale developed by Vroom (1959) and used by Schuler and Kim (1978). A sample of the five items includes: a) In general, how much say or influence do you have on how you perform your job?, and b) To what extent are you able to decide how to do your job? Internal reliability of the five item scale for a sample of 383 Midwestern U.S. utility employees was reported to be 0.87 by Schuler and Kim (1978). Construct validity of this instrument is supported by the findings of Vroom (1959) and Schuler and Kim (1978).

Demographic Information

A demographic form was used to acquire data regarding the respondent's age, gender, highest level of education, years of IP licensing experience,

organization type (i.e. industry or academia), organization size (i.e. student enrollment or employee population), and number of IPL colleagues in his or her organization. The rationale for selecting these demographic variables follows.

While no conclusions are made in this study pertaining to the relationship between age and job satisfaction, or gender and job satisfaction, obtaining information about the respondent's age and gender was important vis-a-vis generalizability of the findings of this study.

Ability was investigated in this study as a moderating variable. Level of education and years of intellectual property licensing experience were the constituent components of the ability variable. Therefore, the respondent was asked to provide each of these pieces of information.

Type of organization, i.e. academic or industrial, was viewed as important information because the literature indicates several differences between these two organizational environments, including decision making styles and degree of formalization.

Data pertaining to the size of the organization and number of intellectual property licensing colleagues was collected in order to determine if these variables correlated with the role constructs and job satisfaction. Results pertaining to demographic information will be presented as ancillary findings in chapter four.

Data Treatment and Analysis

The job satisfaction of intellectual property licensing professionals, as measured by the Job Descriptive Index (JDI) (Smith, et al., 1969) work satisfaction sub-scale (Appendix E), served as the dependent variable of this study. Role ambiguity, role conflict, participation in decision making, effort-performance expectancy, and ability served as the primary independent variables. Age, gender, level of education, organizational type and size, and number of colleagues served as the demographic variables. Respondents provided input via an eight page questionnaire which was then hand-scored by this researcher. Each scale was scored as per the guidelines of the respective authors. The data were analyzed using the Statistical Package for the Social Sciences (SPSS) for Windows. A significance level of .05 was used to test the anticipated findings (Kerlinger, 1973). In order to test the hypotheses, frequency distributions, Pearson-Product Moment correlations, t-tests, and multiple linear regressions were performed and studied. A description of the method used to score each scale follows.

According to the JDI authors' guidelines, the 18-item work satisfaction scale is scored by assigning numerical values to the "Y", "N", and "?" responses. Eleven of the items are worded favorably (e.g., respected), so that a "Y" response indicates satisfaction. For these items, a "Y" receives 3 points, "N" receives 0 points, and a "?" receives 1 point. The remaining items are worded unfavorably

(e.g., uninteresting), meaning that a "Y" response would indicate dissatisfaction. These unfavorable items are reverse-scored with a "N" receiving 3 points, a "Y" receiving 0 points, and a "?" receiving 1 point. A "?" response always receives a score of 1 point, both before and after reverse-scoring. According to Balzer et al. (1997), it has been shown that the "?" response tends to be closer to an unfavorable response (i.e., score of 0) than to a favorable response (i.e., score of 3). Total score is calculated by summing the points. In addition to using the coding method suggested by Balzer et al. (1997), this researcher *also* coded responses such that a "?" received a midpoint score (i.e., 1.5 points). By coding data in this manner a comparison was made to determine whether coding in the traditional way distorted the results.

Each respondent received a total score for role conflict and a total score for role ambiguity. The total score for role conflict was the sum of questions 2, 4, 6, 7, 9, 11, 12 and 14 (Appendix F). Since there are seven possible choices for each question the range for role conflict was 8 to 56. The total score for role ambiguity was the sum of questions 1, 3, 5, 8, 10 and 13. Since there are seven possible choices for role ambiguity questions, the range was 6 to 42.

The scores for the effort-performance expectancy scale were the sum of the 2 items (Appendix G). As there are 5 possible answers for each question, the range of possible scores was 2 to 10.

Participation in decision making scores were the sum of the responses to the 5 questions (Appendix H). Since the respondent can choose 5 possible answers for each question, the range of possible scores was 5 to 25.

With regard to the demographic information, each personal or industrial question was assigned a numerical value according to the response given. For age, the respondent wrote in their present age in number of years. For gender response, respondents were asked to circle either one or two which corresponded to male and female respectively. Level of education was assigned one through seven representing high school graduate, associate's degree, bachelor's degree, some graduate work, master's degree, beyond master's degree, and doctoral degree respectively. For number of years of IP licensing experience the respondent wrote in the number of years. For organization type the respondent chose between academic or industrial by circling either one or two respectively. For size of organization, the respondent wrote in a number corresponding to either the approximate enrollment for academic organizations, or the approximate employee population for industrial organizations. For the number of IPL colleagues, the respondent wrote in the number in the space provided.

All 438 questionnaires were hand-scored by the researcher. The corresponding data were then entered by the researcher into an SPSS for Windows spreadsheet for analysis. Frequency distributions, Pearson-Product Moment

correlations, t-tests, and multiple linear regression techniques were used for the analysis.

Protection of Human Subjects

This study involved no deception nor did it present any risk to those being surveyed. The New York University committee on activities involving human subjects approved this study as exempt (Appendix M).

CHAPTER IV

FINDINGS AND DISCUSSION

The research method used in this study was described in the previous chapter. This chapter begins with an analysis and discussion of the characteristics of the respondent group, and continues with an analysis and discussion of the data pertaining to this study's nineteen research questions and thirteen hypotheses.

Introduction

The purpose of this study was to examine the relationship among perceived role ambiguity, role conflict, participation in decision making, effort-performance expectancy, ability, and job satisfaction of intellectual property licensing professionals who work in academic or industrial organizations. A survey and correlation method was used to collect and analyze data for this study.

The Respondent Group

The subjects of this study were intellectual property licensing (IPL) professionals working in either academic or industrial organizations. The 1999 Licensing Executives Directory was used as the source of information and the sample was limited to academic and/or industrial IPL professionals working in the United States. Students and those listed in the directory as members of national laboratories and law firms were excluded from this study. Dillman's (1978) Total

Design Method (TDM) was followed in conducting the survey and collecting the data. The total number of subjects who were sent surveys was 916. This total number was chosen based on the assumption that a 50% response rate would be achieved allowing for the results of this study to be generalized to the greater population of IPL professionals. Of the 916 subjects, all 216 US academic licensing professionals listed in the Directory were sent questionnaires. The remaining 700 subjects were selected via a systematic sampling of the US industrial licensing professionals. That is, every fifth US industrial member listed was selected and sent a questionnaire. Of the 916 surveys mailed, 114 were returned unopened because of the following reasons:

the respondent had moved and the forwarding order expired	101
the respondent had left the organization and could not be located	12
the respondent had died	1
	114

The number of undeliverable questionnaires thereby reduced the survey base to 802. Of the 114 undeliverables, 99 were from industrial licensing professionals and 15 were from academic licensing professionals. The researcher conducted three separate mailings. The initial request on April 8, 1999 produced 224 responses. The first follow-up mailing, on May 3, 1999, produced 121 responses and the third follow-up mailing, on June 1, 1999 provided another 93 responses.

The response rate is determined by the number of surveys returned in relation to the number in the sample, less those who were ineligible and/or

undeliverable (Dillman, 1978). The researcher received 438 completed surveys which resulted in a response rate of 55% (438/802). Further, of the 438 surveys received, industrial and academic respondents accounted for 318 and 120, respectively. Therefore, the industrial licensing professional response rate was 53% (318/601), and the academic licensing professional response rate was 60% (120/201). The demographic characteristics of all respondents are summarized in Table 1, and these results will be discussed in the following section. Tables 2 and 3 show the demographic characteristics of industrial and academic respondents, respectively.

Table 1

Demographic Characteristics of All Respondents (N = 438)

	Frequency	Percentage
Gender		
Male	339	77.4
Female	99	22.6
Total	438	100.0
Age		
under 40 (28 - 39)	90	20.5
40s (40 - 49)	171	39.1
50s (50 - 59)	137	31.3
over 60 (60 - 71)	40	9.1
Total	438	100.0

continued

Table 1 continued

Level of Education		
High School Degree	2	0.5
Associate's Degree	2	0.5
Bachelor's Degree	36	8.2
Bachelor's w/ Grad Courses	30	6.8
Master's Degree	125	28.5
Beyond Master's Degree	39	8.9
Doctorate	204	46.6
Total	438	100.0
Intellectual Property Licensing Experience		
New (< 5 years)	91	20.8
Experienced (5 - 10 years)	190	43.4
Established (> 10 years)	157	35.8
Total	438	100.0
Number of Colleagues		
Low (<5)	222	50.7
Medium (5 -10)	109	24.9
High (>10)	107	24.4
Total	438	100.0
Size of Organization		
Small (< 1000)	108	24.7
Medium (1000 - 10,000)	136	31.0
Large (> 10,000)	194	44.3
Total	438	100.0

Table 2 presents the demographic information for the 318 industrial IPL professionals responding to this survey.

Table 2

Demographic Characteristics of Industrial Respondents (N = 318)

	Frequency	Percentage
Gender		
Male	258	81.1
Female	60	18.9
Total	318	100.0
Age		
under 40 (28 - 39)	60	18.9
40s (40 - 49)	126	39.6
50s (50 - 59)	105	33.0
over 60 (60 - 71)	27	8.5
Total	318	100.0
Level of Education		
High School Degree	1	0.3
Associate's Degree	0	0.0
Bachelor's Degree	26	8.2
Bachelor's w/ Grad Courses	22	6.9
Master's Degree	87	27.4
Beyond Master's Degree	31	9.7
Doctorate	151	47.5
Total	318	100.0
Intellectual Property Licensing Experience		
New (< 5 years)	67	21.1
Experienced (5 - 10 years)	140	44.0
Established (> 10 years)	111	34.9
Total	318	100.0
Number of Colleagues		
Low (<5)	149	46.9
Medium (5 -10)	71	22.3
High (>10)	98	30.8
Total	318	100.0

continued

Table 2 continued

Size of Organization		
Small (< 1000)	103	32.4
Medium (1000 - 10,000)	96	30.2
Large (> 10,000)	119	37.4
Total	318	100.0

Table 3 shows the demographic characteristics of the 120 academic IPL professionals who responded to this study.

Table 3

Demographic Characteristics of Academic Respondents (N = 120)

	Frequency	Percentage
Gender		
Male	81	67.5
Female	39	32.5
Total	120	100.0
Age		
under 40 (28 - 39)	30	25.0
40s (40 - 49)	45	37.5
50s (50 - 59)	32	26.7
60 and over (60 - 71)	13	10.8
Total	120	100.0
Level of Education		
High School Degree	1	0.8
Associate's Degree	2	1.6
Bachelor's Degree	10	8.3
Bachelor's w/ Grad Courses	8	6.7
Master's Degree	38	31.7
Beyond Master's Degree	8	6.7
Doctorate	53	44.2
Total	120	100.0

continued

Table 3 continued

Intellectual Property Licensing Experience		
New (< 5 years)	24	20.0
Experienced (5 - 10 years)	50	41.7
Established (> 10 years)	46	38.3
Total	120	100.0
Number of Colleagues		
Low (<5)	73	60.8
Medium (5 -10)	38	31.7
High (>10)	9	7.5
Total	120	100.0
Size of Organization		
Small (< 1000)	5	4.2
Medium (1000 - 10,000)	41	34.2
Large (> 10,000)	74	61.6
Total	120	100.0

Findings and Discussion Relative to Demographic Data

As indicated by the data in Table 1, the overall group was comprised mostly of males, with percentages of 77 and 23 for males and females, respectively. Male representation was even higher for the industrial environment, as shown in Table 2, with percentages of 81 and 19 for males and females, respectively. In contrast to industrial organizations, female IPL professionals in academic organizations accounted for nearly one-third of the respondents, with percentages of 67 and 33 for males and females, respectively. Spector (1997) notes that relations between gender and job satisfaction have been extremely

inconsistent across studies. In this study there was no significant difference in the job satisfaction scores of men and women.

With regard to age, approximately 60% of respondents overall reported ages less than 50 years. Academic respondents tended to be younger than their industrial counterparts with percentages of 63 and 59, respectively for those under the age of 50 years. Further, 25% of academic respondents were under the age of 40 years, while only 19% of the industrial respondents reported ages less than 40 years. Albeit weak, a statistically significant and positive correlation of .101 ($p<.05$) was found between age and job satisfaction for all respondents (see Table 6). When the data pertaining to the relationship between age and job satisfaction was examined for gender differences the only significant correlation found was for industrial males. Again, a weak but statistically significant and positive correlation of .138 ($p<.05$) between age and job satisfaction was found for male respondents from industrial organizations. This finding supports the hypothesis proposed by Wright and Hamilton (1978) that the job change mechanism is such that older workers have better jobs and more skill than their younger counterparts and are therefore more satisfied with their jobs. This study further supports the reasoning of Wright and Hamilton with the finding of a moderate correlation (.497, $p<.001$) between age and ability for all respondents (see Table 6).

As for level of education, 84% of all respondents reported having a Master's degree or better. Further, nearly 47% of all respondents have a Doctoral

degree. The percentage of academic and industrial respondents with a Master's degree or better are similar with 83 and 85, respectively. Industrial respondents with a Doctoral degree was slightly higher at 48% as compared to 44% of the academic respondents who reported having earned a Doctoral degree. This study found no significant relationship between level of education and job satisfaction.

Overall, respondents exhibited approximately 10 years of IPL experience. The results pertaining to experience were similar for respondents from each organizational environment with about 80% from each type reporting 5 or more years of intellectual property and licensing experience. Albeit weak, a statistically significant and positive correlation (.154, $p<.001$) was found between experience and job satisfaction for all respondents (see Table 6).

The results for number of colleagues and size of organization were each markedly different for industrial versus academic respondents. With regard to number of colleagues, 31% of industrial respondents reported having more than 10 IPL colleagues, whereas 8% of academic respondents reported having more than 10 IPL colleagues. As for size of organization, 62% of academic respondents worked at institutions with populations greater than 10,000 individuals, whereas 37% of industrial respondents worked in organizations with greater than 10,000 individuals. The lower number of colleagues for academic IPL professionals, versus their industrial counterparts, reflects the smaller operating budgets allocated to the IPL function within academic organizations. The impact of fewer

colleagues and larger organizations on the work of the academic IPL professional will be discussed in the next section.

Descriptive Statistics

This section summarizes and discusses the descriptive statistics, and addresses research questions one through six. Table 4 presents the mean values and standard deviations of the variables examined in this study.

Table 4

Mean Values and Standard Deviations of Variables for All Respondents (N = 438)

Variable	Unit	Mean	s.d.
Job Satisfaction	0-54 scale	47.32	7.80
Role Ambiguity	6-42 scale	19.24	7.12
Role Conflict	8-56 scale	32.69	9.08
Effort-Perf. Exp.	2-10 scale	7.47	1.66
Part. in Dec. Making	5-25 scale	19.48	3.83
Age	years	47.25	8.82
Education Level	1-7 scale (a)	5.76	1.38
Experience	years	10.08	6.90
Organization Size	thousands	19.55	32.18
Number of Colleagues	units	10.56	22.06
Ability	educ level + experience	15.84	7.18

(a) 1 = high school graduate
2 = Associate's degree
3 = Bachelor's degree
4 = Some graduate work
5 = Master's degree
6 = Beyond Master's degree
7 = Doctorate

Research question one asked, what is the job satisfaction level for respondents? Job satisfaction was measured with the 18-item satisfaction with work scale from the Job Descriptive Index (JDI) (Smith, Kendall & Hulin, 1969). Each respondent's score for this scale had a potential range from zero to 54. Overall, respondents reported a relatively high degree of satisfaction with their work as indicated by the mean score of 47.32 shown in Table 4. Job satisfaction scores were slightly (but not significantly) higher for industrial respondents versus academic respondents with scores of 47.50 and 46.83, respectively (see Table 5). By way of comparison, Schuler's (1975) study involving 391 employees of a manufacturing firm examined the job satisfaction of three organizational levels: upper-level managers and professional employees; middle-level managers and entry level professionals; and lower level clerical workers, tradesmen and technicians. Using the JDI work satisfaction scale, scores for these three levels were 41.07, 36.65, and 35.68 respectively.

The write-in comments of the respondents (see Appendix N) point to a variety of reasons which potentially explain why IPL professionals have a high degree of satisfaction with their work. Included in the reasons were: the non-repetitive diverse nature of the tasks; the opportunity to see a deal through from beginning to end; the opportunity to interact with other cultures; and the opportunity to make an impact on the organization's financial "bottom line." Also, a frequently cited reason for which IPL professionals find their jobs

satisfying is the high degree of freedom, i.e. autonomy, frequently given to them in performing their jobs. For example, IPL professionals are given flexibility in determining which companies to negotiate with, and the corresponding strategy and schedule associated with the negotiation. With regard to the impact of autonomy on job satisfaction, Bacharach and Mitchell (1983) reported in their study of 46 New York State school district superintendents that low autonomy was a constant predictor of job dissatisfaction with a correlation coefficient of .24.

Several potential causes of job dissatisfaction, according to the write-in comments, include: a lack of recognition by top management of the strategic importance of intellectual property licensing; stress from too much work and too few resources; and placating multiple constituencies.

Table 5

Mean Values and Standard Deviations of Variables for Academic and Industrial Respondents

	Academic (n = 120)		Industrial (n=318)	
Variable	Mean	s.d.	Mean	s.d.
Job Satisfaction	46.83	7.79	47.50	7.80
Role Ambiguity	19.26	7.79	19.23	6.87
Role Conflict*	35.18	9.62	31.75	8.69
Effort-Perf. Exp.*	7.08	1.82	7.62	1.58
Part. in Dec. Making	19.62	4.34	19.43	3.63
Age	46.74	9.58	47.44	8.52
Education Level	5.63	1.46	5.80	1.34
Experience	9.99	6.65	10.12	7.00
Organization Size*	22.60	27.18	18.40	33.84
Number of Colleagues*	4.88	5.32	12.70	25.37
Ability	15.62	7.29	15.92	6.91

* indicates a significant difference in the score of this variable for academic and industrial respondents ($p<.05$).

Research question two asked, what is the role ambiguity level for respondents? Role ambiguity was measured with six items from the Role Ambiguity and Conflict Scale (Rizzo, House & Lirtzman, 1970). The potential score for role ambiguity ranged from six to 42. As indicated by the mean score of 19.24, shown in Table 4, respondents overall exhibited a moderate degree of perceived role ambiguity in their jobs. Role ambiguity levels were similar for academic and industrial respondents, as seen in Table 5, with scores of 19.26 and 19.23, respectively. These scores are somewhat lower than scores found in other studies. For example, Schuler (1975) reported role ambiguity scores of 24.09, 20.50 and 21.59 for lower, middle and higher organizational level employees respectively.

Research question three asked, what is the role conflict level for respondents? Role conflict was measured with eight items from the Role Ambiguity and Conflict Scale (Rizzo, House & Lirtzman, 1970). The potential score for role conflict ranged from eight to 56. As indicated by the mean score of 32.69, shown in Table 4, respondents overall reported a high degree of perceived role conflict in their jobs. As indicated by the results shown in Table 5, academic respondents reported a significantly higher degree of role conflict than their industrial counterparts (35.18 versus 31.75). This difference was found to be statistically significant for $p<.05$. This significant difference in role conflict scores may be attributed to a number of factors, most notably of which is the

unique set of clients and expectations found within the academic environment. That is, academic licensing professionals, in contrast to their industry counterparts, often find themselves having to satisfy demands from two or more conflicting groups. These groups typically involve some combination of administrators, faculty, industrial partners, or government agencies. Since IPL professionals in the academic setting may be receiving orders from one or more "interested" parties, the flow of authority may come into question. In their seminal study Rizzo, House and Lirtzman (1970) asked the question, "are organizations with a clear and single flow of authority from the top to the bottom less characterized by role conflict among their members?" The results from this study indicate an affirmative response to this question.

Another factor contributing to the difference in role conflict scores may be the degree of bureaucratization within the organization. In theory, bureaucratization, or adherence to rules and procedures, fosters organizational efficiency. However, bureaucratization often runs contrary to the professional ethos of academic organizations. Thus, a lower level of bureaucratization within an academic organization may be manifesting itself, for example, in greater difficulty in achieving consensus among those involved in intellectual property matters.

Finally, with relatively fewer IPL colleagues and larger organizations to serve, as compared to their industrial counterparts, it is not surprising that academic IPL professionals are experiencing higher levels of role conflict.

Research question four asked, what is the effort-performance expectancy level for respondents? Effort-performance expectancy was measured with a two-item scale used by Schuler and Kim (1978), which is an adaptation of House and Dessler's (1974) instrument. The potential score for effort-performance expectancy ranged from two to ten. As indicated by the mean score of 7.47, shown in Table 4, respondents overall reported a moderately high degree of effort-performance expectancy.

Differences in overall effort-performance expectancy scores for organizational type, i.e. 7.619 for industry versus 7.079 for academic (shown in Table 5), were determined to be statistically significant ($p<.05$). There are two possible explanations for this difference. First, the legal, financial and technical support infrastructure is generally more abundant for industrial respondents due to the larger budgets allocated to the intellectual property organization than for their academic counterparts. Comments received from academic IPL professionals (see Appendix N) such as, "To complete assignments in a timely manner often depends upon an externality upon which I have no control" and "Too much work with too little resources," confirm this argument. Thus, regardless of how hard or well the IPL professional works, it is frequently beyond their control to get the job

done in a timely manner because of the dependence on the support teams. Therefore, those in industry who have greater support may perceive that the harder they work the faster a job will get accomplished. The second reason for the difference in effort-performance expectancy scores may be attributed to the difficulty which academic IPL professionals obviously feel about having to satisfy multiple clients as reflected in the higher role conflict scores for academic respondents. This is confirmed by the academic IPL professional who stated, "Much of the stress or conflicts associated with our job is that we have a very diverse group of customers -- faculty, industrial licensees, administrators. Not all of these customers have the same opinions or objectives, so we walk a fine line trying to keep all happy." Clearly, the more conflict present the less control the IPL professional has over the successful and timely outcome of the job.

Research question five asked, what is the participation in decision making level for respondents? Participation in decision making (PDM) was measured with the five item scale developed by Vroom (1959). The potential scores for participation in decision making ranged from five to 25. As indicated by the mean score of 19.48, shown in Table 4, respondents overall reported a high degree of participation in decision making in their jobs. PDM scores for academic and industrial respondents, as shown in Table 5, were 19.62 and 19.43 respectively. PDM was found to be significantly and positively related to job satisfaction for all respondents (see Table 6), and the impact of PDM will be discussed in detail later

in this chapter. The importance of participation in decision making for IPL professionals can be seen in the comment received from one respondent who stated, "Currently, without involvement or authority, this job is strictly administrative. I feel that my job is to execute licenses and routine contracts - a role which is neither interesting to me nor optimal for my company." As will be shown later in this chapter, participation in decision making makes a significant difference with regard to the job satisfaction and role stress of IPL professionals.

Research question six, asked what is the ability level for respondents? Ability level was operationalized as the sum of years of intellectual property licensing experience plus level of education. Level of education ranged from one to seven representing high school graduate, associate's degree, bachelor's degree, some graduate work, master's degree, beyond master's degree, and doctoral degree, respectively. Intellectual property licensing experience ranged from one to 37 years. Ability scores were calculated by adding level of education and experience, and as indicated by the mean score of 15.84, shown in Table 4, respondents overall exhibited a high degree of ability for their jobs. This score was comprised of educational level and experience. Both academic and industrial respondents averaged better than a Master's degree with scores for educational level of 5.63 and 5.80, respectively. As for experience, industrial respondents again averaged slightly higher than their academic counterparts with scores of 10.12 and 9.99, respectively. There was no statistically significant difference

between either educational level, experience or ability of academic versus industrial respondents.

Findings and Discussion Relative to Hypotheses Tests

The following section presents findings pertaining to the testing of this research study's thirteen hypotheses. Each hypothesis and its corresponding research question, will be restated; relevant data will be presented; the statistical decision concerning the null hypothesis will be discussed; and the findings associated with each research hypothesis will be discussed.

Hypothesis 1

Research question seven asked, to what degree is role ambiguity related to job satisfaction? In response to this question, the researcher's first hypothesis, H_1, stated that there would be a negative relationship between role ambiguity and job satisfaction. In order to test the hypothesis of a negative relationship between role ambiguity and job satisfaction, a linear regression analysis was performed and the resulting correlation coefficient was examined. The results, presented in Table 6, indicate a statistically significant negative correlation between role ambiguity and job satisfaction with a coefficient of -0.449 ($p < .001$). This correlation is consistent with the meta-analysis of Jackson and Schuler (1985) who observed an

average correlation of -.46 between role ambiguity and job satisfaction across 56 studies. Therefore, H_1 was supported.

Table 6

Correlations among Variables for all Respondents (n = 438)

Variable	1	2	3	4	5	6	7	8	9	10
(1) js										
(2) ra	-.449[c]									
(3) rc	-.393[c]	.513[c]								
(4) epe	.331[c]	-.460[c]	-.354[c]							
(5) pdm	.533[c]	-.589[c]	-.428[c]	.379[c]						
(6) age	.101[a]	-.126[b]	nsc	nsc	.119[a]					
(7) edlev	nsc	nsc	nsc	nsc	nsc	.144[b]				
(8) exp	.154[c]	-.115[a]	nsc	.096[a]	.108[a]	.488[c]	.111[a]			
(9) org. size	nsc	nsc	nsc	nsc	nsc	nsc	nsc	nsc		
(10) coll	.122[b]	-.108[a]	nsc	nsc	nsc	nsc	nsc	nsc	.317[c]	
(11) ability	.131[b]	-.114[a]	nsc	nsc	.096[a]	.497[c]	.298[c]	.982[c]	nsc	nsc

(a) $p<.05$ (b) $p<.01$ (c) $p<.001$ nsc = no significant correlation

The correlation between role ambiguity and job satisfaction was stronger for academic respondents with a coefficient of -.512, as opposed to industrial respondents whose correlation was -.423. The correlations among variables for academic and industrial respondents are presented in Tables 7 and 8, respectively.

Table 7

Correlations among Variables for Academic Respondents (n = 120)

Variable	1	2	3	4	5	6	7	8	9	10
(1) js										
(2) ra	-.512[c]									
(3) rc	-.325[c]	.544[c]								
(4) epe	.413[c]	-.564[c]	-.468[c]							
(5) pdm	.522[a]	-.653[c]	-.399[c]	.470[c]						
(6) age	nsc	nsc	nsc	nsc	.204[a]					
(7) edlev	nsc	nsc	nsc	nsc	nsc	.209[a]				
(8) exp	.181[c]	nsc	nsc	nsc	.211[a]	.552[c]	nsc			
(9) org. size	nsc	nsc	nsc	nsc	nsc	nsc	nsc	nsc		
(10) coll	nsc	-.221[a]	-.238[b]	nsc	nsc	nsc	nsc	nsc	.656[c]	
(11) ability	nsc	nsc	nsc	nsc	.213[a]	.575[c]	.281[b]	.978[c]	nsc	nsc

(a) p<.05 (b) p<.01 (c) p<.001 nsc = no significant correlation

Table 8

Correlations among Variables for Industrial Respondents (n = 318)

Variable	1	2	3	4	5	6	7	8	9	10
(1) js										
(2) ra	-.423[c]									
(3) rc	-.421[c]	.508[c]								
(4) epe	.294[c]	-.415[c]	-.276[c]							
(5) pdm	.543[c]	-.557[c]	-.458[c]	.344[c]						
(6) age	nsc	-.136[a]	-.138[a]	nsc	nsc					
(7) edlevel	nsc	nsc	nsc	nsc	nsc	.113[a]				
(8) exp	.144[b]	-.121[a]	-.113[a]	nsc	nsc	.465[c]	.126[a]			
(9) org. size	.132[a]	nsc	nsc	nsc	nsc	nsc	nsc	nsc		
(10) coll	.136[a]	-.115[a]	nsc	nsc	nsc	nsc	nsc	nsc	.330[c]	
(11) ability	.118[a]	-.114[a]	-.123[a]	nsc	nsc	.467[c]	.305[c]	.983[c]	nsc	nsc

(a) p<.05 (b) p<.01 (c) p<.001 nsc = no significant correlation

Hypothesis 2

Research question eight asked, to what degree is role conflict related to job satisfaction? In response to this question, the researcher's second hypothesis, H_2, stated that there would be a negative relationship between role conflict and job satisfaction. In order to test the hypothesis of a negative relationship between these variables a linear regression analysis was performed and the resulting correlation coefficient was examined. The results indicate a statistically significant negative correlation between role conflict and job satisfaction with a coefficient of -0.393 ($p<.001$). This finding is consistent with the study by Jackson and Schuler (1985) which found an average correlation of -.48 between role conflict and job satisfaction across 37 studies. Industrial respondents averaged higher than their academic counterparts with scores of -.421 ($p<.001$) and -.325 ($p<.001$), respectively. Therefore, H_2 was supported.

Hypothesis 3

Research question nine asked, to what degree is participation in decision making related to satisfaction with work? In response to this question, the researcher's third hypothesis, H_3, stated that there would be a positive relationship between participation in decision making and job satisfaction. In order to test this hypothesis a linear regression analysis was performed and the resulting correlation coefficient was examined. The results indicate a statistically significant positive

correlation between participation in decision making and work satisfaction with a coefficient of 0.533 ($p<.001$). This positive correlation is consistent with the 0.29 correlation between participation and satisfaction with work found by Schuler (1980). The correlation for industrial respondents was slightly higher than the correlation for respondents from academic organizations with scores of .543 (Table 8) and .522 (Table 7), respectively. Therefore, H_3 was supported.

Hypothesis 4

Research question ten asked, to what degree is participation in decision (PDM) making related to effort-performance expectancy (EPE)? In response to this question, the researcher's fourth hypothesis, H_4, stated that there would be a positive relationship between participation in decision making and effort-performance expectancy. In order to test the hypothesis of a positive relationship between PDM and EPE a linear regression analysis was performed and the resulting correlation coefficient was examined. The results indicate a statistically significant positive correlation between PDM and EPE with a coefficient of 0.379 ($p < .001$). This positive correlation is consistent with the correlation of 0.44 between PDM and EPE reported by Schuler (1980). The correlation for academic respondents was .470 (Table 7), which was slightly stronger than the .344 (Table 8) correlation for industrial respondents. Therefore, H_4 was supported.

Hypothesis 5

Research question eleven asked, to what degree is participation in decision making (PDM) related to role ambiguity? In response to this question, the researcher's fifth hypothesis, H_5, stated that there would be a negative relationship between participation in decision making and role ambiguity. In order to test this hypothesis a linear regression analysis was performed and the resulting correlation coefficient was examined. The results, shown in Table 6, indicate a statistically significant negative correlation between PDM and role ambiguity with a coefficient of -0.589 ($p < .001$). This negative correlation is consistent with the correlation of -.48 between participation and role ambiguity reported by Schuler (1980). The correlations for academic respondents was -.653 (Table 7) and for industrial respondents was -.557 (Table 8). Therefore, H_5 was supported.

Hypothesis 6

Research question twelve asked, to what degree is participation in decision making (PDM) related to role conflict? In response to this question, the researcher's sixth hypothesis, H_6, stated that there would be a negative relationship between participation in decision making and role conflict. A linear regression analysis was performed to test the hypothesis of a negative relationship between PDM and role conflict and the resulting correlation coefficient was examined. The results, shown in Table 6, indicate a statistically significant

negative correlation between PDM and role conflict with a coefficient of -0.428 ($p<.001$). This negative correlation is consistent with the correlation of -.39 between participation and role conflict reported by Schuler (1980). The correlation for industrial respondents was -.458 (Table 8) and for academic respondents was -.399 (Table 7). Therefore, H_6 was supported.

Hypothesis 7

Research question thirteen asked, to what degree is IPL professional ability related to job satisfaction? In response to this question, the researcher's seventh hypothesis, H_7, stated that there would be a positive relationship between ability and job satisfaction. In order to test the hypothesis a linear regression analysis was performed and the resulting correlation coefficient was examined. The results, shown in Table 6, indicate a statistically significant positive correlation between ability and job satisfaction with a coefficient of 0.131 ($p < .01$). Albeit a weak correlation, H_7 was therefore supported.

Each of the constituent components of ability, i.e. level of education and experience, were examined for their individual relationships with job satisfaction. As presented in Table 6, level of education was not significantly correlated with job satisfaction. However, experience was significantly correlated with job satisfaction (.154, $p<.001$). Table 9 shows mean job satisfaction scores and standard deviations for three levels of experience. "New" IPL professionals were

classified as those individuals with less than five years of experience. This group of 91 individuals averaged 44.81 for job satisfaction. "Experienced" IPL professionals were classified as those individuals with five to ten years of experience. There were 190 such individuals, and they averaged 47.61 for job satisfaction. Finally, "Established" IPL professionals were individuals with more than 10 years of experience. This group of 157 individuals had a mean score of 48.41 for job satisfaction.

Table 9

Job Satisfaction Mean Scores and Standard Deviations for all Respondents by Experience Level

	Mean Score	Standard Deviation
Intellectual Property Licensing Experience		
New (<5 years) (n = 91)	44.81	10.29
Experienced (5 -10 years) (n = 190)	47.61	7.12
Established (> 10 years) (n = 157)	48.41	6.54

Thus, the data indicate that experience is the factor most responsible for the significant correlation between ability and job satisfaction.

Hypothesis 8

Research question fourteen asked, to what degree is IPL professional ability related to role ambiguity? In response to this question, the researcher's

eighth hypothesis, H_8, stated that there would be a negative relationship between ability and role ambiguity. In order to test the hypothesis a linear regression analysis was performed and the resulting correlation coefficient was examined. The results, shown in Table 6, indicate a statistically significant, albeit weak, negative correlation between ability and role ambiguity with a coefficient of -0.114 ($p < .05$). The correlation for academic respondents was .116 (Table 7) and industrial respondents was .114 (Table 8). Therefore, H_8 was supported.

Again, each of the constituent components of ability were examined for their relative contributions to the relationship between ability and role ambiguity. As indicated in Table 6, there was no significant correlation between level of education and role ambiguity. However, albeit a weak correlation, experience was significantly correlated with role ambiguity (-.115, $p<.05$). Table 10 presents the mean role ambiguity scores and standard deviations for the three levels of experience. New employees (< 5 years) averaged 20.54 for role ambiguity. Experienced individuals (5 - 10 years) averaged 19.49 for role ambiguity. Finally, established employees (> 10 years) had a mean score of 18.17 for role ambiguity. Thus, experience was the factor responsible for the significant relationship between ability and role ambiguity.

Table 10

Role Ambiguity Mean Scores and Standard Deviations
for All Respondents by Experience Level

	Mean Score	Standard Deviation
Intellectual Property Licensing Experience		
New (<5 years) (n = 91)	20.54	7.54
Experienced (5 -10 years) (n = 190)	19.49	7.08
Established (> 10 years) (n = 157)	18.17	6.82

Hypothesis 9

Research question fifteen asked, to what degree is IPL professional ability related to role conflict? In response to this question, the researcher's ninth hypothesis, H_9, stated that there would be a negative relationship between ability and role conflict. In order to test the hypothesis a linear regression analysis was performed and the resulting correlation coefficient was examined. As indicated by Table 6, there was no significant correlation between ability and role conflict for all respondents and academic respondents (Table 7). However, there was a significant, albeit weak, correlation between ability and role conflict (-.123, $p<.05$) for industrial respondents. Therefore, H_9 was only partially supported.

Each of the constituent components were examined for their relative contributions to the relationship between ability and role conflict for industrial respondents. As shown in Table 8, there was no significant correlation between

level of education and role conflict for industrial respondents. However, there was a significant, albeit weak, negative correlation between experience and role conflict (-.113, $p<.05$). Table 11 presents the mean role conflict scores and standard deviations of industrial respondents for three experience levels. New employees (<5 years) averaged 34.22 for role conflict. Experienced individuals (5 - 10 years) averaged 31.29. Finally, established employees had a mean score of 30.85 for role conflict. Thus, experience is the factor most responsible for the significant negative relationship between ability and role conflict for industrial respondents.

Table 11

Role Conflict Mean Scores and Standard Deviations for Industrial Respondents by Experience Level

	Mean Score	Standard Deviation
Intellectual Property Licensing Experience		
New (<5 years) (n = 67)	34.22	9.29
Experienced (5 -10 years) (n = 140)	31.29	8.87
Established (> 10 years) (n = 111)	30.85	7.86

Hypothesis 10

Research question sixteen asked, to what degree does participation in decision making (PDM) moderate the relationship between role ambiguity and job

satisfaction? In response to this question the researcher's tenth hypothesis, H_{10}, stated that participation in decision making would moderate the relationship such that as participation increased the negative impact of role ambiguity on job satisfaction would be reduced. In order to test this hypothesis PDM scores were divided into two categories. Low PDM scores were those that were less than or equal to the mean, i.e.19.48, resulting in 197 scores ranging from 6 to 19. High PDM scores were those greater than the mean, resulting in 241 scores ranging from 20 to 25. Correlation coefficients for the role constructs and job satisfaction were then calculated for each group of PDM scores. The results are shown in Table 12. As indicated by the data in Table 12, the correlation between role ambiguity and job satisfaction was reduced from -.421 to -.227 as PDM increased. Therefore, H_{10} was supported.

Table 12

Effect of Moderating Variables on Role Construct and Job Satisfaction Relationship

Dependent Variable Job Satisfaction (n = 438)	Independent Variable Role Ambiguity Correlation Coefficient	Independent Variable Role Conflict Correlation Coefficient
Moderating Variable		
Ability low[a] (< = 16) (n = 272)	-.446[c]	-.433[c]
Ability high[a] (> 16) (n = 166)	-.442[c]	-.293[c]
PDM low[b] (< = 19) (n = 197)	-.421[c]	-.400[c]
PDM high[b] (> 19) (n = 241)	-.227[c]	-.242[c]

PDM = Participation in Decision Making
(a) Ability u = 15.84, s.d. = 7.18 (b) PDM u = 19.48, s.d. = 3.83 (c) $p < .001$

The impact of PDM on the relationship between the role constructs and job satisfaction is further illustrated by the results of the full versus linear regression analysis presented in Table 13. The data in Table 13 show that there was a significant increase in the variance explained in satisfaction with work using the full model versus the restricted model. With regard to the relationship between role ambiguity and participation in decision making (H_{10}) , $R^2 = .34$ for the main effects plus an interaction term versus $R^2 = .31$ for main effects only.

Table 13

Main and Interaction Effects Using Role Ambiguity, Role Conflict and Participation in Decision Making with Job Satisfaction

Dependent Variable = Job Satisfaction (n=438)	R^2	F	d/f
RA, PDM, RAPDM	.34	75.18*	3/435
RA, PDM	.31	98.62*	2/436
RC, PDM, RCPDM	.35	78.73*	3/435
RC, PDM	.31	101.11*	2/436

RA = Role Ambiguity; RC = Role Conflict; PDM = Participation in Decision Making
RAPDM = Role Ambiguity x Participation in Decision Making
RCPDM = Role Conflict x Participation in Decision Making
* p<.001

Hypothesis 11

Research question seventeen asked, to what degree does participation in decision making moderate the relationship between role conflict and job satisfaction? In response to this question the researcher's eleventh hypothesis, H_{11}, stated that participation in decision making would moderate the relationship such that as participation in decision making increased the negative impact of role conflict on job satisfaction would be reduced. Again, PDM scores were divided into two categories. Low PDM scores were those less than or equal to the mean of 19.48, and high PDM scores were those greater than 19.48. Correlation coefficients were calculated for each group and the results are shown in Table 12. As indicated by the data in Table 12, the correlation between role conflict and job satisfaction was reduced as PDM increased. Therefore, H_{11} was supported.

Again, the impact of PDM on the relationship between the role constructs and job satisfaction is further illustrated by the results of the full versus linear regression analysis presented in Table 13. The data in Table 13 show that there was a significant increase in the variance explained in satisfaction with work using the full model versus the restricted model. With regard to the relationship between role conflict and participation in decision making (H_{11}), $R^2 = .35$ for the main effects plus an interaction term versus $R^2 = .31$ for the main effects only.

Hypothesis 12

Research question eighteen asked, to what degree does IPL professional ability moderate the relationship between role ambiguity and job satisfaction? In response to this question the researcher's twelfth hypothesis, H_{12}, stated that ability would moderate the relationship such that as ability increased the negative impact of role ambiguity on job satisfaction would be reduced. To test this hypothesis, ability scores were divided into two categories. Low ability scores were those less than or equal to 16 (the mean was 15.84), and high ability scores were those greater than 16. Correlation coefficients were calculated for each group and the results are shown in Table 12. As indicated by the data in Table 12, the correlation between role ambiguity and job satisfaction was reduced, albeit a small change, as ability increased. Therefore, H_{12} was supported.

The impact of ability on the relationship between the role constructs and job satisfaction is further illustrated by the results of the full versus linear regression analysis presented in Table 14. The data in Table 14 show that there was a significant, albeit slight, increase in the variance explained in satisfaction with work using the full model versus the restricted model. With regard to the relationship between role ambiguity and ability (H_{12}) , $R^2 = .22$ for the main effects plus an interaction term versus $R^2 = .21$ for main effects only.

Table 14

Main and Interaction Effects Using Role Ambiguity, Role Conflict and Ability with Job Satisfaction

Dependent Variable = Job Satisfaction (n=438)	R^2	F	d/f
RA, Ability, RAA	.22	39.56*	3/435
RA, Ability	.21	57.06*	2/436
RC, Ability, RCA	.18	31.06*	3/435
RC, Ability	.16	42.67*	2/436

RA = Role Ambiguity; RC = Role Conflict; RAA = Role Ambiguity x Ability
RCA = Role Conflict x Ability
* p<.001

Hypothesis 13

Research question nineteen asked, to what degree does IPL professional ability moderate the relationship between role conflict and job satisfaction? In response to this question the researcher's thirteenth, and final, hypothesis, H_{13}, stated that ability would moderate the relationship such that as ability increased the negative impact of role conflict on job satisfaction would be reduced. Again, ability scores were divided into two categories: low ability scores were those less than or equal to 16; and high ability scores were those greater than 16. Correlation coefficients were calculated for each group and the results are shown in Table 12. As indicated by the data in Table 12, the correlation between role

conflict and job satisfaction was reduced as ability increased. Therefore, H_{13} was supported.

Again, the impact of ability on the relationship between the role constructs and job satisfaction is further illustrated by the results of the full versus linear regression analysis presented in Table 14. The data in Table 14 show that there was a significant, albeit slight, increase in the variance explained in satisfaction with work using the full model versus the restricted model. With regard to the relationship between role conflict and ability (H_{13}), $R^2 = .18$ for the main effects plus an interaction term versus $R^2 = .16$ for the main effects only.

Findings Relative to Alternative Scoring of Job Descriptive Index

As proposed in Chapter 3, in addition to scoring the Job Descriptive Index in the manner described by Balzer et al. (1997) where an undecided response, i.e. a "?", receives a score of 1 point, the researcher also examined the results when undecided responses were assigned a score of 1.5 points. By coding data in this manner a comparison was made to determine whether coding in the traditional way distorted the results.

Each one of the hypotheses involving job satisfaction scores was examined using the alternative scoring method. These hypotheses were H_1, H_2, H_3, H_7, H_{10}, H_{11}, H_{12}, and H_{13}. The results of each hypothesis test was the same for the

alternative scoring method as it was for the traditional scoring method. That is H_1, H_2, H_3, H_7, H_{10}, H_{11}, and H_{13}, were each supported when job satisfaction was scored in the alternative fashion. H_{12} was not supported when scored in the alternative manner. Thus, the traditional method of scoring the Job Descriptive Index was not seen to distort the results in this study.

The following, and final, chapter will present the study's summary, conclusions, implications and recommendations for the intellectual property licensing profession and future research.

CHAPTER V

SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

A summary of the study along with conclusions, implications and recommendations are presented in this final chapter.

Summary

Effective interaction with the external environment is essential in order for organizations to survive in today's highly competitive global marketplace. Initiating, negotiating and executing transactions which benefit the organization financially is of paramount importance. In response to this financial challenge, industrial and academic organizations alike are seeking new ways of generating revenue. Exploiting the organization's intellectual property for financial gain is rapidly becoming one such new source of revenue. An organization's intellectual property assets can include patents, copyrights, trademarks, trade secrets, and any and all expertise that gives the organization a strategic advantage over another organization. Intellectual Property Licensing (IPL) professionals represent their organizations through interactions with external parties. Essentially, the job of the IPL professional involves negotiating deals which are financially beneficial to his or her organization. In order to perform this job effectively, IPL professionals must first be familiar with the intellectual property owned by their employer. This

requires communicating within the organization with technical and legal personnel so as to gain an understanding of the content of the intellectual property and how it is protected legally.

With an understanding of the organization's intellectual property portfolio in hand, the IPL professional can then devise strategies for exploiting the various parts. This strategy should include a list of candidate organizations with whom to engage in licensing discussions. The potential risks and rewards associated with each negotiation should be highlighted. The IPL professional must then gain approval to proceed with negotiations. This approval process can be quite different for industrial versus academic organizations. For example, industrial organizations are typically organized bureaucratically and therefore try to minimize the number of approvals needed in order to proceed. Academic organizations, on the other hand, are generally in favor of a collegial decision making process and as such seek to involve anyone who may be affected by the decision.

Once approval to proceed is gained, the IPL professional then initiates contact with the external party and begins the negotiation process. In this capacity IPL professionals span their organization's boundaries. This activity of boundary spanning has been linked, theoretically and empirically, to higher levels of role conflict and role ambiguity for the individual. For example, role conflict can arise for the IPL professional when financial expectations are different for various

internal members of his or her organization. Role ambiguity, on the other hand, can result when the objectives of the role are not clearly communicated. This is an important issue because the presence of role conflict and/or role ambiguity can have a devastating impact on the job satisfaction of the IPL professional, which in turn can impact the efficiency of the organization. That is, as employee job satisfaction declines, organizational efficiency can be diminished.

However, certain factors have been identified with reducing the negative impact of role conflict and role ambiguity on employee job satisfaction. For example, it is believed that employees who participate in making decisions pertaining to their jobs benefit from the information and feedback gained through participation. Specifically, the employee is better able to verify their expectations and understanding of the job when they participate. Also, it is believed that an increase in employee ability, i.e. experience and education, will help to reduce the negative impact of role conflict and ambiguity on job satisfaction. Specifically, the employee benefits from the insights and further understanding of the job and its requirements provided by an increase in experience and/or education.

Therefore, the purpose of this study was to examine the relationships between perceived role ambiguity, role conflict, job satisfaction, participation in decision making, effort-performance expectancy and ability of intellectual property licensing (IPL) professionals working in academic or industrial organizations. Examining the job satisfaction of IPL professionals is important as

these individuals are engaged in activities which impact the economic welfare of their organizations and society.

Gathering data for this study was accomplished by sending survey questionnaires to a total of 916 IPL professionals listed in the 1999 Licensing Executives Society Directory. Of the 916 individuals, 216 were IPL professionals working in U.S. academic institutions. The remaining 700 individuals were systematically chosen at random, i.e. every fifth name, and were members who worked in U.S. industrial organizations. IPL professionals who were listed as students, members of national laboratories, or who were affiliated with law firms were excluded from this study. Dillman's (1978) Total Design Method (TDM) was followed in executing the survey and collecting the data. Of the 916 questionnaires mailed to IPL professionals, 114 were undeliverable reducing the base to 802 (201 and 601 for academic and industrial respondents, respectively). A total of 438 completed questionnaires were returned, with 120 and 318 received from academic and industrial respondents, respectively. This represents an overall response rate of 54.6% (438/802). The response rate from academic IPL professionals was 60% (120/201). The response rate from industrial IPL professionals was 53% (318/601).

The eight page questionnaire contained the Job Descriptive Index work satisfaction sub-scale developed by Smith, Kendall and Hulin (1969); the Role Conflict and Ambiguity Scale developed by Rizzo, House and Lirtzman (1970);

the Effort-Performance Expectancy Scale developed by House and Dessler (1974) and modified by Schuler and Kim (1978); the Participation in Decision Making Scale developed by Vroom (1959); and a set of demographic questions. The demographic questions inquired about the respondent's age, gender, educational level, intellectual property licensing experience, type and size of organization, and the number of IPL colleagues.

Significant findings, corresponding to each of the variables examined, were produced in this study. A summary of the findings pertaining to this study's thirteen hypotheses follows.

For respondents overall, job satisfaction was found to be negatively correlated with role ambiguity (-.449, $p<.001$) and role conflict (-.393, $p<.001$). Effort-performance expectancy (.331, $p<.001$), participation in decision making (.533, $p<.001$) , age (.101, $p<.05$), experience (.154, $p<.001$), number of colleagues (.122, $p<.01$), and ability (.131, $p<.01$) were all positively correlated with job satisfaction. Table 6 summarizes the correlations among variables for all respondents.

For respondents overall, role ambiguity was significantly and negatively related to job satisfaction. Therefore, hypothesis 1 was supported. Role conflict was positively correlated with role ambiguity (.513, $p<.001$). Effort-performance expectancy (-.460, $p<.001$), participation in decision making (-.589, $p<.001$), age (-.126, $p<.01$), experience (-.115, $p<.05$), number of colleagues (-.108,

p<.05), and ability (-.114, p<.05), were all negatively correlated with role ambiguity.

For respondents overall, role conflict was significantly and negatively correlated with job satisfaction. Therefore, hypothesis 2 was supported. Role conflict was negatively correlated with effort-performance expectancy (-.354, p<.001) and participation in decision making (-.428, p<.001).

For respondents overall, participation in decision making (PDM) was significantly and positively correlated with job satisfaction. Therefore, hypothesis 3 was supported. PDM was also significantly and positively correlated with effort-performance expectancy. Therefore, hypothesis 4 was supported. PDM was significantly and negatively correlated with role ambiguity. Therefore, hypothesis 5 was supported. PDM was significantly and negatively correlated with role conflict. Therefore, hypothesis 6 was supported. PDM was positively correlated with age (.119, p<.05), experience (.108, p<.05) and ability (.096, p<.05).

For respondents overall, ability (i.e. educational level plus experience) was significantly and positively correlated with job satisfaction (.131, p<.01) Therefore, hypothesis 7 was supported. Ability was significantly and negatively correlated with role ambiguity (-.114, p<.05). Therefore, hypothesis 8 was supported. Ability was significantly and negatively correlated with role conflict

for industrial respondents only (-.123, $p<.05$). Therefore, hypothesis 9 was partially supported.

For respondents overall, participation in decision making (PDM) did moderate the relationship between role ambiguity and job satisfaction such that as PDM increased the negative impact of role ambiguity on job satisfaction was reduced (see Table 12). Therefore, hypothesis 10 was supported.

For respondents overall, participation in decision making (PDM) did moderate the relationship between role conflict and job satisfaction such that as PDM increased the negative impact of role conflict on job satisfaction was reduced (see Table 12). Therefore, hypothesis 11 was supported.

For respondents overall, ability did moderate, albeit slightly, the relationship between role ambiguity and job satisfaction such that as ability increased the negative impact of role ambiguity on job satisfaction was reduced (see Table 12). Therefore, hypothesis 12 was supported.

Finally, for respondents overall, ability did moderate the relationship between role conflict and job satisfaction such that as ability increased the negative impact of role conflict on job satisfaction was reduced (see Table 12). Therefore, hypothesis 13 was supported.

The following section will discuss the conclusions, pertaining to each of the major variables, drawn from this study.

Conclusions

Job Satisfaction

Overall, respondents exhibited a relatively high degree of satisfaction with their work. Job satisfaction for each organizational type, i.e. academic and industrial, was also relatively high, with no significant difference between the mean satisfaction scores of each group. As evidenced by respondent comments (see Appendix N), the diverse nature of IPL work, resulting in low levels of perceived monotony, is a clear contributor to the IPL professional's high degree of job satisfaction. Exposure to the many types of intellectual property, and having to understand the subject matter associated with each, is intellectually stimulating. Also, the autonomy enjoyed by IPL professionals plays a role in their high degree of job satisfaction. Choosing and meeting with prospective licensees is a function of the job which enables the IPL professional to experience and understand other organizations, environments, and cultures. Finally, negotiating and executing agreements which benefit their organizations is an exciting and tangible result of their efforts.

Significant correlations were found between job satisfaction and eight of the ten other variables examined in this study. As anticipated, moderate negative correlations were determined between job satisfaction and each of the role constructs, i.e. role ambiguity (-.449, $p<.001$) and role conflict (-.393, $p<.001$). This result is consistent with the vast body of work which has examined the

relationship between role stress variables and job satisfaction, and confirms the importance of minimizing role ambiguity and role conflict within the IPL professional's environment.

Also as expected, effort-performance expectancy (.331, $p<.001$) and participation in decision making (.533, $p<.001$) were determined to be positively correlated with satisfaction. The positive moderate correlation between participation and satisfaction is clear evidence of the benefits afforded to IPL professionals when they are allowed to play a role in arriving at decisions which impact their jobs.

Overall, respondents indicated a weak positive correlation between ability and job satisfaction (.131, $p<.01$). Specifically, prior IPL experience, rather than level of education, was found to be significantly and positively related to satisfaction (.154, $p<.001$). From this result, one can conclude that an individual's satisfaction with work is likely to increase the more they are allowed to experience the varying and diverse requirements of the job.

Finally, albeit a weak correlation, a significant and positive relationship exists between the number of colleagues an IPL professional has, and his or her satisfaction with work (.122, $p<.01$). Clearly, IPL professionals can learn from the experiences of their colleagues. Therefore, the greater the number of colleagues, the more opportunities the IPL professional has to learn. As the IPL professional learns and gains experience, their satisfaction with work grows.

Also, distribution and sharing of the workload, resulting in increased satisfaction with work, is more easily accomplished as the number of colleagues increases.

Role Ambiguity and Role Conflict

Consistent with expectations, respondents reported relatively high levels of perceived role ambiguity and role conflict. These results were anticipated due to the boundary spanning nature of intellectual property and licensing work. However, an interesting result is that the role conflict mean score for academic respondents was statistically significantly higher than that of their industrial counterparts (35.18 versus 31.75). Therefore, one must conclude that there exist fundamental differences in academic and industrial environments which contribute to the higher level of role conflict for academic IPL professionals. One possible explanation may have to do with the difference in the organization's decision making process. That is, academic institutions typically engage in a collegial approach to decision making, whereas industrial organizations generally favor a bureaucratic style. The collegial approach, often involving committees, councils, and/or task forces, introduces multiple individuals into the decision making process thereby increasing the probability, and frequency, of role conflict situations between the IPL professional and other individuals. Whereas a bureaucratic approach, by definition, seeks to minimize the incidence of conflict

in order to create a streamlined and organizationally efficient process of decision making.

Another factor contributing to higher role conflict scores for academic respondents are the variations in goals and objectives of academic versus industrial organizations. Publishing research findings is a high priority for many academic researchers and their institutions, whereas industrial researchers generally maintain their findings as trade secrets. Of these two approaches, commercial partners clearly prefer less public divulgation of the intellectual property for which they are paying. Therefore, the publish or perish edict in the academic community appears to be at odds with the commercialization efforts of the licensing function.

Finally, perceived levels of role ambiguity and role conflict are each reduced as IPL professional experience increases. This result indicates that experience provides the IPL professional with certain skills that can be used to diminish role stress scenarios.

Participation in Decision Making

As hypothesized, the negative correlation between role ambiguity and job satisfaction was reduced as the respondent's level of participation in decision making increased. This result supports the cognitive model of participation effects which views the flow of information to be crucial to worker satisfaction.

According to cognitive models, increases in satisfaction are attributable to specific inputs from workers on issues in which they are interested and knowledgeable. The negative correlation between role conflict and job satisfaction was also reduced as the respondent's level of participation in decision making increased. Clearly, as indicated by the data and the respondents' comments (see Appendix N), participation allows the individual the opportunity to discuss and overcome impediments, i.e. conflicts, encountered in performing their jobs.

Ability

For respondents overall, ability was significantly, albeit weakly, and positively correlated with job satisfaction (.131, $p<.01$). Specifically, experience was found to be a better predictor of job satisfaction than an individual's level of education. This result implies that skills can be gained through work experience that allow individuals to become increasingly satisfied with their job.

As for the moderating impact of the ability variable, the negative relationship between role ambiguity and job satisfaction was reduced slightly as ability increased. Therefore, based on the data, it is likely that role ambiguity is a phenomena which occurs, and is problematic, for all individuals regardless of their level of education and/or prior work experience.

The negative correlation between role conflict and job satisfaction was also reduced as employee ability increased. Based on the literature, it was

anticipated that an increase in ability would enable the IPL professional to better cope with role conflict. Therefore, it is likely that work experience provides individuals with opportunities to acquire skills which allow them to cope effectively with role conflict.

Implications and Limitations

Three significant implications arise from this study. First, role conflict levels were found to be significantly higher for academic IPL professionals than for industrial IPL professionals. This implies that fundamental differences exist between academic and industrial organizations which impact the role of the IPL professional. The exact factors causing this significant difference in role conflict scores has not been determined. Further, the negative correlation between role conflict and job satisfaction implies that conflict is bad for the organization. However, one could argue that conflict is necessary in order for organizations to learn and evolve successfully. It would be fascinating to learn from individuals and organizations if and how they use conflict constructively to benefit themselves and their organizations.

Second, it was determined that participation in decision making is effective in reducing role stress and increasing worker satisfaction. This finding has implications for the methods of communications used by organizations. However, the methods, or *how* participation occurs within the academic and

industrial environments remains to be studied. Also, while participation may be beneficial to the IPL professional in the form of enhanced job satisfaction, participation may not be beneficial to the IPL professional's manager. For example, when the manager truly knows more about the job than the employee and gains nothing through participation other than a happier worker, the manager may view participation overall as counterproductive since the process of participation chews up a great deal of everyone's time.

Third, with regard to role stress and job satisfaction, ability levels of IPL professionals were found to make a difference. Specifically, increases in relevant work experience reduce levels of role conflict, and increase levels of job satisfaction. This result has very positive implications for training programs which simulate work experience, as well as organizations which are building intellectual property and licensing departments. Specifically, these organizations could benefit from the wealth of experience possessed by other organizations and should seek to benchmark with them. Also, there is a great opportunity to engage with IPL professional retirees to benefit from their experiences.

There are also several important limitations to this study. First, it should be noted that while role ambiguity was found to be significantly and negatively related to job satisfaction, task ambiguity was not measured in this study. The comments offered by the respondents, as well as personal experience of the researcher, indicate that IPL professionals enjoy a certain degree of task

ambiguity. Further, the degree of task ambiguity desired by the IPL professional may depend upon the nature of task. Specifically, those IPL professionals engaged in patent licensing, since this type of intellectual property negotiation is often the most contentious (usually because the licensee feels that they are paying for nothing other than the right to continue their business, i.e. a tax), may be less desirous of task ambiguity (e.g. clarity of consideration expected in return for intellectual property rights granted) than those IPL professionals who predominantly negotiate technology licenses which are generally less contentious than patent license negotiations (usually because the licensee feels that they are paying for something new to add to their business). The degree of task ambiguity desired may also be a function of whether the IPL professional is responding as a licensor or licensee.

This study was also limited in that it examined only IPL professional and not their managers. For example, as was described earlier, participation in decision making from the manager's perspective was not measured.

Finally, with regard to experience, this study was limited in that it did not determine if experience was positively correlated with job satisfaction because the IPL professional had simply settled into their job and organization over time and was therefore more comfortable and satisfied, or if the IPL professional was truly using his or her IPL-related experience to enhance their job satisfaction.

Recommendations for the Intellectual Property Licensing Profession

Based on the results of this study, it is recommended that those who manage intellectual property licensing (IPL) professionals in industrial and academic organizations:

Assess each IPL professional's level of participation in decision making and take steps to improve upon this level as needed. Such steps may include making the IPL professional responsible for generating information (e.g. market and cash flow analysis for particular deals) which is needed to reach an informed decision.

Consider streamlining decision making processes as much as possible in order to minimize delays in pursuing new revenue opportunities. This is especially true for academic environments, and might include agreeing on campus-wide principle and policy statements which can then be followed by researchers, administrators, and IPL professionals.

Consider the potential benefits (vis-a-vis role ambiguity, role conflict, and job satisfaction) of an individual's prior relevant work experience when hiring new IPL professionals into the organization. If young candidates are to be hired ensure that a training program, which taps into the organization's knowledge and experience, is available which properly indoctrinates the new recruit into the role of an IPL professional within the new environment.

A word of caution is also offered with these recommendations. As is the case with any evolving organization, a solution, i.e. recommendation, that is appropriate for one may not be appropriate for another. For example, experience *per se* may not always lead to improvements in job satisfaction and organizational efficiency. Quite often problems are best solved by individuals with no prior experience in a given subject matter, but who possess a youthful enthusiasm for getting things done. Also, a particular individual's experience and "solutions" may be entirely wrong for the problem at hand. Therefore, the inherent complexity, and associated pros and cons, of matching any given individual's skills and background with the organization's needs should be carefully considered. This caution also applies to decisions concerning levels of participation, as well as decision making processes within the organization.

Recommendations for Future Research

Future research may be directed at addressing and answering the following issues and questions.

High levels of role conflict and role ambiguity are expected for individuals working in boundary spanning positions. However, as indicated by this study, a significantly higher level of role conflict exists for academic IPL professionals versus their industrial counterparts. What are the various factors contributing to the higher level of role conflict for academic IPL professionals? Therefore, a

replication of this study which includes an interviewing element so as to uncover the IPL professional's attitudes about the job and job environment is needed.

It was determined in this study that participation in decision making made a significant difference in reducing the negative impact of role conflict and role ambiguity on the job satisfaction of IPL professionals. However, the approaches used by organizations to enable participation, e.g. group meetings, one-on-one meetings, videoconferencing, etc., were not identified. Are some methods of participation more effective than others? Therefore, future research may be directed at understanding the various types of participation activities and the perceived effectiveness of each.

The results of this study indicate that IPL professional ability makes a significant difference in reducing the negative impact of role conflict on the job satisfaction of IPL professionals. That is, the employee's prior relevant work experience plays an important role in moderating the relationship between role conflict and job satisfaction. However, this study did not reveal the types of skills acquired through experience by IPL professionals. An understanding of skills needed by IPL professionals would be beneficial to those engaged in developing training programs. Are negotiating skills as important as a knowledge of a technical discipline? A listing and ranking of the skills required of IPL professionals would be of great practical use by management. Therefore, a study which examines the skill set of IPL professionals is needed.

In addition to understanding the skills required to be successful, an understanding of the career path of the IPL professional would be useful. Is the career path different for IPL professionals in various industries? Are ethical issues more prevalent in one type of organization or industry than another?

This study examined the job satisfaction of IPL professionals but did not investigate the productivity of these individuals. It was determined that IPL professionals have a high degree of job satisfaction, but to what degree are they productive? Therefore, a study which examines the productivity of IPL professionals is recommended.

Finally, this study could also be replicated in the international realm to determine if any significant differences exist among various cultures. Do some countries and governments place more emphasis on intellectual property and licensing, and if so is it reflected in the satisfaction and productivity of the IPL professionals working in those countries?

As with any rapidly developing field there are many simple questions which can be asked about intellectual property and licensing. But, as with any endeavor involving humans, the answers to these simple questions are likely to be complex. Nevertheless, the questions should be asked, the answers and solutions should be offered, and the quest for knowledge continued.

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APPENDIX A

COVER LETTER

[Letterhead of New York University]

April 21, 1999

Subject
Organization
Street Address
City, State, Zip Code

Dear Subject:

As a successful professional who deals with intellectual property and licensing matters, you are certainly aware of the emphasis and many opportunities found in this discipline today. It is for this reason that I am asking you for ten minutes of your time to assist in a project to better understand key factors which may be impacting your job. In return for your time, a summary of the results of this study, which includes an examination of job satisfaction, participation in decision making, and ability levels of professionals involved with IP, is available upon request.

This survey, which is being conducted as a part of the research requirements for my doctoral dissertation at New York University, is designed to examine specific organizational and individual characteristics which may impact the role of professionals handling IP. Your name was chosen as part of a random sample of the Licensing Executives Society International directory. In order that the results truly represent the thinking of those involved with intellectual property and licensing, it is important that each questionnaire be completed and returned.

Your completing the questionnaire and returning it to me in the stamped, self-addressed envelope as soon as possible would be greatly appreciated. You may be assured that your answers will be kept strictly confidential. The questionnaire has an identification number for mailing purposes only. This is so that we may check your name off of the mailing list when your questionnaire is returned. Your name will never be placed on the questionnaire.

If you would like to receive a summary of the results of this study, please indicate this by writing your name and address on the back of the return envelope. Of course, if you have any questions about this survey, please do not hesitate to call me at (914) 765-4348.

Your cooperation is greatly appreciated.

Sincerely,

/s/
Al Torressen
Doctoral Candidate

/s/
Michael Bronner, Ph.D.
Doctoral Committee Chair

Enclosures

APPENDIX B

LETTER REQUESTING PERMISSION TO USE JOB DESCRIPTIVE INDEX

Albert M. Torressen
10 Linden Avenue
Bronx, New York 10465
phone: 914-765-4348
fax: 914-765-4390

December 14, 1998

Ms. Shahnaz Aziz
BGSU Test Measures
Department of Psychology
Bowling Green State University
Bowling Green, Ohio 43403

Dear Ms. Aziz,

Thank you for speaking with me by telephone recently. To refresh your memory, I am a doctoral candidate at New York University working under the direction of Dr. Michael Bronner in the department of Administration, Leadership and Technology in the School of Education. I am writing for permission to use the Job Descriptive Index - work satisfaction sub-scale. As we discussed I am enclosing a check made payable to the Department of Psychology - JDI Fund in the amount of $140. This amount is to pay for the copyright fee for 1000 JDI - work satisfaction sub-scales, as well as the scoring key and reference book. The JDI sub-scale will be used to examine satisfaction with work of individuals engaged in intellectual property licensing. The title of my dissertation is A Study to Examine Perceived Role Ambiguity, Role Conflict, Participation in Decision-Making, Ability and Satisfaction with Work Among Intellectual Property Licensing Professionals.

After reviewing a number of articles addressing the construction, validation and reliability of the Job Descriptive Index, I feel that it would be appropriate for my study. Thank you for your assistance with this matter. I look forward to receiving the materials, and your permission to use the JDI - work satisfaction sub-scale.

Sincerely,

/s/
Al Torressen
Doctoral Candidate

Enclosure

APPENDIX C

LETTER GRANTING PERMISSION TO USE JOB DESCRIPTIVE INDEX

Bowling Green State University

Department of Psychology
Bowling Green, Ohio 43403-0228
(419) 372-2301
Fax: (419) 372-6013
Web Page: http://www.bgsu.edu/departments/psych/

COPYRIGHT PERMISSION

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Date: 12/18/98

Purchaser: Albert M Torressen

Address: 10 Linden Avenue

Bronx, New York

10465 USA

Permission to reproduce: 1000 copies of the work satisfaction subscale

To obtain copyright information for the JDI and JIG contact

The JDI Research Group
Department of Psychology
Bowling Green State University
Bowling Green, Ohio 43404
(419) 372-8247

APPENDIX D

LETTER REQUESTING AND GRANTING PERMISSION TO USE ROLE CONFLICT AND AMBIGUITY SCALE

Albert M. Torressen
10 Linden Avenue
Bronx, New York 10465
phone: 914-765-4348
fax: 914-765-4390

January 6, 1999

Dr. Sidney L. Lirtzman
Bernard M. Baruch College
City University of New York
17 Lexington Avenue, Box E-0933
New York, NY 10010

Dear Dr. Lirtzman,

I am a doctoral candidate at New York University working under the direction of Dr. Michael Bronner in the department of Administration, Leadership and Technology in the School of Education. I am writing for permission to use the 14-item Role Conflict and Ambiguity Scale in my dissertation.

The scale will be used to examine perceived role ambiguity and role conflict as I believe these role constructs to be related to the job satisfaction of intellectual property licensing professionals in academic and industrial environments. The title of my dissertation is A Study to Examine Perceived Role Ambiguity, Role Conflict, Participation in Decision Making, Ability and Job Satisfaction Among Intellectual Property Licensing Professionals.

After reviewing a number of articles addressing the construction, validation and reliability of the Role Conflict and Ambiguity Scale, I feel that it would be appropriate for my study. Thank you for your consideration. I look forward to hearing from you.

Sincerely,

A.M. Torressen

Albert M. Torressen
Doctoral Candidate

Permission is granted to use scales for purposes described above.

Dean 1/12/99

** TOTAL PAGE.01 **

APPENDIX E

JOB DESCRIPTIVE INDEX - WORK SATISFACTION SCALE

Think of the work you do at present. How well does each of the following words or phrases describe your work? In the blank beside each word or phrase below, write

Y for "**Yes**" if it describes your work
N for "**No**" if it does not describe it
? for "**?**" if you cannot decide

_____ Fascinating

_____ Routine

_____ Satisfying

_____ Boring

_____ Good

_____ Gives sense of accomplishment

_____ Respected

_____ Uncomfortable

_____ Pleasant

_____ Useful

_____ Challenging

_____ Simple

_____ Repetitive

_____ Creative

_____ Dull

_____ Uninteresting

_____ Can see results

_____ Uses my abilities

APPENDIX F

ROLE CONFLICT AND AMBIGUITY SCALE

The statements listed below will describe some specific characteristics about your particular job. Using the scale below, **please circle the number that corresponds with how true** each statement is for your present job.

Strongly Disagree 1	Disagree 2	Mildly Disagree 3	Neither Agree or Disagree 4	Mildly Agree 5	Agree 6	Strongly Agree 7

1.	Clear, planned goals and objectives exist for my job.	1	2	3	4	5	6	7
2.	I have to do things that should be done differently.	1	2	3	4	5	6	7
3.	I know that I have divided my time properly.	1	2	3	4	5	6	7
4.	I receive an assignment without the assistance to complete it.	1	2	3	4	5	6	7
5.	I know what my responsibilities are.	1	2	3	4	5	6	7
6.	I have to circumvent a rule or policy in order to carry out an assignment.	1	2	3	4	5	6	7
7.	I work with two or more groups who operate quite differently.	1	2	3	4	5	6	7
8.	I know exactly what is expected of me.	1	2	3	4	5	6	7
9.	I receive incompatible requests from two or more people.	1	2	3	4	5	6	7
10.	I feel certain about how much authority I have.	1	2	3	4	5	6	7
11.	I do things that are apt to be accepted by one person and not by others.	1	2	3	4	5	6	7
12.	I receive an assignment without adequate resources and materials to complete it.	1	2	3	4	5	6	7
13.	Explanation is clear of what has to be done.	1	2	3	4	5	6	7
14.	I work on unnecessary things.	1	2	3	4	5	6	7

APPENDIX G

EFFORT-PERFORMANCE EXPECTANCY SCALE

Using the scale below, **please circle the number that corresponds with how true** each statement is for your present job.

Strongly Disagree 1	Disagree 2	Neither Agree or Disagree 3	Agree 4	Strongly Agree 5

1. If I work hard at my job it is likely that I will meet high standards of excellence.	1	2	3	4	5
2. Doing things as well as I am capable results in completing my assignment on time.	1	2	3	4	5

APPENDIX H

PARTICIPATION IN DECISION MAKING SCALE

Think about your present job. Using the scale below, **please circle the number that corresponds with how much** of that thing there is in your job.

	Very Little 1	Little 2	A Moderate Amount 3	Much 4	Very Much 5
1. In general, how much say or influence do you have on how you perform your job?	1	2	3	4	5
2. To what extent are you able to decide how to do your job?	1	2	3	4	5
3. In general, how much say or influence do you have on what goes on in your work group?	1	2	3	4	5
4. In general, how much say or influence do you have on decisions which affect your job?	1	2	3	4	5
5. My superiors are receptive and listen to my ideas and suggestions.	1	2	3	4	5

APPENDIX I

DEMOGRAPHIC QUESTIONNAIRE

1. Your present age: _____ years

2. Your gender. **(please circle number of your answer)**

1 Male

2 Female

3. Which is the highest level of education that you have completed? **(please circle a number)**

		(Please specify degree and major)
1	High school graduate	_____ _____
2	Associate's degree	_____ _____
3	Bachelor's degree	_____ _____
4	Some graduate work	_____ _____
5	Master's degree	_____ _____
6	Beyond Master's degree	_____ _____
7	Doctorate	_____ _____

4. What is the total number of years you have been working in intellectual property licensing? (include all previous intellectual property licensing work experience plus your present job) **(please enter a number)**

_____ years

5. What is the type of organization you are presently working in? **(please circle a number)**

1 Academic

2 Industrial

6. What is the approximate number of students or employees of the organization you are presently working in? **(please enter a number)**

_____ Students enrolled (for Academic)

_____ Total employees (for Industrial)

7. What is the number of Intellectual Property Licensing colleagues you have in your present organization? **(please enter a number)**

_____ IPL colleagues

APPENDIX J

REMINDER POSTCARD (FRONT AND BACK)

April 28, 1999

Recently, a questionnaire seeking your input about Intellectual Property and Licensing matters was mailed to you. Your name was drawn in a random sample of the Licensing Executives Society.

If you have already completed and returned it to us please accept our sincere thanks. If not, please do so today. Because it is sent to only a small, but representative, sample of Licensing Professionals it is extremely important that yours also be included in the study if the results are to accurately represent the opinions of Licensing Professionals.

If by some chance you did not receive the questionnaire, or it got misplaced, please call me right now, collect at (914-765-4348) and I will get another one in the mail to you today.

Sincerely.
/s/
Al Torressen
New York University
Doctoral Candidate

Al Torressen
10 Linden Avenue
Bronx, New York 10465

Subject
Organization
Street Address
City, State, Zip Code

APPENDIX K

FIRST FOLLOW-UP LETTER

[Letterhead of New York University]

May 19, 1999

Subject
Organization
Street Address
City, State, Zip Code

Dear Subject:

About three weeks ago you should have received a questionnaire designed to identify certain organizational and individual characteristics impacting the role of those individuals dealing with intellectual property and licensing matters. As of today your response has not yet been received.

I am writing to you again because of the significance each questionnaire has to the usefulness of this study. Even if your job extends beyond intellectual property and licensing responsibilities (as indicated by a number of respondents), your answers are important to this study. In the event that your original questionnaire was not delivered or has been misplaced, a replacement is enclosed. I would greatly appreciate fifteen minutes of your time to complete the questionnaire and return it to me as soon as possible in the enclosed stamped, self-addressed envelope.

Let me assure you that your answers will be kept strictly confidential. The questionnaire has an identification number for mailing purposes only. This is so that your name may be checked off of the mailing list when your questionnaire is returned. Your name will never be placed on the questionnaire, and only group data will be reported. If you would like to receive a summary of the results of this study, please indicate this by writing your name and address on the back of the return envelope. If you have any questions about this survey please do not hesitate to call me at (914) 765-4348.

Your cooperation is greatly appreciated.

Sincerely,

/s/
Al Torressen
Doctoral Candidate

/s/
Michael Bronner, Ph.D.
Doctoral Committee Chair

Enclosures

APPENDIX L

SECOND FOLLOW-UP LETTER

[Letterhead of New York University]

June 20, 1999

Subject
Organization
Street Address
City, State, Zip Code

Dear Subject:

About seven weeks ago I began writing to you about my study which examines the job satisfaction of people who deal with intellectual property and licensing in their industrial and/or academic work environment. As of today I have not yet received your completed questionnaire, and I would greatly appreciate your taking the time now to complete and return the enclosed replacement copy. Please let me stress the significance each returned questionnaire has to the usefulness of this study. Even if your job extends beyond intellectual property and licensing responsibilities (as indicated by a number of early respondents), your answers are very important to the successful completion of this study.

The large number of questionnaires returned so far is very encouraging. But, whether I will be able to describe accurately how industrial and academic LES members perceive these important issues depends greatly upon those who have not yet responded. This is because past experiences suggest that those yet to respond may hold quite different opinions of job satisfaction than those who respond early.

It is for these reasons that I am again sending you the questionnaire. Let me assure you that your answers will be kept strictly confidential. The identification number on the questionnaire is for mailing purposes only. If for some reason you do not wish to participate in the study please return your questionnaire so that your name may be deleted from the mailing list. If you would like to receive a summary of the results of this study, expected to be ready this Fall, please indicate this by writing your name and address on the back of the return envelope. Please do not hesitate to call me collect at 914-765-4348 if you have any questions about this study. Thank you very much in advance for your time and input. Your contribution to the success of this study will be greatly appreciated.

Sincerely,

/s/
Al Torressen
Doctoral Candidate

/s/
Michael Bronner, Ph.D.
Doctoral Committee Chair

Enclosures

APPENDIX M

HUMAN SUBJECTS

New York University
A private university in the public service
Office of Sponsored Programs
[illegible] Washington Place, Apt. [illegible]
New York, NY 10003-6641
Telephone (212) 998-2121
FAX (212) 995-4029

MEMORANDUM

TO: Albert Michael Torressen
10 Linden Avenue
Bronx, NY 10465

FROM: Marti L. Dunne, Chairperson
University Committee on Activities Involving Human Subjects

DATE: January 20, 1999

RE: "A Study to Examine Perceived Role Ambiguity, Conflict, Participation in Decision Making, Ability, and Job Satisfaction Among Intellectual Property Licensing Professionals" (SED/Admin., Leadership, & Tech., no agency, diss., *exempt*)

The above-referenced protocol has been granted exempt status by the University Committee on Activities Involving Human Subjects.

Please note that, where applicable, subjects must be given a copy of the signed consent form before the subjects' participation. All data as well as the investigator's copies of the signed consent forms must be retained by the principal investigator for a period of at least three years following the termination of the project. Should you wish to make changes to the Committee-approved procedures, the following materials must be submitted for Committee review:

- **description of proposed revisions;**
- *if applicable,* **any new or revised materials**, such as recruitment fliers, letters to subjects, or consent forms; and
- *if applicable,* **updated letters of approval from cooperating institutions.**

If you have any questions regarding the Committee's requirements, please contact Patricia Rose at 212-998-2119 or phr1@is2.nyu.edu.

cc: Dr. Michael Bronner—Faculty Sponsor

APPENDIX N

COMMENTS FROM RESPONDENTS

Comments Received from Industrial Organizations

"Thank you for this survey! This growing field remains in organizational obscurity as compared to other traditional centralized functions (i.e., HR, PR, CFO, etc.). As such, personal satisfaction remains depressed since recognition and rewards are not accurately linked to organizational performance. Another factor involves the confusion of the skills necessary to perform this function. Most business managers mis-interpret these as "legal." While some knowledge of law is necessary, other items such as business, negotiation, technical, etc. are critical as well."

"Some decidedly negative factors contributing to any negative survey selections are the current corporate / business trends to reduce the number of personnel, to placate short-term demands of the financial markets, and to compensate top executives at a disproportionate level (for such short-term planning). Stress from too much work / too few resources is wide-spread in the profession."

"There is systemic disrespect for IP in the U.S."

"Wear multiple hats: Director of Research; Director of Patents & Licensing; prosecute all Patents, US and Foreign. Also function as in-house Counsel."

"The job itself can be very satisfying and most of us get a significant amount of satisfaction and appreciation from the internal customers we serve. However, the environment in which we work is very frustrating. It is very difficult to get timely decisions from management when evaluating new technology, and licensing professionals in our company tend to be regarded as scapegoats on which to place blame if something should go wrong."

"The only clear goals at the top are (1) keep us out of harms way (i.e. patent use); (2) secure a clear path for us in the future, i.e. patent our inventions and license in those others that we need; (3) license out those technologies necessary to secure back rights; (4) enforce our patents through litigation; (5) make money from licensing... Our success as a company resides heavily on our IP program."

"The company has not communicated well to the rest of the organization their commitment to in licensing products and technologies. As a result it is always a battle to get resources from other departments."

"There are people who find licensing fascinating; I am not one of them. With limited exceptions, the people in other organizations with whom I deal combine the personal integrity of used-car salesmen with the decisiveness of Dagwood Bumstead's boss, Mr. Dithers. In no case, do they have the authority to make decisions. These are made by their superiors or by senior management outside their chain of command. Generally, they appear to be people who have not been successful as "line managers" and have been found a place where they can do the least damage to their organization. The catch phrase is, "those who can't lead, license." Note that they are not fired / outplaced, just peripheralized."

"I believe that the greatest satisfaction (and success) is found when the IP licensing executive is actually involved from the earliest stages wherein the transaction is being conceptualized right through final language. It is similarly important that the IP licensing executive carry the authority and independence of a professional. Otherwise stated, the best and happiest IP licensing executives have great bandwidth and capacity to work independently."

"Our licensing activities have increasing exposure to Asia, i.e. Japan, China and India. Our activities in these countries are unique and extremely challenging opportunities."

"A greater interaction between the Licensing Executives Society and the Association of University Technology Managers would be good."

"An issue for IP professionals is that few people outside of IP understand it and can assess the value of the IP service provided. This is not to say that IP service is not appreciated and I think that the IP professional feels rewarded by the experience and compensation."

"In my opinion, people who need a lot of clarity of direction, results, etc., will not be happy in licensing function."

"In a business setting one rarely finds a CEO who understands the peculiar skill set and demands of licensing professionals. This leads to problems regarding compensation and support."

"Organizational disruptions make it difficult to maintain a consistent licensing program. Short-term, "bottom line" thinking results in research cutbacks that diminish the value of licensing assets. Certain technologies offer challenging licensing opportunities."

"In my organization, there is a disconnect between those in R&D who are looking for technology that could impact the discovery process and the commercial folks who are looking to license products. Those who license products are closer to the "bottom line" and have more influence and support than those in R&D whose efforts will not effect the "bottom line" for years."

"Licensing intellectual property requires technical, commercial and legal skills. The work is complex, but uniquely satisfying."

"A genuine feeling of pride and accomplishment in the leveraging my people and I have been achieving related to IP deals. This is adding significantly to my company's shareholder value."

"We rely upon our client's attorneys as well as our outside counsel for timely completion of agreements. Of course, client's counsel is beyond our sphere of influence and, in my experience, the source of delays and frustration."

"Licensing professionals are more accomplished when they possess specific commercial / management experience in the industry for which they license IP as well as possessing specific scientific experience in the field. The 33 year old MBA who believes his finance background provides an acceptable platform for licensing is the true novice and will not grow in the position."

"No job is challenging all of the time. Rush projects often end up being not rushes at all but someone else' schedule. We often hurry up and wait."

"I currently work as an in-house patent licensing attorney. I find the entire experience of working as in-house counsel to be greatly preferable to that of working in a law firm. I believe that if I had taken this survey while working at a law firm, my responses would have reflected extreme job dissatisfaction."

"I believe the role of licensing would be more satisfying if it were considered to be of strategic importance and (within a firm) integrated within project teams / or somehow involved with business direction and operation. Currently (without involvement or authority) this job is strictly administrative. I feel that my job is to execute licenses and routine contracts - a role which is neither interesting to me nor optimal for my company."

"Negotiations are uncomfortable. Many, many things are outside my control; resources, decision making, etc."

"Our top management is very patent savvy to the extent that they are able to review my work to some extent. Most management is not capable of doing this."

"The type of organization / structure may impact satisfaction - e.g., if in Licensing dept. v Law dept. v Business group."

"Factors impacting job satisfaction include: salary, bonuses, etc.; involvement in deal closure vs due diligence; is role / responsibility in in-licensing or out-licensing."

"Significant factors: fair pay; promotability; visibility (top management); peer prestige; industry association participation; inter-functional turf issues.

"Licensing is the last "gentlemen's business" in the pharmaceutical market. We treat each other with respect and trust -- with dignity. LES fosters a strong ethic of conduct. For partnerships to work, especially for the "long haul," you must build a relationship of trust. For those who fail to honor this trust, you select to avoid. There is so much opportunity that I can pick and choose who I make business with!! Friendship and trust makes a major difference."

"Our company has recognized that we cannot invent everything in house and has committed to developing organizational structure and skills to work with partners."

Comments Received from Academic Organizations

"Guaranteed never a dull moment!"

"Best job I have ever had!"

"Too much work with too little resources."

"Neither University or Foundation know much about technology transfer, but do try to dictate what should be done - particularly true of Foundation. Makes a very difficult work environment."

"The Association of University Technology Managers is an organization geared to provide education and training to technology transfer professionals through its publications, journal, training courses, annual and regional meetings and website."

"There is a tremendous amount that can be done in this job, a lot that needs to be done, relatively moderate amounts that must be done. Overall, the job leads to an overabundance of things to do. Also, the longer you stay in one place, the more unfinished business there is. That can be frustrating."

"Intellectual Property development and licensing is challenging, but academic management of university find it difficult to comprehend the real costs and risks. Faculty interactions with business reflect poor understanding of business needs and obligations to the faculty member's employing institution. Licensing staff are ethically challenged every day."

"Understaffing for the workload is a problem. But staff has doubled in the past two years. More additions are planned. Love this job!"

"A question that many such licensing professionals have relates to career path and upward mobility, and what degree(s) are most appropriate."

"As is often said, technology transfer is a pyramid of disappointment. Monitoring and managing faculty expectations is very important but difficult to accomplish w/o a sufficient outreach and education program. Ideally it would be nice to focus on the larger deals but in order to keep the faculty happy often a large amount of time and energy must be spent on licenses that bear no or little fruit."

"Our department does not have much money and this becomes a real problem when it comes to resources. We desperately need a full time assistant in this area. Overall, I am very happy in this position. It is very exciting. It is a different job every day."

"Intellectual property management needs to be conducted as a business, not an add-on like an additional department in a university. It needs to be staffed with business people, not professors."

"Much of the "stress" or conflicts associated with our job is that we have a very diverse group of "customers" -- faculty, industrial licensees, administrators. Not all of these customers have the same opinions or objectives, so we walk a fine line trying to keep all happy."

"To complete assignments in a timely manner often depends upon an externality upon which I have no control (e.g. university counsel approval, etc.)."

"The Association of University Technology Managers and the Licensing Executives Society are doing good jobs supporting our mission; the government should be more supportive (i.e. Congress)."

"At an academic institution the mission of the licensing professional needs to be clear: Is it to maximize revenues, or benefit the state / public, or serve the faculty, or some hybrid of the above?"

"Luckily, we have a revenue stream that is sufficient to fund this much-expanding program. Faculty are responding very favorably; our disclosure rate has nearly doubled from two years ago."

"As with any job, satisfaction is often influenced by the level of respect one receives in their position. Having a supportive administration is enormously helpful. It seems that having some technical expertise is very useful in uderstanding the projects / technologies / issues for which one is negotiating a contract which in turn gains the respect of the faculty."