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Adoption Factors Impacting Human Resource Analytics Among Human Resource Professionals

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ADOPTION FACTORS IMPACTING HUMAN RESOURCE ANALYTICS AMONG
HUMAN RESOURCE PROFESSIONALS

by
Roslyn Vargas

A DISSERTATION

Submitted to
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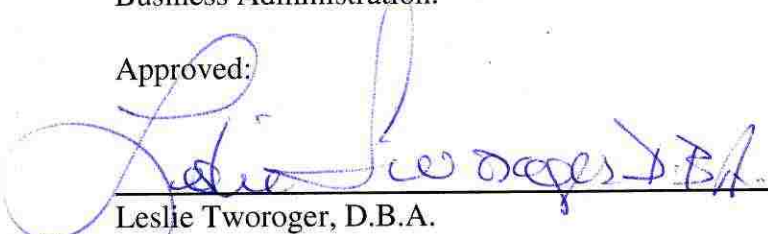
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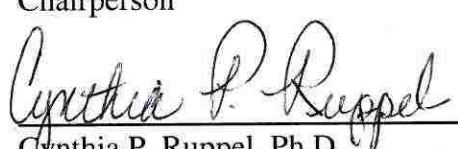
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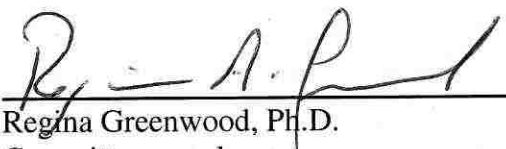
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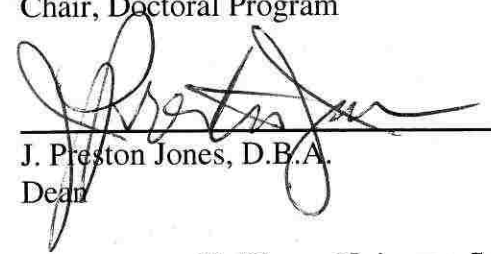
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ABSTRACT

ADOPTION FACTORS IMPACTING HUMAN RESOURCE ANALYTICS AMONG HUMAN RESOURCE PROFESSIONALS

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In today's fast paced, ever-changing world, one cannot help hearing the terms *Big Data* and *analytics*. The Internet holds vast amounts of data and this data, for example in retail, is being used to predict shopping habits, current needs, trends, and more. Why should this be limited to the retail side of an organization? Today, there is a more significant push for Human Resource (HR) professionals to be strategic business partners, and, therefore, HR professionals need to work on leading, not lagging, in the area of measurements and analytics. Some organizations that have adopted the use of analytics in their HR departments have been extremely successful. If this is the case, why are not more HR professionals adopting the use of human resource analytics (HRA)?

The purpose of this study is to gain insight as to the reasons why more HR professionals are not using HRA to improve organizational performance and to gain and maintain a competitive advantage. An exploration of prior research was performed and resulted in the development of a model representing factors that impact the adoption of HRA. The model was then tested for content validity and reliability using Partial Least Squares of Path Modeling. Results of the study of 302 HR professionals, currently working in the field of HR, suggest the hypotheses testing social influence, tool availability, effort expectancy, performance expectancy, and quantitative self-efficacy as factors impacting the adoption of HRA were all significant. Conversely, the factors data availability, fear appeals, and general self-efficacy were not significant. Findings indicate that the factors impacting the adoption of HRA are not only in the hands of the HR professional but, to some extent, the organization as well. If organizations truly want to adopt HRA, they must make available to the HR professionals the tools, data, resources, and support necessary. This study contributes to the literature on individual-level adoption, specifically of HRA. Implications for theory and practice are discussed, as well as further research.

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During the years of my dissertation journey, there have been many colleagues, friends, and family members who have given me so much encouragement and support to attain my goal, all of whom I thank for the strength to finish.

My dissertation committee members, all of whom I respectfully refer to as my angels and who have spent countless hours giving me guidance to get through the process, I extend my sincere gratitude. Dr. Leslie Tworoger, who as a colleague encouraged me to continue on the long road to completion and graciously took on the role of dissertation chair. Her words of wisdom and encouragement helped me get through some of the difficult times. The most appreciated and memorable moment was Dr. Tworoger introducing me to Dr. Cynthia Ruppel, who became my methodologist. Dr. Ruppel invested countless hours of coaching me and making the analysis portion enjoyable. Her comedic relief to help me understand the process and methodology is invaluable. Dr. Regina Greenwood, my reader in the committee, also spent countless hours guiding me, and giving advice, to ensure my paper was near perfection. My committee's experience and expertise in each of their fields and their commitment to this journey has been a true blessing.

A heartfelt appreciation goes out to Dr. J. Preston Jones, Dean, for having the foresight in suggesting such a wonderful committee and for his continued support and leadership at the business school; to Mary Toledo, who has been one of my biggest supporters at the Huizenga School of Business and Entrepreneurship; to Dr. Yuliya Yurova, who gave her time and expert knowledge on the analysis of my survey; to Dr. Suri Weisfeld-Spolter and the members of the doctoral program, who assisted me in all of the administrative aspects; and to all of the full-time faculty with whom I have the privilege to teach alongside.

I would like to thank my 3 children, 9 grandchildren, mom, and brother for excusing my absence while I was on this journey. Your love and support mean so much to me. Last, but certainly not least, an enormous amount of thanks and love goes to my husband, Julio. His support and constant encouragement to get this dissertation done is indescribable. I could not have done this without his support.

DEDICATION

I dedicate this dissertation to my father, Oscar “Nick” Rivera (deceased), who was the backbone in pursuing my doctorate degree. His constant reminders to get a good education and to complete my dissertation before he died will forever stay in my memory. Although I could not get this finished before he left us, I did finish!

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CHAPTER I

INTRODUCTION

This chapter will familiarize the reader with the purpose of the study. Using Human Resource Analytics (HRA) is an increasingly important part of the decision-making process of human resource (HR) professionals. Analyzing data to draw conclusions based on factual evidence is more likely to be an objective decision, than those decisions that are made with intuition. The acceptance of using HRA will help organizations attain competitive advantage by enabling them to create a stronger link to hire and retain top talent. On the contrary, failure to accept HRA will have an adverse effect on the organization's competitive advantage. Similarly, much of the practitioner literature points to the lack of business savvy and lack of financial knowledge that HR professionals had and some continue to have. Not understanding or being comfortable with quantitative data definitely appears to be one of the factors affecting the adoption of these innovations in HR (Bassi, 2011; Fitz-enz, 2010).

In the past year, the practitioner literature for the human resource management (HRM) profession has been inundated with articles, surveys, and research results concerning the use of technology and HRA. In an article in *Talent Management Magazine* titled "HR Tech: The Year Ahead," Gale (2014) writes, "there is no question that 2013 will go down as a big one in the annals of HR technology" (p. 18). Peoplefluent's (2014) article, "HR Forecast 2014: Experts Analyze the Key Trends, Challenges and Opportunities for the Year Ahead," includes comments from industry experts on increased adoption of video and collaboration technologies, Big HR Data, and others. Bersin (2013e) discusses the "datafication" of learning in an article in *Chief*

Learning Officer Magazine and suggests HR professionals are not well versed in analytics. Bersin (2013d) suggests it is appropriate for HR professionals to seek assistance from statisticians.

The use of analytics by HR professionals will be discussed, and key terms will be defined.

Problem

The purpose of this study is to gain insight as to the reasons why more HR professionals are not using HRA to improve organizational performance in order to gain and maintain a competitive advantage. Could there be factors that may act as barriers that impede HR professionals' adoption of HRA?

Practitioner research outlines the shortcomings of HR professionals when it comes to the use of analytics and metrics (Rafter, 2013a). The extant literature further reports that in many organizations, executives still view HR as a "cost center" dealing primarily with soft skills. Executives may believe HR professionals analyze only what has happened, while lacking a perspective and a bottom-line mindset (Stuart, 2005).

Sub-problem

For companies to be successful in today's global environment, the pursuit of innovation, in general, must be accepted to gain a competitive advantage (Bersin, 2013d; Gardner, McGranahan, & Wolf, 2011; Giuffrida, 2013). HR professionals understand that hiring and retaining the right talent is an integral part of a company's success. Companies such as Best Buy, Sysco, SAP America, Inc., Marriott Vacation Club, and others use HRA to track engagement, incentives, leadership, absenteeism, and other trends (Bassi, 2012). If these companies have shown there is a competitive and financial advantage to

using HRA, why are not more companies using HRA? If organizations have a desire to use analytics, then there is a lack of connection between what the organization desires and what the HR professional can deliver.

Results from previous studies assert that CEOs, both locally and globally, believe their HR professionals are one of the most important components for gaining and maintaining competitive advantage through the use of analytics (Lesser & Hoffman, 2012; NoticiasFinancieras, 2013). The academic and practitioner bodies of literature discuss how the use of HRA by HR professionals can have an impact on gaining a competitive advantage in today's global economy (Bassi, 2011; Rafter, 2013a). This research extends the literature on the adoption of innovation at the individual level of HRA and shows the connection between both the academic and practitioner literature.

HRAs are being used in some companies, yielding success in terms of the organizations' performance and the decision-making processes in HR (Bassi, 2012). Collectively, the use of HRA is important for improvement of not only the performance of the employees of an organization but also the improvement of the performance of the organization as a whole (Bassi, 2011).

Background and Justification

The literature reviewed was empirical academic research from scholarly journals, which has included literature on innovation to include innovation adoption and diffusion. Brown, Chui, and Manyika (2011) found that “emerging academic research suggests that companies that use data and business analytics to guide decision making are more productive and experience higher returns on equity than competitors that don't” (p. 2).

The field of HR has transitioned from the personnel department, whose tasks were mostly administrative, to more of a compliance focus that keeps abreast of changes in laws. In general, HR professionals are still involved with past practices of 20th century management and relationship building (Sullivan, 2013), rather than the more recent focus of being a strategic business partner (Lockwood, 2007). Although there are some HR professionals who have become more accustomed to the use of metrics, the profession as a whole still lags behind (Lockwood, 2007). HR professionals have been gaining better recognition as strategic business partners with professional certifications and specialized degrees in the field of HR. However, HR professionals often overlook the use of metrics as performance tools.

This movement to the use of metrics began in the late 1970s when Fitz-enz opened the doors to metrics with tools such as Return on Investment (ROI) and HR Scorecards (Bassi, 2011). ROI looks at costs and benefits involved, usually for one project at a time, whereas an HR Scorecard is a strategy map of the causal effects of programs throughout the organization (Fitz-enz, 2010). This was a revolution in the field, but it has taken approximately three decades for the HR profession to understand and embrace the use of metrics. Failure to use metrics was due to the fact that HR professionals not only believed but also, to some extent, accepted that HR was a cost center (Fitz-enz, 2010). This belief was in part due to the HR professionals' lack of financial knowledge and the inability to show their value to the organization (Fitz-enz, 2010).

To help HR professionals work with metrics, many vendors in the field of technology have developed software to assist in measuring turnover rate, cost per hire,

and other HR metrics. However, HR professionals did not always know how to analyze the data and how to demonstrate HR's value for decision-making in the organization (Fitz-enz, 2010). Much of the data collected was used to provide information for what had already happened rather than to contribute to the strategic direction of the organization. For example, HR professionals provided ad hoc reports of turnover rate, which signifies talent that already has left the organization instead of providing information as to what can be done to prevent turnover. It would be better to use that data for future reference on how to retain their talent and how to assess the attitudes of current talent, since the turnover already has occurred. As an example, according to Cascio and Boudreau (2011), HRA and measurement strategies can also work to address quantity, quality, and costs incurred when there is change of employment, whether due to layoffs, promotions, or retirements.

To retain talent, HR professionals must become more proactive than reactive (Fitz-enz, 2010). The shift to using analytics gives HR professionals the ability to have better alignment with the organizational goals and to use predictive analytics to become a strategic partner. HRA will help HR professionals in developing measurements from an economic standpoint, which certainly will give executives a different view of the HR professional's contribution to the financial outcomes the organization strives to attain (Cascio & Boudreau, 2011). Data to track workplace injuries, the use of insurance, attendance, and other HR activities, usually measured in the present or past, can be analyzed and used to predict future costs.

Today, there is a more significant push for HR professionals to embrace the use of analytics and align themselves with the business and financial side of the organization or

be left behind (Fitz-enz, 2013). HR professionals need to work on leading, not lagging, in the area of measurements and analytics. Much of the literature, even publications directed at practitioners (*HR Magazine, Workforce Magazine and Talent Management Magazine*), discusses the shortcomings of HR professionals when it comes to understanding the business and financial side of the organization (Bassi, 2012; Fitz-enz, 2010).

Studies have shown that companies now rank HRA as one of the most important innovations in the field of technology (Rafter, 2013a). The use of HRA can help in the transition from performance management systems' tools, which store past and current data, to performance management analytics, which use stored data to understand and predict business needs and increase productivity (Schlafke, Silvi & Moller, 2013). The development of this relationship between systems' tools and the utilization of HRA encompasses performance management through improved planning and sourcing, which ensures goals are consistently met in an effective and efficient manner (Osborn, 1990). The use of HRA also helps in the area of talent management, which, in turn, increases productivity through understanding the training and development that will be needed (Osborn, 1990).

If the use of HRA increases productivity, why are not more HR professionals more involved in analytics, specifically HRA? Could HR professionals, themselves, be the barrier to the use of HRA (Giuffrida, 2013; Rafter, 2013a)? Is it the fear of metrics, the lack of knowledge, or their discomfort level with using statistics in their field? The lack of organizational support or the lack of resources, both technological and/or financial, also could be considered factors. According to Brown et al. (2011), companies

whose productivity increased and had greater financial gains did so by making better decisions using business analytics (BA) with data collected.

The literature presents a need and a desire to use HRA to increase productivity for organizations and to gain that competitive advantage (Bassi, 2011; Fitz-enz, 2010; Lesser & Hoffman, 2012; NoticiasFinancieras, 2013; Simon, 2013; SuccessFactors, 2013); however, there also seems to be a disconnect between the desires of the executives of the organizations for better measurements and decision making and the outcomes provided by the HR professionals, which often are limited to providing data of the past (Fitz-enz, 2010). The question raised is why? It has been suggested that HR professionals lack the knowledge of how to use the data and/or have no interest in numbers (Schlafke et al., 2013). Some suggest that improvement, such as increasing productivity and gaining competitive advantage, as noted previously, can occur if HR professionals can overcome their dislike of numbers (Fitz-enz, 2010; Rafter, 2013a; Simon, 2013).

Some practitioner literature points to the lack of business savvy and lack of financial knowledge that HR professionals have and some continue to have: Not understanding or being comfortable with quantitative data definitely appears to be one of the factors affecting the adoption of these innovations in HR (Bassi, 2011; Fitz-enz, 2010). Although there is plentiful literature on the adoption of innovation at the organizational level (Kimberly & Evanisko, 1981; Rogers, 1983, 1985), scant research regarding the adoption of innovation of HRA by individuals has been conducted. Individual adoption is the theoretical foundation framing this study. This investigation focused on individual-level adoption of HRA, by HR professionals.

There has been an abundance of research in the adoption of innovation technology at the organizational level (Kimberly & Evanisko, 1981; Rogers, 1983, 1985); much of the research is based on the technology acceptance model (TAM; Davis, 1989) and the theory of reasoned action (TRA; Venkatesh, Morris, Davis, & Davis, 2003). Some studies, at the organizational level, indicate the lack of innovation adoption has been dependent upon the policies and strategies used by management (Peansupap & Walker, 2005; Talukder, Harris, & Mapunda, 2008).

At the individual level, there have been studies using a variety of constructs to explain why people do or do not accept innovation. When reviewing the literature on user acceptance, it was noted that researchers have used a wide range of models and theories of individual acceptance, eight to be specific: (a) TRA, (b) TAM, (c) theory of planned behavior (TPB), (d) motivation model, (e) diffusion of innovation theory (DOI), (f) social cognitive theory, (g) PC utilization model (Thompson, Higgins, & Howell, 1991), and (h) a combination of the TAM and TPB (Venkatesh et al., 2003). Past studies have found multiple factors, such as attitudes and behaviors, perceived usefulness, performance outcomes, self-efficacy, social factors, and perceived ease of use by the user (Venkatesh et al., 2003).

This research fills the gap in innovation adoption research by applying the individual-level adoption of technological innovation theory literature to examine HR professionals' adoption of the use of HRA in the field of HRM. This research extends the literature on the factors affecting the adoption of innovation at the individual level, specifically the use of HRA among HR professionals.

Research Questions

1. What factors can act as barriers and affect the adoption of HRA among HR professionals?
2. What is the cause for the reported lack of connection between the organization's desires to use HRA and the HR professional's ability and desire to adopt and deliver?

Definitions

Big Data (BD) is “a popular term to describe the exponential growth and availability of data, both structured and unstructured” (SAS, 2014, para. 1).

Business Analytics (BA) “simplifies data that amplifies its value by converting huge volumes of data into a much smaller amount of information, in a way that can provide valuable insight” (Cokins, 2013, p. 1).

Business Intelligence (BI) is “referred to as applications and technologies that are used to gather, provide access to, and analyze data and information to support decision-making efforts” (Baltzan, 2013, p. G2).

Computer Self-Efficacy is “a judgment of one's capability to use a computer” (Compeau & Higgins, 1995, p. 192).

Diffusion of Innovation (DOI) is “the process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 1971, p. 5).

Effort Expectancy is “the degree of ease associated with the use of the system” (Venkatesh et al., 2003, p. 450).

Fear Appeal is “communicating in a persuasive manner, to motivate a behavioral

change and having the individual perceive a threat and tapping into the individual's emotion of fear" (Johnston, 2006, p. 27).

Human Resource Analytics (HRA) is "the application of a methodology and integrated process for improving the quality of people-related decisions for the purpose of improving individual and/or organizational performance" (Bassi, 2011, p. 11).

Innovation Adoption is "a process that results in the assimilation of a product, process, or practice that is new to the adopting organization and/or the individual level" (Damanpour & Wischnevsky, 2006, p. 497).

Performance Expectancy is "the degree to which a person believes that using a system would be free of effort" (Davis, 1989, p. 320).

Performance Management Analytics is "the extensive use of data and analytical methods to understand relevant business dynamics, to effectively control key performance drivers, and to actively increase organizational performance" (Schlafke et al., 2013, p. 111).

Predictive Analytics is "a method for leveraging business intelligence tools such as data mining and statistics to make predictions of future events" (Fitz-enz, 2010, p. 266). Predictive analytics can be used to reveal the return on HR services and investments in programs for HR improvement (Fitz-enz, 2010).

Quantitative Literacy is "knowledge of and confidence with basic mathematical/analytical concepts and operations required for problem solving, decision-making, economic productivity and real-world applications" (Mount St. Mary's College, 2014, para. 1).

Quantitative Self-Efficacy is “the individual’s personal judgment in relation to his mathematical skills” (Ozgen, 2013, p. 306).

Self-Efficacy is “judgments of how well one can execute courses of action required to deal with prospective situations” (Bandura, 1977, p. 122).

Social Influence is “the extent to which members of a social group influence one another’s behavior in adoption” (Talukder & Quazi, 2011, p. 115).

Talent Management is “a set of integrated organizational HR processes designed to attract, develop, motivate, and retain productive, engaged employees” (John Hopkins University, 2014, para. 1).

Technology Acceptance Model (TAM) is “a model showing how users accept and use technology based on their perception of usefulness and perception of the ease of using the technology” (Davis, 1989, p. 320).

Theory of Reasoned Action (TRA) is “an individual’s positive or negative feelings about performing the target behavior” (Fishbein & Ajzen, 1975, p. 302).

Unified Theory of Acceptance and Use of Technology (UTAUT) is “a model for managers needing to assess the likelihood of success for new technology introductions and help them understand the drivers of acceptance” (Venkatesh et al., 2003, pp. 425–426).

Delimitations

This study focused solely on the individual-level adoption of technological innovations and was limited to HR professionals. This study did not intend to focus on the organizational-level adoption of innovation. Adoption of innovation at the organizational level was used only as the context in which the individual functions.

Assumptions

Although many HR professionals believe they have a seat at the table, there are still some executives that believe HR professionals lack the business acumen and skills needed to be true contributors to the organization in terms of the overall business strategy (Stuart, 2005). Since practitioners lead academic researchers in the subject of HRA (Bassi, 2012; Lesser & Hoffman, 2012; Rafter, 2013a; 2013b), this researcher assumes that the anecdotal practitioner literature is correct in touting the benefits of using HRA to companies. Similarly, this researcher assumes that the benefits of gaining competitive advantage, commonly noted in the practitioner literature (Bassi, 2011; Bersin, 2013d; Fitz-enz, 2010), are accurate and will remain consistent over time. This researcher also assumes that level of education, self-efficacy, and social influences play a role in the individual-level adoptions of innovation in terms of HRA.

Summary

Literature on the DOI and the UTAUT were reviewed to identify potential factors impacting HRA adoption, particularly those factors that may act as a barrier to adoption. Figure 1 is the conceptual empirical model for this study, depicting the relation between the factors related to HRA and their impact on the adoption and the use of HRA.

The aforementioned earlier research (Damanpour & Wischnevsky, 2006; Rogers, 1983; Talukder & Quazi, 2011; Venkatesh et al., 2003) was used as the groundwork for this study in order to contribute to the body of knowledge. Also reviewed were practitioner articles and surveys as well as books written by researchers in the field of HR metrics and analytics.

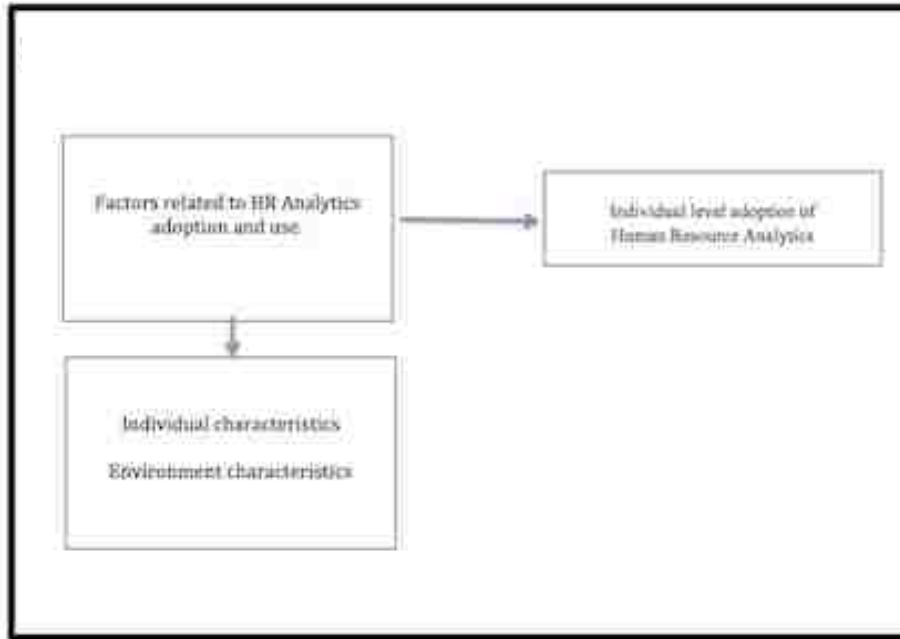


Figure 1. Conceptual empirical model

Conclusion

This research discusses the differences between the organization's desire to use the right metrics and the HR professional's ability to use and maximize the benefits of HRA to add value for the organization.

This chapter familiarized the reader with the purpose of the study and its problem and sub-problem to include the background and justification of the study. Additionally, the delimitations, assumptions, and definition of terms also were discussed. A review of the literature is discussed in the next chapter.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter is to review the earlier research that has investigated business intelligence (BI), business analytics (BA), Big Data (BD), and human resource analytics (HRA), as well as the literature concerning innovation adoption and diffusion. This extant research has been used as the groundwork to develop a model, which fills gaps from prior work. This chapter also will discuss the development of the model through the stages of progression through prior works of Davis (1989), Fishbein and Ajzen (1975), Rogers (1983), Moore and Benbasat (1991), and Venkatesh (2003). For the purpose of this study, some technical terminology has been changed and noted in its respective sections.

In addition to scholarly journal articles, a portion of the literature reviewed included industry-specific practitioner articles and surveys, as well as books written by researchers in the field of human resource (HR) metrics and analytics. This researcher investigated factors that can be barriers to the adoption of HRA among HR professionals. Based on prior research in the area of individual-level adoption, HR professionals might lack the self-confidence to use mathematical or statistical measures or might not have the tools and/or data available to them. The influence of their peers both in and out of the field of HR also may have an effect as to their adoption of HRA. Fear appeals or the implied threat to one's position in HR may be another factor for the HR professional.

Davis (1989) developed a model from the theory of reasoned action (TRA), investigating perceived usefulness and perceived ease of use, which has come to be known as the technology acceptance model (TAM). There are many theoretical models

predicting an individual's level of adoption of innovation, which have been empirically tested. However, the most cited are TRA (Fishbein & Ajzen, 1975), diffusion of innovation (DOI) for individuals (Rogers, 1983), TAM (Davis, 1989), theory of planned behavior (TPB; Ajzen, 1991), perceived characteristics of innovating (PCI; Moore & Benbasat, 1991), and unified theory of acceptance and use of technology (UTAUT; Venkatesh et al., 2003). Perceived ease of use and perceived usefulness will be hypothesized in this study as effort expectancy and performance expectancy, respectively.

Although diffusion theory is not solely concerned with information technology, the theory does offer a framework for discussing acceptance globally (Dillon & Morris, 1996). Prior researchers have argued there are differences between technical and administrative innovation adoption methods and antecedents (Bantel & Jackson, 1989; Damanpour & Schneider, 2008; Kimberly & Evanisko, 1981; Walker, 2006). According to Daft (1978, 2001), administrative innovations concern the organizational structure, which consists of adoption from the bottom up. Conversely, with administrative processes and HR, the adoptions primarily are introduced from the top down. Administrative adoption usually includes management. Similarly, most HR professionals' adoption of innovations, at the organizational level, is, for the most part, in management (Daft, 1978).

As defined by Baltzan (2013), BI "refers to applications and technologies that are used to gather, provide access to, and analyze data and information to support decision-making efforts" (p. G2). BI takes these vast quantities of data, known as BD, and gathers the stored information for purposes of reporting and summarizing mostly historical data

(Cokins, 2013, p. 1). BD “refers to things one can do at a large scale that cannot be done at a smaller one, to extract new insights or create new forms of value, in ways that change markets, organization and the relationship between citizens and governments and more” (Mayer-Schonberger & Cukier, 2013, p. 10). Similarly, BA is analyzing and “converting huge volumes of data into a much smaller amount of information, in a way, that can provide valuable insight” (Cokins, 2013, p. 1). Through the use of BI, BD, and BA, HR professionals can analyze the patterns and trends from their historical data to predict future outcomes in terms of performance, retention, training, and other HR practices for better decision-making, which is known as HRA.

BI as well as BA, BD, and HRA are discussed in detail in the following sections.

Relationship between Business Intelligence (BI), Business Analytics (BA), Big Data (BD) and Human Resource Analytics (HRA)

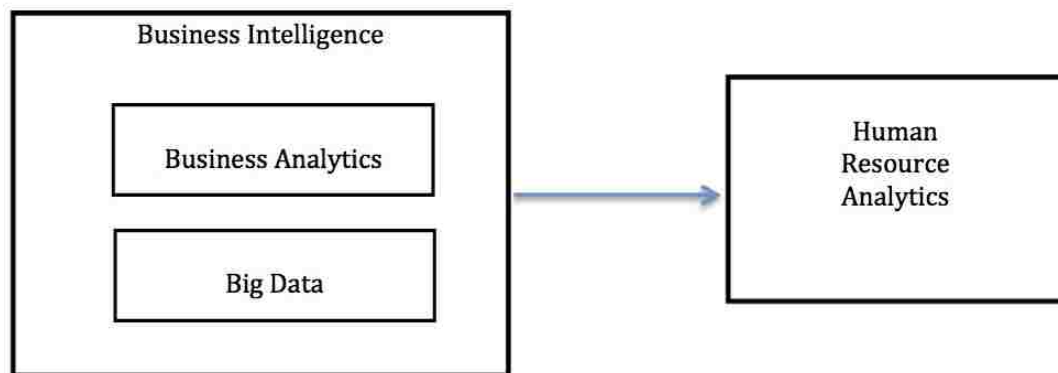


Figure 2. Relationship between business intelligence (BI), business analytics (BA), Big Data (BD), and human resource analytics (HRA)

Business Intelligence

According to Cokins (2013), BI consumes and packages stored information to answer basic questions. It summarizes historical data, typically in table reports and

graphs, as a means for data-mining queries and drill-downs. Many organizations are using some form of data tool, and BI has had, and will continue to have, a vast effect on how people live and work (Khan, Amin, & Lambrou, 2010). Organizations using data through BI have an edge over other organizations in the area of competitive advantage. These early adopters of this booming technology have produced substantial value by predicting behaviors or patterns (Davenport, Harris, & Shapiro, 2010).

According to Fitz-enz (2010), due to insufficient data on the organizations' human capital, work on BI had not included HR data or predictive HRA, which would be beneficial for the organization. HR departments have and continue to gather information concerning their employees; they should use that information not just for what has occurred in the past but also to incorporate the past data with current data and utilize technological resources to look toward the future.

As stated by Bamberger and Meshoulam (2000),

Resourced-based theory (Barney, 1991; Prahalad & Hamel, 1990) suggests that resources that are rare, inimitable, and non-substitutable provide sources of sustainable competitive advantage for the organization. Several researchers argue that, if strategically managed, a firm's "human resource deployments" have the potential to meet these conditions and thus provide the firm with an advantage in terms of its human, social, and intellectual capital (Nahapiet & Ghoshal, 1998: Wright & McMahan, 1992). (p. 7)

Similar to Barney's (1991) Resource Based View (RBV), researchers have developed a strategic HR 3-part model based on the relationship and exchange between the employee and employer (Bamberger & Meshoulam, 2000; Baron & Kreps, 1999). The model's

three parts consist of (a) Internal Labor Market (ILM), which includes retaining employees with specific knowledge while minimizing costs for training and recruitment; (b) high commitment, in which employees are more committed to their actual job function than to the employer; and (c) ILM and high commitment combined, which is prominent in firms in Japan. There are companies in the auto industry, such as Chrysler and Ford in the United States, using this third model. For example, using HRA properly can predict which employees may be getting ready to leave the organization, which will assist in the retention process by either increasing compensation, responsibilities, or even providing job rotation (Siegel, 2013).

Barney, Wright, and Ketchen, (2001) argued that a firm's resources and capabilities can be seen as a combination of intangible and tangible assets, which includes the skills of the organization's management. Barney (1991) noted that managerial talent is a requirement in most strategies. In other words, a manager's experience is an important asset. RBV therefore supports findings from Ranjan and Basak's (2013) study regarding the limited availability of talent needed in HRA. Ranjan and Basak stated,

Even with the relatively high unemployment rates in the weak economic scenario, scarcity of skilled talent is a key concern for many organizations. Analytics is emerging as a handy weapon in this "talent war" to hire, retain, and effectively manage scarce talent. (p. 3)

Business Analytics

Business analytics (BA) is data that amplifies its value by converting huge volumes of data into much smaller amounts of information that can provide valuable

insight (Cokins, 2013). BA is comprised of human competencies, technological elements, and specific business processes (Laursen & Thorlund, 2010). BA is linked to business strategy, which encompasses the organization's mission and vision, which is important to the HR professional for organizational alignment. With the use of BA, organizations can take the approach that their employees are their internal customers and thereby use the data from personnel files that include education, career paths, gender, age, and absenteeism to predict retention, performance, and motivation (Laursen & Thorlund, 2010). Brown et al. (2011) found that "emerging academic research suggests that companies that use data and BA to guide decision making are more productive and experience higher returns on equity than competitors that don't" (p. 2).

HR professionals always have known that the people are an organization's most important asset, and therefore integrating workforce analytics with BA will augment the significance of organizational performance (Visier, 2013). "The biggest hurdle here may be the culture that exists in HR departments, with its strong focus on creativity and soft values" (Laursen & Thorlund, 2010, p. 84).

Big Data

Big Data (BD), as defined by Mayer-Schonberger and Cukier (2013), is vast quantities of information, which can be processed and analyzed instantly to draw conclusions. Scholarly articles, as well as articles written by and for practitioners, suggest the use of BD will change the decision-making process in many organizations to become the new competitive advantage (Boyd & Crawford, 2011; Brown et al., 2011; McGuire, Manyika, & Chui, 2012). Additionally, in a McKinsey & Company research report, BD was labeled "the next frontier for innovation, competition, and productivity" (Manyika et

al., 2011, p. 1). BD, by definition, encompasses exploring large amounts of data (Bersin, 2013d) that must be stored. Data storage has come a long way from a kilobyte. There is now the ability to store amounts of data in terabytes, petabytes, exabytes, zettabytes, and yottabytes. BD has and will “continue to evolve at a very fast pace, driven by innovation in the underlying technologies, platforms/systems, and analytic capabilities for handling data, as well as the evolution of behavior among its users as more and more individuals live digital lives” (Manyika et al., 2011, p. 4).

Analyzing all of this data being collected by different organizations in different sectors, retailers can predict shopping habits, and employers can attempt to increase the productivity of their employees, just to give a few examples (Baker, 2008). Baker (2008) has named the computer scientists and mathematicians exploring all this data “Numerati” (p. 9). Baker discussed a study done by Carnegie Mellon University, which showed that by providing minimal information, such as one’s zip code, date of birth, and gender, “87% of people in the United States could be pinpointed by name” (p. 13). According to Sesil (2013), there is so much data, both structured and unstructured, that there is “too much information for our brain to process adequately” (p. 9). Nevertheless, BD allows organizations to gain a better understanding of what has transpired, what is transpiring, and what will transpire. Conversely, it will also tell what has not transpired and what will not transpire (Simon, 2013).

With the use of BD, employers, employees, politicians, professional athletic organizations, and just about anyone will be able to make better decisions using the information that is being stored (Simon, 2013). A research report prepared by McKinsey & Company surmises there will be a need for “140,000–190,000 more deep analytical

talent positions and 1.5 million more data-savvy managers needed to take full advantage of BD in the United States” (Manyika et al., 2011). According to Simon (2013), “Big Data is blowing up, and supply and demand of practitioners is out of whack” (p. 16).

What does this mean for organizations and HR, in particular? Software companies such as SuccessFactors Inc., Automatic Data Processing (ADP), Taleo Corp., and others are working diligently to be the first and best to provide organizations with the tools to help organizations’ employees use analytics (Gale, 2012). However, some organizations have too many different platforms, which poses a problem if the platforms cannot be integrated (Bersin, 2013a). To illustrate, “HR has two internal sources: data it owns and data it collects from other enterprise systems” (Roberts, 2013, p. 24). It is not unusual for organizations to have multiple HR applications within their aged HR systems. According to Rafter (2013a), “Big Data doesn’t just refer to information obtained from inside a company’s current employee records or operations, but to a mix of personnel data and information from competitors, industry or other benchmarks” (para. 6). Therefore, organizations must look to study properly their data about people to drive their overall organizational performance (SuccessFactors, 2013). The seamless integration of multiple applications and skill sets in advanced analytics are a necessity (SuccessFactors, 2013).

Boyd and Crawford (2011) suggested, “Big Data is no longer just the domain of actuaries and scientists” (p. 2). McGuire et al. (2012) stated, “Big Data is the new, new thing that will see some companies leapfrog others to become best in class” (p. 2). There is much written on BD concerning retailers and how companies can track consumer purchases, which, if marketed correctly, leads to more profitability (Baker, 2008; Bersin, 2013b). This provides an opportunity for HR professionals to use BD in the area of better

decision-making (Bassi, 2012; Bersin, 2013b; Fitz-enz, 2010). BD is moving into the world of HR and becoming the new HR metrics.

Combining the HR data with the business data can no longer be viewed as an option; it must now be a requisite if HR wants to be part of the organization's growth and competitive advantage (Simon, 2013; SuccessFactors, 2013). HR professionals must change their paradigm of processes and increase their skill sets in order to engage and participate in the use of this new trend (Brown, Court, & Willmott, 2013). "People analytics will be here to stay" (Waber, 2013, p. 192). HR professionals must find a way to apply HRA for better decision-making and stop working merely on intuition (Bersin, 2013c) or their "anachronistic" way of operating as they have done for the past 40 years (Simon, 2013, p. 8). A study conducted by the Hackett Group, which consisted of the executives at approximately 150 large companies, revealed that over 70% were either dissatisfied or very dissatisfied with the performance of their HR departments (Peoplefluent, 2013a). Hence, the "findings indicate that HR most likely still spends too much time handling the labor-intensive transactional performance, compensation and benefits management tasks without the support to evolve strategically" (Peoplefluent, 2013a, p. 2).

Bersin (2013c) described data analytics as a real field of study that necessitates the competence to analyze, visualize, understand statistics, and solve problems. HR executives are usually comfortable discussing budgets and forecasting but tend to freeze up when discussing correlations, predictive analytics, or any type of analytical testing (Marquez, 2007). Giuffrida (2013) suggested that some of the barriers are related to the culture of the organization or the lack of technological capabilities, both from the

organizational level as much as from the individual level. All too often data is accumulated, but there is insufficient knowledge of what to do with the data (Bertolucci, 2013; Giuffrida, 2013; Manyika et al., 2011; Schneider, 2006). Simon (2013) stated, “most HR people don’t seek out data in making business decisions or even use the data available to them. In fact, far too many HR folks actively try to avoid data at all costs” (p. 8). Industry thought leaders have felt that HR professionals, for quite some time, have not been able to speak the language of the business, which involves numbers. However, HRA can either prove the reality or change misconceptions of HR professionals’ ability to use and understand quantitative measures (Rafter, 2013a).

Human Resource Analytics

According to Carson, Douthitt, and Mondore (2011), HRA consists of demonstrating the direct impact of data concerning people on important business outcomes. Bassi (2011) defined HRA as “the application of a methodology and integrated process for improving the quality of people-related decisions for the purpose of improving individual and/or organizational performance” (p. 11). Using HRA will take the HR profession to a different level in becoming a true strategic business partner. The use of HRA is considered a broader and much more useful view of data than only HR metrics and can provide an analysis of the organization as a whole (Fitz-enz, 2010). For example, these metrics will enhance HR’s ability to not only know the turnover rate but also to know where it would be most beneficial to allocate the necessary resources to reduce or prevent turnover (Neumann, 2008).

HRA has become a major topic in organizations locally as well as globally. Although metrics in human resource management (HRM) have been available for

decades, there is currently a paradigm shift. An important driver of HR metrics and analytics has been the integration and implementation of Human Resource Information Systems (HRIS), which stemmed from the uncertainties of technology in the year 2000 (Carlson & Kavanagh, 2011). Similarly, the adoption of HRIS shifted HRM from slower manual processes used by HR professionals to quicker, more fluid processes using technology, thereby increasing the capabilities of the organization. This attention to HRA comes at a time where there is opportunity as well a necessity (Bassi, 2011). Opportunity for the use of HRA is gaining momentum as more and more data is becoming available. The availability of this data will lead to the needs that may arise from the growing significance of HRM and the path to profitability (Bassi, 2011). In order to use human capital more effectively, HRA will assist in predicting behaviors of employees, which, in turn, will benefit the decisions made in the investment in HR (Schneider, 2006). According to Ranjan and Basak (2013), “the scope and approach to HRA should be determined based on contextual factors such as objective, internal readiness, investment appetite, and target timeframe to achieve the objective” (p. 1).

What keeps HR professionals from embracing HRA through the use of BD and adopting this new innovation? Some early adopters of HRA who have had positive results are Google, SAP, Xerox, PepsiCo, FedEx Corp., and Aetna Inc., just to name a few (Henneman, 2013; Rafter, 2013a). In an article titled “How Google Became the #3 Most Valuable Firm by Using People Analytics to Reinvent HR,” Sullivan (2013) writes, “Google has the only HR function on the planet that is managed based on people analytics. Google moved into the No. 3 position among the most valuable firms in the world” (para. 1). Xerox revolutionized the candidate screening for their call centers by

utilizing BD and predictive analytics; the result was a turnover decrease of 20% (Rafter, 2013a). For HRA to be successful, HRA leaders must begin to regard value creation and obstacles as opportunities by using the same strategic management approach as leaders do in other business functions (Gardner et al., 2011).

Diffusion of Innovation Theory

Diffusion of innovation (DOI) theory was first introduced by Rogers in 1962 when he was puzzled as to why farmers had adopted new, potentially beneficial agricultural practices at a slow rate or not at all (Rogers, 2003). Since Rogers's first book, there has been an abundance of research done using DOI theory; Rogers himself has published five books on the subject, as of 2014. Using DOI as the basis, there have been many studies on both the macro (organizational) and the micro (individual) levels of adoption that have led to other theories, such as Fishbein and Ajzen's (1975) TRA, which in turn led to Davis's (1989) TAM as well as Ajzen's (1991) TPB and Venkatesh et al.'s (2003) UTAUT, as well as others.

Rogers (1983) defines diffusion as a communication process concerned with sharing new ideas with some amount of uncertainty. Diffusion research has been conducted in many different disciplines, yet there appears to be a similar body of thoughts and generalizations (Rogers, 1995). Rogers (1995) explains there are four main elements in the diffusion process: innovation, communication through channels, communication within a time frame, and communication through members of social systems. Innovation is defined as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 1995, p. 11). According to Rogers (1983), most innovations researched with regard to diffusion have been in the area of

technology. As defined by Rogers (1983), “technology is a design for instrumental action that reduces the uncertainty in the cause-effect relationships involved in achieving a desired outcome” (p. 138). For this study, the innovation is the use of HRA as it relates to gaining competitive advantage through better decision making about HRM.

As stated by Rogers (1983), members of the social system determine if and at what rate the innovation is adopted by their perceptions of relative advantage, compatibility, complexity, trialability, and observability. These also are known as the five traits of innovation (Rogers 1983, 1995). Tornatzky and Klein (1982) found the two characteristics to have a more consistent and significant relationship to adopting innovation were complexity and relative advantage. This study reviews complexity, trialability, and observability as they pertain to factors of adoption at the individual level. Diffusion involves time, which, according to Rogers (2003), includes innovativeness that categorizes members of the social system as (a) innovators, (b) early adopters, (c) early majority, (d) late majority, and (e) laggards. The innovation-decision process, which leads to adoption or rejection of an innovation, occurs within a 5-step process that includes (a) knowledge, (b) persuasion, (c) decision, (d) implementation, and (e) confirmation that an innovation’s rate of adoption is the speed at which the innovation is adopted (Rogers, 1983). These attributes are consistent with those of individual adopters of innovations, which is the focus of this study.

Last, the social system consists of members who are involved in solving problems together in an effort to achieve the same goal (Rogers, 1995). Members of the social system are considered either opinion leaders or change agents, some of whom can influence the adoption of the innovation, slow down the diffusion, or reject the

acceptance of the innovation all together (Rogers, 1995). For purposes of this study, the social system is referred to as social influence and is defined as “the extent to which members of a social group influence one another’s behavior in adoption” (Talukder & Quazi, 2011, p. 115).

Theory of Reasoned Action

The theory of reasoned action (TRA), which was first introduced and eventually developed in 1967 by Fishbein and Ajzen (1975), explains the individual’s behavior of acceptance (Frambach & Schillewaert, 2002). The TRA model suggests that an individual’s execution of a particular behavior is governed by his or her behavioral intent to actually execute the behavior, and the intent to execute the behavior is mutually controlled by two elements. These elements are the individual’s attitude toward the behavior and the general norm concerning the behavior (Ajzen & Fishbein, 1980). Accordingly, a behavior is more likely to be performed if, in fact, the individual has a positive attitude toward the behavior (Talukder et al., 2008).

Technology Acceptance Model

In an effort to understand why information technology is either accepted or rejected, Davis (1989) began researching adoption models and focused specifically on two of the most important elements: (a) perceived usefulness and (b) ease of use. Hence, TAM was developed. TAM is an extension of Ajzen and Fishbein’s (1980) TRA and is used to investigate the elements of acceptance of technology and, in other cases, innovation. Ajzen and Fishbein’s TRA model was developed and used as the explanation and prediction of an individual’s behavior (Davis, 1989). Davis’s TAM considers the behavior as the use of a technological system (Davis, 1989).

Effort expectancy. According to Davis (1989), effort expectancy is used interchangeably with perceived ease of use, which refers to “the degree to which a person believes that using a particular system would be free of effort” (p. 320). Hence, the individual’s adoption is influenced by whether or not the individual perceives the innovation as difficult to perform (Davis, 1989). Similarly, Albert Bandura’s (1977, 1982) vast research on self-efficacy reinforces perceived ease of use (Chau, 2001; Davis, 1989).

Performance expectancy. Performance expectancy is used interchangeably with perceived usefulness, and, as defined by Davis (1989), is “the degree to which a person believes that using a particular system would enhance his or her job performance” (p. 320). According to Talukder et al. (2008), individuals will choose whether or not to use a particular application if the individuals tend to believe using the application will positively affect their job performance. However, although the individual users may believe an application would be useful, it does not necessarily mean the application or innovation may be easy to use. As a result, the individuals may believe the effort and difficulties of learning the application or innovation exceeds the benefit of the effects on their job performance. Therefore, it offsets the benefit of using or adopting the innovation. Hence, “in addition to usefulness, usage is also theorized to be influenced by the ‘ease of use’” (Talukder et al., 2008, p. 465). Perceived usefulness has been shown by many researchers, to be a strong predictor and continues to be significant in measurements (Davis, 1989; Venkatesh et al., 2003). In addition, Compeau and Higgins (1995) found computer self-efficacy to be a critical component affecting perceived

usefulness. Similarly, Chau (2001) states, “computer self-efficacy is a facilitating factor if the system is useful and easy to use in general” (p. 31).

Unified Theory of Acceptance and Use of Technology

For many years, acceptance research in the discipline of information technology and information systems produced many competing models. As a result, the unified theory of acceptance and use of technology (UTAUT) was developed and tested by Venkatesh et al. (2003), all of whom compared eight models to formulate, test, and empirically validate UTAUT. The model included TRA, TAM, TPB, and others. Whereas TAM proposed two constructs (perceived usefulness and ease of use) influencing the behavior of the individual’s adoption, UTAUT proposed additional constructs, such as social influence and facilitating conditions, inclusive of moderating variables (Jeyaraj & Sabherwal, 2008). Constructs also included in their model were performance expectancy, effort expectancy, social influence, and facilitating conditions. In essence, from a theoretical assessment, UTAUT offers an enhanced interpretation of how the contributing factors of behavior and intention advance over a period of time (Venkatesh et al., 2003). UTAUT has been used as the fundamental model in studies and has been used in multiple technologies as well as both in and out of organizational settings (Venkatesh, Thong, & Xu, 2012). The objective of this study is to retest the UTAUT model, to investigate the validity of the scales, and to contribute to the body of knowledge.

Social influence. Social influence is defined as the extent to which members of a social group influence one another’s behavior in adoption (Konana & Balasubramanian, 2005; Talukder & Quazi, 2011). Social influence has been recognized in prior research

regarding the adoption of innovation on champions, who are the change agents for adopting a new innovation (Jeyaraj & Sabherwal, 2008). Social influence can be a factor in the individual's adoption of an innovation, as long as the individual believes adopting would be beneficial and, hence, the individual may imitate (Frambach & Schillewaert, 2002). Conversely, an individual may well reject the adoption if the individual perceives the adoption would negatively affect his or her affiliation with others (Jeyaraj & Sabherwal, 2008; Rice & Anderson, 1994). Individuals may choose to adopt an innovation due to their perception of peer pressure and not necessarily due to the usefulness of the innovation (Talukder, 2012). Peer pressure, or the lack thereof, to adopt HRA may be stemming from other HR professionals or HR associations at both the national or local levels as well as globally, through HR social media networks. On the national level, it would be the Society for Human Resource Management (SHRM), which is the leading voice of HR professionals. For the purpose of this study, the local level associations are Human Resource Association of Broward County (HRABC), Greater Miami Society for Human Resource Management (GMSHRM), and Human Resource Association of Palm Beach County (HRPBC). These HR professional associations may function as the medium for the "diffusion and translation of knowledge" needed for the use of HRA (Newell & Swan, 1995, p. 848). This can be seen in either TRA because of the attitude toward the behavior or TAM because of behavioral intentions (Talukder, 2012; Talukder & Quazi, 2011).

McDonald and Alpert (2007) found that the rate of individual adoption of products that were new was more rapidly due to "word-of-mouth" by consumers. This would likely hold true for the adoption of analytics by HR professionals if SHRM would

suggest that there would be a profound effect by utilizing analytics in many of the HR areas, such as retention, hiring, and overall performance. According to Newell and Swan (1995),

A new technology cannot be adopted by a firm unless knowledge about it is first made available to members of that firm. Thus, an important part of the diffusion process involves the diffusion of knowledge and information that allow [*sic*] people in firms to think of new ideas about technological development. (p. 847)

Other studies done by researchers have found that there is a relationship between social influence and the adoption of a product or innovation. Similarly, colleagues and coworkers can have an impact and influence the behavior, “motivation, and encouragement” of the adoption of an innovation (Talukder & Quazi, 2011, p. 116). Much of the prior research in innovation adoption examines the role of the potential adopter, but assumptions are made as to the influence the champions or change agents have on the individual’s adoption (Jeyaraj & Sabherwal, 2008). Based on his research, Talukder (2012) suggested “to increase the adoption rate of innovations in the organization, peers should provide continuous feedback, support and encouragement for such individuals so that they can master the innovation skills within a short period of time” (p. 55). Jeyaraj and Sabherwal (2008) investigated influencer actions with regard to individual adoption of innovation of information systems and found there is no universal response to acceptance. However, as noted earlier, since many HR professionals are not enthusiastic about the use of metrics, social influence would be a factor to adopting analytics.

H₁: Social influence is positively related to the adoption of HRA.

Tool availability. Tool availability is defined as having the appropriate updated systems and software, as well as having the skill sets necessary to understand what data is needed and having the ability to analyze and interpret the data. Individuals now have access to faster computers capable of holding more information and data than ever before, and they also have seen an improvement in connectivity and networks. This improved technology along with new HRIS has changed the way capital management is evaluated in organizations (Carlson & Kavanagh, 2011). However, systems and software are not the only tools necessary in the use of analytics. Individuals with the necessary skill sets are an important factor, as they know what data is needed, how to analyze the data, and how to interpret the data for reporting purposes and decision making (Carlson & Kavanagh, 2011). Brown et al. (2011) reported there will be a necessity for people with “deep analytical skills” in the area of HR, and there will be a shortage of over 140,000 skilled analysts by 2018.

Peoplefluent (2013b), a provider of talent management solutions, published a white paper titled “7 Keys to Increasing User Adoption of HR Software,” where they identified the seven keys for adoption as being (a) simplicity, which is ease of use of functionality; (b) consumerization for sharing; (c) managerial magnetism, which can be tied to self-efficacy, as managers must feel confident they can improve their talent management strategies; (d) predictive functionality, for better decision-making; (e) appealing labels, which can be tied to social influence; (f) guided participation, which also can be tied to perceived ease of use as well as perceived usefulness; and (g) continuous communication, which can be tied to self-efficacy, as managers must communicate and show how the adoption can have a positive impact on their careers.

Organizations will need to reconsider their multiple platforms and different workflows from their differing functional departments, and look more closely at HRA for better decision making for the entire organization (Manyika et al., 2011). Too many different platforms create department silos in the organization (Brown et al., 2011).

Another issue, noted by Sullivan (2013), is that a great majority of the HR functions are operating within past practices. Sullivan suggests, “if you want serial innovation, you will need to reinvent traditional HR and the processes that drive innovation” (para. 3).

Studies have found that a major reason for poor performance is the lack of or inadequate resources (SuccessFactors, 2013). HR systems being utilized today definitely were not developed with computers and infrastructures now available (Carlson & Kavanagh, 2011). The terms resources and tools are interchangeable for the purposes of this study.

H₂: Tool availability is positively related to the adoption of HRA.

Data availability. Data availability is defined as the accumulated information residing within the HR department and the organization as a whole. Reporting and benchmarking are the two HR activities most often used where metrics and workforce analytics are concerned in terms of administrative process efficiency (Carlson & Kavanagh, 2011). Showing HR’s worth by reporting metrics, such as time to fill available positions, the cost per hire, and other necessary paperwork submitted on time, are examples of the administrative processes. As mentioned earlier, gathering data from different department managers with different platforms that are not integrated becomes difficult. Attempting to purchase or share data from a third-party vendor may not be

economically feasible either (Manyika et al., 2011). Manyika et al. (2011) recommend organizations proliferate the integration of information from multiple data sources to support “transformative opportunities” (p. 12). Gale (2012) indicated that many organizations store their data in so many systems, thus making it difficult for HR professionals to accurately and efficiently understand similarities or differences.

Although there is an enormous amount of data being collected, there is still a need to know where the data is coming from to ensure accuracy and limit ethical issues (Boyd & Crawford, 2011). Studies have shown that fewer than 50% of organizations still use spreadsheets and other manual means of obtaining and examining data (Gale, 2012). Is the use of spreadsheets a necessity because of the lack of computational skills or lack of data? A great majority of HR professionals are females, and, according to Boyd and Crawford (2011), “there is a significant gendered division and most researchers who have computational skills at the present moment are male” (p. 12). Similarly, a study done by Talukder and Quazi (2011) revealed there were “mixed results about the impact of gender on the perception and usage of innovation in the workplace” (p. 118). Talukder and Quazi found the attraction to adopting an innovation had no bearing on gender, but found that men and women alike were using the innovation based on social factors. Cascio and Boudreau (2011) argued that many HR professionals lack the ability to understand statistical terminology. Hence, knowing what to do with the data collected would be difficult.

H₃: Data availability is positively related to the adoption of HRA.

Fear appeals. Fear appeals involve “communicating in a persuasive manner to motivate a behavioral change and having the individual perceive a threat and tapping into

the individual's emotion of fear" (Johnston, 2006, p. 27). For the purposes of this study, fear appeals are associated with the HR professional's adoption of analytics. Data analysis requires skills in understanding statistical measures as well as problem solving; however, a great majority of HR professionals have not yet acquired these skills, leaving organizations the option of finding individuals with such skills (Bersin, 2013b). Hence, HR professionals may fear the loss of their position to a more qualified individual with a statistical background. Ranjan and Basak (2013) have stated, "notwithstanding the traditional challenges to realize the HRA value, outsourcing is fast emerging as a viable option to overcome those" (p. 1). According to Johnston (2006), "fear appeals can originate from social influences such as organizational leaders, technological leaders and trusted colleagues. These fear appeals may be verbalized through formal or informal conversation" (p. 12). As noted by Johnston (2006) and O'Keefe (2002), the definition or the understanding of fear appeals will come from either the message itself or the response to a question or comment. Fear appeals are a communication tool used to change an individual's behavior where an outcome, whether positive or negative, comes from a perceived threat or arousal of fear.

According to O'Keefe (2002) and based on research evidence, there are distinctly different variations of fear appeals. The means of communication will determine the extent of the fear. O'Keefe breaks down the findings of this extensive and complex research related to fear appeals into four sections: (a) for the most part, greater fear is aroused by the contents of the message; (b) there is a change in behavior determined by the strength of the content; (c) there is a higher degree of persuasion when the message or

content is stronger; and finally, (d) there is little evidence that there is a relationship between the content of the fear appeal and the arousal of fear in the individual.

Much of the research on fear appeals has been in the healthcare industry. Schneider et al. (2001) explored the effects on beliefs, attitudes, and behaviors concerning smoking prevention and cessation based on the frame of the message in which evidence showed “prevention behaviors are better promoted by gain-framed messages” (p. 680). Gain-framed messages are contents of a message that describe an outcome, whether positive or negative in nature (Stephenson & Witte, 2001). Similarly, this was also found to be true in research done by Rothman and Salovey (1997) and Tversky and Kahneman (1981). Sherer and Rogers (1984) investigated “the effects of emotional interest, concreteness and proximity on attitude change in the fear appeals paradigm” (p. 332), which included communication through fear appeals regarding becoming a problematic alcohol drinker. The results indicated that fear appeals can be affected by emotional interest and concreteness.

For approximately a decade, Bersin (2013a) has been researching HR professionals and what they measure. HR leaders have expressed that measuring and predicting talent performance is extremely important (Bersin, 2013a). Based on the aforementioned findings, it is reasonable that organizational leaders would be diligent in how they frame their messages to persuade HR professionals to adopt analytics for better decision making and competitive advantage for the organization. Bersin (2013c) points out in his article that organizations will have to find individuals who have the skill sets and competencies to analyze HR data. The way in which the message is conveyed and

what threats (direct or indirect), known as fear appeals, are perceived may have a positive or negative effect on the HR professional's adoption.

O'Keefe (2002) suggested that gender plays a role in persuasion, and it is easier to persuade a female than it is a male. The question here becomes whether or not there is a relationship between gender-based persuasion and fear appeals and the adoption of analytics, based on the societal suggestion that males are much better at metrics and data analytics.

Rogers (1975) stated, "recent reviews of the literature on fear appeals and persuasion agree that the empirical data are inconsistent and difficult to interpret" (p. 94). It is important to note that each individual's fear and arousal of fear is different and dependent on the environment or relational situation (Rogers, 1975).

H₄: Fear appeals are positively related to the adoption of HRA.

Effort expectancy. Effort expectancy is the "degree of ease associated with the use of the system" (Venkatesh et al., 2003, p. 450). Effort expectancy is one of four key constructs that are related to behavioral factors that influence whether one uses a new technology (Venkatesh et al., 2012). For the purposes of this study, ease of use will be interchangeable with the term effort expectancy. According to Venkatesh et al. (2012), "from the perspective of effort expectancy, in organizational settings, employees assess time and effort in forming views about the overall effort associated with the acceptance and use of technologies" (p. 161). The study's investigation was utilizing UTAUT to a consumer context in lieu of an organizational context (Venkatesh et al., 2012). Similarly, this investigation discusses the different software platforms currently residing in some HR departments and whether or not there is acceptance of the newer, more data-driven

software. Prior research has suggested effort expectancy is more noticeable for women than for men (Bem & Allen, 1974; Bozionelos, 1996; Venkatesh et al., 2012).

H₅: Effort expectancy is positively related to the adoption of HRA.

Performance expectancy. According to Venkatesh et al. (2003), performance expectancy is “the degree to which an individual believes that using the system will help him or her to attain gains in job performance” (p. 447). For the purpose of this study, performance expectancy will be used interchangeably with the term perceived usefulness. Performance expectancy has proven to be a “strong predictor of behavioral intention” (Venkatesh et al., 2012, p. 160). Prior studies have found that performance expectancy has a significant impact on one’s intention to use technology and behaviors associated with the use (Venkatesh et al., 2012).

H₆: Performance expectancy is positively related to the adoption of HRA.

Individual Adoption of Innovation

For companies to be successful in today’s global era, the acceptance of innovations in general must be accepted to gain a competitive advantage (Bersin, 2013a; Gardner et al., 2011; Giuffrida, 2013). Studies have shown that CEOs, locally and globally, believe HR is one of the most important components of gaining and maintaining competitive advantage, through the use of analytics (Lesser & Hoffman, 2012; NoticiasFinancieras, 2013). Although CEOs have a desire to incorporate HRA into their organizations, there must be acceptance at the individual level, specifically HR professionals for the purposes of this study, for the intended benefit to be realized (Frambach & Schillewaert, 2002). Adopting innovations can be a multifaceted process, as it involves the actions of individuals whose behaviors can be influenced by others either

in adopting or rejecting the innovation (Jeyaraj & Sabherwal, 2008). An organization's competitive advantage can be significantly affected by the individual's willingness to accept and use the innovation (Conrad, 2013).

As defined by Rogers (1983),

the innovation-decision process is the process through which an individual passes from first knowledge of an innovation to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision. (p. 20)

Consequently, the innovation-decision process will lead to either adoption or rejection of the innovation (Rogers, 1983). While there has been much research on the innovation process in the area of adopting the innovation, there is limited research as to the individual's rejection of the innovation. More often than not, the focus on adoption research is on the behavior of the adopter. This study identifies the behaviors that form barriers to adoption at the individual level.

Acceptance of an innovation has been included at the maximum level under the theoretical analysis of DOI, and while it examines the impact of IT acceptance over time, it does not provide detailed information on user acceptance (Dillon & Morris, 1996). There are, however, continual distinct and unifying ideas in several models that explain acceptance of innovation at the individual level based on beliefs and effects toward a particular innovation and the individual's perceptions (Frambach & Schillewaert, 2002). As noted by Frambach and Schillewaert (2002), TRA, developed by Fishbein and Ajzen in 1975, has become a useful tool in the explanation of the individual's behavior towards innovation acceptance. Similarly, much of the technology literature has a long history

towards innovation and the inability to clearly explain, the individual's or user's acceptance, which obstructs performance (Davis, 1989). Thus, adoption research results have been more concerned with the individual's perception rather than the individual's actual behaviors (Jeyaraj & Sabherwal, 2008).

Self-Efficacy

Bandura's (1977) theory of self-efficacy is based on an individual's belief of his or her capability to succeed and attain a given level of performance. Thus, HR professionals' acceptance and use of HRA would be dependent upon their perception of their capabilities. According to Bandura (1977), there are four sources of information of which individuals' expectancy is an important aspect of their efficacy. These sources are identified as performance accomplishments, vicarious experience, verbal persuasion, and physiological states. Performance accomplishments will either increase efficacy as a result of successes or decrease efficacy with continued failures; vicarious experience is related to modeling and the individuals' belief they can also be successful, as are their peers, in accomplishing tasks; verbal persuasion is most commonly used, as individuals will suggest ways of accomplishing or accepting their ability to perform; and physiological states are based on emotion and fear of success (Bandura, 1977). Hence, self-efficacy has a potential impact on whether HR professionals will embrace analytics and to what extent.

Davis (1989) notes the importance of perceived ease of use is supported by Bandura's extensive research on self-efficacy. An individual, whose judgment is based on how well a task can be performed, can perceive the task as easy to use. Researchers should be aware that both ease of use and perceived usefulness are not necessarily

objective measures and should be seen as subjective, since this is the perception of the user (Davis, 1989).

As discussed by Bandura (1982) in further research, individuals may have reservations as to whether or not they will be successful in whatever tasks they may be attempting. Similarly, HR professionals may not adopt or use analytics because their belief and expectations of their work and results are that they may not have an impact or may be viewed negatively by others within their environment or social networks (Bandura, 1982).

Researchers have argued there would be a negative impact on adoption of innovation due to any tenure with an organization as well as age (Damanpour & Schneider, 2008). Conversely, Talukder et al. (2008) found in their research there was no significant difference in innovation adoption with regard to technology, as its use seemed to be understood by all employees in their work tasks. There is an underlying assumption that individuals, no matter their age, understand that technology and its use is important. As noted by Frambach and Schillewaert (2002), non-adoption does not parallel the adoption (Gatignon & Robertson, 1989). According to Frambach and Schillewaert, there are several stages of adoption, from pre-adoption to continuous adoption, yet the stages for non-adoption can occur at any stage of the process. Although there is quite a bit of research on the adoption of innovation, there is a lack of research on the reasons for non-adoption. However, Stevens, Warren, and Martin (1989) have found that the reasons for individuals not adopting an innovation might stem from the processes involved at early stages of the adoption.

Prior research also has shown it can be hypothesized that attitudes toward computers in general will affect the perceived usefulness and the perceived ease of use of a computer system, which, in turn, can “affect the behavioral intention of using the system” (Chau, 2001, p. 27). This would be similar to using analytical tools. Computer self-efficacy is defined as “a judgment of one’s capability to use a computer. It is not concerned with what one has done in the past, but rather with judgments of what could be done in the future” (Compeau & Higgins, 1995, p. 192). The question is whether or not individuals perceive they lack statistical knowledge and/or have the belief that analyzing data could be difficult, therefore creating a barrier to the adoption of HRA.

H₇: Self-efficacy is positively related to the adoption of HRA.

Quantitative Self-Efficacy

Studies on mathematical literacy (ML; Ozgen, 2013; Ozgen & Bindak, 2008) and math anxiety (MA; Hendel, 1980) show there is an attitudinal relationship and, hence, an effect on mathematical self-efficacy. For the purposes of this study, mathematical self-efficacy will be known as quantitative self-efficacy.

Prior research done by Bandura (1982), Schunk (2009), and Zimmerman (2000) found that those who had a higher level of self-efficacy had a tendency to participate and work better on activities where they gained knowledge and comprehension, which allows the learning process to be greater (Ozgen, 2013). Similarly, Baki, Catlioglu, Costu, and Birgin (2009) and Ozgen (2013) argued that those who “believed that connections between mathematics and the real world increased their success in mathematics” and at the same time “made life easier and had benefits at work” (Ozgen, 2013, p. 312). Conversely, not having the ability to make the connection between mathematics and their

everyday life would cause lack of successes at work. It was concluded that this lack of making the connection had come from either insufficient or lack of proper training (Ozgen, 2013).

According to Hendel (1980), there have been studies on gender and quantitative performance that have shown no support for the theories that gender plays a role. Females are able to perform as well as men using quantitative measures. This, however, contradicts the studies done by Boyd and Crawford (2011) and Talukder and Quazi (2011) that suggest gender differences in “quantitative performance may be accounted for by differences in how females and males are socialized” (Hendel, 1980, p. 219).

In a study conducted in 2007 by SHRM titled “HR and Business Education: Building Value for Competitive Advantage,” it was noted that educators did not stress the importance of understanding the financial side of business. Consequently, graduate schools were not preparing students with the necessary skills (e.g., change management, financial management, communication, statistics, marketing, and economics) to step into strategic HRM/business roles (SHRM Research Quarterly, 2007).

H₈: Quantitative self-efficacy is positively related to the adoption of HRA.

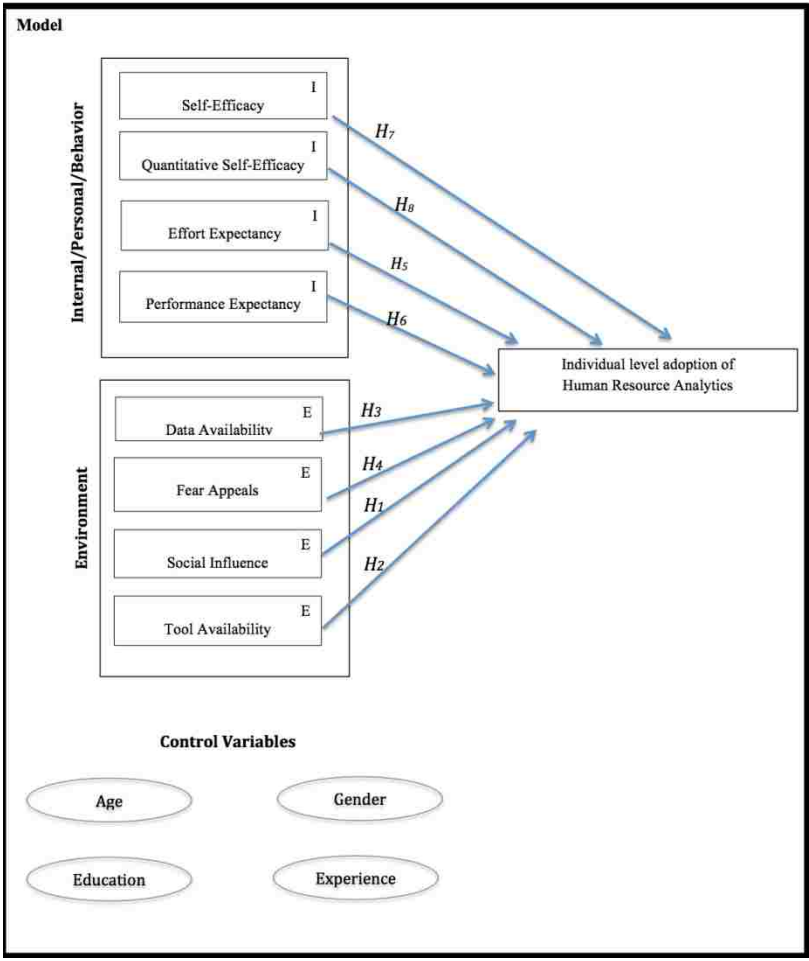


Figure 3. Conceptual Model.

Summary

This chapter reviewed the earlier research that tested several theoretical constructs found in this study concerning innovation adoption and diffusion. A model was developed, which fills the gap from prior work of individual-level adoption, specifically the adoption of HRA by HR professionals.

The following chapter will outline and explain the methodology used in this study, including the targeted sample, data collection, and tools used to collect and analyze the data.

CHAPTER III

METHODOLOGY

Organization of the Chapter

The previous chapters detailed the purpose for this study and reviewed earlier research that has explored several theoretical constructs found in this study. This chapter outlines and explains the methodology used in this investigation that includes the targeted sample, data collection, and tools used to collect and analyze the data.

Research Framework

The focus of this investigation is individual-level adoption of human resource analytics (HRA) by human resource (HR) professionals. The theoretical foundation framing this study is individual adoption theory. The purpose of this study is to gain insight as to the reasons why more HR professionals are not using HRA to improve organizational performance in order to gain and maintain a competitive advantage. The methodology used answers the research questions regarding the factors affecting the adoption of HRA among HR professionals.

1. What factors can act as barriers and affect the adoption of HRA among HR professionals?
2. What is the cause for the reported lack of connection between the organization's desires to use HRA and the HR professional's ability and desire to adopt and deliver?

This research fills the gap by applying the individual-level adoption of technological innovation theory literature to investigate HR professionals' adoption and use of analytics in the field of Human Resource Management (HRM). This research

extends the literature on the factors affecting the adoption of innovation at the individual level, specifically of analytics among HR professionals.

Research Design

This research reviewed theoretical constructs that are contributing factors affecting the adoption of HRA among HR professionals. This investigation consisted of the sampling of individuals currently employed in the field of HR at the time the participant completed the survey. This section details the methodology of the research to include the targeted population and recruitment of participants, the methods used to select the participants, the collection of data, and the tools used to collect and analyze the data.

Sample Population

The sample population for both the pilot and the full-scale studies consisted specifically of HR professionals. For the purposes of this study, HR professionals are defined as individuals currently working in the field of HR, regardless of their function, industry, length of time in HR, or job title within the HR department.

Scale Development

General self-efficacy. This research was designed to measure general self-efficacy adapting a scale developed by Davis (1989) and Chau (2001); Cronbach's alpha was 0.98 for perceived usefulness and .94 for perceived ease of use. According to Davis, prior research of self-efficacy provides "one of several theoretical perspectives suggesting that perceived ease of use and perceived usefulness function as basic determinants of user behavior" (p. 321). For this study, user behavior is correlated to the use of HRA. Davis also noted, "the accumulated body of knowledge regarding self-efficacy, contingent decision behavior and adoption of innovations provides theoretical

support for perceived usefulness and ease of use as key determinants of behavior” (p. 323). Since Cronbach’s alpha of 0.70 or higher is considered acceptable (Venkatesh et al., 2003), and the items in the scales adapted from Davis and Chau were all over 0.80, the scales were adapted. However, it should be noted that items from the scale were slightly modified to specifically address HRA. A 7-point Likert Scale, with the anchors *strongly agree* and *strongly disagree*, was used where appropriate, and specific instructions were given for each section, as necessary.

Table 1

General Self-Efficacy

Construct	Definition	Question number
General Self-Efficacy (Bandura, 1977; Chau, 2001; Davis, 1989)	“Judgments of how well one can execute courses of action required to deal with prospective situations” (Bandura, 1977, p. 122).	<ol style="list-style-type: none"> 1. HR Analytics is easy to use. 2. HR Analytics is convenient to use. 3. I am able to use HR Analytics without much effort. 4. I can always manage to solve difficult problems if I try hard enough. 5. If someone opposes me, I can find the means and ways to get what I want. 6. It is easy for me to stick to my aims and accomplish my goals. 7. I am confident that I could deal efficiently with unexpected events 8. Thanks to my resourcefulness, I know how to handle unforeseen situations. 9. I can solve most problems if I invest the necessary effort. 10. It is easy for me to use my mobile device to access company information. 11. I can remain calm when facing difficulties because I can rely on my coping abilities. 12. When I am confronted with a problem, I can usually find several solutions. 13. If I am in trouble, I can usually think of a solution. 14. I can usually handle whatever comes my way.

Quantitative self-efficacy. For the purposes of this study, mathematical self-efficacy will be known as quantitative self-efficacy. To measure quantitative self-efficacy, this researcher adapted Bai, Wang, Pan, and Frey's (2009) scale, which was determined to be reliable with a Cronbach's alpha of 0.91 for the total scale. Studies on mathematical literacy (ML; Ozgen, 2013; Ozgen & Bindak, 2008) and math anxiety (MA; Hendel, 1980) show there is an attitudinal relationship and, hence, an effect on mathematical self-efficacy. A 7-point Likert Scale, with the anchors *strongly agree* and *strongly disagree*, was used where appropriate, and specific instructions were given for each section, as necessary.

Table 2

Quantitative Self-Efficacy

Construct	Definition	Question number
Quantitative Self-Efficacy (Bai et al., 2009; Ozgen, 2013)	"The individual's personal believed judgment in relation to their quantitative skills" (Ozgen, 2013, p. 306).	15. I find using mathematical and/or statistical measurements interesting.
		16. I worry about my ability to solve mathematical and/or statistical problems.
		17. I get nervous when I use mathematics and/or statistics.
		18. I enjoy working with mathematical and/or statistical measures.
		19. I find mathematical and/or statistical measures challenging.
		20. Math and/or statistics is one of my favorite subjects.

Social influence. Scales developed by Johnston and Warkentin (2010) and Venkatesh et al. (2012) were adapted to measure social influence, since studies done by researchers have found that there is a relationship between social influence and the adoption of a product or innovation. Much of the prior research on innovation adoption examines the role of the potential adopter, but assumptions are made as to the influence the champions or change agents have on the individual's adoption (Jeyaraj & Sabherwal,

2008). According to Venkatesh (as cited in Johnston & Warkentin, 2010), “social influence relates to Thompson, Higgins, and Howell’s (1991) construct social factors, which refers to an ‘individual’s internalization of the reference group’s subjective culture and specific interpersonal agreements that the individual has made with others, in specific social situations’” (p. 554). The scale developed by Johnston and Warkentin met the condition that constructs correlate significantly, as all items correlated with a $p < 0.01$ and a Cronbach’s alpha of 0.87. The scale developed by Venkatesh et al. (2012) was measured for reliability and validity using partial least squares (PLS), with a Cronbach’s alpha of 0.82. Both scales proved to be reliable and therefore adapted. A 7-point Likert Scale, with the anchors *strongly agree* and *strongly disagree*, was used where appropriate, and specific instructions were given for each section, as necessary.

Table 3

Social Influence

Construct	Definition	Question number
Social Influence (Johnston & Warkentin, 2010; Talukder & Quazi, 2011; Venkatesh et al., 2012)	“The extent to which members of a social group influence one another’s behavior in adoption” (Talukder & Quazi, 2011, p. 115).	21. People who influence my behavior think that I should use HR Analytics.
		22. People who are important to me think that I should use HR Analytics.
		23. The senior management of this business has been helpful in the use of HR Analytics.
		24. In general, the organization has supported the use of HR Analytics.
		25. People in my organization who would use HR Analytics, would have a high profile.
		26. Because of my use of HR Analytics, others in my organization would see me as a more valuable employee.

Tool availability and data availability. Studies have found that a major reason for poor performance is the lack of or inadequate resources (SuccessFactors, 2013). HR systems utilized today were definitely not developed with computers and infrastructures that are now available (Carlson & Kavanagh, 2011). The terms resources and tools are

interchangeable for the purposes of this study. The scales from Johnston (2006) and Johnston and Warkentin (2010) were adapted to measure tool availability and data availability, since the scale developed by Johnston and Warkentin met the condition that constructs correlate significantly, as all items correlated with a $p < 0.01$ and the Cronbach's alphas were 0.88 and 0.75, respectively. A 7-point Likert Scale, with the anchors *strongly agree* and *strongly disagree*, was used where appropriate, and specific instructions were given for each section, as necessary.

Table 4

Tool Availability

Construct	Definition	Question number
Tool Availability (Johnston, 2006; Johnston & Warkentin, 2010)	Refers to the degree of the source's (tool) attractiveness, power or forcefulness, and energy (Johnston, 2006).	27. I have a full array of HR Analytics tools available at work if I choose to use them.
		28. I only have very basic HR Analytics tools available at work if I choose to use them.
		29. My company has invested heavily in HR Analytics tools.
		30. Before deciding whether to use any HR Analytics applications, I am able to properly try them out.
		31. I have had a great deal of opportunity to try various HR Analytics applications.
		32. I know where I can go to satisfactorily try out various uses of HR Analytics.

Table 5

Data Availability

Construct	Definition	Question number
Data Availability (Johnston, 2006; Johnston & Warkentin, 2010)	Refers to the degree to which information (data) is perceived as competent of producing correct assertions (Johnston, 2006).	33. My company's database has all the data I need to use HR Analytics software.
		34. My company's HR system collects data from all HR interactions.
		35. We use the same system/platforms for all HR activities.
		36. My company has one database for all departments to use.
		37. My company's database has an interface that is compatible with other systems.

Fear appeals. According to Witte, Cameron, McKeon, and Berkowitz (1996), “a fear appeal is a persuasive message with the intent to motivate individuals to comply with a recommended course of action through the arousal of fear associated with a threat” (p. 329). For the purposes of this study, the fear appeal can be used to persuade an individual to adopt HRA. Fear appeal, was measured by adapting scales from Witte et al. (1996), Johnston (2006), and Johnston and Warkentin (2010). In the scales from Witte et al. and Johnston and Warkentin, “all constructs had significant correlations ($p < 0.01$), with their respective construct composite value” (Johnston & Warkentin, 2010, p. 557). Witte et al.’s (1996) scale proved to be reliable with a Cronbach’s alpha of 0.95. Therefore, the scale was adapted for this study. A 7-point Likert Scale, with the anchors *strongly agree* and *strongly disagree*, was used where appropriate, and specific instructions were given for each section, as necessary.

Table 6

Fear Appeals

Construct	Definition	Question number
Fear Appeals (Johnston, 2006; Johnston & Warkentin, 2010; Witte et al., 1996)	“Communicating in a persuasive manner, to motivate a behavioral change and having the individual perceive a threat and tapping into the individual’s emotion of fear” (Johnston, 2006, p. 27).	38. If I were forced to use HR Analytics, it would have a negative effect on my organizational commitment.
		39. It is likely I would use HR Analytics given the opportunity.
		40. If I were required to use HR Analytics, it would have a significant negative impact on my job performance.
		41. It is highly probable I would use HR Analytics given the opportunity.
		42. If I were mandated to use HR Analytics, it would have a negative effect on my job satisfaction.

Effort expectancy. Effort expectancy is one of four key constructs related to behavioral factors that influence whether one uses a new technology (Venkatesh et al., 2012). This scale used by Venkatesh et al. (2012) tested frequency ranging from *never* to

many times per day. This construct in the study also proved to be valid and reliable, as the construct validity test was conducted for reflective variables. The factor loading tested loaded clearly with no cross-loadings. The internal consistency reliability (ICR) of 0.91 suggests the scale was reliable and therefore adopted. A 7-point Likert Scale, with the anchors *strongly agree* and *strongly disagree*, was used where appropriate, and specific instructions were given for each section, as necessary.

Table 7

Effort Expectancy

Construct	Definition	Question number
Effort Expectancy (Venkatesh et al., 2003)	“The degree of ease associated with the use of the system” (Venkatesh et al., 2003, p. 450).	43. My role with HR Analytics is clear and understandable.
		44. It would be easy for me to become skillful at using HR Analytics.
		45. Learning to use HR Analytics is easy for me.
		46. It is easy for me to become skillful at using HR Analytics.
		47. I would find HR Analytics easy to use.

Performance expectancy. According to Venkatesh et al. (2012), “performance expectancy is defined as the degree to which using a technology will provide benefits to consumers in performing certain activities” (p. 159). In this study, the technology would be considered HRA. Performance expectancy has proven to be a “strong predictor of behavioral intention” (Venkatesh et al., 2012, p. 160). Prior studies have found that performance expectancy has a significant impact on one’s intention to use technology and behaviors associated with the use (Venkatesh et al., 2012). This scale was adopted due to the results having been measured for reliability using PLS with a Cronbach’s alpha of 0.88, which is an acceptable level (Venkatesh et al., 2012). A 7-point Likert Scale, with the anchors *strongly agree* and *strongly disagree*, was used where appropriate, and specific instructions were given for each section, as necessary.

Table 8

Performance Expectancy

Construct	Definition	Question number
Performance Expectancy (Johnston & Warkentin, 2010; Venkatesh et al., 2003)	“The degree to which an individual believes that using the system will help him or her to attain gains in job performance” (Venkatesh et al., 2003, p. 447).	48. I would find the use of HR Analytics useful in my job.
		49. Using HR Analytics enables me to accomplish tasks more quickly.
		50. Using HR Analytics increases my job performance.
		51. If I use HR Analytics, I will increase my chances of getting a raise.
		52. The use of HR Analytics is not very visible in my organization.

Individual-level adoption. To measure individual-level adoption, scales developed by Venkatesh et al. (2003) and Johnston and Warkentin (2010) were adapted. The scale developed by Venkatesh et al. (2003) met the condition that constructs correlate significantly with all variables, as all items correlated with a $p < 0.01$. The scale developed by Venkatesh et al. (2003) was measured for reliability and validity using PLS, with a Cronbach’s alpha of 0.90. Davis (1989) developed a model from the theory of reasoned action (TRA), investigating perceived usefulness and perceived ease of use, which has come to be known as the technology acceptance model (TAM). These scales, which were then adapted by Venkatesh et al. (2003), proved to be reliable with Cronbach’s alphas of 0.98 and 0.94, respectively. A 7-point Likert Scale, with the anchors *strongly agree* and *strongly disagree*, was used where appropriate, and specific instructions were given for each section, as necessary.

Table 9

Individual-Level Adoption

Construct	Definition	Question number
Level of Adoption (Damanpour & Wischnevsky, 2006; Johnston & Warkentin, 2010; Venkatesh et al., 2012)	“A process that results in the assimilation of a product, process, or practice that is new to the adopting organization and/or the individual level” (Damanpour & Wischnevsky, 2006, p. 497).	53. My company is putting a policy in place to use HR Analytics.
		54. I am not required to HR Analytics.
		55. The use of HR analytics is voluntary in my organization.
		56. I am beginning to explore using HR Analytics.
		57. I am interested in using HR Analytics.
		58. I am recommending my company invest in HR Analytics.
		59. I use HR Analytics for some specific tasks.

Since the scales have been adapted from prior research, and there is evidence of validity and reliability from the literature reviewed and refined after the pilot study, the instrument can now be used to investigate factors affecting the adoption of HRA among HR professionals.

Pilot Study

Pre-Pilot. Prior to the pilot study being administered through SurveyMonkey ([http:// www.surveymonkey.com](http://www.surveymonkey.com)), an online provider of web-based survey solutions, colleagues, who are academicians and considered experts in the fields of management, HR, information technology, and research methodology, reviewed a copy of the instrument to ensure accuracy, no redundancy of questions, and appropriate length of the survey, as well as to provide expert opinions. Students in an HR master’s program, some of whom were current HR professionals, also reviewed the instrument for clarity and readability, for length of time to complete the survey, and to ensure the instructions provided were clear and could be understood by a diverse population (see Appendix A for example of pre-pilot comments).

Pilot. A pilot study was conducted prior to conducting the full-scale study, using SurveyMonkey. Administering a pilot test of the study ensures clarity of the questions and helps identify potential problems with the instrument, prior to administering the survey to a larger sample. The goal of the pilot study was to reduce the size of the survey instrument. As noted by Moore and Benbasat (2001), “an ongoing concern to survey researchers is the length of survey instruments” (p. 210; see Appendix B for pilot survey instrument).

Pilot data collection. SurveyMonkey targeted this particular survey to their audience members who were HR professionals. It should be noted that these participants’ responses were not included in the full-scale survey. SurveyMonkey limits the number of surveys their audience (members) can take in a week, to ensure members are not overparticipating. According to the information on SurveyMonkey’s website, SurveyMonkey maintains a pool of respondents to be survey contributors, otherwise known as audience members, but only after each member completes a “profile” survey. The profile survey helps ensure a diverse group of people reflective of the U.S. population, which includes demographics inclusive of age, gender, job type, employment status, location, education, and industry.

SurveyMonkey had originally closed the pilot survey with 108 responses. However, during the data analysis, it was determined that 11 respondents were not qualified to take the survey, as they were not HR professionals currently working in the field of HR, leaving 97 usable responses. SurveyMonkey representatives were contacted and advised of the discrepancies found in the respondents’ background, which caused their elimination from the pool of respondents. The pilot survey was reopened by

SurveyMonkey, who recruited additional HR professionals currently working in the field of HR to participate in the pilot survey. This resulted in an additional 10 usable survey responses, bringing the total of qualified responses to 107 for the pilot.

Pilot study results. SurveyMonkey provided data from 107 qualified respondents, who answered all questions from the pilot instrument, which included the nine constructs shown in Table 10.

Table 10

Pilot Survey Instrument

Measured constructs	Number of questions
General Self-Efficacy	14
Quantitative Self-Efficacy	6
Social Influence	6
Tool Availability	6
Data Availability	5
Fear Appeals	5
Effort Expectancy	5
Performance Expectancy	5
Level of Adoption	7

Validity and reliability of the initial instrument were tested using factor analysis of the pilot study, using the Statistical Package for the Social Sciences (ISM SPSS) version 2.2. The Cronbach's alpha for each construct was over .70, which is considered an acceptable scale (Johnston, 2006). The Cronbach's alpha (scale reliability) is shown in Table 11.

Table 11

Test of Reliability Statistics for Pilot Instrument

Constructs	Cronbach's alpha	# of items
General Self-Efficacy	0.744	7
Quantitative Self-Efficacy	0.760	6
Social Influence	0.730	5
Tool Availability	0.823	5
Data Availability	0.857	3
Fear Appeals	0.739	4
Effort Expectancy	0.860	4
Performance Expectancy	0.816	4
Level of Adoption	0.927	5

As a result of the statistical analysis and feedback provided from the reviewers of the instrument, who were not participants of the survey, a total of 17 questions were removed for the actual survey instrument (see Appendix C). This was done to streamline the survey, based on the comments noted earlier regarding the length of the scale. The questions removed from the pilot instrument were from eight out of the nine constructs tested. Although questions were removed, care was taken to maintain a valid and reliable instrument. The quantitative self-efficacy construct was the only construct for which all questions remained. Table 12 details the constructs and the numbers of the questions that were removed.

Table 12

Questions Removed for Pilot Survey Instrument

Constructs	Removed item numbers
General Self-Efficacy	4, 5, 6, 7, 8, 10, 11
Quantitative Self-Efficacy	None
Social Influence	25
Tool Availability	28
Data Availability	36, 37
Fear Appeals	39, 41
Effort Expectancy	43
Performance Expectancy	51
Level of Adoption	54, 55

As a result of analyzing the pilot data, changes were made to the initial survey to shorten its length. Following the logic of Johnston and Warkentin (2010), “factor loadings were reviewed to ensure that items loaded cleanly on those constructs to which they were intended to load, and did not cross-load on constructs to which they should not load” (p. 557). Table 13 shows the number of items remaining in each construct. The shortened final survey instrument can be found in Appendix D.

Table 13

Test of Reliability Statistics for the Full-Scale Instrument

Measured constructs	Cronbach’s alpha	Number of items remaining
General Self-Efficacy	0.808	7
Quantitative Self-Efficacy	0.853	6
Social Influence	0.853	5
Tool Availability	0.821	5
Data Availability	0.709	3
Fear Appeals	0.793	4
Effort Expectancy	0.927	4
Performance Expectancy	0.780	4
Level of Adoption	0.693	5

Full-Scale Study

In compliance with Nova Southeastern University's Internal Review Board (IRB) process, this researcher submitted for approval a completed IRB with Human Subjects submission form, including, but not limited to, all necessary documents, such as informed and voluntary consent forms, a copy of the letter to participants informing them of the anonymity and confidentiality of the research survey (see Appendix E), and a copy of the survey to be administered (see Appendix D). The submission of all paperwork to IRB was approved (IRB # 061401) before administering the survey.

The instrument was administered through SurveyMonkey to ensure confidentiality and anonymity. Participants completed the survey on a voluntary basis. The survey consisted of demographic questions, which included their current position to ensure the respondents were currently working in the field of HR at the time the respondents participated in the survey, and specific questions relating to the variables contained in the model.

Data Collection

Several technological methods of data collection were used. Electronic mail (e-mail) was sent to personal contacts of this researcher, as this researcher has experience as an HR consultant, educator, and practitioner, as well as being an HR professional. Social network sites (SNSs), including LinkedIn, Twitter, and Facebook, were also utilized. A computerized data collection strategy was employed whereby the subjects received the survey instrument via a link to the survey on SurveyMonkey (Fleming & Wilson, 2001). A complete timeline of the computerized data collection strategy is found in Appendix F.

In an effort to recruit participants, an explanation of the study and an invitation

with the survey link was posted on this researcher's LinkedIn profile page (see Appendix G). This was done to invite LinkedIn members directly connected to this researcher to take the survey. In addition, this researcher's profile was updated to show potential participants the investigator is an academic researcher at Nova Southeastern University and to avoid the assumptions this researcher may be a vendor of HR analytic software.

A sample of HR professionals who were affiliated with the same specific HR groups as this researcher within LinkedIn were targeted as well and invited to connect with this researcher. HR groups such as HR & Workforce Analytics, HR Professionals Worldwide, SHRM, PHR Linked, HR Girlfriends, Hispanic HR Network, HR Executive Network, HR.com, and Linked: HR Technologies were just a few of the groups targeted. Once the group members accepted the investigator's request to connect, the group members were sent a survey link along with a letter containing an explanation of the purpose of the study and the assurance of anonymity and confidentiality (see Appendix G), as well as a request for their assistance by taking the survey and passing it on to others in the targeted population. This created a "snowball" effect. This type of snowball sampling is used when either the characteristics of a sample are very rare or when the expense to locate a sufficient sample size is extremely high (Fricker, 2008).

According to Fricker (2008), "snowball sampling relies on referrals from initial respondents to generate additional respondents" (p. 200). Snowball sampling is just another form of chain referral sampling whereby data is accumulated through social structures existing in SNSs (Bhutta, 2012), such as LinkedIn, Facebook, Twitter, and others. According to Bhutta (2012), "the researcher begins with a small sample from the target subpopulation and then extends the sample by asking those individuals to

recommend others for the study” (p. 59).

Another similar method used to recruit survey participants was to request the LinkedIn groups’ owners of HR & Workforce Analytics, HR Professionals Worldwide, SHRM, PHR Linked, HR Girlfriends, Hispanic HR Network, HR Executive Network, HR.com, and Linked: HR Technologies to post the invitation, an explanation of the study, and the survey link on their respective group’s page. This method only resulted in two groups’ owners accommodating the request, which were HR & Workforce Analytics and HR Girlfriends. The manager of HR & Workforce Analytics LinkedIn group stated, “Hi Roslyn, I have shared your survey on my scoop.it page to help get a few more entries, you can view here: <http://www.scoop.it/t/hr-workforce-analytics>” (personal communication, June, 18, 2014). The manager of HR Girlfriends LinkedIn group wrote, “Hi! I am posting a social media blast for you to get more survey responses. The blasts will go out in the morning! All the best. . . .” (personal communication, September, 4, 2014). There also was a request for members of the HR Girlfriends LinkedIn group to take the survey with a post pleading to help this researcher earn a doctoral degree by taking the survey (see Appendix H). Since the survey was completely anonymous, the response rate from these groups is unknown, but there was a slight increase in completed surveys shortly thereafter.

Yet another method used to recruit participants was to add the survey link on this researcher’s Facebook page. A new Facebook page was created and included the survey instrument link, which was hosted by SurveyMonkey.

In addition, the survey link was sent via e-mail to HR professionals who were personally known to this researcher and were currently working in the field of HR. The e-

mail included a request to pass on the survey link to other HR professionals within their networks (see Appendix G). The survey link was also sent out in a tweet on Twitter to those HR professionals who are current followers of this researcher.

Periodic checks of the survey were consistently done in order to monitor the progression of legitimate survey respondents and completion status. Due to the low numbers of completed surveys in relation to those started, another method to recruit participants was used, employing LinkedIn. LinkedIn gives one the ability to grow his or her professional network, which allows for a larger pool of potential survey respondents. LinkedIn has three different levels of connections; first, second, and third. First-level connections on LinkedIn are those members who are directly connected to an individual LinkedIn member and who are personally known or can be trusted on a professional level; second-level connections are those members who are connected to the individual's first-level connection(s); and third-level connections are those members connected to the individual's second-level connection(s). It should be noted that due to members' privacy settings on LinkedIn, it was challenging to reach them and to even request the member to connect with this researcher.

It was evident that linking directly to second- and third-level professional network connections through LinkedIn was an easier and faster way to reach potential respondents. It was obvious that HR professionals who were indirectly connected to this researcher, through professional groups on social media, were more apt to accept a request to connect on LinkedIn. Once a connection was accepted, a request to participate in the survey, which included the survey link, was sent immediately (see Appendix G).

Another attempt to increase the survey response rate was to refresh the request to

participate in the survey on HR Girlfriends' page on LinkedIn. A response from the group's manager advised an e-mail blast would be sent to their membership in an effort to get more survey responses for this researcher. Due to the efforts to connect with HR professionals on LinkedIn to participate in the study, a noticeable increase in first-level connections resulted. Prior to the recruitment of survey participants, the researcher had less than 500 LinkedIn connections. At this time, the researcher has over 1,000 LinkedIn connections.

Full-Scale Methods of Analysis

Adoption research can give insight into the barriers and motivations that can impact the decision to adopt an innovation or not (Hubbard & Sandmann, 2007). By using instruments from prior research that have been shown to be valid and reliable, a quantitative approach was used in analyzing the data. According to Holton and Burnett (as cited in Swanson & Holton, 1997), the quantitative method "approach has a rich tradition and has contributed a substantial portion of the knowledge in human resource development (HRD)" (p. 65).

To test the hypothesis and the theoretical model (see Appendix I), partial least squares (PLS) was chosen as a method of structural modeling analysis using Addinsoft XLSTAT. According to Tobias (1995), "PLS is a method for constructing predictive models when the factors are many and highly collinear" (p. 1). Following the logic of Venkatesh et al. (2012), PLS should be used, as this study has "a number in interaction terms, and PLS is capable of testing these effects" (p. 167).

Sample. The sample size for the primary study was 302 ($n = 302$) HR professionals, with a scale of nine constructs, which were tested for reliability and

hypothesis support (see Table 14 for the respondents' demographics).

Table 14

Respondents' Demographics

Respondents' characteristics	Frequency	Percentages
Gender		
Male	72	24
Female	230	76
Age (Generation)		
Millennials (18–30)	33	11
Generation X (31–50)	165	55
Baby Boomers (51–75)	104	34
Education		
Associate Degree or less	34	11
Bachelor Degree	123	41
Graduate and Postgraduate Degrees	145	48
HR Tenure		
Range	1–51 years	
Mean	15.4 years	

Several articles (Ramirez, 2012; Regan & Dean, 2014) have shown that over 70% of HR professionals are female. This concurs with the findings of this study, which show that 76% of the respondents are female. According to the Bureau of Labor Statistics (BLS, 2014), HR professionals have more than 5 years of experience in the field of HR. Again this is consistent with the participants of this study, where the mean of HR tenure is 15.4 years. BLS (2014) figures regarding education show a bachelor's degree is required for entry-level positions, whereas the National Center for O*Net Development (O*Net, 2013) lists 68% of HR professionals have a bachelor's degree and 18% of HR professionals hold a master's degree. However, this is not in agreement with the participants of this study, of which 41% hold a bachelor's degree and 48% hold a master's degree. It is important to note that the information from BLS and O*Net are not

as current as this study.

Summary

This chapter outlined and explained the methodology used in this investigation, which included data collection and tools used to collect and analyze the data. The methods outlined in this chapter were followed closely to assure that the data collection and analyses were done in a manner that was statistically correct and ensured confidentiality and anonymity of the participants. The results of the statistical data and the testing of the hypotheses are presented in the next chapter.

CHAPTER IV

ANALYSIS AND PRESENTATION OF FINDINGS

The previous chapter explained the data collection process and analysis techniques as well as the methodology of the study. The data analysis was done in a manner that was statistically correct and appropriate to the data collection. This chapter discusses the results of the statistical data of the study and the testing of the hypotheses.

Exploratory Factor Analysis

Exploratory factor analysis with Varimax factor rotation was conducted using IBM SPSS 21.0. To ensure reliability and consistency of the model, instrument items, which did not load properly, were removed. This was done repeatedly until only the instrument items that loaded properly remained. Table 15 details all construct loadings.

Measurement Model

As noted in Table 15, all instrument items did not load as expected; therefore, those that did not load were removed. Eliminated items included variables such as general self-efficacy, item 4 (I can solve most problems if I invest the necessary effort); quantitative self-efficacy, item 11 (I enjoy working with mathematical and/or statistical measures) and item 12 (I find mathematical and/or statistical measure challenging); organization social influence, item 18 (Because of my use of HR analytics, others in my organization would see me as a more valuable employee); fear appeals, item 28 (It is unlikely I would be forced to try or use HR analytics to keep my job); and performance expectancy, item 38 (The use of HR analytics is not very visible in my organization).

Table 15

Measurement Model

Construct	Question	SL	AVE	DG rho
General Self-Efficacy	5. When I am confronted with a problem, I can usually find several solutions.	0.849	0.723	0.081
	6. If I am in trouble, I can usually think of a solution.	0.887		
	7. I can usually handle whatever comes my way.	0.814		
Quantitative Self-Efficacy	8. I find using mathematical and/or statistical measurements interesting.	0.848	0.599	0.879
	9. I worry about my ability to solve mathematical and/or statistical problems.	0.561R		
	10. I get nervous when I use mathematics and/or statistics.	0.675R		
	13. Math and/or statistics is one of my favorite subjects.	0.819		
	14. People who influence my behavior think that I should use HR Analytics.	0.946		
Individual Social Influence	15. People who are important to me think that I should use HR Analytics.	0.945	0.894	0.889
	16. The senior management of this business has been helpful in the use of HR Analytics.	0.934		
Tool Availability	19. I have a full array of HR Analytics tools available at work if I choose to use them.	0.775	0.584	0.875
	20. My company has invested heavily in HR Analytics tools.	0.792		
	21. Before deciding whether to use any HR Analytics applications, I am able to properly try them out.	0.693		
	22. I have had a great deal of opportunity to try various HR Analytics applications.	0.809		
	23. I know where I can go to satisfactorily try out various uses of HR Analytics.	0.745		
Data Availability	24. My organization's database has all the data I need to use HR Analytics software.	0.897	0.626	0.839
	25. My organization's HR system collects data from all HR interactions.	0.897		
	26. My organization uses the same system/platforms for all HR activities.	0.518		
Fear Appeals	27. If I were forced to use HR Analytics, it would have a negative effect on my organizational commitment.	0.744	0.709	0.880
	29. If I were required to use HR Analytics, it would have a significant negative impact on my job performance.	0.869		
	30. If I were mandated to use HR Analytics, it would have a negative effect on my job satisfaction.	0.904		

(continued)

Construct	Question	SL	AVE	DG rho
Effort Expectancy	31. It would be easy for me to become skillful at using HR Analytics.	0.833		0.948
	32. Learning to use HR Analytics is easy for me.	0.944		
	33. It is easy for me to become skillful at using HR Analytics.	0.934		
	34. I would find HR Analytics easy to use.	0.906		
Performance Expectancy	35. I would find the use of HR Analytics useful in my job.	0.842	0.692	0.872
	36. Using HR Analytics enables me to accomplish tasks more quickly.	0.818		
	37. Using HR Analytics increases my job performance.	0.837		
Individual-Level Adoption	40. I am beginning to explore using HR Analytics.	0.545	0.512	0.813
	41. I am interested in using HR Analytics.	0.775		
	42. I am recommending my organization invest in HR Analytics.	0.782		
	43. I use HR Analytics for some specific tasks.	0.735		
Organizational-Level Adoption	39. My organization is putting a policy in place to use HR Analytics.	1.000		

Note. SL = standardized loading; AVE = average variance extracted, percentage of variance of item explained by the latent variable; DG Rho = composite reliability p (Werts, Linn, & Jörsekog, 1974).

Individual remaining items for constructs had acceptable standardized loadings exceeding the customary 0.707 (Hulland, 1999) threshold suggesting they are measuring the construct on which they loaded. Similarly, there were no significant cross-loadings between items of constructs found that were dissimilar. Each of the constructs had values of Dillon Goldstein's composite reliability (DG Rho) indicator greater than 0.70 (Fornell & Larcker, 1981) and explained more than 50% of the average variance extracted (AVE), thereby establishing construct reliability and convergent validity. Furthermore, the AVE of each latent variable exceeded the squared correlations between constructs, suggesting satisfactory discriminant validity (Chin, 1998; Fornell & Larcker, 1981), as shown in Table 16.

Table 16

Discriminant Validity

Constructs	Mean	SD	EE	DA	FA	PE	TA	QSE	ILA	ISI	OSI	GSE	AVE
Effort Expectancy	4.956	1.260	0.927										0.820
Data Availability	3.575	1.260	0.004	0.709									0.626
Fear Appeals	2.579	1.171	0.158	0.001	0.793								0.709
Performance Expectancy	5.167	1.038	0.192	0.003	0.152	0.780							0.692
Tool Availability	3.302	1.280	0.025	0.219	0.000	0.017	0.821						0.584
Quantitative Self-Efficacy	4.347	1.480	0.250	0.002	0.109	0.089	0.009	0.853					0.599
Individual Level of Adoption	4.646	1.067	0.145	0.001	0.143	0.328	0.036	0.079	0.693				0.512
Individual Social Influence	4.282	1.296	0.005	0.000	0.010	0.081	0.017	0.022	0.089	0.799			0.894
Organization Social Influence	4.114	1.548	0.000	0.058	0.003	0.022	0.188	0.000	0.040	0.171	0.853		0.872
General Self-Efficacy	5.663	0.963	0.062	0.000	0.043	0.028	0.000	0.019	0.008	0.001	0.000	0.808	0.723

Note. Presented in the table are squared correlations with Cronbach's alphas on the diagonal. Discriminant validity requires mean communalities (AVE) to exceed squared correlations between constructs.

Structural Model

The values for the goodness-of-fit (GoF) exceeded the suggested threshold of 0.36 for absolute GoF (Wetzels, Odekerken-Schröder, & van Oppen, 2009) and 0.70 for the relative GoF (Vinzi, Trinchera, & Amato, 2010). Results from the structural model analysis are presented in Table 17.

The significance of standardized path coefficients was obtained using bootstrap with 100 re-samplings and 100 iterations (Chin, 1998); bootstrapped standard errors of the estimates were included for completeness, and all path estimates (both direct and indirect) were significant at 5%. Path coefficients data for the structural model show there were five significant paths and three that were not significant. Table 17 also details which hypotheses were supported and which were not supported. Those supported include H₁ (Social influence is positively related to the adoption of HRA), H₂ (Tool availability is positively related to the adoption of HRA), H₅ (Effort expectancy is positively related to the adoption of HRA), H₆ (Performance expectancy is positively related to the adoption of HRA), and H₈ (Quantitative self-efficacy is positively related to the adoption of HRA).

Conversely, data availability, fear appeals, and self-efficacy did not relate positively to the adoption of HRA. The findings show there is a negative impact to the individual-level adoption of HRA, even when there is data available. This agrees with literature indicating HR professionals find it difficult to differentiate and understand data, which is related to self-efficacy. Fear appeals, which is the message conveyed regarding the adoption of HRA, had negative impact on the adoption.

Table 17

Path Estimates to Individual-Level Adoption (ILA)

Path estimates to ILA	Direct standardized effect	R ²	Hypothesis and result	Rank
Social Influence	0.126*		H ₁ – Supported	3
Tool Availability	0.081*		H ₂ – Supported	5
Data Availability	0.012		H ₃ – Not supported	
Fear Appeals	-0.161*		H ₄ – Not supported	2
Effort Expectancy	0.162*		H ₅ – Supported	2
Performance Expectancy	0.244*		H ₆ – Supported	1
General Self-Efficacy	0.058		H ₇ – Not supported	
Quantitative Self-Efficacy	0.120*		H ₈ – Supported	4
Individual Adoption		.357		
Model Goodness-of-Fit				
Absolute GoF	0.583			
Relative GoF	0.817			

Note. * p -value < 0.05; Significance of standardized path coefficients were obtained using bootstrap with 100 re-samplings and 100 iterations (Chin, 1998).

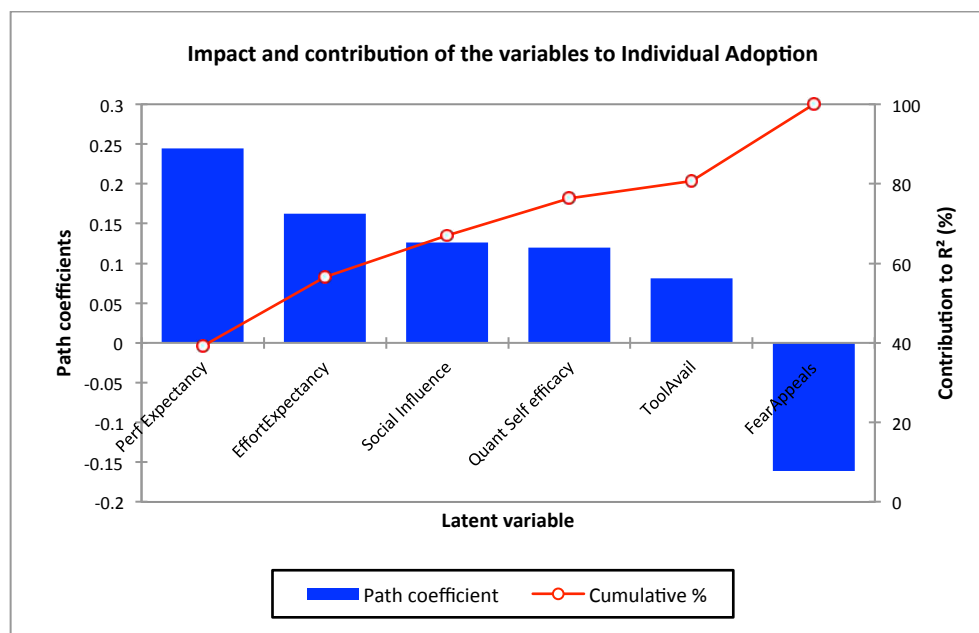


Figure 4. Impact and contribution of the variables to individual adoption.

Figure 4 details the percentage of the impact and contribution of the variables to the R^2 of the individual-level adoption, not directly to the level of adoption. The data in Table 17 shows the ranking in terms of importance. Performance expectancy ranks the highest in terms of importance, whereas fear appeals also appears to be important, but negatively, in the opposite direction hypothesized. Hence, H_4 was not supported.

While the basis of this study was to investigate the individual-level adoption, it is important to note the effect of the organizational adoption. If HRA is not adopted by the organization, appropriate resources might not be available, despite the individual's possible desire to adopt HRA. Table 18 shows the path coefficients and the order of importance, whereas Figure 5 details the percentage of the contribution of the variables to the organizational-level adoption.

Table 18

Path Estimates to Organizational-Level Adoption (OLA)

Path estimates to OLA	Direct standardized effect	R^2	Rank
Social Influence	0.032*		3
Tool Availability	0.034*		2
Data Availability	0.036*		1
Fear Appeals	0.041		
Effort Expectancy	0.038		
Performance Expectancy	0.038		
General Self-Efficacy	0.051		
Quantitative Self-Efficacy	0.047		
Organizational Adoption		0.288	
Model Goodness-of-Fit			
Absolute GoF	0.583		
Relative GoF	0.817		

Note. * p -value < 0.05; Significance of standardized path coefficients were obtained using bootstrap with 100 re-samplings and 100 iterations (Chin, 1998).

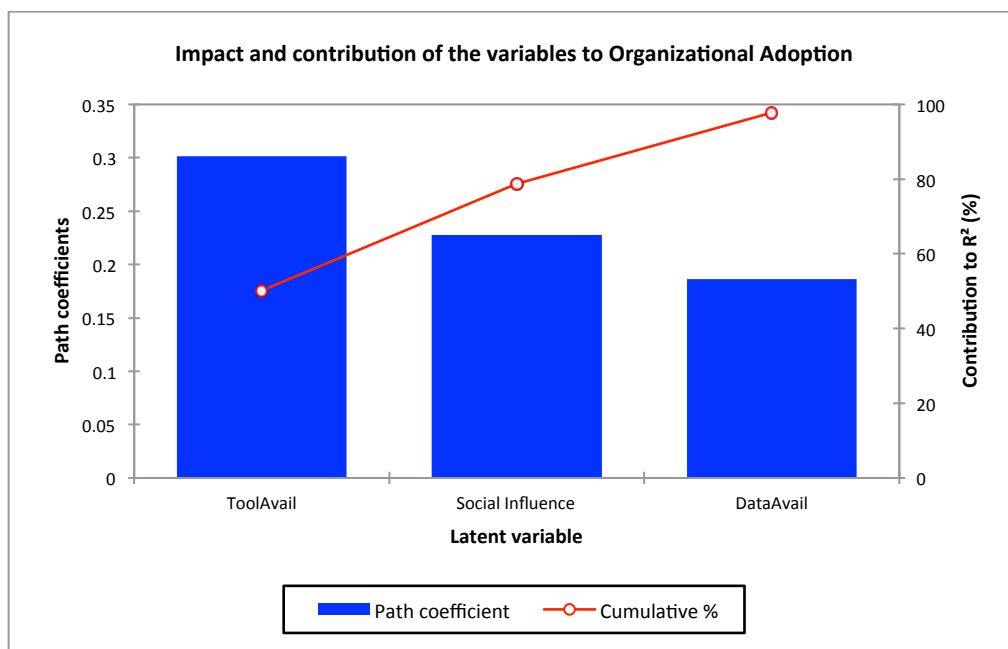


Figure 5. Impact and contribution of the variables to organizational adoption.

The structural model in Figure 6 details the significant path values, which are the bolded figures. The path coefficients on the solid line are those related to the adoption of HRA at the individual level and the basis of this study. Hence, performance expectancy has a strong impact on the HR professionals' decision to adopt HRA. Effort expectancy, social influence, quantitative self-efficacy, and tool availability all have a positive impact on the adoption of HRA. Conversely, fear appeals had a strong impact on the adoption of HRA, but in the opposite direction as hypothesized (see Table 17 for ranking of importance). The path coefficients on the dotted line are those related to the adoption of HRA at the organizational level. Similar to the individual-level adoption, data availability, tool availability, and social influence all have shown to have a positive impact on the adoption of HRA, from the organization (see Table 18 for ranking of importance). Although the level of adoption at the organizational level was not the basis of this study, it is important to show the effects.

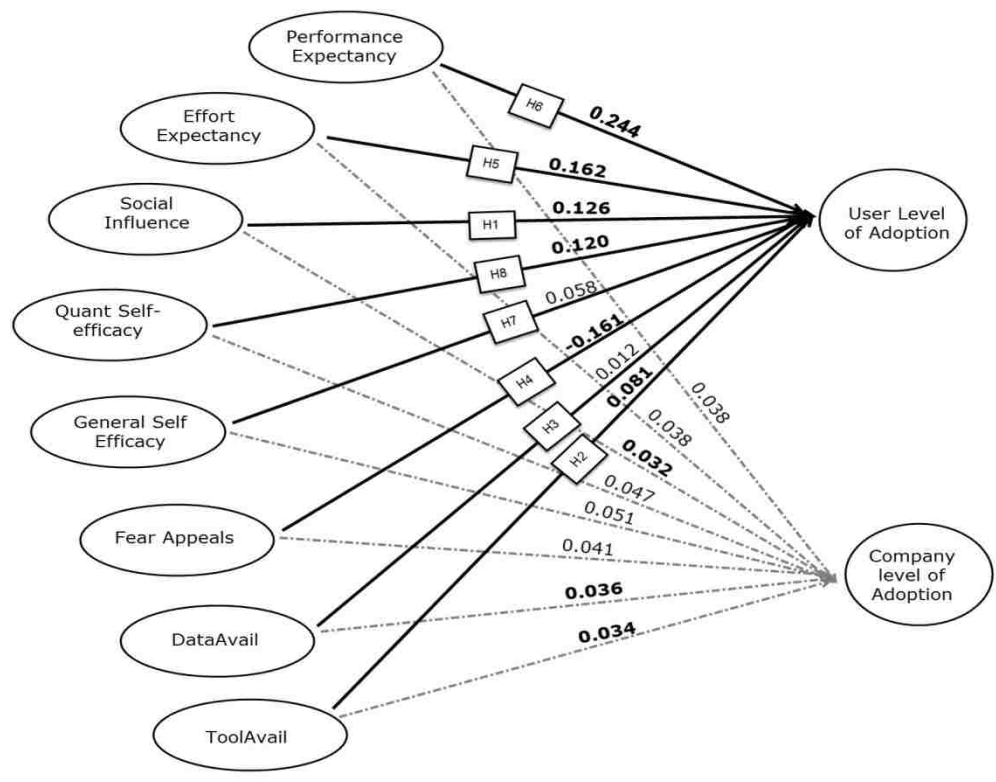


Figure 6. Structural model. All significant path values are bolded.

Summary

This chapter outlined the results of the statistical data of the study and the testing of the hypotheses. The following chapter will discuss implications, limitations, and future research.

CHAPTER V

SUMMARY AND CONCLUSIONS

Introduction

Today, there is a significant push for human resource (HR) professionals to embrace the use of analytics and align perspectives with the business and financial side of the organization or to be left behind (Fitz-enz, 2013). HR professionals must begin to make use of the data being collected within the organization and use it to analyze and predict outcomes to be more successful. Some executives believe HR professionals analyze only what has happened, while lacking a perspective and a bottom-line mindset (Stuart, 2005). Using data analytics and its predictive capabilities will allow the HR professional to become a more strategic partner by aligning HR practices with that of the future direction of the organization.

HR professionals can use HRA in developing measurements from a quantitative standpoint, which will give executives a different view of the HR professional's contribution to the economic outcomes the organization strives to attain (Cascio & Boudreau, 2011). Data which tracks workplace injuries, the use of insurance, attendance, turnover intentions, and other HR activities usually viewed in terms of the present or past, also can be analyzed and used to predict and manage future costs. HRA and measurement strategies can work to address quantity, quality, and costs incurred when there is change in the workforce, whether due to layoffs, promotions, or retirements (Cascio & Boudreau, 2011). The use of HRA provides measurable outcomes that can be used to manage talent, which, in turn, potentially increases productivity through targeting the training and development that will be needed (Cascio & Boudreau, 2011; Osborn, 1990). For

companies to be successful in today's global environment, the pursuit of innovation must be encouraged to gain a competitive advantage in the marketplace (Bersin, 2013d; Gardner et al., 2011; Giuffrida, 2013). HR professionals understand that hiring and retaining the right talent, and the mix of talent, is an integral part of a company's success. Companies such as Best Buy, Sysco, SAP America, Inc., Marriott Vacation Club, and others use HRA to track engagement, incentives, leadership, absenteeism, and other trends (Bassi, 2012). While the basis of this study was to investigate the individual-level adoption of HRA among HR professionals, it is important to note the effects of the organizational context in terms of providing the support and resources necessary to use HRA. Adoption of innovation at the organizational level was used only as the arena in which the individual operates and to determine if the organization's non-adoption of HRA influences, or provides a barrier to the HR professional's decision to use HRA.

This chapter provides discussion of the results of this study as well as the implications of this study. These implications, both theoretical and practical, are presented, as well as recommendations for future research.

Discussion

Individual-level adoption. "In short, many organizations are 'hitting a wall' in HR measurement" (Cascio & Boudreau, 2011, p. 8). The purpose of this study was to gain insight as to the reasons why most HR professionals are hitting a wall by not adopting HRA to improve organizational performance. As a result of this study, there is now empirical evidence to determine how to remove or scale this wall and move forward. This research addresses the gap in individual-level adoption of technological innovation

theory and the HR professional's adoption of the use of HRA in the field of human resource management (HRM).

Bersin (2013d) discussed the datafication of learning in an article in *Chief Learning Officer Magazine* and suggested HR professionals are often not well versed in analytics. While there are some HR professionals who have become more accustomed to the use of metrics, the profession lags behind (Lockwood, 2007). Practitioner research outlines the shortcomings of HR professionals when it comes to the use of analytics and metrics (Rafter, 2013a). The extant literature further reports that many organizational executives still view HR as a "cost center" dealing primarily with soft skills. This research extends the literature on the adoption of innovation at the individual level of HRA and shows the connection between academic research and practice.

Having the appropriate HRA tools available for adoption has a significant impact on the HR professionals' decision to use HRA. Validation of the importance of availability of resources can be seen in a statement sent via a LinkedIn e-mail from a respondent of the survey: ". . . I love math and working with numbers is something I keep looking forward to, my current job doesn't challenging me in such aspect, however, I am up for the challenge . . ." (Anonymous, personal communication, September 10, 2014; see Appendix A for this comment and other respondent comments). Systems and software are not the only tools necessary in the use of analytics.

Individuals with the necessary skill sets are an important factor, as they will need to know what data is needed, how to analyze the data, and how to interpret the data for reporting purposes and decision making (Carlson & Kavanagh, 2011). These could be

reasons why the impact of adopting and using HRA was not as strong. Colleges, universities, and SHRM should be providing the resources to fill this void.

Currently, there are many HR technology vendors attempting to seduce organizations into buying portions or their entire packages of software. Unfortunately, there are many small and medium-sized organizations that do not have the financial means to make these tools available, which would also include training the HR professionals in the use of the software. Similarly, some of these software packages may not be compatible with the technological systems currently used by the organizations, and upgrading their technology could be a financial burden for the organization as well. It should be noted that some practitioners consider the use of Human Resource Information Systems (HRIS) for ad hoc reporting of past data, using analytics (Bassi, 2012).

Fear appeals are statements, describing an outcome, whether positive or negative in nature. For instance, in order to change the behavior of a cigarette smoker, the communication or fear appeal would be framed as “smoking causes cancer.” Fear appeals studies have found a significant positive effect on the modification of beliefs, attitudes, and behavior, as respondents worry about the effects smoking may have on their health. Based on findings of this study, the way in which the message is conveyed and what threats are made—direct or indirect—seem to have a negative effect on the HR professional’s adoption decision. It is difficult to tell whether or not there is an actual threat viewed by the HR professionals, and rather than motivating them it could be demotivating them. This could be centered on how the message is framed to persuade HR professionals in using HRA. Therefore, it is important to note that each individual’s fear and arousal of fear is different and dependent on the environment or relational situation

(Rogers, 1975). Several reports indicate that CFOs and those employed in the area of finance are starting to take over the role of HR (Bassi, 2011). Similarly, organizations that have implemented HRA are housing those functions outside of the area of HR (Fitzenz, 2013). Perhaps the fear of the profession being minimized should be the basis of the HR professional's targeted fear.

A finding of this study is that HR professionals' perception of how easy it is to use HRA positively impacts their decision to adopt its use. When HR professionals have the expectation that HRA is easy to use, there is a likelihood they will use or attempt to use HRA. Prior research has suggested when there is a degree of ease associated with using a technological system, adopting and using the system is more significant for women than for men (Bem & Allen, 1974; Bozionelos, 1996; Venkatesh et al., 2012). Since 76% of the respondents of this study were women, this seems to be in line with the prior research. Women, who find using a new technology easy, are more apt to make a decision to use the technology, in this case, HRA. Accordingly, based on prior practitioner research (Simon, 2013), HR professionals tend to circumvent the analysis of data. Information provided by SHRM, the world's largest HR membership organization (SHRM representative, personal communication, December 9, 2014), states approximately 69% of their members are women. Since the majority in SHRM are women, HR professionals may be less likely to use HRA, unless the systems are easy to use and training is provided. Prior research suggests that women are limited by their own beliefs that traditionally male occupations are unsuitable for them because they feel they lack the aptitudes to master essential skills, such as data analysis (Bandura, 1982; Talukder & Quazi, 2011).

Results show that HR professionals who perceive using HRA will enhance their job performance, which may lead to promotions, are more likely to adopt HRA. The expected improvement in performance has proven to be a “strong predictor of behavioral intention” (Venkatesh et al., 2012, p. 160). This finding concurs with prior studies that have found that when individuals believe using the technology, will help to achieve improvements in job performance, it has a significant impact on one’s intention to use the technology and the behaviors associated with the use (Venkatesh et al., 2003).

Based on a finding of this study, if HR professionals believe they are not capable of performing at their best using HRA, they will not be agreeable to its use. This can be caused by their lack of confidence in their ability to use analytics (Bandura, 1982; Boyd & Crawford, 2011). Researchers also have argued there would be a negative impact on adoption of innovation due to tenure with an organization as well as age (Damanpour & Schneider, 2008). Hence, the results of this study are consistent regarding tenure, as 71% of the respondents have over 10 years of work experience in the field of HR, and 89% of the respondents are over the age of 31. Conversely, Talukder et al. (2008) found in their research that there was no significant difference in innovation adoption with regard to technology, as its use seemed to be understood by all employees related to their work tasks and not related to tenure.

An individual’s comfort level with his or her quantitative skills positively impacted his or her decision to use HRA. Prior studies show there is an attitudinal relationship between mathematical literacy (ML) (Ozgen, 2013; Ozgen & Bindak, 2008) and mathematical anxiety (MA) (Hendel, 1980), which, for the purposes of this study, is quantitative self-efficacy. The attitudinal relationship stems from the individual’s

connection of math itself and how math is used in the real world (Ozgen, 2013). Those who have difficulties in connecting math to real world problems have a negative attitude towards ML, therefore causing MA (Ozgen, 2013). The opposite holds true for those who are able to make the connection between math and the real world (Ozgen, 2013). The individual's comfort level is similar to the belief that one has the capabilities of performing an action, in this case, HRA. This can also be validated by a respondent's comment sent to this researcher in an e-mail through LinkedIn: "... many HR people are afraid of anything mathematical, yet it's the very thing that can give credibility to our decisions" (Anonymous, personal communication, September 13, 2014; see Appendix A).

There have been studies on quantitative performance based on gender showing no support for the theories that gender plays a role in the use of quantitative measures (Hendel, 1980). Boyd and Crawford (2011), however, found that the adoption of an innovation based on skills, in this case, HRA, is determined by gender, which is in keeping with the reports in this study, as there are a high percentage of female respondents.

A finding of this study indicates the influence of a person's social membership has a positive influence on an individual's adoption of HRA. This finding corresponds with other studies that also found colleagues and coworkers can have an impact and influence the behavior, "motivation, and encouragement" of the adoption of an innovation (Talukder & Quazi, 2011, p. 21). HR professional organizations such as the Society for Human Resource Management (SHRM) or any of its affiliates should unequivocally support the use of HRA by providing resources and offering training to

scale this wall. Hence, the probability of making the decision to use HRA by HR professionals would likely increase because of their support. Currently, it appears there is limited conversation within SHRM, the society itself, and its members concerning this topic.

The influence of adopting HRA could also come from colleges and universities by promoting and communicating the importance of using HRA in their courses.

Conversely, colleges and universities that do not offer or provide the necessary training and/or skill sets, such as courses on the use of HR analytics within their HR programs, are missing an opportunity to influence graduating students' choice in using HRA.

Colleges and universities that are not currently offering these metrics in their HR programs should explore adding such courses for their students' future success in HR.

This result is consistent with prior research, in particular, Johnston et al. (2010). Social influence can be a factor in the individual's adoption of an innovation as it was found to be in HRA adoption. As long as the individual believes adopting would be beneficial for their careers, the individual may emulate the influencer and adopt the innovation (Frambach & Schillewaert, 2002). HR analytics champions should encourage other HR professionals and HR associations, through local, national, global and social media networks to use HRA.

The availability of data has a very strong impact on HR professionals' decision to use HRA in the organization. However, a finding of this research shows that even when data is available, HR professionals are less likely to use HRA. This is in line with the fact that studies show there is an enormous amount of data being collected by organizations but may not be available to HR (Boyd & Crawford, 2011). This concurs with Gale

(2012), who indicated it is difficult for HR professionals to accurately and efficiently understand the similarities and differences existing in the data that organizations collect and store in multiple systems. Historically, HR professionals always have had information on each employee and have been able to easily, with a click of a mouse, have a report filled with data that can only tell stories of the past or present. Organizations such as Hewlett-Packard, Wikipedia, LinkedIn, and others are using HRA to predict who will be leaving the organization, what skill sets potential employees may have, and how employees will perform based on past performance and personality traits, just to name a few (Siegel, 2013). The concern here is that if HR professionals are not using the current data to predict the future, in terms of talent management, this could have a negative impact on the financial picture of the organization. Retaining top talent is as important as, hiring and training new talent as it is quite costly, and does not take into account the loss of productivity.

Role of the organization. As noted earlier, the basis of this study was to investigate an individual's adoption of HRA. Additionally, it is important to note the effects of the organization's support and resources, such as tools and training provided to employees. Without support and resources from the organization, the individual would be less likely to use HRA. However, it is important to note that HRA is a more recent type of measurement for HR professionals, and it would be beneficial for those who do not have the necessary skills to use HRA to work with early adopters of HRA, in an effort to gain the confidence to use the new innovation. Organizations can remove the barriers that might exist by providing their HR staff with opportunities to network with other HR professionals and be exposed to HRA champions.

Studies have found that the HR systems utilized in some organizations today are outdated and do not have the capabilities to work seamlessly with computers and infrastructures that are currently in use (Carlson & Kavanagh, 2011). Some organizations may not be upgrading their systems as often in the HR department, as they do in marketing, finance, and operations. However, it is inconsistent with the 58% of the participants of this study reporting their organizations use HRA. Some HR practitioners believe their HRIS is the equivalent of using HRA, which creates the inconsistencies in the findings.

Implications for Theory

The unified theory of acceptance and use of technology (UTAUT) model has been used and continues to be used as the fundamental model in studies with multiple types of technologies. However, there is limited research regarding the adoption of HRA by HR professionals. This study extends the adoption theory of individual-level adoption by addressing the gap and analyzing the adoption factors, which impact the adoption of HRA among HR professionals as well as retests the UTAUT model for validity of the scales.

This study analyzed the connection between the individual level of adoption of HRA and social influence, tool availability, data availability, fear appeals, effort expectancy, performance expectancy, general self-efficacy, and quantitative self-efficacy. A combination of variables from prior studies of Davis (1989), Fishbein and Ajzen (1975), Rogers (1983), Moore and Benbasat (1991), and Venkatesh (2003), all of whom investigated effort expectancy and performance expectancy, were used in the development of the model for this study. Other variables such as social influence, tool

availability, data availability, fear appeals, general self-efficacy, and quantitative self-efficacy from prior studies of Konana and Balasubramanian (2005), Talukder and Quazi (2001), Carlson and Kavanagh (2011), Johnston (2006), O'Keefe (2002), Bandura (1977), Ozgen (2013), and Hendel (1980), respectively, were also adopted in the development of this model. A finding of the study shows the ranking in order of importance of these variables are (a) performance expectancy, (b) effort expectancy and fear appeals, (c) social influence, (d) quantitative self-efficacy, and (e) tool availability.

The analysis of this study shows the positive impact social influence, tool availability, effort expectancy, performance expectancy, and quantitative self-efficacy have on the adoption of HRA. Conversely, data availability, fear appeals, and general self-efficacy show there is a negative impact. Interestingly enough, findings show there is a negative impact to the individual-level adoption of HRA, even when there is data available. This agrees with literature indicating HR professionals find it difficult to differentiate and understand data, which is also related to self-efficacy.

This study also explores what causes an organization to adopt the innovation of HRA as opposed to the individual, so that the organization can diffuse the innovation. Without support and resources given to the individual by the organization, adoption will be limited.

Implications for Practice

This study indicates that performance expectancy, effort expectancy, fear appeals and social influence, are the most important factors in the HR professionals' decision to use HRA. This comes as no surprise, since HR professionals, for the most part, spend most of their time in relationship building and utilizing their soft skills. Recently, the

term *human resource business partner (HRBP)* has been discussed in recruiting HR professionals, but only in the context of a title. A true business partner must have an understanding of the actual business as a whole. Therefore, HR professionals should take note of the latest trends in analytics and begin to consider using HRA, if they seek to become a true strategic partner of the organization and earn a seat at the executive table.

As the leading HR authority in providing resources to HR professionals and being an organization having the largest membership count dedicated to HRM, SHRM and its affiliates, both locally and globally, should actively promote the use of HRA to their members. Likewise, HR professionals who are currently using HRA should mentor their counterparts who are not using analytics in HR to help them scale the wall. Companies can and should provide time and resources to encourage and facilitate such mentoring. Consequently, this will give support to those who do not have the comfort level for using analytics or quantitative methods.

HR professionals enrolled in colleges and universities should consider taking courses geared towards analytics, even if it is an elective. Similarly, those HR professionals not enrolled in an academic institution should, at a minimum, attend continuing education, training workshops or webinars on the use of HRA.

More senior HR professionals also should begin to encourage and collaborate with their junior counterparts, who may have some quantitative and software skills knowledge and together create a professional learning community within their organizations and networks. Actively seeking opportunities to learn or improving how to use HRA would be beneficial to the HR profession. HR professionals must avoid lagging

behind in adopting HR metrics. Otherwise, they risk becoming irrelevant in the corporate decision making process.

Human capital, which is recognized as one of the most important assets of an organization, has also been identified as one of the major costs for an organization. Currently, many HR professionals struggle with ensuring there are no biases during the hiring process in order to be compliant with legalities. However, there are some unconscious or hidden biases that exist, such as gender, age, in-group, “looks like me”, the infamous halo or horn effect, and many others. These biases are frequently uncontrollable because HR professionals and managers use intuition to hire (Fitz-enz, 2010). The use of HRA will reduce these biases, as the use of objective measures will be used instead of mere intuition. The decisions become more objective rather than subjective. This also will reduce costs for the organization in hiring, performance management, and promotions, and it will eliminate any unnecessary legal issues regarding the aforementioned.

Many organizations currently have the ability to track their employees’ use of the Internet and block inappropriate websites. The data collected from this usage would be beneficial for HR professionals to predict the behaviors of the employees by using analytics. The data can provide insight as to how much time in productivity is lost due to cyberslacking; it could tell if employees are seeking other employment and be better prepared for the turnover or avoid the turnover of high performers altogether. This is one example of how data from functions outside of HR can be used for predictive analytics. However, the fact still remains that the HR professionals will need to understand what data needs to be collected, what data is already being collected and how to use the data to

make better assessments for the future. HR professionals need to climb over the wall they keep hitting by exploring, embracing, and adopting the use HRA.

Executive-level HR professionals should become knowledgeable in the area of HRA. A vested interest in the decision-making efforts in determining the appropriate software and tools vendors have to offer is paramount to the success of transitioning to this type of measurement tool and the acceptance of this innovation by the rest of the HR staff. The decision-making process should include costs, ease of use for the HR staff, training on the software, and its compatibility with their current technological systems.

Limitations

A limitation of this study is the fact that it is a cross-sectional study, not a longitudinal study. A longitudinal study would identify changes occurring, if any, at the individual level in the adoption of HRA.

Another limitation of the study is the self-reporting method employed on the ease of use and perceived usefulness in the adoption of HRA. It should be noted that participants on surveys tend to respond in a manner so that they come across in a more positive light (Donaldson & Grant-Vallone, 2002). Hence, there is a tendency to either over or under report. This is especially true with the items concerning general self-efficacy and quantitative self-efficacy, as they tend to be behavioral-type questions and may not be generalizable. Another limitation with self-reports is whether or not the participants have a good understanding of the questions asked, especially the study's definition of HRA. While the development of the various questions was meant to be as conventional as possible, they were worded to test the factors impacting the adoption of

HRA specifically (Moore & Benbasat, 1991). Therefore, the results of this study may not be generalizable.

While there were a few international respondents, this is not a good representation of global HR professionals. The great majority of this study's respondents (98%) work in the field of HR within the United States. In this era of globalization, being an early adopter of HRA would give a global organization a sustainable competitive advantage.

Social media was used to target and recruit the appropriate subjects for the study. SurveyMonkey was the tool chosen to administer the survey. These are newer methods of reaching subjects and collecting data. While there is significant extant literature explaining and promoting these methods, their use is the subject of some debate among some methodologists. After attempting several more traditional methods such as obtaining lists from targeted professional organizations, this was found to be the most feasible method to reach the desired population since it appears to be the method preferred by the respondents.

Recommendation for Future Research

Future studies can replicate this research on a larger scale. A more diverse sample, using a larger pool of respondents outside of the United States, should be sought. This study can also be replicated at the organizational level, to determine the most effective way for the organization to support the adoption of HRA and HR professionals.

Further research as to whether or not HR professionals with the wrong skill for using HRA are being graduated and hired should be investigated. Another recommendation would be to partner with SHRM at the national level in order to recruit their members as respondents. This would be a much broader and diverse sample, as

there are currently 254,035 SHRM national members (SHRM representative, personal communication, December 8, 2014; see Appendix J). Partnering with SHRM's local chapters and their affiliates, such as the Staffing Management Association (SMA), would also provide a larger sample of HR professionals for a future study.

Further research on non-adopters is recommended. As noted by Frambach and Schillewaert (2002), non-adoption is not the opposite of adoption (Gatignon & Robertson, 1989). Although there is extensive research on the adoption of innovation, there is a lack of research on the reasons for non-adoption.

Summary

This research illustrates various factors that impact the HR professional's adoption of HRA and presents findings indicating which factors appear to be more prevalent. Empirical and non-empirical literature, as well as HR practitioner literature on data analytics and innovation adoption literature at the individual level, specifically human resource analytics among HR professionals is extended. The broader impact of this research aims to change the views of HR professionals who are still involved with past practices of 20th century management and relationship building (Sullivan, 2013), rather than the more recent focus of being a strategic business partner (Lockwood, 2007).

This study indicates that the factors impacting the adoption of HRA are in the hands of both the HR professional and the leadership of the organization. HR professionals need to understand that the employers are definitely looking to use analytics to gain and maintain a competitive advantage. HR professionals look to recruit candidates for various departments in the organization who are tech savvy and understand how to analyze data. HR professionals need to take the same approach when recruiting and

hiring HR professionals within their own departments and should start adopting HRA themselves to be at the forefront of implementing the new era of data analytics in HR.

Similarly, leaders of organizations who are looking to gain a competitive advantage in the decision-making processes related to HR and the organization must ensure that the necessary tools, data, support, and resources are made available to HR professionals to enhance decision-making.

APPENDIX A
SURVEY RESPONDENT'S COMMENTS

Date	Comments
05/10/2014	<p>Professor Vargas, I completed the survey in 18 minutes. It was lengthily, but you did mention the reason for that during class. I also thought I was not the appropriate individual to take the survey because my experience in HR is minimal.</p>
05/14/2014	<p>Hello Professor Vargas, I have reviewed your provided survey instrument, as requested. For someone who is currently not working in HR, I found the survey a bit overwhelming. It's not to say that I did not understand what was being asked; however, I would most likely not be able to answer some of the questions posed as I do not have all of my organizations HR Analytics tools available to me with which to respond. I do have to say that being someone with a somewhat low attention span with surveys, I do believe it was a tad long and repetitive at times. I can only assume that you are trying to ask similar questions in different ways in order to spark a different response. I hope that all goes well with your dissertation and that you are able to graduate very soon. It is quite evident that you are truly gifted in your trade and will continue to excel in what you do. Thanks for making our class so engaging. I really like that! Please let me know if you require any additional assistance. I will be taking your survey shortly. Best regards,</p>
06/08/2014	<p>Good evening Professor Vargas, The survey took 12 minutes to complete and it was clear this time around. This might have been an oversight but #47 is missing the "agree" option.</p> <p>Good afternoon Professor Vargas, I completed the survey. It took about 11 minutes and it was easy to understand. I did note an issue with the drop down on question 48. It did not have all the options as the other questions. It was specifically missing the option for agree. Have a great Sunday! Regards,</p>
06/09/2014	<p>Good evening the soon to be Dr Vargas, How are you? I am so happy to hear you are almost done! :) I would be more an happy to assist you. I am close with the SHRM President . Please send the email through my Nova: . I would be more than happy to get you in touch with him and his colleagues! :)</p>
06/10/2014	<p>Hi Ros! Not a problem....I would be happy to help you out any way that is possible. I am glad to hear that you're almost there! Best! Nick</p>

(continued)

Date	Comments
	<p>Hi Roslyn, I would be happy to forward the information. Best of luck, [REDACTED]</p> <p>I have sent 57 personalized requests out to my LinkedIn people. My family is also sending it out to HR departments where they work. I'm keeping my fingers crossed. [REDACTED]</p> <p>Roslyn, Sounds like you are busy!! I am excited for you :-) I know you have put a lot of time, energy and effort into achieving your doctorate. Great job!! Congratulations :-) I will definitely pass the survey on for you... [REDACTED]</p>
06/11/2014	<p>No problem and congratulations dear Roslyn. As always I am very proud of you. Best, [REDACTED]</p> <p>Roslyn! Congratulations for making it this far! I shall get it done shortly for you... [REDACTED]</p>
06/16/2014	<p>Hi Roslyn - Completed survey...good luck! [REDACTED]</p> <p><i>Hello Roslyn, I know how important this survey is. I sent this to my former HR colleagues. Hopefully they will in turn pass it on. What is the minimum participation count to make this a valid research study?</i> [REDACTED]</p>
06/17/2014	<p>Just finished it, Roslyn. Good luck with the PhD. [REDACTED]</p> <p>Completed and sent. [REDACTED]</p> <p>Would love to see what you find out Roslyn! [REDACTED]</p>
06/27/2014	<p>Done. Good luck! [REDACTED]</p>
06/28/2014	<p>Absolutely I will complete the survey for you and will ask me colleagues to also complete it. What is the deadline for you to receive the completed surveys? [REDACTED]</p>
06/30/2014	<p>Hi Roslyn, I was away when your message came in. I will forward to HR professionals. Congratulations on all your hard work. [REDACTED]</p>
07/01/2014	<p>Consider it done. I sent it to several people. Hope all is well. [REDACTED]</p>

(continued)

Date	Comments
07/14/2014	Hi Roslyn Yes I remember you and would be happy to take and pass along. Good luck. Hopefully I wont be to far behind you on the diss. [REDACTED]
07/15/2014	So sorry for the delay. Congrats on the dissertation! As someone who is ABD, I am thrilled that you are charging through. I am not in the HR field now. The people who I would send the survey to are [REDACTED] and [REDACTED]. Probably, you have already sent the survey to them. But, if not, email me the information at [REDACTED] and I will make it snow! Good luck, and let me know if you know anyone privately or in a corporate setting who would like a Soft Skills or Myers-Briggs workshop. Keep in touch, and all the best of luck. [REDACTED]
07/21/2014	Sure no problem, I will complete the survey tomorrow. Regards, [REDACTED]
07/22/2014	Have forwarded to [REDACTED] leadership team, [REDACTED] and [REDACTED]. [REDACTED]
07/23/2014	Done. Good luck! [REDACTED]
07/25/2014	Hi Roslyn, I apologize for my late response. I wanted to let you know that I have completed your survey and if there is anything else you need please do not hesitate to reach out to me. Thanks! [REDACTED]
08/03/2014	Hello Roslyn, It was my pleasure to complete the survey. All my best to you with becoming Dr. Vargas!! Also, it caused me to really reflect on this topic. Regards, [REDACTED]
08/08/2014	Hello Roslyn I will be more than glad to help you achieve your goal, Do not worry, I'll forward this to my contacts. Regards,
08/27/2014	I forwarded your Survey to those that were in the HR profession when I first received it...plus completing it myself.. Now...I suggest you locate all of the SHRM chapters in a 100 mile radius of you...contact the President and ask if they will allow you to speak about your research as a Meeting Speaker and then pass out and collect your Surveys at the end...You will quickly have several hundred surveys completed and this will be the basis of your sample... [REDACTED]

(continued)

Date	Comments
	<p>Here is a copy of the message I sent to 22 of my very closest H-R professionals that I know. Hope this helps!</p> <p>Regards,</p> <p>[REDACTED]</p> <p>----- Forwarded Message -----</p> <p>From: [REDACTED]</p> <p>To:</p> <p>Sent: Wednesday, August 27, 2014 9:45 PM</p> <p>Subject: Fw: Thank you for connecting me.</p> <p>Please take a look at the below Linked-In contact and request that I received. Although I do not personally know Roslyn Vargas, I have helped her by completing the Survey Monkey material, in support of her terminal degree pursuit. When you get a chance, please cut and paste the URL and complete the survey, too.</p> <p>Thanks!</p> <p>Regards,</p> <p>[REDACTED]</p>
08/30/2014	We gladly help.
08/31/2014	Be glad to help and forward to my colleagues. Best of luck on your study!
09/01/2014	I have completed the survey. All the best in your endeavors!
09/02/2014	Hello Roslyn, I just completed the task. Good Luck!
09/03/2014	Hello Roslyn, I would be happy to assist. I'll work on this tonight.
	<p>Roslyn,</p> <p>I took the survey. I have to say I have had very little training in HR Analytics. Although I've been a generalist most of my career, at times I've been asked to take charge of the compensation and benefits functions which I enjoyed very much, even though I had not had training in those areas, nor had I had roles earlier in my career. I am open to learning new things and have great hopes for the integration of HR Analytics into the practice of HR.</p> <p>I found out through experience that handling something like compensation is not as daunting as I had thought it would be. Many HR people are afraid of anything mathematical, yet it's the very thing that can give credibility to our decisions.</p> <p>I look forward to learning about the results of your research.</p> <p>Regards,</p> <p>[REDACTED]</p>

(continued)

Date	Comments
09/04/2014	<p>Hi Roslyn, No problem. I'll be sure to take your survey ASAP. Good luck on your study and on obtaining your degree! Regards, [REDACTED]</p>
09/04/2014	<p>I completed your survey, and wish you the best of luck! Kind regards, [REDACTED]</p>
09/05/2014	<p>Hi! I am posting a social media blast for you to get more survey responses. The blasts will go out in the morning! All the best, [REDACTED]</p>
09/05/2014	<p>Hi Roslyn, Nice to meet you and I am happy to help you become a doctor! I took the survey and wish you all the best. Have a great day! [REDACTED]</p>
09/08/2014	<p>Hi Roslyn! I wanted to share some feedback with you. I started to take the survey and I have to say that it was really long and I was unable to get through it. I received the same feedback from others. You may want to consider the survey length as it is a barrier to completion for many. I hope that helps. [REDACTED]</p>
09/08/2014	<p>Hello Roslyn, I completed the survey. Wish you all the best! Regards, [REDACTED]</p>
09/09/2014	<p>Good morning Roslyn, I will be more than happy to assist you with this.</p> <p>You're welcome. I will do this for you! Good luck!!</p> <p>Sure thing I'll work on it in the morning and I'll pass it along! Best of luck to you [REDACTED]</p>
09/10/2014	<p>Hi Roslyn, You're welcome! I have completed the survey. Good Luck!</p>

(continued)

Date	Comments
	<p>Hello Roslyn, I hope this e-mail finds you well. Welcome to my LinkedIn connections. I wish you success during your PHD career path. I took the survey and I am glad to help others succeed during their education and career. However, I noticed two things about the survey. First, given the sequence of the scale, which one has more value: agree or slightly agree? for the way it was put it seems slightly agree has more weight, I found it confusing. The second thing I noticed was the question about challenging, the question "I find mathematics and/or statistics measurement challenging." extremely delicate, I love math and working with numbers is something I keep looking forward to, my current job doesn't challenge me in such aspect, however, I am up for the challenge and I like it, some people find numbers challenging and not exciting or engaging. How would you analyze that question for people who answer "strongly agree"? Would it be analyzed as math and statistics are and will always be a challenge for people whether they enjoy it or not? or there is a possibility people like it and love the challenge? I hope your survey is completed, and I wish you continuous success in your endeavors. Regards, ████████████████████</p>
	<p>Hi Roslyn, I took your survey. Best of luck. ████████</p>
	<p>Done. Good luck!!!</p>
	<p>Roslyn, I completed the survey. Good luck on your study! ████████</p>
	<p>Hi Roslyn, I'd be happy to help. Good luck with your project. Let me know if I can be of further assistance Sincerely, ████████████████████</p>
	<p>Roslyn, It is my pleasure. Should I let you know when it is completed? Is there a deadline? I can take it this weekend? Best wishes with your dissertation. That is such a great accomplishment. I was truly happy to assist! Sincerely, ████████</p>
09/14/2014	Sure! will do!

(continued)

APPENDIX B
PILOT SURVEY INSTRUMENT

Pilot Survey Instrument: Answer the following questions using the below 7 pt. Likert Scale

Strongly Disagree Disagree Slightly Disagree Neutral Slightly Agree Agree Strongly Agree

General Self-Efficacy: [Adapted from Davis (1989); Chau (2001)]

1. HR Analytics is easy to use.
2. HR Analytics is convenient to use.
3. I am able to use HR Analytics without much effort.
4. I can always manage to solve difficult problems if I try hard enough.
5. If someone opposes me, I can find the means and ways to get what I want.
6. It is easy for me to stick to my aims and accomplish my goals.
7. I am confident that I could deal efficiently with unexpected events
8. Thanks to my resourcefulness, I know how to handle unforeseen situations.
9. I can solve most problems if I invest the necessary effort.
10. It is easy for me to use my mobile device to access company information.
11. I can remain calm when facing difficulties because I can rely on my coping abilities.
12. When I am confronted with a problem, I can usually find several solutions.
13. If I am in trouble, I can usually think of a solution.
14. I can usually handle whatever comes my way.

Quantitative Self-Efficacy: [Adapted from Bai et al. (2009)]

15. I find using mathematical and/or statistical measurements interesting.
16. I worry about my ability to solve mathematical and/or statistical problems.
17. I get nervous when I use mathematics and/or statistics.
18. I enjoy working with mathematical and/or statistical measures.
19. I find mathematical and/or statistical measures challenging.
20. Math and/or statistics is one of my favorite subjects.

Social Influence: [Adapted from Johnston and Warkentin (2010); Venkatesh et al. (2012)]

21. People who influence my behavior think that I should use HR Analytics.
22. People who are important to me think that I should use HR Analytics.
23. The senior management of this business has been helpful in the use of HR Analytics.
24. In general, the organization has supported the use of HR Analytics.
25. People in my organization who would use HR Analytics, would have a high profile.
26. Because of my use of HR Analytics, others in my organization would see me as a more valuable employee.

Tool Availability: [Adapted from Johnston (2006)]

27. I have a full array of HR Analytics tools available at work if I choose to use them.
28. I only have very basic HR Analytics tools available at work if I choose to use them.
29. My company has invested heavily in HR Analytics tools.
30. Before deciding whether to use any HR Analytics applications, I am able to properly try them out.
31. I have had a great deal of opportunity to try various HR Analytics applications.
32. I know where I can go to satisfactorily try out various uses of HR Analytics.

Data Availability: [Adapted from Johnston (2006)]

33. My company's database has all the data I need to use HR Analytics software.
34. My company's HR system collects data from all HR interactions.
35. We use the same system/platforms for all HR activities.
36. My company has one database for all departments to use.
37. My company's database has an interface that is compatible with other systems.

Fear Appeals: [Adapted from Johnston and Warkentin (2010); Witte et al. (1996)]

38. If I were forced to use HR Analytics, it would have a negative effect on my organizational commitment.

39. It is likely I would use HR Analytics given the opportunity.
 40. If I were required to use HR Analytics, it would have a significant negative impact on my job performance.
 41. It is highly probable I would use HR Analytics given the opportunity.
 42. If I were mandated to use HR Analytics, it would have a negative effect on my job satisfaction.

Effort Expectancy: Adapted from Venkatesh et al. (2012)

43. My role with HR Analytics is clear and understandable.
 44. It would be easy for me to become skillful at using HR Analytics.
 45. Learning to use HR Analytics is easy for me.
 46. It is easy for me to become skillful at using HR Analytics.
 47. I would find HR Analytics easy to use.

Expectancy: [Adapted from Johnston and Warkentin (2010); Venkatesh et al. (2012)]

48. I would find the use of HR Analytics useful in my job.
 49. Using HR Analytics enables me to accomplish tasks more quickly.
 50. Using HR Analytics increases my job performance.
 51. If I use HR Analytics, I will increase my chances of getting a raise.
 52. The use of HR Analytics is not very visible in my organization.

Level of Adoption: [Adapted from Johnston and Warkentin (2010); Venkatesh et al. (2012)]

53. My company is putting a policy in place to use HR Analytics.
 54. I am not required to HR Analytics.
 55. The use of HR analytics is voluntary in my organization.
 56. I am beginning to explore using HR Analytics.
 57. I am interested in using HR Analytics.
 58. I am recommending my company invest in HR Analytics.
 59. I use HR Analytics for some specific tasks.

Demographic Information: Please check the appropriate box for each of the following items.

60. Age:
 18-24 25-30 31-35 36-40 41-45
 46-50 51-55 56-60 61-65 over 65
61. Gender: Male Female
62. Education (highest level):
 High School Diploma Vocational Training Associate Degree Bachelor's Degree
 Master's Degree MS or MBA Other Please Specify _____
 Doctorate Degree
63. Professional Designation(s): i.e., PHR, SPHR, GPHR, PHR-CA, SPHR-CA
 Yes No If yes, specify which designation _____
64. Human Resource Certificate(s): Yes No
65. Current Position:
 Generalist Specialist Manager Director HRIS
 Other Please Specify _____

66. What is the functional area of your current position?
 Training/Development Compensation/Benefits Employee Relations
 HRIS Management Other Please Specify _____
67. How long have you worked for your current employer?
 Less than 1 year 1 – 5 years 6 – 10 years 11 – 15 years
 16 – 20 years 21 – 25 years 26 or more years
68. How long have you worked in the field of Human Resources? _____ years
69. Industry sector in which you are employed.
 Banking Information Technology-HR Related Telecommunications
 Health Financial/Insurance Government Other Please Specify _____
70. Our company has available for me to use at work (check all that apply)
 Excel Standalone internally customized HR System
 A third-party HRIS Third-party vendor name _____
 Other Please Specify _____
71. Approximately how many people does your company employ?
 Fewer than 100 100 – 499 500 – 999 1,000 – 4,999
 5,000 – 9,999 10,000 – 24,999 25,000 or more
72. Where is your company headquarters located? United States Other Country
 Please specify _____
73. Where is your worksite located? United States Other Country
 Please specify _____
74. My company currently uses HR analytics. Yes No
75. Do you currently use analytics? Yes No

APPENDIX C

PILOT INSTRUMENT QUESTIONS REMOVED

Pilot Instrument Showing Questions Removed:

General Self-Efficacy: [Adapted from Chau (2001); Davis (1989)]

1. HR Analytics is easy to use.
2. HR Analytics is convenient to use.
3. I am able to use HR Analytics without much effort.
4. ~~I can always manage to solve difficult problems if I try hard enough.~~
5. ~~If someone opposes me, I can find the means and ways to get what I want.~~
6. ~~It is easy for me to stick to my aims and accomplish my goals.~~
7. ~~I am confident that I could deal efficiently with unexpected events~~
8. ~~Thanks to my resourcefulness, I know how to handle unforeseen situations.~~
9. I can solve most problems if I invest the necessary effort.
10. ~~It is easy for me to use my mobile device to access company information.~~
11. ~~I can remain calm when facing difficulties because I can rely on my coping abilities.~~
12. When I am confronted with a problem, I can usually find several solutions.
13. If I am in trouble, I can usually think of a solution.
14. I can usually handle whatever comes my way.

Quantitative Self-Efficacy: [Adapted from Bai et al. (2009)]

15. I find using mathematical and/or statistical measurements interesting.
16. I worry about my ability to solve mathematical and/or statistical problems.
17. I get nervous when I use mathematics and/or statistics.
18. I enjoy working with mathematical and/or statistical measures.
19. I find mathematical and/or statistical measures challenging.
20. Math and/or statistics is one of my favorite subjects.

Social Influence: [Adapted from Johnston and Warkentin (2010); Venkatesh et al. (2012)]

21. People who influence my behavior think that I should use HR Analytics.
22. People who are important to me think that I should use HR Analytics.
23. The senior management of this business has been helpful in the use of HR Analytics.
24. In general, the organization has supported the use of HR Analytics.
25. ~~People in my organization who would use HR Analytics, would have a high profile.~~
26. Because of my use of HR Analytics, others in my organization would see me as a more valuable employee.

Tool Availability: Adapted from Johnston and Warkentin (2010)

27. I have a full array of HR Analytics tools available at work if I choose to use them.
28. ~~I only have very basic HR Analytics tools available at work if I choose to use them.~~
29. My company has invested heavily in HR Analytics tools.
30. Before deciding whether to use any HR Analytics applications, I am able to properly try them out.
31. I have had a great deal of opportunity to try various HR Analytics applications.
32. I know where I can go to satisfactorily try out various uses of HR Analytics.

Data Availability: Adapted from Johnston and Warkentin (2010)

33. My company's database has all the data I need to use HR Analytics software.
34. My company's HR system collects data from all HR interactions.
35. We use the same system/platforms for all HR activities.
36. ~~My company has one database for all departments to use.~~
37. ~~My company's database has an interface that is compatible with other systems.~~

Fear Appeals: [Adapted from Johnston and Warkentin (2010); Witte et al. (1996)]

38. If I were forced to use HR Analytics, it would have a negative effect on my organizational commitment.
39. ~~It is likely I would use HR Analytics given the opportunity.~~
40. If I were required to use HR Analytics, it would have a significant negative impact on my

job performance.

~~41. It is highly probable I would use HR Analytics given the opportunity.~~

42. If I were mandated to use HR Analytics, it would have a negative effect on my job satisfaction.

Effort Expectancy: Adapted from Venkatesh et al. (2012)

~~43. My role with HR Analytics is clear and understandable.~~

44. It would be easy for me to become skillful at using HR Analytics.

45. Learning to use HR Analytics is easy for me.

46. It is easy for me to become skillful at using HR Analytics.

47. I would find HR Analytics easy to use.

Performance Expectancy: [Adapted from Johnston and Warkentin (2010); Venkatesh et al. (2012)]

48. I would find the use of HR Analytics useful in my job.

49. Using HR Analytics enables me to accomplish tasks more quickly.

50. Using HR Analytics increases my job performance.

~~51. If I use HR Analytics, I will increase my chances of getting a raise.~~

52. The use of HR Analytics is not very visible in my organization.

Level of Adoption: [Adapted from Johnston and Warkentin (2010); Venkatesh et al. (2012)]

53. My company is putting a policy in place to use HR Analytics.

~~54. I am not required to HR Analytics.~~

~~55. The use of HR analytics is voluntary in my organization.~~

56. I am beginning to explore using HR analytics.

57. I am interested in using HR analytics.

58. I am recommending my company invest in HR analytics.

59. I use HR Analytics for some specific tasks.

60. Using HR Analytics enables me to accomplish tasks more quickly.

61. Using HR Analytics improves the quality of work I do.

62. Using HR Analytics makes it easier to do my job.

63. Using HR Analytics enhances my effectiveness on the job.

64. Using HR Analytics gives me greater control over my work.

APPENDIX D
SURVEY INSTRUMENT

Survey Instrument: After reading the following statements, choose the answer most appropriate from the choices below:

Strongly Disagree Disagree Slightly Disagree Neutral Slightly Agree Agree Strongly Agree

General Self-Efficacy: [Adapted from Chau (2001); Davis (1989)]

1. HR Analytics is easy to use.
2. HR Analytics is convenient to use.
3. I am able to use HR Analytics without much effort.
4. I can solve most problems if I invest the necessary effort.
5. When I am confronted with a problem, I can usually find several solutions.
6. If I am in trouble, I can usually think of a solution.
7. I can usually handle whatever comes my way.

Quantitative Self-Efficacy: [Adapted from Bai et al. (2009)]

8. I find using mathematical and/or statistical measurements interesting.
9. I worry about my ability to solve mathematical and/or statistical problems.
10. I get nervous when I use mathematics and/or statistics.
11. I enjoy working with mathematical and/or statistical measures.
12. I find mathematical and/or statistical measures challenging.
13. Math and/or statistics are one of my favorite subjects.

Social Influence: [Adapted from Johnston and Warkentin (2010); Venkatesh et al. (2012)]

14. People who influence my behavior think that I should use HR Analytics.
15. People who are important to me think that I should use HR Analytics.
16. The senior management of this business has been helpful in the use of HR Analytics.
17. In general, the organization has supported the use of HR Analytics.
18. Because of my use of HR Analytics, others in my organization will see me as a more valuable employee.

Tool Availability: Adapted from Johnston (2006)

19. I have a full array of HR Analytics tools available at work if I choose to use them.
20. My company has invested heavily in HR Analytics tools.
21. Before deciding whether to use any HR Analytics applications, I am able to properly try them out.
22. I have had a great deal of opportunity to try various HR Analytics applications.
23. I know where I can go to satisfactorily try out various uses of HR Analytics.

Data Availability: Adapted from Johnston (2006)

24. My organization's database has all the data I need to use HR Analytics software.
25. My organization's HR system collects data from all HR interactions.
26. My organization uses the same system/platforms for all HR activities.

Fear Appeals: [Adapted from Johnston and Warkentin (2010); Witte et al. (1996)]

27. If I were forced to use HR Analytics, it would have a negative effect on my organizational commitment.
28. It is unlikely I would be forced to try or use HR Analytics to keep my job.
29. If I were required to use HR Analytics, it would have a significant negative impact on my job performance.
30. If I were mandated to use HR Analytics, it would have a negative effect on my job satisfaction.

Effort Expectancy: Adapted from Venkatesh et al. (2012)

31. It would be easy for me to become skillful at using HR Analytics.
32. Learning to use HR Analytics is easy for me.
33. It is easy for me to become skillful at using HR Analytics.
34. I would find HR Analytics easy to use.

Performance Expectancy: [Adapted from Johnston and Warkentin (2010); Venkatesh et al. (2012)]

35. I would find the use of HR Analytics useful in my job.
 36. Using HR Analytics enables me to accomplish tasks more quickly.
 37. Using HR Analytics increases my job performance.
 38. The use of HR Analytics is not very visible in my organization.

Level of Adoption: [Adapted from Johnston and Warkentin (2010); Venkatesh et al. (2012)]

39. My organization is putting a policy in place to use HR Analytics.
 40. I am beginning to explore using HR Analytics.
 41. I am interested in using HR Analytics.
 42. I am recommending my organization invest in HR Analytics.
 43. I use HR Analytics for some specific tasks.

Demographic Information: Please check the appropriate box for each of the following items.

44. Age:

- 18-24 25-30 31-35 36-40 41-45
 46-50 51-55 56-60 61-65 over 65

45. Gender: Male Female

46. Education (highest level):

- High School Diploma Vocational Training Associate Degree Bachelor's Degree
 Master's Degree MS or MBA Other Please Specify _____
 Doctorate Degree

47. Professional Designation(s): ie; PHR, SPHR, GPHR, PHR-CA, SPHR-CA

- Yes No If yes, specify which designation _____

48. Human Resource Certificate(s): Yes No

49. Current Position:

- Generalist Specialist Manager Director HRIS
 Other Please Specify _____

50. What is the functional area of your current position?

- Training/Development Compensation/Benefits Employee Relations
 HRIS Management Other Please Specify _____

51. How long have you worked for your current employer?

- Less than 1 year 1 – 5 years 6 – 10 years 11 – 15 years
 16 – 20 years 21 – 25 years 26 or more years

52. How long have you worked in the field of Human Resources? _____ years

53. Industry sector in which you are employed.

- Banking Information Technology-HR Related Telecommunications
 Health Financial/Insurance Government Other Please Specify _____

54. Our organization has available for me to use at work (check all that apply)
Excel Standalone internally customized HR System
A third-party HRIS Third-party vendor name _____ Other Please Specify _____
55. Approximately how many people does your company employ?
Fewer than 100 100 – 499 500 – 999 1,000 – 4,999
5,000 – 9,999 10,000 – 24,999 25,000 or more
56. Where is your organization's headquarters located? United States
Other Please specify _____
57. Where is your worksite located? United States
Other Country Please specify _____
58. My organization currently uses HR analytics. Yes No
59. Do you currently use analytics, in general? Yes No

APPENDIX E
LETTER TO PARTICIPANT

Dear Participant,

I have been an HR practitioner for over 25 years and I am seeking your assistance. In an effort to meet one of the requirements for a doctoral degree at Nova Southeastern University, I am conducting a research study titled "An Investigation to the Factors Affecting the Adoption of Analytics Among HR Professionals". The data collected by this study and the conclusions generated will complete my doctoral dissertation.

This survey is completely anonymous, so please answer each question honestly. Your participation in this study will be particularly important to the accuracy of the results. Survey Monkey is used in order to maintain and ensure anonymity. Please take a few minutes to complete the survey.

On the following pages you will find several different kinds of questions about demographics, attitude towards using technology, level of comfort working with numbers and/or statistical information, knowledge of analytics and social support.

There are many questions concerning HR Analytics. HR Analytics demonstrates the direct impact of people data on important business outcomes. For example, United Health Group used HR analytics to track where their long-term employees, as well as their most productive employees, were recruited. The information was then used for future recruitment.

There are also questions concerning mobile devices. Mobile devices are defined as small handheld wireless computing devices that allow people to access data and information from wherever they are, such as a smartphone, PDA, or tablet.

Specific instructions are given at the start of each section, as necessary.

Please accept my gratitude now for your participation in this study, as I will not be able to thank you at completion due to the anonymity of the survey.

Sincerely,

Roslyn Vargas

APPENDIX F
DATA COLLECTION STRATEGY TIMELINE

Date	Process
08/03/2013	Research process began.
08/28/2013	Decision made to research Individual-Level Adoption.
08/30/2013	Addition of Fear Appeals as a construct.
12/04/2013	Concept Paper and preliminary literature was submitted for approval.
01/22/2014	Concept Paper Approved.
01/23/2014	Continuing to gather and read articles for the review of the literature on individual-level adoption, general self-efficacy, quantitative self-efficacy, performance expectancy, effort expectancy, tool availability, data availability, social influence and fear appeals.
04/18/2014	Created Pilot Survey Instrument on SurveyMonkey for colleagues to review and check for accuracy, length of survey, etc.
04/18/2014	Requested students from Human Resource Measurement class to take the survey (in paper format), to review for clarity.
04/22/2014	Pilot Survey opened on SurveyMonkey, and respondents recruited by SurveyMonkey.
04/28/2014	Created a separate SurveyMonkey link for Human Resource Measurement students to test the survey online for length of time to complete.
04/28/2014	Proposal submitted for Oral Defense.
05/05/2014	SurveyMonkey closed the Pilot Survey with 108 responses. However, 11 respondents were <i>not</i> qualified to take the survey, as they were not HR professionals currently working in the field of HR, leaving 97 usable responses.
05/14/2014	Oral Defense of Proposal.
05/16/2014	SurveyMonkey was contacted and advised of the discrepancies found in the respondents' background, which caused their disqualification to take the survey since the respondents were not HR professionals currently working in the field of HR.
05/18/2014	The Pilot Survey was reopened by SurveyMonkey, who recruited additional HR professionals, currently working in the field of HR to participate in the pilot survey.

(continued)

Date	Process
05/19/2014	<p>For the second time the Pilot Survey was closed, by SurveyMonkey. This resulted in an additional 10 usable survey responses, bringing the total of respondents for the pilot to 107.</p> <p>The data was collected and analyzed.</p>
06/02/2014	The Full-Scale Study Survey instrument was modified and shortened.
06/06/2014	IRB approval was received.
06/09/2014	<p>Sent out survey instrument link to personal HR professional contacts via personal e-mail addresses and LinkedIn.</p> <p>Changed LinkedIn profile to read Academic Researcher at Nova Southeastern University and recruited participants by including the survey instrument link and invitation to participate.</p> <p>Requested connections to forward the survey link for a “snowball sampling”.</p>
06/11/2014	Sent out the survey instrument link via Twitter.
06/14/2014	Requests to connect on LinkedIn were sent to HR professionals and once the connection was accepted, a letter to participate, which included the survey link was sent to the individual.
06/17/2014	Joined HR Girlfriends Group on LinkedIn and invited group members to participate in the survey.
06/18/2014	<p>A request was made to the LinkedIn group manager of HR & Workforce Analytics to post the survey link and invitation on the group’s LinkedIn page.</p> <p>The HR & Workforce Analytics group manager complied and posted the information on the group’s page.</p> <p>The survey link and invitation was also posted on the manager’s “scoop it” page, which is a blog written by the group’s manager.</p>
06/24/2014	<p>Changed line for HR Girlfriends group on LinkedIn, which read, “help me become Dr. Vargas”.</p> <p>Positive responses and comments were received from the request with the added line.</p>
06/28/2014	The manager of the LinkedIn group HR Girlfriends sent out an e-mail blast of the survey link and invitation to the HR Girlfriends group.
07/09/2014	Recruited participants by adding survey instrument link on FaceBook.
07/21/2014	A new FaceBook page was created and participants were recruited by adding the survey link, including the invitation. This resulted in only 1 response.

(continued)

Date	Process
07/22/2014	<p>Due to the low numbers of completed responses, the recruitment of participants was changed. A request to connect with HR professionals currently working in the field of HR, who were 2nd and 3rd level connections, via LinkedIn e-mail was made. After receiving an acceptance to connect, an invitation to take the survey along with an explanation of the survey and its link was sent immediately, with an additional line, which stated, "help me become Dr. Vargas."</p> <p>Again, this brought about an overwhelming amount of positive comments and commitment to forward the survey link to create the snowball effect.</p>
07/25/2014	<p>Survey instrument was modified by increasing the number of questions per page, which decreased the total number of pages of the survey. This made the survey appear shorter.</p>
08/27/2010	<p>Noticeable increase in completed surveys after recruitment process was changed.</p>
09/04/2014	<p>After refreshing the request on HR Girlfriends' group page on LinkedIn, a response from the group's manager, [REDACTED], advised an e-mail blast would be sent to their membership in an effort to get more survey responses for the researcher.</p>
09/12/2014	<p>Noticeable increase in LinkedIn connections, which went from under 500 to over 1,000 1st level connections.</p>
09/14/2014	<p>Survey closed.</p>

APPENDIX G
LINKEDIN INVITATION

Thank you for connecting with me. I am an HR professional, looking for assistance from other HR professionals! I am conducting a study titled “An Investigation to the Factors Affecting the Adoption of Analytics Among HR Professionals”, **to complete my doctoral degree.**

SurveyMonkey is used to maintain and ensure anonymity. **Please** take 10 minutes of your time to **complete** the survey, as I cannot use the data unless the survey is completed. I also ask that you help me by forwarding this on to other HR professionals in your network. Please help me become Dr. Vargas!!

<https://www.surveymonkey.com/s/GY6TTNC>

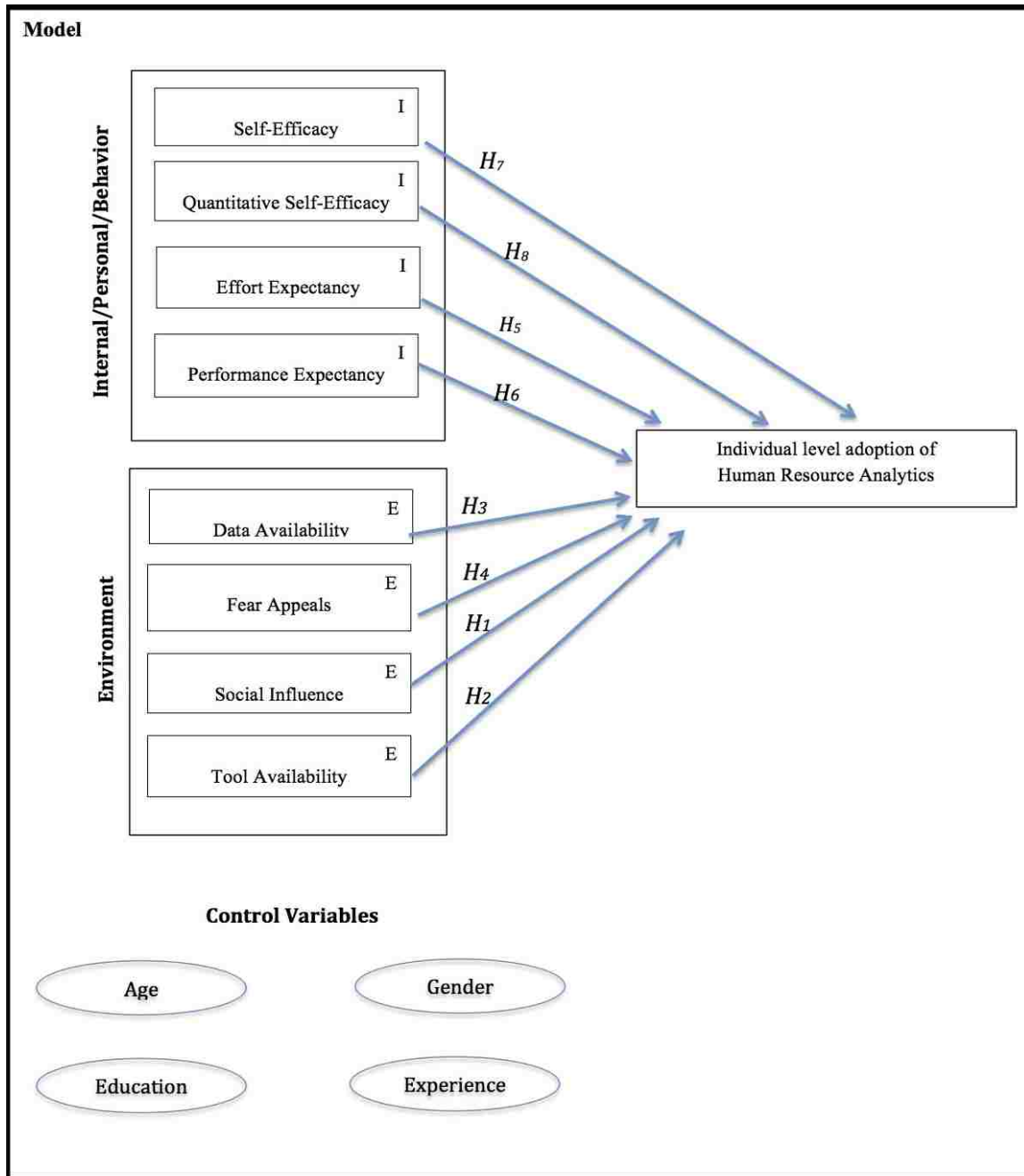
Thank you in advance.

APPENDIX H
LINKEDIN HR GIRLFRIENDS POST

Can you please help me get my degree conferred quickly? How you ask? I am conducting research to complete my dissertation and need HR professionals to take my survey. I am asking that HR professionals take the 10-minute survey and pass it on to other HR professionals in their network creating a "snowball" effect. I hope you can help! Please see the e-mail below to pass on with the survey link.

APPENDIX I

MODEL



APPENDIX J
COMMUNICATION FROM THE SOCIETY FOR
HUMAN RESOURCE MANAGEMENT (SHRM)

Roslyn,

Thank you for using the Knowledge Center! Here are the numbers you requested. There are a total of 254,035 SHRM national members. Of that 175,414 reported being female, 46,088 reported being male. 32,533 members didn't report a gender. I hope this helps.

Best Regards,

[REDACTED]

[REDACTED]

Society for Human Resource Management 1800 Duke Street | Alexandria, VA 22314
+1.800.283.7476 Option 5 shrm.org | [@SHRMKnowledge](https://twitter.com/SHRMKnowledge)

Leading People. Leading Organizations.

APPENDIX K
CONSISTENCY MATRIX

ADOPTON FACTORS IMPACTING HUMAN RESOURCE ANALYTICS AMONG HUMAN RESOURCE PROFESSIONALS			
Problem: This study will measure and evaluate individual-level adoption of HR Analytics by HR professionals. This study will also measure the effort expectancy and performance expectancy of adopting analytics as an innovation.			
Sub-problem: A comparative analysis of results from Human Resource professionals will allow for an evaluation of each individual's behaviors and barriers towards the adoption of HR Analytics.			
Subjects: HR professionals, who are members of HR related forums, on social media sites.			
Hypothesis	Source (Reference)	Instrument item	Method of Analysis
H1: Social influence is positively related to the adoption of HR Analytics	Vekantesh et al. (2012) ICR = 0.82; Johnston and Warkentin (2010) $p < 0.01$	Questions 21–26 adapted from Johnston and Warkentin (2010) and Venkatesh et al. (2012)	Partial Least Squares (PLS)
H2: Tool availability is positively related to the adoption of HR Analytics	Johnston and Warkentin (2010) $p < 0.01$	Questions 27–32 adapted from Johnston (2006)	Partial Least Squares (PLS)
H3: Data availability is positively related to the adoption of HR Analytics	Johnston and Warkentin (2010) $p < 0.01$; Manyika et al. (2011)	Questions 33–37 adapted from Johnston (2006)	Partial Least Squares (PLS)
H4: Fear appeals is positively related to the adoption of HR Analytics	Johnston (2006); $p < 0.01$; Witte et al. (1996) $a = .96$	Questions 38–42 adapted from Johnston (2006) and Witte et al. (1996)	Partial Least Squares (PLS)
H5: Effort expectancy is positively related to the adoption of HR Analytics	Vekantesh et al. (2012) ICR = 0.91; Johnston and Warkentin (2010) $p < 0.01$	Questions 43–47 adapted from Johnston (2006) and Venkatesh et al. (2012)	Partial Least Squares (PLS)
H6: Performance expectancy is positively related to the adoption of HR Analytics	Vekantesh et al. (2012) ICR = 0.88; Johnston and Warkentin (2010) $p < 0.01$	Questions 48–52 adapted from Johnston (2006) and Venkatesh et al. (2012)	Partial Least Squares (PLS)
H7: Self-efficacy is positively related to the adoption of HR Analytics	Davis (1989) Cronbach's alpha: .98 and .94; Chau (2001) Cronbach's alpha: 0.806	Questions 1–14 adapted from Davis (1989) and Chau (2001)	Partial Least Squares (PLS)
H8: Quantitative self-efficacy is positively related to the adoption of HR Analytics	Ozgen (2013) $P = .87$ Ozgen and Bindak (2008); Bai et al. (2009)	Questions 15–20 adapted from Bai et al. (2009)	Partial Least Squares (PLS)

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