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EMPLOYEE WORK ENGAGEMENT:
TO WHAT EXTENT DOES SELF-DETERMINATION THEORY (SDT) PROVIDE A
THEORETICAL EXPLANATION OF EMPLOYEE LEVELS OF WORK ENGAGEMENT IN
IDAHO HIGHER EDUCATION

by
Dan Woerner

A dissertation submitted
in partial fulfillment
of the requirements for the degree of
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COMMITTEE APPROVAL

To the Graduate Faculty:

The members of the committee appointed to examine the dissertation of Daniel H. Woerner find it satisfactory and recommend that it be accepted.

Dr. Paul Watkins
Major Advisor and Committee Chair

Dr. Robert Lyon
Committee Member

Dr. Joel Bocanegra
Committee Member

Dr. Sharon Stein
Committee Member

Dr. Joann Togle
Graduate Faculty Representative

DEDICATION

To my wife Lori. Her support and encouragement is what gave me the strength to complete this project.

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TABLE OF CONTENTS

List of Figures	xii
List of Tables	xiii
Abstract	xv
Chapter I: Introduction.....	1
Background of the Study	4
Statement of the Problem.....	6
Purpose of the Study	7
Research Questions	7
Significance of the Study	8
Benefit of the Study	9
Definitions.....	9
Assumptions, Limitations, Delimitations	10
Biases	11
Chapter II: Literature Review	12
The Engagement Discourse in Higher Education.....	12
Theoretical Framework for Engagement	15
Definitions of Engagement	15
Trait, state, or behavioral	19
The needs-satisfying approach.....	22
The job demands-resources model.....	23
The affective shift model	24
Social Exchange theory.....	24

Individual Antecedents of Employee Engagement	25
Job Satisfaction	25
Job characteristics	28
Supervisor and coworker relationship	30
Development and growth opportunities	30
Rewards and recognition	31
Work Engagement	31
Social context of work engagement	36
Work role and work activity	36
Affective shift model	38
Consequences of work engagement	38
Self-Determination Theory	40
Competence	42
Autonomy	44
Relatedness	46
Social contexts and internalization	48
Self-Determination Theory and Utrecht Work Engagement Theory	49
Chapter III: Methodology	52
Participants/Sampling	54
Instrumentation	55
Procedures	58
Data collection	58
Design	59

Analysis of data.....	60
Data storage and security	62
Human subjects compliance	62
Chapter IV: Results.....	63
Research Questions	64
Research Design.....	64
Response Rate	65
Respondents Demographics.....	66
Work Department.....	67
Education Level	67
Job Classification, Gender, and Race/Ethnicity.....	68
Employment Background Characteristics.....	70
Basic Psychological Needs (BPN) and Utrecht Work Engagement Scale (UWES)	70
Research Questions and Results	71
Research Questions Two, Three, and Four.....	76
Work Elements.....	83
MANOVA Summary	87
Structural Equation Modeling (SEM).....	88
Categorical Principal Components Analysis (CAPTCA).....	99
Variable Principal Normalization	103
Chapter V: Discussion of Findings	107
Summary of the Study	107
Respondent Participation	108

Respondent's Perceptions	108
Relationship Between Basic Psychological needs and Levels of Work Engagement	109
Supervisory Responsibilities.....	111
Place of Employment.....	112
Work Elements Perceptions	113
Recommendations for Senior Leadership	114
Limitations and Future Research	115
Conclusions.....	116
References.....	117
Appendix A - Demographic Questions.....	133
Appendix B - Basic Need Satisfaction at Work Questionnaire	137
Appendix C - Work & Well-being Survey (UWES)	139
Appendix D – First Questionnaire Email.....	140
Appendix E - First Questionnaire Reminder Email.....	142
Appendix F - Second Questionnaire Reminder E-mail	143
Appendix G - Thank you message to Finished Respondents	144
Appendix H –Conceptual Framework for Study	145
Appendix I - Significant Parameter Estimates between Dependent Variables and Independent Variables	146
Appendix J – Between-Subject Factors and Multivariate Tests – Years in HE	150
Appendix K - Tests of Between-Subjects Effects – Years in HE.....	152
Appendix L – Parameter Estimates – Years in HE.....	153
Appendix M – General Linear Model – MANOVA - Between-Subjects Factors.....	160

Appendix N: Box's Test of Equality of Covariance Matrices.....	162
Appendix O: Table 4 Multivariate Tests	163
Appendix P: Levene's Test for Equality of Error Variances	165
Appendix Q: Modified Tests of Between Subjects Effects	166
Appendix R: Modified Significant Parameter Estimates.....	168
Appendix S: Complete Parameter Estimates	172
Appendix T: CATPCA Variance Accounted For	187

LIST OF FIGURES

Figure 1: Macey and Schneider framework for understanding the components of employee engagement	20
Figure 2: SEM model for the study.....	89
Figure 3: Unmediated Path from Work Elements to Level of Engagement	93
Figure 4: Mediated Path for Work Elements to Basic Psychological Needs.....	95
Figure 5: Unmediated Path from Basic Psychological Needs to Level of Engagement.....	97
Figure 6: Variance Accounted for Dimension 1	100
Figure 7: Variance Accounted for Dimension 2	101
Figure 8: Total Variance Accounted For Total	102
Figure 9: Component Loadings of all 13 Variables.....	104

LIST OF TABLES

Table 1 Total number years employed in higher education.....	66
Table 2 Work department (unit) of respondents	67
Table 3 Distribution of highest educational level attained by respondents	68
Table 4 Distribution of survey population and respondents by, job classification, gender, and race/ethnicity	69
Table 5 Number of respondents who have supervisory roles compared to those who do not have supervisory roles, and place of employment.....	70
Table 6 Multivariate Tests	72
Table 7 Tests of Between-Subjects Effects	73
Table 8 Parameter Estimates.....	74
Table 9 Modified Significant Tests of Between Subject Effects	79
Table 10 Model Fit Summary – Baseline Comparisons	90
Table 11 SEM Mediated Model Results.....	90
Table 12 Regression Weights: (Group number 1 – Default Model).....	91
Table 13 Standardized Regression Weights: (Group number 1 - Default Model)	92
Table 14 Squared Multiple Correlations: (Group Number 1 – Default Model)	93
Table 15 Regression Weights: (Group Number 1 – Default Model).....	94
Table 16 Standardized Regression Weights: (Group Number 1 – Default Model).....	94
Table 17 Regression Weights: (Group Number 1 – Default Model).....	96
Table 18 Standardized Regression Weights: (Group Number 1 – Default Model).....	96
Table 19 Regression Weights: (Group Number 1 – Default Model).....	98

Table 20 Standardized Regression Weights: (Group Number 1 – Default Model).....	98
Table 21 Component Loading for Dimension 1 and 2	103

Employee Work Engagement: To What Extent Does Self-Determination Theory (SDT) Provide
a Theoretical Explanation of Employee Levels of Work Engagement in Idaho Higher Education

Dissertation Abstract – Idaho State University (2018)

The purpose of this quantitative study was to determine if self-determination theory (SDT), the human needs of autonomy, competence, and relatedness (Basic Psychological Needs), provides a theoretical explanation of professional staff work engagement (vigor, dedication, and absorption – Levels of Work Engagement) in public higher education institutions in Idaho. The participants selected were the understudied support and professional staff at four four-year public higher education institutions and four two-year community colleges in Idaho. Previous limited research with higher education professional staff has shown that interacting with students, connectedness to the organization, and professional development were significant factors in job satisfaction.

The instruments for the study consisted of the combination of two instruments geared specifically to measure employee levels of work engagement (Utrecht Work Engagement Scale) and the Basic Psychological Needs Satisfaction at work scale, and demographic questions to determine respondents' perceptions at work. The research questions which guided this study were: (1), what is the relationship between self-determination theory and employee engagement for professional staff? (2), to what extent are professional staff with supervisory responsibilities engaged compared to professional staff with no supervisory responsibilities? (3), to what extent do supervisors vs. non-supervisors report needs psychological needs fulfillment? And (4), do two-year professional employees perceive need fulfillment and engagement differently than four-year professional staff?

The results of this study indicated that perceptions of professional staff in public higher education of Basic Psychological Needs (autonomy, competence, and relatedness) are strongly correlated to their Level of Work Engagement (vigor, absorption, and dedication), which supports other studies showing SDT as a strong influence of work satisfaction and work engagement. Respondents who perceived higher levels of autonomy perceived significant higher levels of vigor and dedication. Results showed that respondents perceptions of autonomy and relatedness were a poor predictor of levels of absorption, yet competence influenced all three dependent variables of vigor, dedication, and absorption. The perception of absorption appears to be influenced by the perception of individual competence and having positive relationships (relatedness) and perceiving autonomy in the workplace appear to influence dedication and vigor with Idaho public higher education professional staff respondents.

Key Words: Self-Determination Theory, Work Engagement, Employee Engagement, Idaho Public Higher Education institutions, Higher Education Staff, Utrecht Work engagement Scale (Levels of Work Engagement), Basic Psychological Needs Satisfaction

CHAPTER I

Introduction

In the last several decades, colleges and universities have become labor-intensive organizations with budget predominantly dedicated to personnel (Johnsrud, 2002). The National Center for Education Statistics (NCES) reported that in 2015 higher education institutions employed nearly 4 million individuals. Of the approximately 4 million, about 2.5 million were employed full-time and nearly 1.5 million were employed part-time (NCES, 2017, p. 10). Of the 2.5 million full-time employees, nearly 740,000 of those are full-time instructors and nearly 370,000 are graduate assistants, leaving nearly 1.4 million professional and support staff or 56% of the total full-time staff (NCES, 2017).

Bauer (2000) noted that traditionally many institutional employment policies were designed for faculty needs, however, many professional support staff, such as technical, skilled crafts, maintenance, but primarily clerical and secretarial have responsibilities, tasks needs, and interests which are different from faculty and even mid-level administrators. Germeroth (2015) suggest that success for higher education institutions is significantly impacted by the workload performed by professional and supportive institutional staff, however, this workgroup is generally greatly underrepresented, least compensated, and least valued group for input in organizational goals and decision-making. Support and professional staff must be a constant focus of attention, as the success of the organization will be judged by their performance (Simon, 1997).

Bauer (2000) observed that in higher education institutions, support staff are often first point of contact for current students, incoming students, parents, prospective students, legislative officials, and other constituents. “This is especially true for clerical staff, whose attitudes and

level of helpfulness can substantially contribute to the constituents' perceptions of the campus climate" (p. 87). However, Hermesen (2014) noted that at a time of increased responsibilities and requirements (due to budget restrictions) and an increase of public concerns about rising higher education costs, there is a large group of campus employees who are being asked to take on added roles and responsibilities, however, are also seeing a decline in their working environments. With current institutional working conditions and if support and professional staff are the first point of contact in many institutions, it behooves higher education institutions to have engaged employees in their organizations. Sijts and Crim (2006) argue that in their research of engagement one CEO of a large company recognized that an engaged workforce is the difference between compliance and commitment. The CEO also recognized that a leader cannot "demand" more engagement or stronger performance. It must be cultivated.

Because of the increase research on engagement, knowledgeable higher education employees provide a source of competitive advantage to the organization and "attracting, motivating, and retaining them is a constant endeavor" (Abraham, 2012, p. 27) of management. As leadership recognizes that the greatest asset of their organization are its employees, organizations are looking to HR to set up strategic agenda for the development of employee engagement and commitment (Andrew & Sofian, 2012). Given the enormous research of engagement, what is the source of its appeal? At the core of employee engagement lies what has come to be known as "positive psychology" (Schohot & Vigoad-Gadot, 2010). Macey and Schneider (2008) argue that though the literature on engagement is comprehensive it is not very clear whether employee engagement is a unique concept or "merely a repackaging of other constructs" (p. 4).

A lack of a precise definition in the engagement concept does not suggest that the

concept lacks theoretical or practical usefulness. Part of the confusion lies in how engagement is seen, whether it should be classified as a state, trait, or behavior (Mayer & Gagne, 2008).

Furthermore, Meyer and Gagne (2008) remind us that currently there is “a lack of consensus regarding the measurement of engagement” (p. 61). However, because of the recent research on engagement, we now have better understanding of what some of the key “components” of engagement are. What appears to be missing is a robust unifying theory to guide practice and especially research (Meyer and Gagne, 2008). For this purpose, Meyer and Gagne propose that self-determination theory (SDT) provides such a theory.

Deci and Ryan (1985) posited that autonomous regulation (volitional and intrinsic) has been shown to lead to greater levels of “performance, persistence, initiative, and creativity” (Meyer & Gagne, 2008, p. 60), and outcomes that organizations desire from their employees. Meyer & Gagne (2008) noted that the current employee engagement construct has significant overlap with autonomous motivation as defined by SDT. In other words, employee engagement fits intuitively within the SDT framework (Weidemann, 2016). SDT is a theory of motivation, which posits that optimal human functioning emerges from the satisfaction of the three basic human needs of competence, autonomy, and relatedness (Ryan & Deci, 2000). Meyer & Gagne noted SDT has been in place for over 30 years and has been well tested in controlled research and field research. The authors argue that there has been sufficient research of SDT in a work context to corroborate to its relevance. Meyer & Gagne further noted, “... SDT research has consistently demonstrated that individuals who are ‘engaged’ in what they are doing also experience greater physical and psychological well-being than those who are amotivated or lack of personal control” (p. 61). SDT need satisfaction has also been shown to be related to a

multiple of positive work outcomes such as motivation, performance, job satisfaction, retention, organizational commitment, and trust of management (Gagne & Deci, 2005).

Background of the Study

After their 2016 nationwide survey of the American workforce Gallup (2017) noted that only 33% of employees interviewed reported they were engaged at work. Gallup also reported that 51% reported not being engaged, and 16% reported as being “actively disengaged” (p. 2), statistics that demonstrate the low level of employee engagement in various organizations. The 2013 Harvard Business Review found that the factors that business leaders view as most critical to success were attaining a high level of customer service, creating effective communication, and attaining a high level of employee engagement and strong executive leadership. Ulrich (1997) suggested that with organizations attempting to create more output with fewer resources, management must engage the employee’s body, mind and soul. This has led to organizations increasingly following employee engagement levels, and now have a sizable body of empirical research which has demonstrated that creating an engaged workforce can maximize a company’s investment in human capital, improve productivity, it can significantly reduce costs, such as turnover, which impacts the bottom line of an organization. A 2008 report by the U.S. Merit Systems Protection Board (MSPB) found increased levels of employee engagement in federal agencies was significantly related to enhanced agency outcomes (Leeds & Nierle, 2014). Even the Federal Administration’s 2015 fiscal year budget included a focus on improving federal employee engagement through a plan to provide federal agencies with “actionable information to target areas where improvement is needed” (p. 62).

After some initial review of the literature it may appear that though employees appear satisfied with their work, it may not necessarily mean the those employees are experiencing work

engagement. Erickson (2005), in her Senate Hearing presentation examining issues relating to the 21st century workplace stated,

Engagement is above and beyond simple satisfaction with the employment arrangements or basic loyalty to the employer--characteristics that most companies have measured for many years. Although satisfaction and engagement often trend together, they're different phenomena arising from different sources. Satisfaction is about sufficiency--enough pay, benefits, and flexibility to work and live, and no major problems or sense of unfair treatment to sour one's attitude toward the employer. Satisfaction is the cost of entry into the business environment of the future.

Engagement, in contrast, is about passion and commitment--the willingness to invest oneself and expend one's discretionary effort to help the employer succeed. For engaged employees, time passes quickly; they identify with the task at hand, resist distractions, spread their enthusiasm to others, and care deeply about the result (p. 10)

In his research of employee engagement, Schaufeli (2013) believes that the emergence of employee engagement has to do with two converging developments. First, there is a growing interest by organizations (including higher education institutions) to invest in human capital and the psychological involvement of employees in the organization, and secondly, the increased interest of positive psychological states, including human development and well-being.

One of the main objectives of this study is to understand the professional employee work engagement in Idaho higher education institutions. Working mainly behind the scenes, professional staff (non-faculty) roles in higher education allow institutions to operate effectively. Functions such as maintaining classrooms, technology, facilities, parking, financial aid, finance, admissions, administrative responsibilities, etc., generally impact faculty and students directly or indirectly, therefore, retaining engaged professional staff provides continuity, expertise, knowledge, and other positive benefits for higher education. Salaries and positions of support and professional staff in public higher education institutions vary substantially (Transparent Idaho, 2018) depending on technical and/or managerial expertise. Furthermore, reasons as to why individuals seek employment in higher education institutions may vary. What do employees

value in their job tasks? The organization? Work relationships? These questions have been inspiration to study some of the motivating factors that facilitate employee work engagement in public higher education institutions. Recognizing some of the motivating factors that lead to employee work engagement could yield positive results for the individual, a particular department, and ultimately the institution. Sijts and Crim (2006) pose a guiding question, “How much more productive is an engaged workforce compared to a non-engaged workforce?” (p. 2). Furthermore, Little and Little (2010) raised the idea if employee engagement as a meaningful concept can add to the existing management knowledge or if employee engagement is a concept that is “redundant with existing research” (p. 117). Little and Little suggest that perhaps employee engagement is a multi-dimensional, multi-layered construct (as in organizational culture, Rousseau, 1985), and this construct should be

Rigorously tested in order for its theoretical soundness and practical application to be strengthened. Only by understanding the nature of the construct and its relationship to attitudes, behavioral intentions and behaviors can it be applied to the benefit of organizations and employees (pp. 117-118).

Though the object of this study will not be to answer these specific questions, the findings of this study could help understand the characteristics of engaged employees and the value these engaged employees could bring to higher education institutions.

Statement of the Problem

Higher education is an organization that relies heavily on human capital and human interactions. Before a student reaches the instructional part of academics, the student interacts with many support and professional staff, areas such as financial aid, admissions, registration, technology, library, bookstore, cafeteria, facilities, and other related services (Hong, 2011). Higher education professional and supportive staff may be some of the largest institutional employee constituents, many who work in the front lines with students, parents, faculty, and

community members, and in many ways represent the quality, character and care of higher education institution. Employee attitude toward the institution is often reflected in the individuals with whom they work and interact with (Bauer, 2000). Furthermore, many employees have noted that they felt their worth in their institutions was not recognized (Messa, Horn, Longacre, Olenchak, and Penney, 2016). At the same time, senior administrators are challenged to identify elements, which are critical to student education experience. Therefore, identifying elements critical to work engagement in higher education employees could potentially allow senior administrators to take full advantage of employee performance in a public higher education context.

Purpose of the Study

Research on higher education employee engagement has focused primarily on faculty and high-level administrators and little on the employee engagement of support and professional staff, particularly non-supervisory supportive positions. However, “often overlooked and undervalued” (Hong, 2011, p. 4), support staff play an essential role in the educational process in higher education institutions. The purpose of this quantitative study is to determine if self-determination theory (human needs of autonomy, competence, and relatedness) provides a theoretical explanation of employee work engagement (vigor, dedication, and absorption) in public higher education institutions.

Research Questions

- What is the relationship between self-determination theory and employee engagement for higher education staff?
- To what extent are professional staff with supervisory responsibilities engaged compared to employees with no supervisory responsibilities?

- To what extent do supervisors vs. non-supervisors report needs psychological needs fulfillment?
- Do two-year employees perceive need fulfillment and engagement differently than four-year employees?

Significance of Study

Higher education institutions are described as a unique workplace setting, much different from the business sector. Birnbaum (1988) noted that higher education institutions “are the most paradoxical of organizations” (p. 3) and what distinguishes higher education institutions from the business world is its governance, described as loosely joined organizations, distinct from the more strongly- bound, hierarchical corporate setting (Birnbaum, 1988). Additionally, Messa et al. (2016) noted that higher education support and professional staff present a “unique population.” (p. 4). Furthermore, higher education institutions offer employee quality of work-life integration (meaning, mission, convenience, education benefits, time off, child care, transportation, housing, and retirement) opportunities that are unlike some business settings (Messa et al., 2016; Williams, 2017). In their study of the meaning of work, Cartwright and Holmes (2006) emphasized the point that in the concept of meaningful work research (and organizations) should focus on actively developing the positive aspects of life and work as compared to continually attempting to identify and address negative aspects of work. Researching higher education employee motivational factors, which lead to work engagement, could provide useful information to help public higher education administrators effectively manage their professional personnel in today’s financially lean climate. In addition, higher education employee engagement research could potentially assist employees effectively manage

their attitude toward their work at a time of increasing responsibilities and evolving work environments (Hermesen, 2008).

Benefit of the Study

Hermesen (2008) noted current engagement research, could help understand these sometimes “conflicting goals of increased motivation and productivity” (p. 2). Understanding which motivational factors can lead to work engagement can not only assist institutions to better manage areas such as turnover, morale, attendance, and productivity, but could assist senior and mid-level institutional administrators create positive workplaces that offer meaning and create the opportunity for employee work engagement. Recent findings have demonstrated that the U.S. workforce is currently operating at roughly one third of its potential. There is substantial opportunity for organizations to tap into even two thirds of their potential (Gasta, 2016). Bolman and Deal (2008) noted that, when workers find satisfaction and meaning in work, the organization profits from effective use of talent and energy, whereas unhappy workers engage in withdrawal, resistance, and rebellion, leading to a loss for everyone. Idaho public higher education institutions administrators could benefit from this study as results could provide some valuable insight into improving employee work engagement. Hopefully, this study serves to highlight the dynamics that have a positive impact on the level of professional employee work engagement in public higher education institutions.

Definitions

In reviewing the literature on work engagement, there are several terms needing clarification to ensure understanding throughout this study. These terms will be used throughout the study and definitions should give context to terms when used.

Higher Education Employee - In this research public higher education employees are

support staff, which typically are regarded as classified and/or non-classified employees in Idaho public higher education institutions. Classified employees are hourly employees and typically are the support staff found in areas such as facilities, admissions, financial aid, registrar's office, administrative assistants, human resources, and finances. Non-classified positions typically encompass supervisory roles, technical and/or professional expertise.

Public higher education institutions – The research will study eight public higher education institutions in Idaho. Four four-year institutions and four community colleges.

Work engagement – Refers to when an employee has a “sense of energetic and effective connection with their work activities” (Schaufeli & Salanova, 2007, p. 140). According to Schaufeli, et al. (2001) work engagement is defined as “a positive fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption” (p. 74).

Employee engagement – Kahn (1990) defines employee engagement “as the harnessing of organizational members’” selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances” (p. 694). Though terms may appear to be interchangeable, with work engagement, Schaufeli (2013) makes the argument that work engagement “refers to the relationship of the employee with his or her work, whereas employee engagement may also include the relationship with the organization” (p. 1). Andrew and Sofian (2012) further define employee engagement as “the level of commitment and involvement an employee has towards his or her organization and its values” (p. 499).

Assumptions, Limitations, Delimitations

Assumptions. Several assumptions were inherent in this study. Included in these assumptions were that the respondents completed the questionnaire honestly and to the best of

their ability; were knowledgeable enough to understand the challenges they faced in their department; and the online survey instrument provided a valid measurement of their work perceptions.

Limitations. As with many online surveys, there was a potential for poor rate of return on the online questionnaire emailed to subjects. One survey company noted that the average online response rate is around 26% (“Survey response rates”, 2017). A further limitation of the study could have resulted in the lack of internet access for certain employees. As a result, potential respondents may have elected not to participate or may not have known about the survey. Furthermore, there could have been unknown biases between four-year and two-year institutional employees. Lastly, there was no consistent manner to determine how a respondent were interpreting or answering questions based on their current emotional state at work.

Delimitations. The respondents of this study were limited to state of Idaho, which limits the results of this study to Idaho public institutions, while generalizations to other geographic areas were made with caution. Finally, only self-determination theory was used as the theory to be applied with higher education staff members.

Biases

As a higher education employee, part of the author’s responsibilities require to interact with other higher education employees to perform certain tasks. The author realizes that casual conversations and observations with different employees (primarily at one institution) has developed the author’s own opinions as to why an employee may or may not engage in their work at a particular higher education public institution. By using the self-determination theory, the Utrecht Work Engagement Scale (UWES), and the Basic Psychological Need Satisfaction at Work Scale questionnaire should assist in diminishing these biases.

CHAPTER II

Literature Review

Macey and Schneider (2008) noted that interest in employee engagement is relatively new, and had its beginnings in the business world rather than from academic research. Furthermore, though employee engagement may be somewhat easy to recognize, it has proven challenging to define (Meyer, Gagne, & Parfyonova, 2010). Though elusive to define, employee engagement has been marketed extensively by organizations as a technique of gaining a competitive advantage (Macey & Schneider, 2008). Meyer et al. (2010) observed that what adds to the confusion on how to define employee engagement can be understood by how HR consulting firms generally offer definitions which are compatible with the marketing and development strategies they are attempting to promote. In contrast, academic researchers can potentially be influenced by their academic disciplines and theoretical orientations. Regardless, Shohat and Vigoda-Gadot (2010) noted that employee engagement “must be considered as a potentially new challenge for both theory and practice in management” (p. 105).

The Engagement Discourse in Higher Education

Within the higher education arena, the research of support and professional staff (non-faculty employees) has mainly focused on factors that contribute to employee job satisfaction and little regarding work engagement. Considerable amounts of research has focused on faculty and students (Bauer, 2000) and little of professional staff (non-faculty), yet working mainly behind the scenes, non-faculty roles in higher education allow institutions to operate effectively. Functions such as maintaining classrooms, technology, facilities, parking, financial aid, finance, admissions, administrative responsibilities, etc., generally impact faculty and students directly or indirectly. Therefore, retaining engaged professional staff provides continuity, expertise,

knowledge, and other positive benefits for faculty, students, and ultimately, the institution. The lack of research with non-faculty staff is what drives this study. Understanding how basic psychological need satisfaction can positively influence levels of work engagement in Idaho public higher education will add to the limited research with higher education professional staff.

This particular group of professional staff comprise a large percentage of employees in higher education, nevertheless little research has been done on the motivation factors of these professional staff (non-faculty staff). Saks (2006) noted that a great deal of what has been written regarding employee engagement originates from the “practitioner literature and consulting firms” (p. 600). Bakker & Schaufeli (2008) noted that thus, there is a great difference between what corporate interests are in employee engagement and the academic research literature.

The job satisfaction literature in higher education has shown that there are many work life and identity issues, demographic, and profile characteristics that influenced individual job satisfaction and morale (Hermsen, 2014). These concerns included institutional type, with community college employees being more satisfied than those employed in a research university or liberal arts college (Johnsrud, Heck, and Rosser, 2000). In their study of midlevel administrators at 10 higher education institutions, Johnsrud et al. (2000) found that the quality of relationships with supervisors and colleagues, opportunities for career development and advancement, and the recognition and appreciation for their “work well done” (p. 54), are particular worklife factors that are important to midlevel administrators. Furthermore, the negative effect of these worklife factors can influence their intentions to leave the institution.

Internationally, Brown and Sargeant (2007), in their study among full-time university workers, found significant differences in overall extrinsic and intrinsic job satisfaction and organizational and religious commitment among age groups. Furthermore, workers with post-

secondary degrees had higher levels of overall job satisfaction than those with only a high school diploma, and supervisory responsibilities had a higher level of intrinsic job satisfaction than employees who were staff.

Hong (2011) studied the classified employees of nine community college in California focusing on the job satisfaction attributes deemed important by classified employees. Hong found that five variables had statistical significance: work itself, responsibility, connectedness to the organization, supervisor, and salary. Bauer (2000), in her study of classified employees of a southern university found that factors that contribute to classified employee job satisfaction are rewards and recognition; work-life balance; opportunities for growth; training and development; and perceptions of the individual's work environment. Bauer noted that when employees experience feedback, help with achieving work-life balance, and offered rewards and recognition facilitates an employee to "feel valued and satisfied" (p. 95).

Hermesen and Rosser (2008) examined the work life perceptions, identity, work engagement, and job satisfaction of staff members in a Midwest institution. They found that working conditions, identity constructs of job fit (and role fit), and staff members who reported spending more time with students, were factors related to higher work engagement. Interestingly, they also found that the longer employees in this survey had been working on campus, the lower their level of work engagement, which is surprising and appears to be contrary to what other research has found (Brown & Sargeant, 2007; Hong, 2011). Schaufeli et al. (2006) found that length of employment had a weak yet positive relationship with work engagement. In a study of private higher education employees in Punjab, Pakistan (considered the hub of Higher Education Institutes in Pakistan), Amjad, Sabri, Ilyas, and Hameed (2015) found that there was significant effects of workplace friendships on job satisfaction, turnover intentions, task

performance, and on contextual performance. Amjad et al. concluded that workplace relationships significantly and positively affects “task performance, contextual performance, turnover intentions of Pakistani private sector university employees” (p. 316).

Theoretical Frameworks for Engagement

Definitions of Engagement

To understand the work motivation elements of this large higher education professional staff segment, it is essential to review what the academic literature says regarding employee work engagement. The literature in engagement points to the fact that there is a lack of a precise and agreed-upon definitions of the construct of engagement. From a practitioner’s perspective, this lack of consensus (ambiguous) can be problematic when making recommendations, and from a research perspective, various conceptualizations make it challenging to “accumulate a coherent body of research knowledge” (Fleck & Inceoglu, 2010, p. 31).

Kahn (1990), one of the first to refer to employee engagement in a positive frame, defined employee engagement as “... the harnessing of organizational members’ selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances (p. 694). Kahn describes personal engagement and disengagement as “the endpoints of a continuum” (p. 700). Alternately, Kahn defines personal disengagement as the “uncoupling of selves from work roles; in disengagement, people withdraw and defend themselves physically, cognitively, or emotionally during role performances” (p. 694). Macey and Schneider (2008) describe employee engagement as a desirable condition organizations should seek, it serves an organizational purpose, and specifically, it suggests employee involvement, commitment, passion, enthusiasm, focused effort, and energy, which connotes both attitudinal and behavioral components. Current definitions can be broad, which

include defining engagement as a state, trait, a set of behaviors, work characteristics, or a combination of these (Macey and Schneider, 2008). This understanding has come to be known as “positive psychology”, which namely is focusing studies on the characteristics of successful employees, managers, and productive work teams (Harter, Schmidt, & Hayes, 2002).

From a practitioner’s point of view, the International Survey Research (2003) described employee engagement as the organizational practice by which they enhance employee commitment and contribution to achieve greater business outcomes. In their annual report of British employees, the Chartered Institute of Personnel Development (CIPD) (2006) described some of the characteristics of an engaged employee as having a “passion for work”, i.e. feeling positive about your work, and being willing to “go the extra mile” to finish your job to the best of your abilities. The CIPD suggest that engagement as three dimensions: emotional engagement (involved emotionally with one’s work), cognitive engagement (extremely focused at work), and physical engagement (going the “extra mile”). This is in line with Kahn (1992) who suggested that personal engagement is the expression of a person’s “preferred self” in their task behaviors that promote connections to work and to others, and have a personal presence (cognitive, physical, and emotional). Kahn’s theory is that “people have dimensions of themselves that, given appropriate conditions, they prefer to use and express in the course of role performances” (p. 700).

Macey, Schneider, Barbara, and Young (2009) found in a sample of 65 different types of organizations, that the top 25% on an engagement index showed a greater return on assets (ROA), profitability, and more than double the shareholder value when compared to the bottom 25% of the engagement index. Therefore, engagement can be considered “an important strategic tool to attract, motivate, and retain the employees to achieve business success” (Gupta &

Sharma, 2016, p. 60). In another study, an IBM Software Technical Whitepaper (2014) suggest that employee engagement is a combination of behaviors and trait. In their conceptualization, they describe employee engagement as “a result of organizational policies and practices, as well as leadership and managerial behaviors that precede the state of employee engagement” (pp. 1-2). Kumar and Pansari (2014) suggested that employee engagement is a “multidimensional construct which comprises of all the different facets of the attitudes and behaviors (i.e. satisfaction, identification, commitment, loyalty, and performance) of employees towards the organization” (p. 55). Ultimately, engagement could be viewed as how an organization measures its investment in human capital (Kusuma & Madasu, 2015).

Schaufeli and Salanova (2007) suggest that employees exhibit engagement when an employee has a “sense of energetic and effective connection with their work activities” (p. 140). Furthermore, according to Schaufeli, et al. (2001) work engagement is defined as “a positive fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption” (p. 74). In other words, when employees are engaged, they invest more of themselves in their work role (Fleck & Inceoglu, 2010). Kahn (1992) further develops his theory of psychological engagement as four dimensions of psychological presence: individuals “feel and are attentive, connected, integrated, and focused in their role performances” (p. 322). By channeling personal energies into physical, cognitive, and emotional action, individuals become physically involve in their work, whether alone or with others, become cognitively attentive, and “empathetically connected to others in the service of the work they are doing in ways that display what they think and feel, their creativity, their beliefs and values, and their personal connections to others” (Kahn, 1990, p. 700).

Though there is a lack of consensus in a precise definition of engagement, Macey and Schneider (2008) note that there is agreement that employee engagement is desirable and has organizational value. Andrew and Sofian (2012) define employee engagement as the “level of commitment and involvement an employee has towards his or her organization and its values” (p. 499). Andrew and Sofian posit that the volume of research suggest that employee engagement could be a strong factor for organizational performance and success. With engaged employees there seems to be a substantial potential to affect employee retention, loyalty, productivity, and research has shown some evidence that this employee engagement could lead to customer satisfaction, brand name and the “overall stakeholder value” (p. 499). Andrew and Sofian suggest that employee engagement is an extensive construct that includes virtually all aspects of human resources management. Therefore, employee engagement is critical for any organization. Similarly, from a practitioner's perspective, one CEO described engagement as “giving people the tools they need to succeed in their careers, which in turn drives the outcomes that we’re seeking in the marketplace” (Harvard Review, 2013, p. 3).

What draws organizations to having engaged employees is the idea that engaged employees feel a strong desire to strive towards challenging goals and accept a personal commitment to achieve these goals. Engaged employees strive to succeed, they bring a great deal of energy to their tasks, and they enthusiastically apply that energy to their work (Leiter & Bakker, 2010). Furthermore, Leiter and Bakker suggest that engaged employees are attentive and put their energy in all aspects of their tasks. Engaged employees bring their full capacity to solve problems, interactions with other people, and in being solution orientated.

On a somewhat innovative approach, Saks (2006) hypothesized that employee engagement model is composed of two types of engagement: job engagement and organization

engagement. Saks postulates that two prevailing roles for most employees is their work role and their role as a member of a particular organization, which allows for calculated understanding of the employee engagement construct. Saks' (2006) construct of the dual role of engagement hypothesizes that antecedents (job characteristics, perceived organizational support, perceived supervisor support, rewards and recognition, procedural justice, and distributive justice) lead to both job engagement and organization engagement. The consequences of job and organization engagement are job satisfaction, organizational commitment, lower intention to quit, and organizational citizenship behavior. In his extensive research on engagement, Schaufeli (2013) noted that Saks' multidimensional approach (distinction between job and organizational engagement) "has hardly been taken up by the research community" (p. 7). Shuck and Wollard (2011) suggest a somewhat different construct of engagement by positing engaged employees excel in their tasks because of the individual's ability to adapt their behavior toward stated organizational outcomes, and not to be confused with extra-role behaviors such as organizational commitment behavior, which is not part of an individual's primary area of responsibility.

Schaufeli (2013) noted that consultancy firms have "conceptualized engagement by combining and relabeling existing concepts, such as commitment, satisfaction, involvement, motivation, and extra-role performance" (p. 4). As a result, the business world sees engagement as a blend of three existing concepts: job satisfaction, commitment to the organization, and extra-role behavior (discretionary effort to go beyond the job description) (Schaufeli, 2013).

Trait, state, or behavioral. Macey and Schneider (2008) posit that some of the confusion emerges as to whether engagement refers to a psychological (state) (involvement, commitment, attachment, mood), behavioral (effort or observable behavior, including prosocial and organizational citizenship behavior), or trait (disposition or positive affect). For practitioners,

the appeal of employee engagement has been the behavioral outcomes or behavioral engagement, which is thought to be connected to organizational effectiveness (Weidemann, 2016). Behavioral engagement is often referred to as discretionary effort (Tower-Perrin, 2012), or organizational citizenship behavior (Organ, 1997). Trait employee engagement is referred to the notion that certain individual characteristics (proactive personality, positive affect, and conscientiousness) could be attributed toward employee engagement (Macey & Schneider, 2008). Macey and Schneider’s conceptual framework for understanding employee engagement

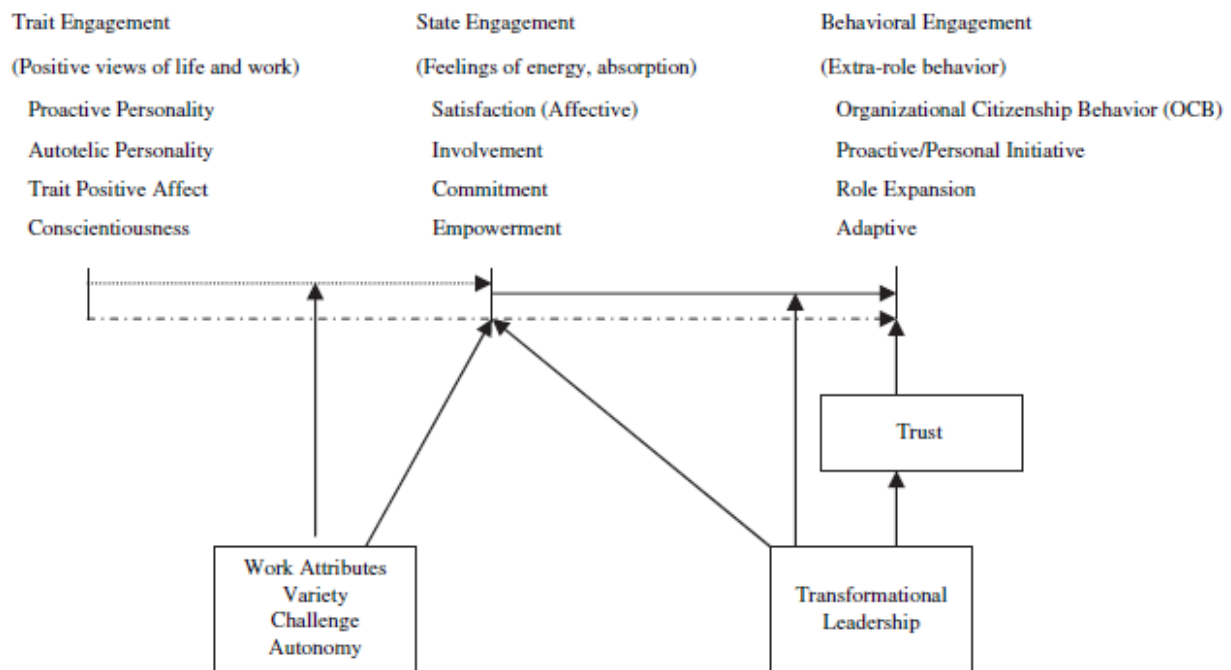


Figure 1. Macey and Schneider framework for understanding the components of employee engagement.

suggest that the term engagement is used at different times to refer to psychological state, traits, and behaviors.

In developing their framework, Macey and Schneider (2008) focused on revealing the distinct characteristics of previous research that best reside in the “conceptual space” seen as “engagement so that future research and practice can more precisely identify the nature of the

engagement construct they are pursuing” (p. 6).

Schaufeli and Bakker (2010), on the other hand, suggest a narrow (“more precisely”) model that considers work engagement as an experienced psychological state (Kahn, 1990) which mediates the impact of job resources and personal resources on organizational outcomes (as cited in Schaufeli, 2013, p. 8). Schaufeli and Bakker’s model of work engagement distinguishes the *experience* of work engagement from its perceived *antecedents* and *consequences*. In other words, “neither resourceful jobs (as in the Satisfaction-Engagement approach) nor the employees’ performance behaviors (business approach) are conceived as constituting elements of work engagement” (Schaufeli, 2013, p. 8). Schaufeli (2013) noted that antecedents and consequences (of engagement) should be included in research and practice, yet considered to be distinct concepts. Schaufeli argues that though a particular job may be resourceful an employee may not necessarily feel engaged due to personal problems. Furthermore, an employee may feel engaged but not show personal initiative because of work restrictions. Schaufeli further posits that work engagement is “neither inherently linked to challenging work nor to performance” (p. 8). Therefore, work engagement should be viewed as a separate entity.

Schaufeli (2013) suggests that definitions of engagement as a psychological state (such as Kahn, 1990) suggest that “engagement entails a physical-energetic (vigor), an emotional (dedication), and a cognitive (absorption) component” (p. 9). Also, based on the work of Kahn (1990) May, Gilson, and Harter (2004) developed an engagement inventory using the dimensions of cognitive, emotional, and physical engagement (Schaufeli, 2013). This inventory is very similar to the engagement inventory developed by Schaufeli et al. (2001), which includes the dimensions of absorption, dedication, and vigor scales.

Christian, Garza, and Slaughter (2011), in their review of engagement literature, noted that as Kahn (1990) suggested in his research, work engagement has an “ebb and flow” characteristic, a condition that may differ between and within individuals. Christian et al. (2011) also refers to engagement “as a state of mind that is relatively enduring but may fluctuate over time” (p. 94), or even daily. This fluctuation can be caused by a range of personal and situational reasons. Furthermore, some employees may display engaged behaviors because they may feel compelled to do so by organizational factors, such as fearing they may lose their jobs. Even when organizations administer engagement surveys, management cannot be completely sure if an employee’s engagement is due to an external force, such as fear of employment, or an internal basis such as a positive, internalized, motivated state (Fleck, & Inceoglu, 2010).

Schaufeli (2013) posits that a theoretical framework for engagement has not been created. Schaufeli posits that what has been proposed are theoretical perspectives that emphasize different aspects, but are not “integrated into one overarching conceptual model”, though Meyer and Gagne (2008) suggest that self-determination theory provides a strong unifying theory to guide research and practice.

The needs-satisfying approach. Kahn (1990) proposed in his research that employees become engaged when three psychological conditions are met. First, meaningfulness, which is associated with “work elements that created incentives or disincentives to personally engage (p. 704). Second, psychological safety, which is associated with “elements of social systems that created more or less nonthreatening, predictable, and consistent social situations in which to engage” (p.704). And third, psychological availability, which was associated with individual distractions that preoccupied people to various degrees and left them more or less resources with which to engage in work roles. Meaningfulness is influenced by the nature of the job (role and

task characteristics), psychological safety is mainly influenced by the social environment (relationships, group dynamics, leadership style, and social norms), and psychological availability depends on physical and emotional energy, insecurities, and outside life, employees bring to their role performance

The job demands-resources model. The job demands-resources model assumes that engagement is the result of the inherently motivating nature of job and personal resources (Schaufeli, 2013). First, job resources are defined as those characteristics that are useful in attaining work goals, reduce job demands, or encourage personal growth and development (performance feedback, job control, and social support from coworkers). Second, personal resources are individual characteristics of the self that are related with resiliency and denote the ability to control and influence one's environment positively (e.g., self-efficacy, optimism and emotional stability). JD-R model suggests that these two resources “foster engagement in terms of vigor (energy), dedication (persistence), and absorption (focus)” (p. 16). The negative aspect of this model is that when work demands are too high, employees may exert additional effort to complete work goals. These extra efforts may create physical and psychological demands, such as fatigue and irritability (Schaufeli, 2013). Although, Bakker and Schaufeli (2008) suggest that the JD-R model suggests that different mechanisms determine employee health and optimal functioning the motivational process as compared to employee ill health and health impairment process.

In a review of 16 cross-sectional studies from seven countries Schaufeli and Taris (2014) concluded that job resources and job demands has an impact over time on burnout and work engagement. Their study found that increases in job resources predicted work engagement, whereas job demands and decreases in job resources predicted burnout (Schaufeli, Bakker, &

van Rhenen, 2009).

In their review of qualitative and quantitative studies on work engagement, Bakker and Demerouti (2008) found that either job resources and personal resources, independently or combined, predict work engagement. Also, job and personal resources mainly have a positive impact on employee engagement when job demands are high, with work engagement having a positive impact on performance. Bakker and Demerouti conclude that those employees who are engaged at work and perform their tasks well are able to produce their own work resources, which then nurture engagement again over time and generate a “positive gain spiral” (p. 218).

The affective shift model. The affective shift model is based on the “assumption that both positive and negative affect have important functions for work engagement” (Bledlow, Frese, Schmitt, and Kuhnel, 2011, p. 1246). The affective shift model is an attempt to explain the dynamic nature of work engagement in which work engagement increases and decreases daily as an individual maneuvers from one task to another and being exposed to several kinds of events while at work (Schaufeli, 2013). Bledlow et al., (2011) further explain that the central proposition of the affective shift model is that work engagement will only result from the “experience of negative affect if a shift to positive affect takes place” (p. 1247). This shift in negative affect followed by positive affect is known as an *affective shift*. It is this energetic interchange of positive and negative affect during work that produces work engagement (Schaufeli, 2013).

Social exchange theory. Social exchange theory (SET) is based on the assumption that human commitments are created through a “series of interactions between parties who are in a state of reciprocal interdependence” (Saks, 2006, p. 603). SET posits that relationships evolve over time “into trusting, loyal, and mutual commitments” (p. 603) as long as both parties behave

by certain ‘rules’ of exchange. Saks (2006) argues that one way individuals can repay their organization is through their level of engagement. In other words, employees will purposely choose to engage in varying degrees in response to the resources they receive from their organization. In contrast, when an organization fails to provide the proper job resources, employees are more likely to withdraw and disengage themselves from their work roles, which eventually could lead to burnout (Schaufeli, 2013). Alfes, Shantz, Truss, and Soane (2013), in their study of employees in a service sector of the UK, found that engaged employees demonstrate greater organizational citizenship behavior towards the organization if they feel supported by the organization and have a positive relationship with their immediate supervisor. Furthermore, if they feel supported and valued by their employer they are less likely to leave and invest their energy in a different organization.

Individual Antecedents and Drivers of Employee Engagement

Though antecedents might differ for individual employees there are some factors that research has shown that precede employee engagement. These are discussed briefly to give context to work engagement.

Job satisfaction. Job satisfaction is a work related concept that has been researched as organizations explore ways to increase motivation and productivity (Hermesen, 2014). Abraham (2012) suggested that the “more a person’s work environment fulfills his or her needs, values or personal characteristics, the greater the degree of job satisfaction” (p. 27). Locke and Henne, 1986), see job satisfaction as a pleasurable or positive emotional state because of a job appraisal or job experience. Garg & Kumar (2012), in their study of employees of the pharmaceutical sector found that, “A person may be satisfied with job but may not actually do meaningful work. Job satisfaction in itself does not create high performance. Engagement is Job Satisfaction +

Performance” (p. 93). Christian et al, (2011) noted that job satisfaction and engagement have underlying differences, “engagement connotes activation, as opposed to satisfaction, which is more similar to satiation” (p. 97). Furthermore, Christian, et al., found that job satisfaction is an evaluative description of an explicit job characteristic or condition (I like my salary), “which is a feature of a job attitude” (p. 97, as opposed to work engagement, which is a description “of an individual’s experiences resulting from the work (e.g., ‘I feel vigorous when working’)” (p. 97). They conclude that to the proportion to which an employee invests their “full selves” in the execution of their task appears to be a different concept from the extent to which employees are satisfied with their jobs or if they value their organizations.

In her study of job satisfaction and engagement among employees of a private insurance company, Abraham (2012) found that factors such as work, benefits, recognition, cooperation, fair treatment, sound company policies, team spirit and performance management system can increase job satisfaction in individuals, which can lead to employee engagement. Baard et al., (2004) state “the fact that intrinsic need satisfaction related to performance is useful in sorting out the inconsistent relations” (p. 2063) between job satisfaction and work performance. Saks (2006) found that antecedent variables of job characteristics, perceived organizational support, supervisor support, rewards and recognition, procedural justice, and distributive justice explained a significant amount of the variance in job engagement. Saks further explains that when employees perceive higher organizational support they are more likely to respond with increased levels of engagement in their job and in the organization. In studies where employees perceived these positive antecedents, employee engagement resulted at both the job and organizational levels (Clifford, 2010).

Kahn (1990) noted that there were certain psychological conditions in which individuals personally engage and disengage in their jobs. Kahn stated, “These conditions are psychological experiences of the rational and unconscious elements of work contexts” (p. 695). Hackman and Oldham (1980) describe a similar general causal flow in that job characteristics impact critical psychological states that influence an individual’s internal (intrinsic) work motivation (as cited by Rich, Lepine, & Crawford, 2010). Rich, et al., (2010), in his study of the job attitudes of full-time firefighters, elaborated on Kahn’s three direct psychological conditions for engagement. These psychological conditions can be thought of as in terms of three questions individuals ask themselves prior to choosing to personally engage or disengage from their work role: How meaningful is it for me to bring myself into this performance? (2) How safe is it to do so? In addition (3) How available am I to do so? In their study, Rich et al., (2010) concluded that Kahn’s theory provided a “more complete” theory of the self in terms of the vigor that people invest in their work roles. Rich et al, found “statistically significant indirect relationships through engagement between each of the antecedents and each of the outcomes, and these relationships emerge in models that also include job involvement, job satisfaction, and intrinsic motivation as mediators” (p. 628). Furthermore, they found that engagement completely accounts for the relationships between antecedents and the performance outcomes.

The results of the 2014 Employee Job Satisfaction and Engagement published by the Society for Human Resource Management (SHRM) further explain the association of job satisfaction as an antecedent of employee engagement. The top factors influencing engagement are collaborated by research already discussed so far. The report noted that employee engagement is linked to a number of job satisfaction contributors related to the conditions of the workplace. According the SHRM 2014 report, among the highest factors influencing job

satisfaction (and ultimately engagement) in an organization are: relationship with co-workers (79%), contribution of work to organization's business goals (76%), meaningfulness of the job (75%), relationship with immediate supervisor (73%), the work itself (73%), organization's financial stability (73%), variety of work (71%), autonomy and independence (69%), overall corporate culture (67%), management's recognition of employee job performance (62%), communication between employees and senior management (60%), organization's commitment to corporate social responsibility (58%), job-specific training (55%), organization's commitment to professional development (54%), career development opportunities (54%), career advancement opportunities within the organization (54%), networking opportunities (within or outside the organization) (51%) (p. 30).

How do engagement antecedents and drivers perform in other cultures? Bedarkar & Pandita (2014), in a review of employee engagement literature, listed the top global engagement drivers (antecedents) for 2010: career opportunities, brand alignment, recognition, people/HR practices, and organization reputation (p. 109). These five engagement drivers align with what the empirical research has shown to drive engagement (Saks, 2006; Stone, et al., 2008; Radhakrishna & Raju, 2015; SHRM, 2014; Andrew & Sofian, 2012).

In an extensive literature review on sustaining employee engagement, Krishnaveni and Monica (2016) discovered four job characteristics that cannot only create, but can sustain employee engagement in the workplace. These four job features are job characteristics, supervisor and coworker relationships, development and growth opportunities, and rewards and recognition.

Job characteristics. Using Kahn (1990) psychological theory in which there must be psychological conditions to influence an individual's engagement: psychological meaningfulness

(value congruence), psychological safety (perceived organizational support), and psychological availability (core self-evaluations), Krishnaveni & Monica (2016) noted, “Tasks characteristics such as challenging work and clearly identified, creative and autonomous role offer ‘attractive identities’, self-image and status” (p. 10). Krishnaveni & Monica further elaborated that meaningfulness which included job-enrichment and work-role fit displayed the strongest relation with engagement. Oldham and Hackman (2010) posited five “core” job characteristics:

- Skill variety - the degree to which the job requires a variety of different activities in carrying out the work, involving the use of a number of different skills and talents of the person
- task identity - the degree to which the job requires doing a whole and identifiable piece of work from beginning to end
- task significance - the degree to which the job has a substantial impact on the lives of other people, whether those people are in the immediate organization or the world at large
- autonomy - the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out
- job-based feedback - the degree to which carrying out the work activities required by the job provides the individual with direct and clear information about the effectiveness of his or her performance (p. 464).

Saks (2006) also found that employees involved with jobs that are high on the job characteristics are more likely to respond with greater job engagement. Vanam (2009) also found that among full-time workers job resources positively related to job engagement. Finally, there is a body of

research dealing with how the work itself is a driver of engagement (Bakker & Bal, 2010; Kühnel, J., Sonnentag, & Westman, 2009; LePine, Rich, & Crawford 2010; Parker, Jimmieson, & Amiot, 2010; Richardsen, Burke, & Marinussen, 2006; Schaufeli & Bakker, 2004; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009b).

In summary, Oldham and Hackman (2010) argue that at the heart of Job Characteristic Theory is that if work contains certain attributes it increases the probability that individuals will find work meaningful, take ownership of their performance and outcomes. Furthermore, individuals will value opportunities for growth becoming intrinsically motivated to perform their tasks. This in turn should result in “higher quality of work outcomes” (p. 465).

Supervisor and coworker relationship. Work settings that encourage and sustain relationships are built on concepts such as cooperation, support, trust, and partnerships (Kahn, 2010). Areas of leadership that are drivers of engagement are leaders who builds trust (Tims, Bakker, & Xanthopoulou, 2011; Xu & Thomas, 2011), leadership who recognize and respect subordinate employees (Bakker & Bal, 2010; Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007; Schaufeli, Bakker, & Rhenen, 2009).

Kovjanic, Schuh, Jonas, Van Quaquebeke, and Van Dick (2012), in their study of leadership transformation in two different European countries, found there is a strong relationship between transformational leadership and fulfillment of competence, autonomy, and relatedness. Furthermore, they found that need satisfaction played a mediating role in linking transformational leadership and employee outcomes.

Development and growth opportunities. Researchers have noted a positive relationship between learning opportunities and employee engagement (Saks, 2006; Robinson et al., 2004; Shuck & Wollard, 2010). In a study designed to measure job attitudes of full-time firefighters,

Rich (2010) found that through manager leadership training and creating performance management systems which provide development feedback, these factors can “promote employee engagement directly and enhance employee performance indirectly” (p. 631).

Rewards and recognition. Employee engagement level can fluctuate based on an individual’s perception of work benefits (Kahn, 1990). In addition, Saks (2006) identified rewards as an essential factor in the minds of employees as an emotional driver of employee engagement. SDT assumptions differ from those traditionally found in many organizations where behavior tends to be managed mostly by external rewards (Stone, et al., 2008). These type of “carrot and stick” approaches to motivate individuals generally lead to a greater focus on the “tangible rewards of work rather than on the nature and importance of the work itself” (p. 3). However, these extrinsic rewards can produce short-term productivity increases by controlling behavior, which is poor motivation quality, it is unsustainable, and eventually can create other negative consequences. Some negative examples would be creating culture of fraud, cheating, and deception. By emphasizing tangible rewards could ultimately lead to undermining of intrinsic interest in the work itself. Stone et al., (2008) suggest that though restructuring organizational compensation and reward programs for critical workforce can have significance, many restructurings are unsuccessful because they are not grounded in the core principles of autonomous, sustainable motivation.

Work Engagement

Bakker, Schaufeli, Leiter, and Taris (2008) noted that the field of psychology has been criticized as devoted to addressing mental illness rather than mental well-being. This is supported in that the number of “negative state” publications far outnumber the “positive state” publications. Turner, Barling, and Zacharatos (2002) argued, that research needs to extend its

focus and explore in more depth the positive sides, to get a full understanding of the meaning and effects of working (as cited in Bakker, et. al., 2008) . Schaufeli, Salanova, Gonzalez, and Bakker (2002) noted that the focus of newer research reflects an emerging trend towards “positive psychology” which focuses on individual strengths and optimal functioning rather than on weaknesses and malfunctioning.

Fredrickson and Losada (2005), in a study among business teams, empirically validated that positive communication and expressions of support among team members clearly differentiated thriving teams over languishing teams. In their observational study of 60 management teams, Fredrickson and Losada identified 15 teams that produced superior results (as indicated by profitability, customer satisfaction, and 360* evaluations by superiors, peers, and subordinates) based upon the words verbalized. Bakker and Schaufeli (2008) further suggested that successful teams exhibited more positive effect verbalization displayed a wider range of ideas and initiatives, while teams with average or no success were more constrained in the number of effect and ideas. Finally, “the poorest performing teams were tightly bounded, uncreative, and generally negative in outlook” (p. 150).

Bakker et al. (2008) in their call for more research into positive psychology, define work engagement as a “positive, fulfilling, affective-motivational state of work-related well-being that can be seen as the antipode of job burnout. Engaged employees have high levels of energy, are enthusiastic about their work and they are often fully immersed in their job so that time flies” (pp. 187-188). Schaufeli (2013) refers to work engagement as “everyday connotations of engagement refer to involvement, commitment, passion, enthusiasm, absorption, focused effort, zeal, dedication, and energy” (p. 1). Although “employee engagement” and “work engagement” are used interchangeably, Schaufeli makes the argument that work engagement denotes the

relationship of the individual with their work, while employee engagement may also include the relationship with the organization. Schaufeli concludes, “By including the relationship with the organization the distinction between engagement and traditional concepts such as organizational commitment and extra role behavior becomes blurred” (p. 1).

Schaufeli (2013) suggest that work engagement may be easy to identify, however, in practice it can be challenging to define. Macey and Schneider (2008) argued, that much of the confusion about how we define engagement can be credited the “bottom-up” method on how the engagement notion has quickly evolved within the practitioner community. Schaufeli (2013) noted, “this bottom up method that flourishes in business is not only at odds with the top down academic approach that requires a clear and unambiguous definition of the term, but it also hampers the understanding of work engagement for practical purposes” (p. 1).

Schaufeli et al. (2002) define work engagement “a positive, fulfilling, work related state of mind that is characterized by vigor, dedication, and absorption” (p. 74). Bakker and Leiter (2012) suggest that vigor is characterized by high levels of energy and “mental resilience” (p. 182) at work. Dedication denotes level of involvement and experiencing a “sense of significance and enthusiasm” (p. 182) in doing work tasks, and absorption refers to a high level of concentration and “happily engrossed in one’s work” (p. 182).

Vigor can be described as the willingness to invest effort in one’s work, and resolve in the face of difficulties. Bakker et al. (2008) noted that vigor and dedication are considered direct opposites of exhaustion and cynicism, which are the two core symptoms of burnout. The continuum that is spanned by exhaustion and vigor has been labelled ‘energy,’ whereas the continuum that is crossed by cynicism and dedication has been called “identification’. For this reason work engagement is “characterized by a high level of energy and strong identification

with one's work, whereas burnout is characterized by the opposite: a low level of energy and poor identification with one's work" (Bakker, et. al., 2008, p. 188). Bakker, et al. (2008) posit that engaged employees have a "sense of energetic and effective connection with their work" (as opposed to those who suffer from burnout) (p. 188), and view their work as challenging (as opposed to stressful and demanding).

Shirom (2010) suggested that vigor reflects an individuals' "feelings concerning the energy reservoirs that they possess at work" (p. 70). As vigor is closely related to motivation, the motivational processes within organizations represent in some ways how individuals decide how to allocate their energetic resources among different tasks. Hence, vigor could be regarded as a precursor of motivation at work (Shirom, 2010).

Schaufeli, Bakker, and Salanova (2006) define dedication as "being strongly involved in one's work and experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge" (p. 702). Sweetman and Luthans (2010) suggested that dedication contains direct associations to Psychological Capital in that it contains efficiency related to involvement in one's work, "optimism in attributions of significance and pride, hope in dedicated waypower and pathways, and resiliency in continuing in the face of challenging obstacles and adversity" (p. 57). Finally, absorption, the third and final aspect of engagement, can be viewed as individuals being fully absorbed in their work, "whereby time passes quickly and one has difficulties with detaching oneself from work" (Schaufeli et al., 2006, p. 702). Sweetman and Luthans (2010) argue that absorption relates to individual efficacy by having the confidence to be absorbed, individuals are optimistically expecting that positive results will occur, and are resilient in being persistently absorbed in a task.

Cristian et al. (2011) define work engagement “as a relatively enduring state of mind referring to the simultaneous investment of personal energies in the experience or performance of work” (p. 95). Schaufeli and Salanova (2007) suggested that being completely absorbed in one’s work is similar to what has been referred to “flow” (Csikszentmihalyi, 1978). “Flow” is where individuals described the subjective experience as being fully absorbed in a state of optimal experience. It is characterized by intense and focused attention, clear mind, mind and body unison, effortless concentration, complete control, loss of self-consciousness, distortion of time, and experiencing the activity as intrinsically rewarding, when often the end goal is just an “excuse for the process” (Nakamura & Csikszentmihalyi, 2009, p. 90). Though “flow” refers to a rather specific, short-term high experience, with work engagement it is viewed as a more prevalent and persistent state of mind (Schaufeli & Salanova, 2007). In a longitudinal study of Finnish health care personnel, Mauno, Kinnunen, and Ruokolainen (2007) found that work engagement (specifically vigor and dedication) was experienced regularly among the participants with average levels not changing over a two-year period. Furthermore, the study showed that job resources was a better predictor of work engagement than job demands.

Bakker et al. (2008) argue that in engagement creates fulfilment in contrast to the empty feeling left by burnout. Engagement is characterized by energy, involvement, and effectiveness, which are the opposite of burnout where “energy turns into exhaustion, involvement into cynicism, and efficacy into ineffectiveness” (p. 188). Leiter and Bakker (2010) noted that the vigor (energy) and absorption (focus) displayed in work engagement permits individuals to maximize their work potential. Leiter and Bakker (2010) suggest that work engagement builds on the cognitive broadening perspectives of Fredrickson (Fredrickson, 1998, 2001), where

Fredrickson's research showed that positive emotions increase the flexibility, creativity, integration, and efficiency of reasoning.

Social context of work engagement. Although work engagement is personal experience it does not occur in isolation. It is in the context of interpersonal relationships where employees may influence one another's experience of engagement as well as their work environment. (Leiter & Bakker, 2010). This is known as "emotional contagion", which is defined as the "transfer of positive (or negative) experiences from one person to another" (Bakker, 2009, p. 21). This effect could potentially have a positive effect on a team. Co-workers are potential resources of knowledge, emotional support, and materials, which influence the engagement experience. Furthermore, front line supervisor and managers define and symbolize the values of the organization, determine the flow of organizational resources, and model the way of thinking, feeling, and reacting to critical organizational events. It is in the employee interactions with customers, clients, students, or patients that the energy, dedication, absorption, or efficacy that what lies at the heart of work engagement turns into action (Leiter & Bakker, 2010).

Work role and work activity. Kahn's (1990) posits that an engaged employee is seen as "harnessing of organization member's selves to their work roles" (p. 694). When employees are engaged, individuals employ and express themselves physically, cognitively, emotionally and mentally during work role behavior. In other words, an engaged employee expends effort into their tasks because they identify with. (Bakker et al., 2008). It could be described as an energetic, dynamic relationship exists between the employee who puts their personal energies (physical, cognitive, emotional, and mental) into their work role and the work role that allows this employee to express themselves. Kahn views of engagement can be viewed as behavior (driving energy in one's work role) and considered as the expression of psychological presence, a certain

mental state. When an individual is engaged it is assumed to produce positive outcomes, such as personal growth and development (individual level), as well as improved performance quality (organizational level).

Rothbard (2001) took a somewhat different view and defined engagement as a two-dimensional motivational concept which includes attention (cognitive - how much time spent thinking on work role) and absorption (individual's intensity of focus on a work role). For this reason, Bakker, et al. (2008) suggest that the main reference of Kahn's (1990) engagement theory is the work role, "whereas for those who consider engagement as the positive antithesis of burnout it is the employee's work activity, or the work itself" (p. 189).

Bakker et al. (2008) noted that scholars agree that engagement is characterized by a high level of energy (dimension) and strong identification (dimension) with an individual's work. Bakker, et al. suggest that research is served best by a consistent construct for work engagement, "one that focuses on employee's experience of work activity" (p. 189). Though Macey and Schneider (2008) propose employee engagement as an all-inclusive term which accommodates the different types of engagement (trait, state, and behavioral engagement), Bakker et al. (2008) propose describing engagement as a "specific, defined, and properly operationalized psychological state that is open to empirical research and practical application" (p. 189).

Reviewing a qualitative study of Dutch employees from different occupations who scored high on the Utrecht Work Engagement Scale, Bakker and Demerouti (2008) noted that engaged employees have high energy and self-efficacy and this assists them to exercise influence over events that affect their lives, even events outside of work. Engaged employees displayed positive attitude and activity level, which allowed engaged employees to create their own positive feedback, in "terms of appreciation, recognition, and success" (p. 210). Bakker and Demerouti

suggest that engaged employees are not supermen, but experience tiredness like any other individual. The difference is that engaged employees describe tiredness as a rather satisfying state because it is associated with positive achievements, instead of work failures (Schaufeli & Salanova, 2007). Another critical characteristic of employees who experience work engagement is that engaged employees are not workaholics, as they enjoy work-life balance and, unlike workaholics, they work hard because “for them working is fun” (p. 210).

In a qualitative study of Danish midwives, Engelbrecht (2006) found that when participants described a highly engaged colleague, their interviews revealed that an engaged midwife is an individual who radiates energy and maintains “up the spirit at the ward, especially in situations where work morale is low and frustrations spreads” (p. 210). Engelbrecht noted,

The love of the job she is doing is expressed through the passion with which she fulfils her daily tasks. In addition to the normal tasks of a midwife, she is also engaged in other job-related but voluntary activities at the ward (p. 154).

Affective shift model. Bledow, Schmitt, Frese, and Kuhnel (2011) found the Affective Shift model of work engagement is tied to the presence of positive affect “but emerges from a dynamic interplay of positive and negative affect” (p. 1254). Based on self-regulation theories they inferred that when moving from a situation where a negative affect (negative events) occurs to a situation where high-positive mood is experienced, this was related with high work engagement. Furthermore, Bledow et al., found that

Moreover, results confirmed that the lower individuals were in positive affectivity, the more they depended on positively stimulating external events in order to become engaged. Results suggest that positive events have an additional direct influence on work engagement for people low on positive affectivity that is not transmitted through consciously experienced positive mood (p. 1254).

Consequences of work engagement. Research has shown that positive relationship between work engagement and job performance (Bakker, Demerouti, & Verbeke, 2004; Gierveld

& Bakker, 2005; Schaufeli, Taris, & Bakker, 2006). In one study Bakker et al. (2004) demonstrated that engaged employees obtained higher ratings from their colleagues on in-role and extra-role performance, showing that engaged employees perform well and are willing to go above what is required. Hence, having an engaged workforce would be of great benefit to any higher education institution. Bauer (2000) suggest that the evidence appears to show that “attention to staff needs will result in positive outcomes such as satisfaction and productivity” (p. 95).

Schaufeli and Salanova (2007) that for organizations to maximize employee well-being and optimal organizational health noted those things that have a positive influence on the employee’s health and well-being is generally good for the organization, and often vice versa. Schaufeli and Salanova further noted that the concept of engagement could play a vital role in the well-being of employee and organizational health. Furthermore, engagement can be related to positive work outcomes (high quality performance, low absenteeism, organizational commitment) which can lead to organizational success.

In a different approach, Deci, Ryan, Gagne, Leone, Usunov, and Kornazheva (2001) studied the extent of autonomy, competence, and relatedness support in two different types of economies: (a) centrally planned economy, Bulgaria and (b) a capitalist economy, U.S. The authors found that, regardless of organizational size or economic system, employees whose work environments supported their basic psychological needs were more proactive at work and better adjusted psychologically.

Finally, in an extensive literature review on sustaining employee engagement, Krishnaveni and Monica (2016) discovered four job characteristics that not only create, but can sustain employee engagement in the workplace. These four job features are job characteristics,

supervisor and coworker relationships (relatedness), development and growth opportunities (competence), and rewards and recognition.

Self-Determination Theory

To truly understand how engagement develops in the individual, there needs to be a list of potential antecedents (Meyer & Gagne, 2008). In other words, “we must be able to identify and explain the underlying mechanisms” (p. 61). Meyer and Gagne (2008) suggested that self-determination theory (SDT) provides a strong unifying theory to guide research and practice. Furthermore, Meyer et al., (2010) suggest that SDT has been increasingly adapted as a framework for the research of work motivation. Self-determination theory (STD) was pioneered by Ryan and Deci in the 1980’s, and describes the basic human needs of autonomy, competence, and relatedness, which has been shown to describe employee satisfaction and level of motivation in different types of organizations. SDT offers a description of the characteristics in an environment that support as opposed to thwart an organism’s attempt to engage in a particular situation. By allowing needs fulfillment (supporting) it can yield engagement and mastery, and to the extent that needs fulfillment is thwarted, it diminishes an “individual’s motivation, growth, integrity, and well-being” (Deci & Ryan, 2002, p. 9).

In an orderly review of all available SDT literature at the time, Vallerand, Pelletier, and Koestner (2008) noted that SDT represents a theory with “great heuristic power” (p. 257). A few key basic theoretical principles can help shape and understand motivational processes, causes, and effects in a range of life contexts. More importantly, Vallerand et al., underscores the fact that

[T]he findings reviewed are quite robust as they were obtained through a variety of methodological designs (experimental, correlational, prospective, and longitudinal), methods (paper-pencil, response latencies, observational, informant), and statistical analyses.... That similar findings have been consistently obtained across a host of

domains and outcomes, in line with the theoretical tenets of SDT, is a testament of the breadth of the theory as well as its internal, external, and ecological validity' (p. 257).

Deci & Ryan (2000) noted that SDT proposes there are three innate psychological needs which are critical for an individual's' optimal functioning, competence, autonomy and relatedness. It is vital that these needs be satisfied for psychological interest, development, and wellbeing to be sustained (Ryan & Deci, 2017). Gagne & Deci (2005) postulate that the psychological needs for competence (feeling effective), autonomy (volition), and the need for relatedness (desire to feel connected to others), underlie intrinsic motivation, meaning individuals need to feel competent, autonomous, and relatedness to maintain their intrinsic motivation. SDT defines these needs as "universal necessities, as the nutrients that are essential" (p. 337) for growth, integrity and well-being (Ryan & Deci, 2017). SDT suggest these basic psychological needs of autonomy, relatedness, and competence are presumed to represent the underlying motivation mechanism that stimulates well-being and enhanced performance (Ryan & Deci, 2017).

Deci & Ryan (2000) describe need satisfaction as the innate psychological nutrients that are vital for "healthy development and effective functioning" (p. 262). This is similar to basic physiological needs, which relate to nutrients required for physical health and safety, including requirements such as oxygen, clean water, proper nutrition, and a physically safe environment. The deprivation of these needs can lead to serious harm and ill health to an organism (Ryan & Deci, 2017). Gagne and Deci (2005) further elaborate that something is a need only to the degree that its satisfaction encourages psychological health and its thwarting weakens psychological health. They further argue that the needs for competence, autonomy, and relatedness are viewed essential for all individuals, "so SDT research focuses not on the consequences of the strength of those needs for different individuals, but rather on the

consequences of the extent to which individuals are able to satisfy the needs within social environments” (p. 337). If one desires to nurture an individual, one must understand what the individual requires to develop and function optimally. Furthermore, these requirements must be provided and afforded for the individual (Ryan & Deci, 2017).

Van Den Broeck, De Witte, Lens, and Soenens (2010) posit that this definition underlines several important distinctions from past motivation theories. First, attention is given to individuals’ psychological rather than biological needs (Maslow, 1943). Second, these psychological needs are said to be innate (similar to biological needs), and remain important throughout a lifespan. And third, basic need satisfaction is considered as vital for individuals’ ideal functioning and well-being, “as the provision of water, minerals and sunshine is crucial for plants to blossom” (p. 3).

Competence. Deci and Ryan (1985) describe the psychological need for competence as a longing to feel effective in interacting with the environment. It is this desire that drives individuals to persistently grow and improve and “to take on even more challenging tasks” (Weidemann, 2016, p. 11). Stone, Deci, & Ryan (2008) see competence as the confidence an individual has of the ability to impact essential outcomes. It is our basic need to feel effectance and mastery” (Ryan & Deci, 2017, p. 11).

The need for competence is highly related to the construct of self-efficacy. According to Bandura (1986) self-efficacy is the belief an individual has about their own abilities to perform tasks and achieve expected outcomes. The main distinction between competency and self-efficacy is that self-efficacy can be observed as an individual difference among employees and competence, according to SDT, is a “basic need shared across people” (Weidemann, 2016, p. 11). Furthermore, these individual beliefs about self-efficacy may or may not be accurate and are

focused on a possible task, whereas personal feelings of competence are experienced after individuals master actual tasks (Weidemann, 2016).

Deci and Ryan (2000) draw on experiments, which showed that positive feedback enhanced intrinsic motivation as compared to no feedback (Boggiano & Ruble, 1979, Deci, 1971), and that negative feedback decrease intrinsic motivation as compared to no feedback (Deci & Cascio, 1972). Deci and Ryan (2000) linked these results to the need for competence,

suggesting that events such as positive feedback that signify effectance provide satisfaction of the need for competence, thus enhancing intrinsic motivation, whereas events such as negative feedback that convey ineffectance tend to thwart the need for competence and thus undermine intrinsic motivation (p. 234).

Deci and Ryan (2000) further elaborated that positive feedback has its enhancement effect on intrinsic motivation only when “individuals feel responsible for the competent performance or when it does not eclipse an individual feelings of autonomy” p. 235). Interestingly Baard, Deci, and Ryan, (2004), in a study of employees from a banking operations center, found that the specific need satisfaction that most strongly related to anxiety/depression was competency (lack of).

In a study of schoolteachers, Bradley (2010) found that “feelings of mastery (competence) increases with levels of job demands and job control [autonomy], and that these effects are mediated by the process of active learning” (p. 97). In contrast, when teachers experienced low levels of job control (autonomy) under high levels of demand it was negatively related to employee mastery of tasks and feelings of competence. By perceiving autonomy in their tasks, the subjects experience higher levels of mastery (competence). Bradley noted

Thus, workers who are required to perform highly demanding jobs are likely to be challenged and invigorated by their work if, and only if, they are also granted high levels of job control. Under such conditions, workers learn new skills, experience success, and develop feelings of increased personal mastery (p. 99).

Autonomy. Deci and Ryan (2000) suggest that though perceive competence is vital for any type of motivation (extrinsic or intrinsic), “perceived autonomy is required for the motivation to be intrinsic” (p. 235). Deci & Ryan (2000) noted that autonomy refers to volition. They describe autonomy as the “organismic desire to self-organize experience and behavior and to have activity be concordant with one’s integrated sense of self” (p. 231). With autonomy, as it refers in SDT, is not referring to ideas of internal *locus of control*, independence or individualism. Rather, autonomy refers to the experiences of “integration and freedom, and it is an essential aspect of healthy human functioning” (p. 231). Autonomy refers (in the context of SDT) to when behavioral engagement aligns with an individual’s authentic values, interests, and needs (Roth, 2014; Ryan & Deci, 2017). Angyal (1941) suggested that human development could be characterized by an individual’s constant movement towards greater autonomy, which depends on the attainment of several competencies.

The construct of autonomy suggest that autonomy is the experience of acting with a sense choice, volition, and self-determination (Stone et. al., 2008) rather than the need for control (Deci & Ryan, 1985). It does not refer to independence, or being separate from, not relying upon (Deci & Ryan, 2000) as individuals can be dependent on others in a task while still maintaining autonomy (Stone, et. al., 2008). In order to feel self-determined, or autonomous, an individual needs to experience a sense of choice (volition) when engaging in tasks (Deci & Ryan, 1985). Meyer and Maltin (2010) described autonomy succinctly, “The need for autonomy is satisfied when, at the deepest levels of reflection, individuals believe that what they are doing is freely chosen and consistent with their core values” (p. 328).

In one study at Xerox Corporation, managers were trained in teaching active listening techniques. After the training, employees perceived greater autonomy support from managers

and employees reported considerably improved attitudes. Furthermore, employees who perceived more support from their supervisor reported more trust in the organization's top management (Stone, et. al., 2008). In a study of first-line employees from a major investment, banking firm Baard et al., (2004), found that perceived manager autonomy support by employees was significantly related to experienced satisfaction of competence, autonomy, and relatedness. Interestingly, Baard et al., in this particular study, found that women tended to perceive their managers as less “autonomy-supportive”, perceived marginally less satisfaction of their relatedness need, perceived that they received lower performance evaluations, and to display less well-being. Several explanation were given, however, the authors concluded that further research would be required to determine which factors account for the pattern of gender differences found. Vallerand et al., (2008), in their systematic research of SDT literature noted that the majority of articles highlight the fact that environments that provide autonomy support lead to qualitatively greater forms of motivation characterized by “high levels of self-determination, in turn, are conducive to more adaptive cognitive, affective, and behavioral outcomes” (p. 257).

In their literature review of High Performance Work Systems, Boxall and Macky (2007) noted that organizations that have granted greater employee autonomy has resulted in attaining higher performance objectives. After adopting Japanese automobile manufacturing practices, the wavering American automobile industry began a major upward transformation. This transformation began by moving away from low-discretion and control-focused work systems, towards task management styles that involved production workers and raised their skills and incentives. “High-involvement work practices typically include greater decision-making autonomy on the job, as well as off line quality circles or other types of problem-solving groups” (p. 264). Parker et al. (2010) found that when an employee experience the basic psychological

need of autonomy (“perceived high job control”) the individual expressed greater engagement (dedication to their job).

Boxall and Macky (2008), in describing what led to High Performance Work Systems, found evidence that high involvement work practices leads to high performance work systems. One of these high involvement work practices that lead to superior performance is increased autonomy by decreasing centralized decision-making. At the center of high-involvement work transformations are practices that attempt to reverse the Taylorist process of centralized decision making and problem solving by management and enhancing use of employee capabilities for “self-management (*i.e. autonomy*), personal development and problem solving” (p. 9).

Relatedness. The third psychological need that Deci & Ryan (2002) postulate in self-determination theory is the need for relatedness. They define relatedness as the desire “to feel connected to others - to love and care, and to be loved and cared for” (p. 231). Deci and Ryan research supports Baumeister and Leary (1995) in that relatedness (interpersonal attachments) is a fundamental need. Baumeister & Leary (1995) advocate that the need to belong, a need to create and sustain at least a minimum amount of interpersonal relationships, “is innately prepared (and hence nearly universal) among human beings” (p. 499). Baumeister and Leary suggest that the need to belong has two main factors to consider. First, that people need frequent personal contacts and interactions with other individuals. Ideally these interactions should be positive or pleasant, however, it is important that the majority of relationships be absent of conflict and negative affect. Secondly, people need to perceive that a relationship or interpersonal bond be stable, display concern (empathy), and continue long term. This perception provides a context to one’s interactions with others and is essential for satisfying the need to belong. To satisfy the need to belong, the individual must believe that another person “cares about his or her welfare

and likes (or loves) him or her” (p. 500). Furthermore, the lack of belonging with others, or personal attachments, is linked to a variety of ill effects on health, adjustment, and well-being. Deci and Ryan (2000) suggest that an unusually strong desire to be with other people is not a reflection of a strong innate need for relatedness could be a result, to some degree, of earlier experiences in which the basic needs were thwarted.

Gagne and Deci (2005) noted that relatedness plays a central role in a person’s internalization of organizational values and regulations. Therefore, organizations should structure work to allow interdependence among employees and identification with work groups, encourage respect and empathy towards other employees, which in turn could have a positive effect on “internalization of autonomous motivation and work outcomes” (p. 355).

Deci and Ryan (2000) noted that SDT hypothesizes that over a lifetime, intrinsic motivation will more likely thrive in contexts marked by a sense of secure relatedness. Deci and Ryan postulate there are situations where relatedness is less vital to intrinsic motivation than autonomy and competence (playing solitaire, hiking). However, “a secure relational base appears to provide a needed backdrop - a distal support - for intrinsic motivation, a sense of security that makes the expression of this innate growth tendency more likely and more robust” (p. 235).

Baard et al. (2004) in their study of banking employees noted that since both total need satisfaction and the need for relatedness were predictors of task performance, suggests that it is certainly beneficial to continue using the “concept of need satisfaction in research on organizational performance” (p. 2063). In their research of the role of basic need satisfaction between job demands, job resources, and employees’ exhaustion and vigor (main components of burnout and engagement), Van den Broeck et al., (2008), found some evidence that needs satisfaction partially accounted for the relationship between job demands to exhaustion and

between job resources to vigor. In other words, employees who have access to job resources are more likely to experience a general feeling of psychological freedom (i.e. autonomy), interpersonal connectedness (i.e. relatedness [*belongingness*]) and effectiveness (i.e. competence). This accounts for why employees feel less exhausted and more vigorous at work. Furthermore, Van den Broeck et al., suggest that basic need satisfaction, as posited by SDT, can help explain the relationships of job characteristics that are health enhancing vs. health impairing, as well as those characteristics that are ill health (burnout) and well-being (engagement).

Social contexts and internalization. Gagne and Deci (2005) suggest that one critical reason for proposing that there are basic psychological needs is that these needs “provide the basis for predicting which aspects of a social context will support intrinsic motivation and facilitate internalization of extrinsic motivation” (p. 338). This has been supported by study of parents providing support for competence, relatedness, and autonomy with respect to their children’s homework (Grolnick & Ryan, 1989). Another study by Black and Deci (2000) found that the “autonomy supportiveness” of professors in a college level organic chemistry course “predicted not only increases in autonomous motivation over the semester but also course grades after controlling for SAT scores and GPAs. The finding was especially strong for students with initially low levels of autonomous motivation” (p. 338). Another study by Williams and Deci (1996) showed that when instructors were more “autonomy supportive”, students displayed greater internalization of the standards presented in the course and this “predicted autonomous, value-congruent behaviors 6 months after the course ended” (p. 338).

Self-Determination Theory and Utrecht Work Engagement Survey

In a study to identify the levels of work engagement of a manufacturing organization in South Africa, Coetzer and Rothmann (2007) found that work engagement was positively statistically and practically significant related organizational support and growth opportunities in individuals. Employees appear more engaged in their tasks when they are provided with “organizational support (supervisor, role clarity, information, communication, and participation) and growth opportunities (in the form of variety in the job, opportunities to learn and autonomy)” (p. 27). Social support (relatedness) and advancement were moderately related to work engagement. The study showed that in this particular manufacturing organization work engagement was best predicted by organizational support and growth opportunities in the job.

Van den Broek et al., (2010) found in their workplace specific measure survey of the three basic psychological needs that all three needs were positively associated with job satisfaction and vigor, and were negatively associated with exhaustion (i.e. vigor and exhaustion being on opposite ends of a continuum). Furthermore, satisfaction of the three needs was positively related to life satisfaction, with competence and relatedness satisfaction being more strongly associated to life satisfaction than to job satisfaction and vigor, and need satisfaction related positively to organizational commitment and perceived performance. Dulagil (2012) suggested that satisfaction of the basic needs in SDT is related with elements that may contribute to employee engagement (i.e. vigor and job satisfaction).

Shuck, Zigarmi, and Owen (2014) studied the relationship between SDT, engagement (using the UWES and Job Engagement Scale [JES]), and performance (using a measure of harmonious and obsessive passion [HOPS]). The authors found that the association between the Basic Psychological Needs Survey (BPNS) and all four of the engagement scales were positive,

which suggested that when individuals rated BPNS higher (SDT), engagement scores were also higher. Furthermore, the association between each of the four engagement scales and intentions demonstrated significant positive associations for UWES and Harmony, but not for JES and Obsession scales. Using the three unique scales, “engagement indicated direct significant relations with SDT in each case” (p. 12).

De Wet (2015), in a quantitative and cross-sectional study of South African office personnel, found the engagement (UWES) had a strong positive relationship with the satisfaction of basic psychological needs (SDT). Furthermore, it found a moderate positive relationship with perceived managerial support and moderate negatively related to both emotional exhaustion (burnout) and intentional to leave (retention). Earlier research supports these findings (Shuck et al., 2014; Van den Broeck, et al., 2010).

Summary

Faculty and students typically have been the focus of academic research, and appropriately so. However, working mainly behind the scenes, non-faculty roles in higher education allow institutions to function successfully. This particular group of professional staff comprise a large percentage of employees in higher education, yet little research has been done on the work motivation factors of these professional staff (non-faculty staff). The lack of research with non-faculty staff is what drives this study. Previous research has shown that interacting with students, connectedness to the organization, and professional development were significant factors in job satisfaction with some professional staff.

Results of Saks’ (2005) study suggest that employee engagement can be understood in terms of SDT. Employees who perceive higher organizational support are more likely to respond with greater levels of engagement in their job and in their organization. Employees who are

placed in jobs that are high on the job characteristics, development and growth opportunities, rewards and recognition, supervisor and coworker relationships are more likely to respond with greater job engagement. Engaged employees are also more likely to have high-quality relationship with their employer leading them to also have attitudes, intentions, and behaviors that are more positive.

CHAPTER III

Methodology

The purpose of this quantitative study was to determine if self-determination theory (human needs of autonomy, competence, and relatedness) provides a theoretical explanation of employee work engagement in public higher education institutions. This particular group of professional staff comprise a large percentage of employees in Idaho public higher education, yet little research has been done on the level of work engagement of these individuals (non-faculty staff). Understanding how basic psychological need satisfaction can positively influence levels of work engagement in Idaho public higher education will add to the limited research with higher education professional staff. A quantitative methodology will be used for the study of higher education employee work engagement in higher education institutions. Creswell (2014) explains that a “survey design provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. From sample results, the researcher generalizes or draws inferences to the population” (p. 201). The quantitative methodology was used to measure the relationship between variables. One of the objects of the study was to show the strength and direction of the relationship between the defined variables (Creswell, 2014). Quantitative studies are broad in scope and include data from large populations of participants. Researchers use quantitative methods to explore rigid data in an attempt to generate predictions or descriptions of the information obtained (Chitwood, 2010). Furthermore, the quantitative data does not only confirm or disprove data. Quantitative data can be used for exploratory purposes (Rossman & Wilson, 1985). Research Questions (RQ) for this study will be RQ 1: What is the relationship between self-determination theory and employee engagement for higher education staff?

H1a: Higher education employees who perceive higher levels of autonomy have significant higher levels of work engagement (vigor, dedication, absorption).

H1b: Higher education employees who perceive higher levels of competence have significant higher levels of work engagement (vigor, dedication, absorption).

H1c: Higher education employees who perceive higher levels of relatedness have significant higher levels of work engagement (vigor, dedication, absorption).

RQ 2: To what extent are employees with supervisory responsibilities engaged compared to employees with no supervisory responsibilities?

H2a: Employees with supervisory responsibilities perceive significantly higher levels of vigor than employees with no supervisory responsibilities.

H2b: Employees with supervisory responsibilities perceive significantly higher levels of dedication than those employees with no supervisory responsibilities.

H2c: Employees with supervisory responsibilities perceive significantly higher levels of absorption than those employees with no supervisory responsibilities.

RQ 3: To what extent do higher education employees with supervisory responsibilities report basic psychological needs fulfillment compared to employees with no supervisory responsibilities?

H3a: Employees with supervisory responsibilities have significantly higher autonomy than employees with non-supervisory responsibilities.

H3b: Employees with supervisory responsibilities have significantly higher competence than those employees with non-supervisory responsibilities.

H3c: Employees with supervisory responsibilities have significantly higher relatedness than those employees with non-supervisory responsibilities.

RQ 4: Do two-year higher education employees perceive need fulfillment and engagement differently than four-year employees?

H4a: Employees in two-year public higher education perceive higher levels of engagement (vigor, dedication, absorption) than employees in four-year institutions.

H4b: Employees in two-year public higher education perceive higher basic psychological need (autonomy, competence, relatedness) than four-year higher education employees.

Participants/Sampling

The target population for the proposed study was limited to the understudied support and professional staff at four four-year public higher education institutions and four two-year community colleges in Idaho. The state of Idaho was selected for several reasons. Currently, there is no academic research on levels of work engagement which included higher education staff from Idaho public higher education institutions. Idaho State public employees represent a large group of potential participants, which have similar hiring practices, must submit an application through the Idaho Human Resources department, and represent a large percentage of higher education employees in Idaho. Public institutions typically have public access to information of the public servants in state institutions, allowing for accessible contact information. Finally, Idaho offered geographical differences (urban versus rural) and institutional differences (two-year versus four-year) within the state.

The employee eligible for this study must have been working full-time at the time the survey was administered. They needed to have a school email address and agreed to be involved in study. The names and work-related emails of all employees for the four four-year institutions (under the direction of the State Board of Education of the particular mountain state) was obtained from each institution's online directory. The names and work-related emails for the

four-public community colleges (mostly locally supported) was similarly obtained using the online directory for each institution.

For this study, any employee whose job title is listed as faculty or adjunct, or if their job title included some type of teaching responsibility, these names were left off the lists of higher education employees. The number of professional staff contact information used for this study is N=4809.

Instrumentation

The instruments for the study consisted of the combination of two instruments geared specifically to measure employee levels of work engagement and basic psychological needs fulfillment (satisfaction), and also included demographic questions to determine respondents' characteristics. The use of previous instruments can enhance the validity and reliability of the data for this study. The instrument to measure employee engagement (dependent variable) will be the Utrecht Work Engagement Scale (UWES). The Utrecht Work Engagement Scale measures all three subscales: vigor, dedication and absorption (Schaufeli et al., 2002). The UWES was selected for this study since there are various studies (across a number of countries) which have documented the reliability and validity (Schaufeli, 2007).

UWES uses a nine item questionnaire and are rated on a seven-point frequency- based scale (0=strongly disagree, 1=moderately disagree, 2=slightly disagree, 3=neither agree nor disagree, 4=slightly agree, 5=moderately agree, 6=strongly agree), which measure an employee's vigor, dedication, and absorption. Sample items include "*I am enthusiastic about my job*", "*My job inspires me*", and "*When I get up in the morning, I feel like going to work*". Three items assess vigor, whereby those who score high on this questions have a great deal of energy, zest, and stamina when working. Three items assess dedication, meaning those who score high on

these identify strongly with their work because the participant experience work as meaningful, inspiring, and challenging. They also feel enthusiastic and proud about their work. Finally, three items assess absorption. Participants who score high are “happily engrossed in their work and have difficulties detaching themselves from their work because it carries them away. As a consequence, all else is forgotten and time seems to fly” (Schaufeli & Salanova, 2007, p. 144).

Schaufeli and Bakker (2004) found that Cronback’s α of all nine items varies from .85 to .94 across a nine national samples. The α – value for the total database is $\alpha=.90$. Furthermore, Schaufeli and Bakker found that UWES consists of three related aspects (vigor, absorption, dedication) that are “measured by three internally consistent scales” (p. 8) when cross-examining UWES results from nine different countries.

The second instrument used will be the 21-item *Basic Psychological Need Satisfaction at Work Scale* questionnaire (independent variable) to measure the basic psychological needs (competence, autonomy, and relatedness) in their job that are assumed to be innate and universal (Deci, Ryan, Gagné, Leone, Usunov, & Kornazheva, 2001; Ilardi, Leone, Kasser, & Ryan, 1993; Kasser, Davey, & Ryan, 1992). The basic psychological needs uses 21 items which are rated on a seven-point frequency – based scale (0=not at all true, 3=somewhat true, and 6=very true. Items 1, 2, 4, and 5 do not have identifying descriptors. There are six items for competence, eight items for relatedness, and seven items for autonomy. Sample items are “*I enjoy the challenge my work provides*” (competence), “*I really like the people I work with*” (relatedness), and “*I feel like I can make a lot of inputs to deciding how my job gets done*” (autonomy). Respondents use item 1 or 2 if item 0=not at all true or 3=somewhat true do not apply, and use item 4 or 5 if item 3=somewhat true and 6=very true do not apply). The reliability (internal consistency) validity of the scale has been shown to be strong with a Cronbach’s alpha coefficient for autonomy ($\alpha=.79$),

competence ($\alpha=.73$) and relatedness ($\alpha=.84$) (Deci, et. al., 2001, p.934). Intrinsic need satisfaction was found to be positively correlated with work performance ratings and with psychological adjustment confirming its validity (Baard, et al., 2000).

The object of this study was to combine both questionnaires to determine if there are any correlations between the psychological need satisfaction of relatedness, autonomy, and competence, with work engagement demonstrated by vigor, dedication, and absorption (UWES). When the psychological needs of relatedness, autonomy, and competence are satisfied, could they account for the levels of vigor, dedication, and absorption in professional employee engagement? Additionally, demographic questions were created to determine potential relationships applicable to higher education classified employees. Thirteen demographic questions were asked:

- How long have you worked in higher education? (Include all years if you have worked at more than one institution)
- Have you only worked at one (current) institution?
- If you have worked at more than one higher education institution, what motivated you to move?
- How long have your worked in your current position?
- What department do you currently work in?
- Employee classification (classified, non-classified, or other)
- Do you supervise full-time employees in your current position? (direct reporting)
- Is your place of employment a 4-year college or community college?
- Are you female or male? (one response option was “rather not say”)
- What is your age?

- Respondent's ethnicity
- Respondent's race
- Highest level of education completed

The relationship between the independent variables (demographic questions) and the factors measured by the basic work needs scale and the UWES engagement scale facilitated an in-depth view of SDT applicability to public higher education employees.

Procedures

Data collection. Data was collected using an online survey. Sue & Ritter (2012) noted that online surveys could be “extremely useful when you have a large and geographically diverse sample. They are economical and can be done rapidly (Kumar, 2014). However, there are some constraints with their use. Not everyone has Internet access, so online surveys cannot be used with all population groups. Kumar (2014) noted that there are many web-based survey hosts and one needs to do “some research to determine suitability for your situation” (p. 151). To encourage participation respondents completing the survey will be eligible to enter a drawing to win one of the five \$25 gift certificate cards.

Higher education employees who agreed to participate in the research completed the demographic, Utrecht Work Engagement Scale (UWES), and the Basic Psychological Need Satisfaction at work Scale questionnaire. The Need Satisfaction at Work Scale were used to measure basic psychological needs (self-determination theory) and the UWES will be utilized to measure employee levels of work engagement (vigor, dedication, and absorption). The surveys were combined into a single survey to allow for completion of the process in a single session. The surveys were hosted by Qualtrics (Qualtrics, ISU, 2017)). Creswell (2014) suggested that the researcher needs to establish the validity and reliability of each instrument. Creswell noted that

validity of an instrument as “whether one can draw meaningful and useful inferences from scores on the instruments” (p. 206). For reliability of an instrument, Creswell (2014) suggests to look for “whether authors report measures of internal consistency (are the items’ responses consistent across constructs?)” (p. 206).

Design. An online survey instrument was used in this quantitative study. Adaptations and modifications (if necessary) were based after a thorough review of the literature. The survey items were presented on a Likert scale. Information on demographic and profile characteristics were collected to determine whether differences in motivation and work engagement exist among individuals. The survey was emailed to higher education staff in Idaho with a brief introduction and a link to the survey (Appendixes D, E, F, & G). There are 4809 higher education employee contact information (email address) which were obtained using each public higher education institution’s online directories. Participation for the respondents was voluntary and five \$25 (\$125 total) gift certificates for incentives were utilized. The introduction and consent letter gave information regarding the survey and an option to agree to participate in the study. If the respondent agreed to participate, the email provided a link to the questionnaire. Dillman (2011) recommended making multiple contacts with participants in order to increase response rates for online surveys. Following the initial contact, two reminder emails were sent one week after the initial survey was emailed; a second reminder 14 days after the initial questionnaire was emailed.

Permission for using UWES was granted by agreeing that the use is for noncommercial educational or research purposes only. This means that no one is charging anyone a fee. There are some other agreements found online at www.wilmarschaufeli.nl in which the researcher agrees to share some of the data with the authors of the website. The purpose is to add

these data to their international database and use them only for further validating the UWES

(<http://www.wilmarschaufeli.nl/downloads/test-manuals/>). Permission to use the Basic

Psychological Need Satisfaction at work Scale questionnaire was granted online by agreeing to the websites agreement, which states,

In order to access these questionnaires you must first had to register and log into the website. On the registration page, you were asked to agree to terms and conditions stating that you will only use the scales for academic research. Once this is complete you had access to the scales while logged in to the website
(<http://selfdeterminationtheory.org/questionnaires/>)

The objective in this study is to combine both instruments to determine the relationship between employee motivation (STD) and employee work engagement.

Analysis of data. The independent variables for this study were the higher education employee perceptions of autonomy, competence, and relatedness, gender, length of employment in higher education, supervisory responsibilities, age, and place of employment (two-year of four-year institution) . The dependent variables were the Levels of Work Engagement characteristics of vigor, absorption and dedication and the levels of Basic Psychological Needs (SDT) of autonomy, relatedness, and competence. The relationship between SDT (motivation) and employee engagement has been shown in several studies cited in the literature review, yet only a couple of studies were done with higher education employees. This study could potentially shed new insights into the relationship between SDT and employee engagement.

Several statistical tests were performed to examine the direction and strength in relationships between the all variables - survey of Basic Psychological Need Satisfaction at work Scale questionnaire, dependent variable - Utrecht Work engagement scale (UWES) and a series of demographic variables. Data was analyzed using SPSS statistics software. One interest of this study was the relationship between engaged employee and the needs satisfaction proposed by

SDT. If needs satisfaction is positively correlated to higher levels of employee engagement and negatively correlated to lower levels of employee engagement, then it could be said that self-determination theory is applicable to public higher education institutions.

Analysis included in the study:

- Descriptive statistics including frequencies, means, and standard deviations for variables
- Pearson's Correlations to measure the strength and direction in the relationships between both scales (needs satisfaction and engagement)
- A General Linear Model (GLM) using MANOVA – a multivariate analysis was done, which allows for multiple dependent variables (for this analyses: vigor, absorption, dedication) and the three independent variables (covariates) relatedness, autonomy and competence to be analyzed.
- A Structural Equation Model (SEM) was configured for the present study, based on the data from 972 Classified and Non-Classified employees in Idaho public institutions of colleges and universities. The latent variable of Level of Engagement, used as the outcome variable in the model, was indicated by three of the subscales of the UWES: absorption, vigor, and dedication. The single exogenous (predictor) latent variable represented Work Elements. It was hypothesized that Work Elements would potentially directly affect Level of Engagement (at least in isolation) and was indicated by seven subscales developed by the researcher: education level, male/female, place of employment, supervise others, employee classification, department, and years in higher education.
- A Categorical Principal Components Analysis (CATPCA) was performed to study the variances accounted for with all 13 variables in the study. This was based on developing

components, which provide the relationship between all variables and the variance explained for the model.

- The data will be managed and analyzed using the Statistical Package for the Social Sciences (SPSS).

Data Storage and Security. The data was collected using Qualtrics online survey platform, (Provo, UT, 2017)] as it offers anonymity and convenience to the respondents by allowing researcher to send out online questionnaires with “Making responses anonymous” option. The responses were confidential and no identifying information such as respondent's name, email address or IP address was collected. Once data was collected, information was stored on local computer and the ISU Qualtrics account, which are password protected. Data was be permanently deleted once the study was completed.

Human Studies Compliance. The Human Studies Compliance forms were submitted through Idaho State University’s Cayuse IRB system on October 5, 2017. Study IRB-FY2018-110 was approved October 25, 2017 by the ISU Human Subjects Chair.

CHAPTER IV

Results

The purpose of this quantitative study was to determine if self-determination theory (SDT), the human needs of autonomy, competence, and relatedness (Basic Psychological Needs), provides a theoretical explanation of professional staff work engagement (vigor, dedication, and absorption – Levels of Work Engagement) in public higher education institutions in Idaho. Given the dearth of literature on higher education staff, this research project focused on higher education professional staff in the state of Idaho which allows for an in depth view of Idaho public higher education professional employees. Professional staff roles in Idaho higher education facilitate institutional operations as we know it today. This particular group of professional staff comprise a large percentage of employees in Idaho higher education, working in academic departments, student affairs, admissions, academic advising, athletics, and other departments in which respondents have direct contact with students and faculty. Nonetheless little research has been done on the work motivation factors of these professional staff (non-faculty staff).

Previous research has shown that interacting with students, connectedness to the organization, and professional development were significant factors in job satisfaction with some professional staff. The public higher education professional staff include respondents from four-year and two-year institutions, which can likewise provide insightful information between both. Furthermore, the relationship between SDT (motivation) and employee engagement has been shown in several studies cited in the literature review, yet only a couple of studies were done with higher education professional staff. This study could potentially shed new insights into the relationship between SDT and employee engagement.

Three main areas were explored in this study: demographics information (which included Work Elements: gender, years in higher education, job classification, supervisory responsibilities, department [work area], education level, and place of employment), Basic Psychological Needs (autonomy, relatedness, competence), and Levels of Work Engagement (vigor, absorption, dedication). The quantitative methodology (survey) was used to measure the relationship between dependent variables (Basic Psychological Need satisfaction work scale and Utrecht Work Engagement Scale) and the independent variables (demographics).

Research Questions

The overarching theme, which guided this study is to show the strength and direction of the relationship between the defined variables. Specific questions analyzed were:

- What is the relationship between self-determination theory and employee engagement for professional staff in Idaho Higher Education institutions?
- To what extent are professional staff with supervisory responsibilities engaged compared to professional staff with no supervisory responsibilities?
- To what extent do supervisors vs. non-supervisors report basic psychological needs fulfillment?
- Do two-year professional employees perceive need fulfillment and engagement differently than four-year professional staff?

Research Design

An online survey instrument was used in this quantitative study. Adaptations and modifications were done after a thorough review of the literature. The survey items were presented on a Likert scale. Information on demographic and profile characteristics were collected to determine whether differences in motivation and work engagement exist among

individuals. A round-table survey instrument discussion with five professional staff was conducted to gather feedback and suggestions of the survey instrument. After revisions were completed a pilot study was conducted by emailing professional staff at a private college in New York City and to professional staff at a public higher education institution in Idaho. Feedback from the respondents was collected and reviewed by the researcher to determine changes that needed to be made to the research instrument prior to distribution to the professional staff in public higher education institutions in Idaho.

The survey was emailed to professional staff in eight higher education institutions with a brief introduction and a link to the survey (Appendixes D, E, F, & G). 4807 professional staff contact information (email address) were obtained using each public higher education institution's online directories. Participation for the respondents was voluntary and four \$25 (\$125 total) gift certificates for incentives were utilized (an Excel random selector option was used to select five names from the 641 that agreed to send their name and email). The introduction and consent letter gave information regarding the survey and an option to agree to participate in the study. If the respondent agreed to participate, the email provided a link to the questionnaire. Dillman (2011) recommended making multiple contacts with participants in order to increase response rates for online surveys.

Response Rate

There were 4807 professional staff email contact information (work email address) which was obtained using the online directory of each public higher education institution. Following the initial contact, two reminder emails were sent one week after the initial survey was emailed, and the second reminder 14 days after the initial questionnaire was emailed. A fourth thank you email was sent after 21 days (when the survey closed). After four-email communication with the

employees, 1051 surveys were started and 972 responses were considered usable, resulting in a response rate of 20.2%. The lower response rate could have been affected by several factors, some of which could be: outdated email addresses, lack of internet access during working hours, lack of interest in survey content or no desire in participating in survey, individual time constraints, or skepticism in an online survey. In spite of the low response, a large number of respondents (972) that represented 11 different higher education institutional departments completed the survey. The 972 responses serves to mitigate low response bias.

Respondent Demographics

Table 1 displays the number of years respondents have worked in higher education. The

Table 1

Total number years employed in higher education

Total years employed in HE	Number of Respondents	Percentage
0-5	335	34.5
6-10	241	24.8
11-15	137	14.1
16-20	115	11.8
21-25	44	4.5
26-30	46	4.7
31-47	34	3.5
Did not indicate	20	2.0

table gives the total number of years combined (if an individual has worked at more than one institution). The survey allowed respondents to input an actual number; however, for statistical purposes, categories were created (in five-year increments) which permitted statistical comparisons.

Work Department. With the option to write-in the department in the survey, there were 11 distinct department identified (Table 2). Included in the Finance/Administration category are employees who identified working in marketing, communication, bursar, and accounting office for their particular institution.

Table 2

Work department (unit) of respondents

Department	Number of Respondents	Percentage
Facilities	105	10.8
Student Services	207	21.3
Student Affairs	103	10.6
Athletics	33	3.4
Other	133	13.7
IT Network/technology	46	4.7
Academic	171	17.6
Academic Affairs	30	3.0
Finance/Administration	114	11.7
Human Resources	21	2.7
Support Staff	6	.06

Education level. Table 3 gives the breakdown of the education level of the respondents. In relation to the highest degree attained, approximately 67% of the respondents had earned a Bachelor's degree (34%) or Master's (33.7%).

Table 3

Distribution of highest educational level attained by respondents.

Educational Level	Number of Respondents	Percentage
High School Diploma	25	2.6
Technical Degree/Cert.	26	2.7
Some College courses	91	9.4
AS Degree	63	6.5
BA/BS Degree	329	34.0
Some Graduate Courses	43	4.4
Master's	328	33.7
Professional Degree	11	1.0
Adv. Prof. Degree (Terminal)	53	5.4

Job classification, gender, and race/ethnicity. In addition to individual characteristics, information was also collected about the respondents' job classification (classified, non-classified, other), gender, and race/ethnicity. Classified employees are hourly and typically can be found in support roles throughout the institution (facilities, secretarial, office support staff, administrative assistants, financial aid, registrar, admissions, and finance). Non-classified employees are salaried and typically have a particular skill set such as IT personnel, directors, assistant directors, supervisors, managers, and administrators).

Table 4

Distribution of survey population and respondents by job classification, gender, and race/ethnicity.

Job Classification, gender, race	Number of Respondents	Percentage
Job Classification	<i>N</i> = 972	
Classified (hourly)	381	39.00
Non-classified (salary)	558	57.30
Other	33	3.40
Gender	<i>N</i> = 972	
Female	641	66.40
Male	322	33.30
Other	3	.03
Race/Ethnicity		
Caucasian	833	85.70
African American	9	.09
American Indian	8	.08
Asian	11	.10
Native Hawaiian / Pacific Islander	3	.03
Other/prefer not to answer	108	11.00
Ethnicity		
Hispanic	51	5.00

Table 4 shows the number of individual characteristics were collected from the survey respondents. Of the 972 total respondents, 641 (66%) were female, 322 (33%) were male, and 3 (.03%) did not report their gender. The racial/ethnic identity provided by survey respondents indicated that the majority were Caucasian, (85.6%), followed by respondents who selected other/prefer not to answer (11%), African American (.09%), American Indian (.08%), Asian (.10%), and Native Hawaiian/Other Pacific Islander (.03%). The average age of respondents was 44.7 (*SD* = 11.907).

Employment Background Characteristics. The survey also asked several questions about employees' background in higher education. Respondents had been working in their current position for an average of 6.3 years ($SD = 6.12$). Likewise, 673 respondents (69%) indicated they have been working at one campus and 298 respondents (30.6%) indicated that have been employed in a professional position at another institution.

Table 5

Number of respondents who have supervisory roles compared to those who do not have supervisory roles, and place of employment

	Number of Respondents	Percentage
Supervisory responsibilities	N = 972	
Non-supervisory	653	67
Supervisory	316	32.6
Other	3	.03
Place of employment	N = 972	
Community College	128	13.2
Four-year Institution	841	87.6
No Answer	3	.03

Regarding supervisory responsibilities in their job, 653 respondents (67%) indicated that they do not supervise any full-time employees, compared to 316 respondents (32.6%) who indicated they supervise one or more full-time employees (Table 5). Finally, respondents indicated if they were employed at a four-year institution (87.6%) or at a two-year institution (Community College) (13.2%).

Basic Psychological Needs (BPN) and Utrecht Work Engagement Scale (UWES)

A total of 30 items in the survey questionnaire sought to gather BPN (21 items) and UWES (nine items) perceptions related to work engagement. The three BPN factors addressed in

this study were autonomy (seven items), relatedness (eight items), and competence (six items) (Appendix B). The three work engagement factors were vigor (three items), absorption (three items), and dedication (three items) (Appendix C).

Research Questions and Results

To address the four research questions, this study researched the relationship between Basic Psychological Needs satisfaction proposed by SDT and the Levels of Work Engagement of professional staff in higher education. If Basic Psychological Needs satisfaction is positively correlated to higher levels of employee Levels of Work Engagement and negatively correlated to lower levels of employee engagement, then it could be said that self-determination theory is applicable to public higher education institutions. Survey data resulted in 972 usable responses on variables deemed important in the study. Missing data was minimal for variables used in the analyses which follow and some procedures automatically compensated for missing data or had options to deal with missing data: Categorical Principal Component Analysis (CATPCA), Structural Equation Modeling (SEM - using Analysis of Moment Structures [AMOS]), and Multivariate ANOVA (MANOVA).

Research question one. RQ1 examined if there was a relationship between self-determination theory (satisfaction of Basic Psychological Needs) and employee engagement of higher education professional staff. Hypotheses for research question one are focused on the predictive relationship between Basic Psychological Needs (BPN) Variables (autonomy, competence, relatedness) and Levels of Work Engagement (LWE) variables (vigor, dedication, absorption). To address research question one the General Linear Model (GLM) -- Multivariate which allows for multiple dependent variables (for this analyses: vigor, absorption, dedication) and the three independent variables (covariates) relatedness, autonomy and competence.

Table 6

Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.154	58.526 ^b	3.000	966.000	.000
	Wilks' Lambda	.846	58.526 ^b	3.000	966.000	.000
	Hotelling's Trace	.182	58.526 ^b	3.000	966.000	.000
	Roy's Largest Root	.182	58.526 ^b	3.000	966.000	.000
Autonomy	Pillai's Trace	.035	11.557 ^b	3.000	966.000	.000
	Wilks' Lambda	.965	11.557 ^b	3.000	966.000	.000
	Hotelling's Trace	.036	11.557 ^b	3.000	966.000	.000
	Roy's Largest Root	.036	11.557 ^b	3.000	966.000	.000
Competence	Pillai's Trace	.287	129.298 ^b	3.000	966.000	.000
	Wilks' Lambda	.713	129.298 ^b	3.000	966.000	.000
	Hotelling's Trace	.402	129.298 ^b	3.000	966.000	.000
	Roy's Largest Root	.402	129.298 ^b	3.000	966.000	.000
Relatedness	Pillai's Trace	.019	6.265 ^b	3.000	966.000	.000
	Wilks' Lambda	.981	6.265 ^b	3.000	966.000	.000
	Hotelling's Trace	.019	6.265 ^b	3.000	966.000	.000
	Roy's Largest Root	.019	6.265 ^b	3.000	966.000	.000

a. Design: Intercept + Autonomy + Competence + Relatedness

b. Exact statistic

The results of the analysis is shown below in the following tables. In Multivariate Tests the most robust measure is Pillai's Trace which shown significance of $< .001$.

Table 7

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Vigor	671.279 ^a	3	223.760	233.582	.000
	Dedication	782.194 ^b	3	260.731	392.578	.000
	Absorption	357.057 ^c	3	119.019	148.060	.000
Intercept	Vigor	.013	1	.013	.014	.907
	Dedication	1.772	1	1.772	2.668	.103
	Absorption	104.434	1	104.434	129.917	.000
Autonomy	Vigor	17.877	1	17.877	18.661	.000
	Dedication	15.304	1	15.304	23.042	.000
	Absorption	.177	1	.177	.220	.639
Competence	Vigor	150.485	1	150.485	157.090	.000
	Dedication	243.746	1	243.746	367.003	.000
	Absorption	168.230	1	168.230	209.278	.000
Relatedness	Vigor	15.425	1	15.425	16.102	.000
	Dedication	3.903	1	3.903	5.877	.016
	Absorption	.182	1	.182	.227	.634
Error	Vigor	927.295	968	.958		
	Dedication	642.898	968	.664		
	Absorption	778.135	968	.804		
Total	Vigor	24502.556	972			
	Dedication	29573.111	972			
	Absorption	28950.556	972			
Corrected Total	Vigor	1598.575	971			
	Dedication	1425.093	971			
	Absorption	1135.192	971			

a. R Squared = .420 (Adjusted R Squared = .418)

b. R Squared = .549 (Adjusted R Squared = .547)

c. R Squared = .315 (Adjusted R Squared = .312)

The next table (table 7) shows the Tests of Between-Subject Effects. As noted the Corrected Model shows significance of $p < .001$ for all the dependent variables. Also shown are

the effects of each of the independent variables on each of the dependent variables. All are significant at the $p < .001$ except for the Autonomy-Absorption, Relatedness-Absorption which are not significant, and Relatedness-Dedication which is significant and $p < .02$.

Table 8 displays the Regression Parameter estimates for all the independent variables (autonomy, competence, and relatedness) as related to each of the dependent variables (vigor, dedication, and absorption). The Regression Parameter Estimates also shows the significance of each independent variable on dependent variables.

Table 8

Parameter Estimates

Dependent Variable	Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	95% Confidence Interval
						Lower Bound	Upper Bound
Vigor	Intercept	-.023	.194	-.117	.907	-.404	.359
	Autonomy	.183	.042	4.320	.000	.100	.266
	Competence	.542	.043	12.534	.000	.457	.626
	Relatedness	.181	.045	4.013	.000	.092	.269
Dedication	Intercept	.264	.162	1.633	.103	-.053	.582
	Autonomy	.169	.035	4.800	.000	.100	.238
	Competence	.689	.036	19.157	.000	.619	.760
	Relatedness	.091	.037	2.424	.016	.017	.164
Absorption	Intercept	2.030	.178	11.398	.000	1.680	2.379
	Autonomy	.018	.039	.469	.639	-.058	.094
	Competence	.573	.040	14.466	.000	.495	.650
	Relatedness	.020	.041	.476	.634	-.061	.101

Note: results which are not significant are in bold.

Results in Table 8 suggest that all three levels of Basic Psychological Needs (autonomy, relatedness, and competence) reveal significant relationships with the Levels of Work Engagement variables (vigor, absorption, and dedication). In this case we reject the null

hypotheses. To further explore the relationship between Basic Psychological Needs and Levels of Work Engagement, three hypotheses were researched.

- H1a: Higher education professional staff who perceive higher levels of autonomy have significant higher levels of work engagement (vigor, dedication, absorption).
- H1b: Higher education professional staff who perceive higher levels of competence have significant higher levels of work engagement (vigor, dedication, absorption).
- H1c: Higher education professional staff who perceive higher levels of relatedness have significant higher levels of work engagement (vigor, dedication, absorption).

The parameter estimates reveal there are significant relationships between the independent variables of Basic Psychological Needs with the dependent variables of Level of Work Engagement. Those respondents who had higher levels of autonomy perceived significant relationships with vigor ($p < .001$), dedication ($p < .001$), however, autonomy did not influence absorption significantly ($p = .639$). Respondents did not perceive higher levels of autonomy with significant higher levels of absorption. Furthermore, relatedness (H1c) did not influence absorption significantly ($p = .634$). In this study, only the independent variable competence (H1b) had a significant influence on absorption ($p < .001$).

As shown in Table 8, competence (H1b) was the lone independent variable which had a significant relationship with all three dependent variables vigor, dedication, and absorption ($p < .001$). Perceived confidence in their work skills was a significant predictor for the Level of Word engagement. Interestingly Baard, Deci, and Ryan, (2004), in a study of employees from a banking operations center, found that the specific need satisfaction that most strongly related to anxiety/depression was competency (lack of).

Levels of relatedness (H1c) had a significant relationship with vigor ($p < .001$), not as

strong significant relationship with dedication ($p = .016$) (the lower bound and upper bound of the confidence interval was above zero), and a non-significant relationship with absorption ($p = .634$). Relatedness (H1c) appears to have a greater impact on the individual's daily energy level and strength to do the job (vigor), rather than the level of happiness and feeling immersed in their work (absorption). Furthermore, the level of absorption perceived by an individual appears to be directly related with the levels of competence (i.e., sense of accomplishment, feeling capable in the tasks) that an individual employee perceives. Moreover, the results seem to suggest that having positive relationships with individuals at work appears to positively influence the level of vigor.

The results in GLM for research question one seem to support other research in which Basic Psychological Needs have are positively associated with higher levels of job satisfaction and work engagement (Coetzer and Rothman, 2007; Van den Broek et al., 2010; Shuck, Zigarmi, and Owen, 2014; and De Wet, 2015). Furthermore, this study seems to validate Saks' (2005) research where he suggested that employee engagement can be understood in terms of Self-Determination Theory. Employees who perceive higher organizational support (satisfying Basic Psychological Needs) are more likely to respond with greater levels of engagement in their job and in their organization.

Research Questions Two, Three, and Four

These six variables were also used as a set of dependent variables in a General Linear Model (GLM) for MANOVA (Multivariate Analysis of Variance) where the correlation data was also relevant to indicate acceptable correlations of dependent variables. The GLM MANOVA was utilized to evaluate the hypotheses for research questions two, three, and four.

As indicated in the hypotheses for research questions two, three and four, the main

variables of interest prior to the data analysis were focused on relationships between Work Engagement Variables: Vigor, Dedication, Absorption, and Basic Psychological Needs Variables: Autonomy, Competence, Relatedness, and the two independent variables below:

- Supervise Others (Supervision: two levels: No, Yes)
- Place of Employment (Community College or Four-Year Institution Employment: (two-year, four-year)

Research questions two through four were analyzed using the General Linear Model (GLM) using MANOVA as earlier indicated. The three Basic Psychological Needs variables and the three Work Engagement Variables were the dependent variables in the MANOVA analyses. The two variables, *Supervision*, and *Place of Employment* were initially the two main independent variables, each with two levels as indicated above. After further analyses, several other independent variables were added to the MANOVA model to gain a richer understanding of other characteristics which had impact on the Basic Psychological Needs and Levels of Work Engagement. The additional independent variables (all categorical and labeled Work Elements), added to the model were: Years in Higher Education (seven levels), Female/Male (two levels), Education Level (eight levels), Employee Classification (three levels), and Department (11 levels) in which the survey respondents are currently employed (See Appendix M - Between-Subjects Factors) for levels details of *N*. As indicated above 972 respondents were utilized in the analysis).

The correlation of the dependent variables indicated that the correlations of the dependent variables were sufficient to support the MANOVA. Box's Test of Equality of Covariance Matrices for the MANOVA was significant Box's $M = 217.923$, $F(1.261, df\ 105, df2\ 2624.832)$ $p = .040$ (see Appendix N - Box's Test of Equality of Covariance Matrices) suggesting

that the matrices were not equal; therefore the multivariate effect using Pillai's trace was evaluated because it is more robust with respect to violations of this assumption than the other multivariate tests of statistical significance.

The Pillai's trace for the multivariate effects of the seven independent variables are shown in Appendix O - Multivariate Tests: Department, Employee Classification, Supervise Others, and Male/Female, were all statistically significant at the $p < .01$ level and Place of Employment is statistically significant at the $p < .11$ level. These results show there is significant effect of the independent variables on all of the dependent variables, considered as a group. Two independent variables, *Years in Higher Ed* and *Education Level*, were not significant utilizing Pillai's Trace so Levene's test for Equality of Error Variances was utilized (Appendix P - Levine's Test For Equality of Error). Variances shows that there are no significant values for the dependent variables meaning that the null hypothesis of equality of error variances of the dependent variable is equal across groups was not rejected and therefore there is strong evidence that the data in the MANOVA meet the requirements of the GLM model. The Univariate Tests of Between-Subjects Effects shows F ratios and eta squared values together with the p values for each level of all independent variables for each dependent variable are shown in Table 9 (Modified Significant Tests of Between Subject Effects). The complete results are located Appendix R - Tests of Between Subjects Effects. The adjusted R squared values (equivalent to the overall eta squared values) at the bottom of Table 7 range from .547 to .312, indicating that many of the Basic Psychological Needs and Levels of Engagement were, associated with significant effect strengths. The Parameter Estimates in Appendix I - Significant Parameter Estimates shows the significance of each level of the independent variables to each of the six

Table 9

Modified Significant Tests of Between Subject Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Department	Autonomy	42.979	12	3.582	3.069	.000
	Relatedness	28.661	12	2.388	2.601	.002
	Absorption	24.55	12	2.046	1.835	.039
Employee Classification	Autonomy	15.571	2	7.786	6.671	.001
	Competence	4.538	2	2.269	2.343	.097*
	Vigor	18.338	2	9.169	5.696	.003
	Dedication	13.823	2	6.911	4.971	.007
	Absorption	17.478	2	8.739	7.839	.00
Supervise Others	Autonomy	8.241	2	4.12	3.53	.03
	Relatedness	11.289	2	5.645	6.146	.002
Place of Employment	Autonomy	9.968	2	4.984	4.27	.014
	Competence	14.122	2	7.061	7.29	.001
	Relatedness	5.647	2	2.824	3.074	.047
	Vigor	8.904	2	4.452	2.766	.063*
	Dedication	11.557	2	5.779	4.156	.016
Male/Female	Competence	12.019	3	4.006	4.137	.006
	Relatedness	11.885	3	3.962	4.313	.005
	Absorption	8.84	3	2.947	2.643	.048
Education Level	Competence	14.846	9	1.65	1.703	.084*
	Dedication	21.671	9	2.408	1.732	.078*

* = Not statistically significant at the .05 level.

dependent variables (the full details of all parameter estimates are in Appendix S - Complete Parameter Estimates Table).

Appendix I (Significant Parameter Estimates between dependent variables and independent variables) shows that the *t*-tests have significant *p* values, rejecting the null hypothesis that the parameter is equal to zero and it does contribute statistically to the SEM model.

The hypotheses for research question two, to what extent are professional staff with supervisory responsibilities engaged compared to professional staff with no supervisory responsibilities, specifically dealt with the following:

- H2a: Employees with supervisory responsibilities perceive significantly higher levels of vigor than professional staff with no supervisory responsibilities.
- H2b: Employees with supervisory responsibilities perceive significantly higher levels of dedication than those professional staff with no supervisory responsibilities.
- H2c: Employees with supervisory responsibilities perceive significantly higher levels of absorption than those professional staff with no supervisory responsibilities.

MANOVA was conducted to test the hypothesis that there would be one or more mean differences between those who supervise others and those who do not supervise others in regards with Basic Psychological Needs (autonomy, relatedness, and competence) and Levels of Work Engagement (vigor, absorption, and dedication). With the data from Appendix H, J and K (Table 6 and 7) we can reject the null hypotheses. There were statistically significant relationships between professional staff with supervisory responsibilities compared to professional staff with no supervisory responsibilities when considered jointly on the variables vigor, dedication, absorption, autonomy, relatedness, and competence, Pillai's Trace = .027, $F(12, 1860) = 2.12$, $p < .013$. Furthermore, Table 6 shows that as a group, those who have supervisory responsibilities

and those who do not have supervisory responsibility, have statistical significant relationship (effect strengths) with autonomy ($p = .030$), relatedness ($p = .002$), and absorption ($p = .038$). The significant parameter estimates between dependent variables and independent variables shows that those who do not have supervisory responsibilities demonstrated a significant difference ($p = .011$) in absorption from those who do have supervisory responsibilities ($p = .584$) (reject H2c). The model did not find significant differences between those who supervise others and those who do not supervise others in relation to competence ($p = .102$), vigor ($p = .439$), though there is some effect strengths in dedication ($p = .083$), though below the $p = .05$ value. Research seems to suggest that being a supervisor or non-supervisor is a poor predictor of Levels of work engagement. Dedication and Vigor are not explained by position in an organization. They appear to be characteristics of an individual's level of work engagement whether they supervise or do not supervise others.

Research question three. RQ3 asked to what extent professional staff in Idaho higher education does with supervisory responsibilities report basic psychological needs fulfillment compared to professional staff with no supervisory responsibilities. Specifically, the hypotheses state that those who supervise other will have greater levels of Basic Psychological Needs than those who do not supervise others.

- H3a: Employees with supervisory responsibilities have significantly higher autonomy than professional staff with non-supervisory responsibilities.
- H3b: Employees with supervisory responsibilities have significantly higher competence than those professional staff with non-supervisory responsibilities.
- H3c: Employees with supervisory responsibilities have significantly higher relatedness than those professional staff with non-supervisory responsibilities.

The results showed there was a significant difference between professional staff with supervisory responsibilities compared to professional staff with no supervisory responsibilities when considered jointly on the variables vigor, dedication, absorption, autonomy, relatedness, and competence, Pillai's Trace = .027, $F(12, 1860) = 2.12$, $p = .013$. With the data from Table 9 and 10 we can reject the null hypotheses. In the Tests of Between-Subjects Effects results (table 6), the independent variable of supervise others had a significant difference with autonomy ($p = .03$) and relatedness ($p = .002$). The parameter estimates (Table 7) reveals that those respondents who have supervisory responsibilities have statistically significant effect strengths from those who do not have supervisory responsibilities in relation with autonomy ($p = .009$) (accept H3a) and relatedness ($p = .001$) (accept H3c). The model showed that the dependent variable of competence (H3b) in supervise others did not have a significant effect on the model over those who do not supervise others (do not accept H3b) and supervision responsibilities does not contribute significantly to the model. One possible explanation is that competence can be gained independently from supervising others. Mastering work tasks is sufficient to gain competence, regardless of level of responsibilities.

Research question four. RQ4 focused on the hypothesis that two-year professional staff perceive need fulfillment and work engagement differently than four-year professional staff.

Specifically, the hypothesis state:

- H4a: Professional staff in two-year public higher education perceive higher levels of engagement (vigor, dedication, absorption) than professional staff in four-year institutions.

- H4b: Professional staff in two-year public higher education perceive higher basic psychological need (autonomy, competence, relatedness) than four-year professional staff.

The results showed there was no significant difference between professional staff from two-year institutions compared to professional staff from four-year institutions when considered jointly on the variables vigor, dedication, absorption, autonomy, relatedness, and competence, Pillai's Trace = .020, $F(12, 1860) = 1.53$, $p = .108$. However, the in the Modified Tests of Between-Subjects Effects results (appendix Q), Place of Employment (two-year and four-year institutions combined) showed a significant contribution to the model in relation to the dependent variables autonomy ($p = .014$), competence ($p = .001$), relatedness ($p = .047$), and dedication ($p = .016$). Place of employment showed marginal effects in relation to vigor ($p = .063$).

Table in Appendix Q (Modified Tests of Between Subjects Effects) reveals that Community College (two-year institution) contributed statistically to the model with Level of Work Engagement predictor variable dedication ($p = .015$) and displays strong effects (correlation) to the model. Furthermore, vigor ($p = .094$) and absorption ($p = .078$) did not contribute statistically to the model (H4a), with their contributions (effect strengths) to the model being marginal. In regards to the Basic Psychological Needs predictors, Community College (two-year institution) contributed statistically in relation to Competence ($p = .005$) and a relative effect strength with relatedness ($p = .065$) (though not statistically significant at the $p = .05$ level). Community College did not contribute statistically to the model in relation to *autonomy* ($p = .352$).

Work Elements

Work Elements were the individual characteristics respondents from the Idaho public

higher education institutions used to describe their gender, number years of service (combined years of service if worked in more than one institution – Years in HE), type of institution they currently work at (two-year [community college] or four-year), level of education, supervisory responsibilities, job classification (classified, non-classified, or other), and department at their current place of employment. These work elements were developed as part of the demographic section of the survey and then added to the SEM models to determine how they related and influenced basic psychological needs and levels of work engagement. These characteristics were included to further distinguish the higher education employees in Idaho institutions (supervisory responsibilities and place of employment we also included in work elements when performing statistical analysis, however, supervisory responsibilities and place of employment are discussed in research questions two-four). The results in the significant parameter estimates (appendix R) indicate that *Employee Classification*, *Gender*, *Department*, *Years in Higher Education*, and *Education Level* (labeled *work elements* in the SEM models) are independent variables that have statistically significant predictive capability in the presence of other dependent variables, that is, whether they contribute to some degree to the model. Since the variables were studied together some of the variables that do not have a significant p value (predictive capability) when combined with other predictors, may potentially have predictive capability when some of those predictors are removed from the model.

Employee Classification. Pillai's Trace = .029, $F(12, 1860) = 2.29$, $p = .007$. The Tests of Between-Subjects Effects (Table 6) indicates that, when levels of Employee Classification are combined, they were associated with substantial effect strengths with Basic Psychological Needs (autonomy $p = .001$) and Levels of Work Engagement (vigor $p = .003$, dedication $p = .007$, absorption $p < .001$). Furthermore, when testing the level of the independent variables to each of

the six dependent variables (Appendix Q), the *t*-test shows significant relationships between Employee Classification (Classified) and autonomy $p = .016$, competence $p = .058$, vigor $p = .037$, and absorption $p = .007$, showing significant relation in the model.

One possible explanation to significant employee classification perceptions could be related to perceptions of those who supervise others. Many respondents who *supervise others* typically have a *non-classified* classification, which can shed some insight in the differences displayed between *classified* and *non-classified* employees, and the differences between those who *supervise others* and those respondents who do not have supervisory responsibilities. In other words, those who supervise others could be the same respondents who are categorized as *non-classified employees*.

Years in higher education. What stands out from the results in significant parameter estimates (Appendix L) is that every category for the independent variable *Years in HE*, whether in increments of five years [Appendix R] or the 23 categories (recorded by respondents – Appendix K) contributed significantly with the dependent variables of competence ($p < .001$), autonomy ($p < .001$), relatedness ($p < .001$), dedication ($p < .001$), absorption ($p < .001$), and vigor ($p < .001$) (Appendix K & L). No other Work Element variable levels had the significant contribution to the model across all six dependent variables as Years in higher education. In the SEM model for the study (Figure 2), in the SEM model for Unmediated Path from Work Elements to Level of Engagement (Figure 3), and in the SEM model for Mediated Path for Work Elements to Basic Psychological Needs (Figure 4), Years in HE contribution to the model is significant. Interestingly, when comparing all seven work elements to the dependent variables in the Modified Tests of Between-Subjects effects (Appendix Q), Years in HE combined categories (five-year increments) did not contribute significantly to the dependent variables. Yet the

parameter estimates reveals that Years in HE do make significant contributions to the model when studied with all other variables.

Results suggest that time required for perception of basic psychological needs satisfaction, which in this study appears to account for the level of engagement, is minimal. The relationships were significant from the first year working in higher education. It is possible that individuals working in higher education may gain a level of competence soon after beginning the careers in higher education, which accounts for the significant relationships in all Years in HE. Likewise, there could be other factors that influence Years in HE which this study did not capture. Further research is needed to account as to why the work element *Years in HE* has such a strong significant relationship with all six dependent variables (competence, autonomy, relatedness, dedication, absorption, and vigor). Do individuals who work in higher education (regardless of department or position) believe they are part of something bigger? A desire to make a difference in the lives of others? Does working in higher education give an individual a sense of purpose which may influence basic psychological needs and levels of work engagement?

Gender. Pillai's Trace = .047, $F(18, 2793) = 2.45$, $p = .001$. Male and females (combined) showed a significant contribution in relation to competence ($p = .006$), relatedness ($p = .005$), and absorption ($p = .048$). Appendix O shows that gender contribution specifically shows Females respondents contributed statistically significant (strongest effects) to the model in relation to the three variables of competence ($p = .009$), relatedness ($p = .001$), and absorption ($p = .006$). When studying all seven independent variables together, females respondents perceived higher levels than males in competence, relatedness, and absorption in the model. In this study, there were twice as many female respondents ($n = 641$) to male respondents ($n = 322$) which

may account for the significant differences. Further research is needed to explain the differences in competence, though as explained previously, competence has a significant relationship with absorption. It seems logical that female respondents scored significantly higher in relatedness, as many females value relationships (connectedness) with other individuals.

Department. Pillai's Trace = .123, $F(72, 5604) = 1.63$, $p = .001$. Department (area of employment) showed significant contribution with *autonomy* ($p < .001$), *relatedness* ($p = .002$), and *absorption* ($p = .039$). Table 9 gives a breakdown of the individual departments and their significant contribution (effects) on the model in relation to the six dependent variables.

Appendix Q (Modified Tests of Between Subjects Effects) seems to indicate that there is a stronger contribution to the model when departments are combined, compared with the low number of individual department significant contributions found in Appendix R.

Level of education. Pillai's Trace = .070, $F(54, 5604) = 1.22$, $p = .127$. Table 6 and 7 show that level of education does not contribute significantly to the model, though an argument could be made that *competence* ($p = .084$) and *dedication* ($p = .078$) may have marginal effects. Looking at the *t*-tests for level of education, *Bachelor's Degree* ($p = .053$), *Some College – No Degree* ($p = .057$), and *Some Grad Credit – No Degree* ($p = .094$) appear to have some effects when compared to the other levels of education.

MANOVA Summary

Research questions two through four were analyzed using the General Linear Model (GLM) using MANOVA. The three Basic Psychological Needs variables and the three Work Engagement Variables were the dependent variables in the MANOVA analyses. The two variables, *Supervision*, and *Place of Employment* were initially the two main independent variables. After further analyses, additional independent variables (all categorical) added to the

model which showed several significant effect strengths as a group and in the individual levels in the independent variables of Work Elements, in relation to the dependent variables of autonomy, competence, relatedness, vigor, absorption, and dedication. Years in higher education (seven levels), Female/Male (two levels), Education Level (eight levels), Employee Classification (three levels), and Department (11 levels) in which the survey respondents are currently employed displayed significantly strong effects (correlations) in the model. Using the research question of the study, the AMOS model showed that several independent variables in the Multivariate Tests were statistically significant in relation to each of the dependent variables. The Tests of Between Subjects and Parameter estimates (Appendix Q & R) showed that there were many levels in the independent variables (Work Elements) that contributed significantly (highly correlated) to each of the six dependent variables and significant relationships exists in the model.

Structural Equation Modeling (SEM)

The structural equation model that was configured for the present study, based on the data from 972 Classified and Non-Classified employees in Idaho public institutions of colleges and universities, is shown in Figure 1. SEM was used to analyze the structural relationships for the conceptual model for this study (Appendix H). The model focused on the Utrecht Work Engagement Scale (UWES) introduced by Schaufeli et al., 2002. The latent variable of Level of Engagement, used as the outcome variable in the model, was indicated by three of the subscales of the UWES: absorption, vigor, and dedication. The single exogenous (predictor) latent variable represented Work Elements. It was hypothesized that Work Elements would potentially directly affect Level of Engagement (at least in isolation) and was indicated by seven subscales developed by the researcher: education level, male/female, place of employment, supervise others, employee classification, department, and years in higher education.

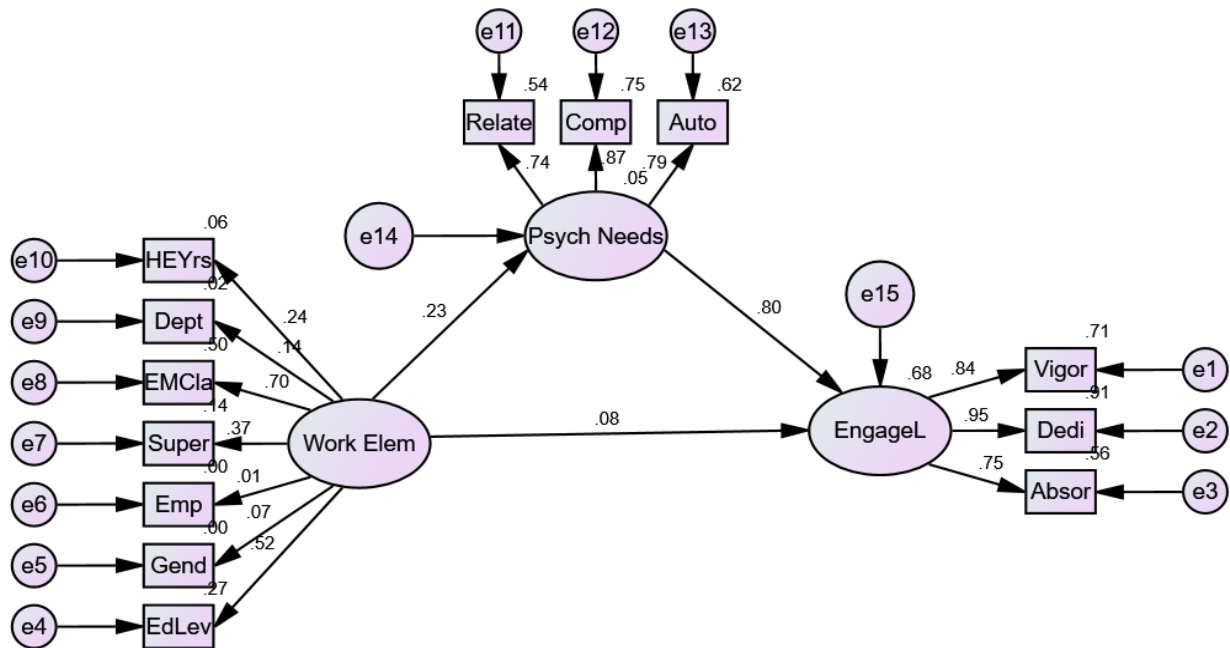


Figure 2. SEM model for the study.

There was one separate mediation path through which Work Elements was hypothesized to influence Level of Engagement. The latent mediator variable was named Basic Psychological Needs with three indicators as measured by the Basic Psychological Need Satisfaction at Work Scale used by Deci, Ryan, Gagné, Leone, Usunov, & Kornazheva, 2001; Ilardi, Leone, Kasser, & Ryan, 1993; Kasser, Davey, & Ryan, 1992. The three indicators were: autonomy, relatedness, and competence.

The model as configured appeared to represent a good fit to the data. The chi square test was statistically significant, 354.777 (62, 972), $p < .001$, the NFI was .918, the IFI was .931, the TLI was .898, the CFI was .931, and the RMSEA was .070. Based on these results no modifications such as adding correlations between errors were implemented.

Table 10

Model Fit Summary - Baseline Comparisons.

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.918	.879	.931	.898	.931
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.070	.063	.077	.000
Independence model	.218	.213	.224	.000

Table 11

SEM Mediated Model Results

Chi-square	df	<i>p</i>
354.772	62	.000

Both of the individual paths involved in the indirect effects were statistically significant (Table 12). The path from Work Elements to Basic Psychological Needs (standardized coefficient = .231, unstandardized coefficient = .171 with a standard error of .035, $p < .001$, and from Basic Psychological Needs to Level of Engagement (standardized coefficient = .801, unstandardized coefficient = 1.187 with a standard error of .058, $p < .001$ were significant. An Aroian test (Aroian, 1944/1947) incorporated into a Sobel Test Significance of Mediation of the indirect path yielded a Z score of 4.75217366 with a one-tailed $p < .00000$ and a two-tailed $p < .00000$, indicating strong statistical significance.

Table 12

Regression Weights: (Group Number 1 - Default Model)

		Estimate	S.E.	C.R.	P
Basic Psychological Needs	< Work Elements	.171	.035	4.871	***
Engagement Level	< Work Elements	.088	.034	2.594	.009
Engagement Level	< Basic Psychological Needs	1.187	.058	20.474	***
Vigor	< Engagement Level	1.000			
Dedication	< Engagement Level	1.073	.029	37.476	***
Absorption	< Engagement Level	.752	.028	27.319	***
Relatedness	< Basic Psychological Needs	1.000			
Competence	< Basic Psychological Needs	1.206	.048	25.345	***
Autonomy	< Basic Psychological Needs	1.210	.051	23.522	***
Education Level	< Work Elements	1.000			
Male/Female	< Work Elements	.034	.020	1.715	.086
Place of Employment	< Work Elements	.002	.014	.154	.878
Supervise Others	< Work Elements	.177	.023	7.687	***
Employee Classification	< Work Elements	.390	.048	8.149	***
Department	< Work Elements	.393	.118	3.331	***
Years in HE	< Work Elements	2.139	.391	5.469	***

*** < .000

The path from Work Elements to Levels of Work Engagement (standardized coefficient = .080, unstandardized coefficient = .088 with a standard error of .034, $p = .009$) in table 13 were significant, though not as strong as the unmediated path from Work Elements to Level of Work Engagement (standardized coefficient = .229, unstandardized coefficient = .180 with a standard error of .037, $p < .001$). Of the additional seven variables that were studied, two of them, Male/Female (standardized coefficient = .070) and Place of Employment (standardized

coefficient = .006) were not significant and accounted for very little of the variance (table 12 and 13).

Table 13

Standardized Regression Weights: (Group Number 1 - Default Model)

			Estimate
Basic Psychological Needs	<	Work Elements	.231
Engagement Level	<	Work Elements	.080
Engagement Level	<	Basic Psychological Needs	.801
Vigor	<	Engagement Level	.840
Dedication	<	Engagement Level	.954
Absorption	<	Engagement Level	.749
Relatedness	<	Basic Psychological Needs	.736
Competence	<	Basic Psychological Needs	.865
Autonomy	<	Basic Psychological Needs	.790
Education Level	<	Work Elements	.524
Male/Female	<	Work Elements	.070
Place of Employment	<	Work Elements	.006
Supervise Others	<	Work Elements	.372
Employee Classification	<	Work Elements	.704
Department	<	Work Elements	.139
Years in HE	<	Work Elements	.241

However, the direct path (unmediated) (Figure 2) from Work Elements to Level of Engagement (standardized coefficient = .080, unstandardized coefficient = .088 with a standard error of .034, $p = .009$) was also significant but not as strongly significant as the indirect path. This raised the possibility of complete mediation having been observed. To evaluate this possibility, the unmediated model was analyzed, and it was found that the path from Work Elements to Level of Engagement (Figure 2) was statistically significant in that model (standardized coefficient = .267, unstandardized coefficient = .296 with a standard error of .052, $p < .001$; table 15).

Table 14

Squared Multiple Correlations: (Group Number 1 - Default Model)

	Estimate
Basic Psychological Needs	.053
Level of Work Engagement	.678
Years in HE	.058
Department	.019
Employee Classification	.496
Supervise Others	.138
Place of Employment	.000
Male/Female	.005
Education Level	.274
Autonomy	.625
Competence	.749
Relatedness	.542
Absorption	.561
Dedication	.911
Vigor	.705

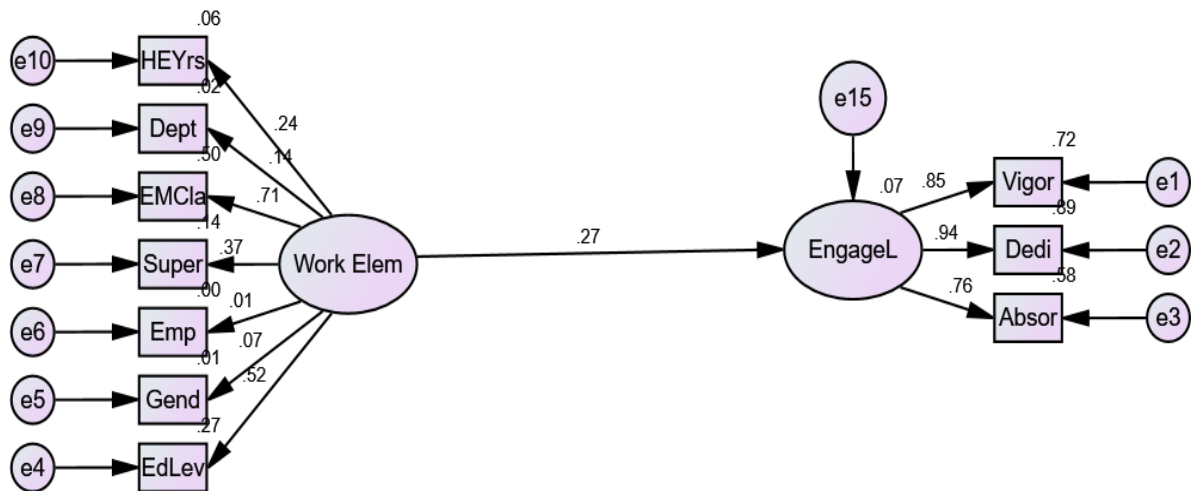


Figure 3. Unmediated Path from Work Elements to Level of Engagement.

Table 15

Regression Weights: (Group Number 1 - Default Model)

			Estimate	S.E.	C.R.	P
Engagement Level	<	Work Elements	.296	.052	5.736	***
Vigor	<	Engagement Level	1.000			
Dedication	<	Engagement Level	1.051	.032	33.094	***
Absorption	<	Engagement Level	.759	.027	27.773	***
Education Level	<	Work Elements	1.000			
Male Female	<	Work Elements	.036	.020	1.787	.074
Place of Employment	<	Work Elements	.002	.014	.171	.864
Supervise Others	<	Work Elements	.178	.023	7.702	***
Employee Classification	<	Work Elements	.393	.048	8.127	***
Department	<	Work Elements	.390	.118	3.300	***
Years In HE	<	Work Elements	2.140	.392	5.454	***

*** < .000

Table 16

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
Engagement Level	<	Work Elements	.267
Vigor	<	Engagement Level	.846
Dedication	<	Engagement Level	.942
Absorption	<	Engagement Level	.762
Education Level	<	Work Elements	.521
Male Female	<	Work Elements	.073
Place of Employment	<	Work Elements	.007
Supervise Others	<	Work Elements	.373
Employee Classification	<	Work Elements	.706
Department	<	Work Elements	.138
Years In HE	<	Work Elements	.240

Given the obtained pattern of statistical significance, the mediation structure was separately examined. The results for the Basic Psychological Needs mediation structure are shown in Figure 3 above. The mediated paths had approximately the same values as were obtained in the full model. The path from Work Elements to Basic Psychological Needs (standardized coefficient = .229, unstandardized coefficient = .180 with a standard error of .037, $p < .001$) is statistically significant as also indicated in the full model.

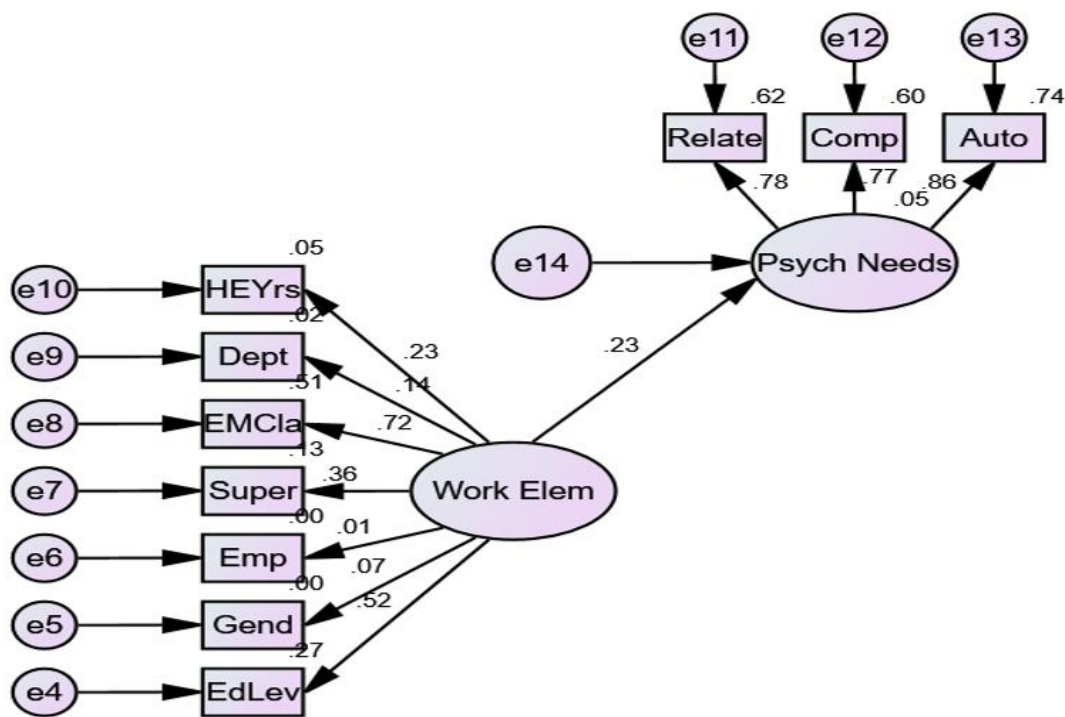


Figure 4. Mediated Path for Work Elements to Basic Psychological Needs

Tables 17 and 18 show the regression weights and standardized regression weights. All relationships are positive between Work Elements and Basic Psychological Needs in Figure 4, meaning as the predictor variables increased, so did the dependent variables. Some noteworthy points in the regression weights (table 17) reveal that standardized coefficient estimate .004 ($p = .792$) for Place of Employment (research question four) accounts for only .011 of the variance

Table 17

Regression Weights: (Group Number 1 - Default Model)

		Estimate	S.E.	C.R.	P
BPN	< Work Elements	.180	.037	4.881	***
Relatedness	< BPN	1.000			
Competence	< BPN	1.010	.043	23.520	***
Autonomy	< BPN	1.236	.051	24.454	***
Education Level	< Work Elements	1.000			
Male Female	< Work Elements	.033	.020	1.670	.095
Place of Employment	< Work Elements	.004	.014	.263	.792
Supervise Others	< Work Elements	.171	.023	7.538	***
EC	< Work Elements	.397	.051	7.804	***
Department	< Work Elements	.408	.118	3.465	***
Years In HE	< Work Elements	2.051	.387	5.292	***

*** < .000

BPN = Basic Psychological Needs

EC = Employee Classification

Table 18

Standardized Regression Weights: (Group number 1 - Default model)

		Estimate
Basic Psychological Needs	< Work Elements	.229
Relatedness	< Basic Psychological Needs	.784
Competence	< Basic Psychological Needs	.772
Autonomy	< Basic Psychological Needs	.860
Education Level	< Work Elements	.523
Male Female	< Work Elements	.068
Place of Employment	< Work Elements	.011
Supervise Others	< Work Elements	.359
Employee Classification	< Work Elements	.717
Department	< Work Elements	.144
Years In HE	< Work Elements	.231

between Work Elements and Basic Psychological needs. Employee Classification (.717), Educational Level (.523), and supervise others (.359) had the highest Standardized Regression Weight estimates. They accounted for a good portion of the variance between the Work Elements and Basic Psychological Needs. Educational Level and Employee Classification are related in that many respondents who are classified as non-classified employees also supervise others and typically have bachelor's or graduate level degree.

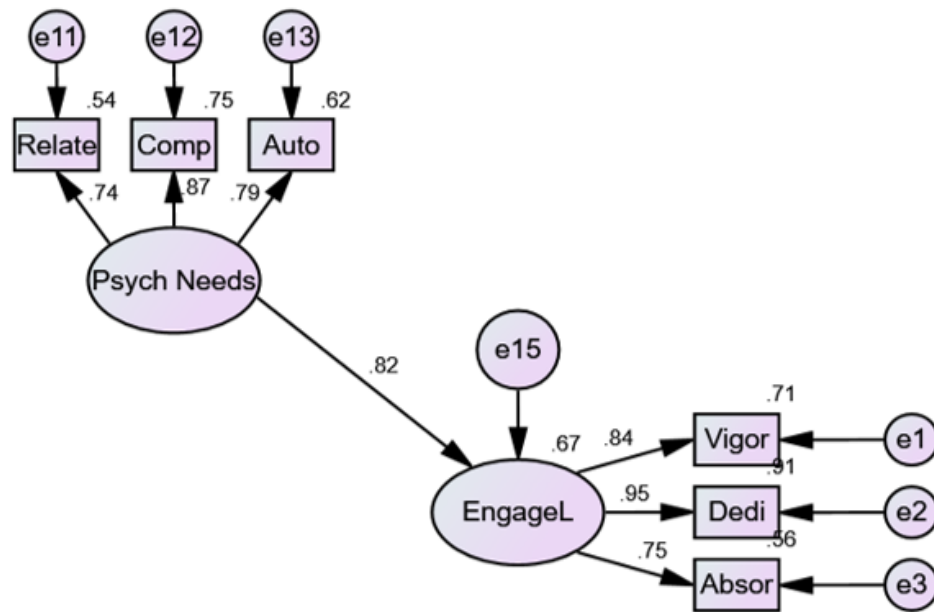


Figure 5. Unmediated Path from Basic Psychological Needs to Level of Engagement.

To further analyze research question one and corresponding hypothesis (RQ1 - the relationship between Basic Psychological Need variables and Level of work Engagement variables) an unmediated path from basic psychological Needs to Level of Engagement was run with SEM (Figure 5).

Table 19

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P
EL	<	Basic Psychological Needs	1.214	.058	21.016	***
Vigor	<	Engagement Level	1.000			
Dedication	<	Engagement Level	1.074	.029	37.430	***
Absorption	<	Engagement Level	.751	.028	27.278	***
Relatedness	<	Basic Psychological Needs	1.000			
Competence	<	Basic Psychological Needs	1.206	.048	25.351	***
Autonomy	<	Basic Psychological Needs	1.209	.051	23.504	***

*** < .000

EL = Engagement Level

Table 20

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
Engagement Level	<	Basic Psychological Needs	.820
Vigor	<	Engagement Level	.840
Dedication	<	Engagement Level	.955
Absorption	<	Engagement Level	.748
Relatedness	<	Basic Psychological Needs	.736
Competence	<	Basic Psychological Needs	.866
Autonomy	<	Basic Psychological Needs	.790

Research question one asked whether there was a significant relationships between Basic Psychological Needs and the Levels of Work Engagement in higher education employees. We reject the null hypotheses, meaning we found significant relationships between the variables. The full SEM model (figure 2), Basic Psychological Needs was an unmediated variable between Work Elements and Levels of Work engagement was used to show where the variances were

contained. This time, a SEM model (figure 5) was set up to show a direct path between Basic Psychological Needs and Levels of Work Engagement. In this separate model, paths had approximately the same values as were obtained in the full model. The path from Basic Psychological Needs to Levels of Work Engagement (standardized coefficient = .820, unstandardized coefficient = 1.214, with a standard error of .058, $p < .001$) (Table 20) is statistically significant as also indicated in the full model. All relationships are positive between Basic Psychological Needs and Levels of Work Engagement, meaning the as one variable increases (predictor) the dependent variable increases positively. The standardized coefficients reveal a strong relationship between both Basic Psychological Needs and Levels of Work Engagement, and between each individual variable within Basic Psychological Needs and Levels of Work Engagement (table 20). The measurement portion of the model is also quite good – the lowest R squared value is .54 (relatedness), which indicates that the model is accounting for a large proportion of the variance in the measured items.

Categorical Principal Components Analysis (CATPCA).

The next analysis incorporated in this research was Categorical Principal Components Analysis (CATPCA). This is based on developing components, which provide the relationship between all variables and the variance explained. Appendix T - Variance Accounted For, shows the variance accounted for by each of variables in the analysis.

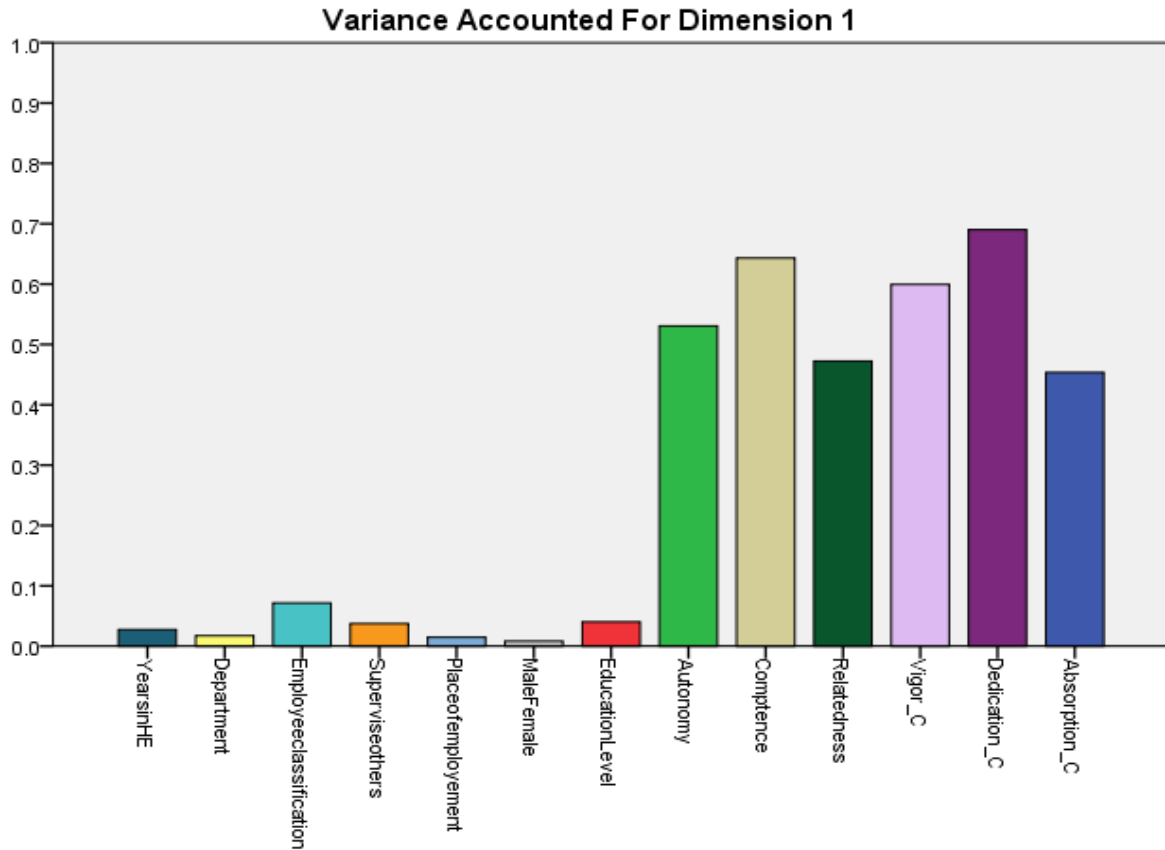


Figure 6. Variance Accounted for Dimension 1.

The variance accounted for is shown graphically in the three figures, which follow: Figure 6, Variance Accounted for Dimension 1, Figure 7, Variance Accounted for Dimension 2, and Figure 8 the Total Variance Accounted For. Figure 8 gives a representation of the variance accounted for each of the variables in Basic Psychological Needs and Levels of Work Engagement. Dedication (.831), competence (.802) represent the highest variance accounted for in this model, with absorption scoring somewhat lower at .673. These strong variances give support to research question one as to the degree of variance (effects) between all six variables of Basic Psychological Needs and Level of Work Engagement.

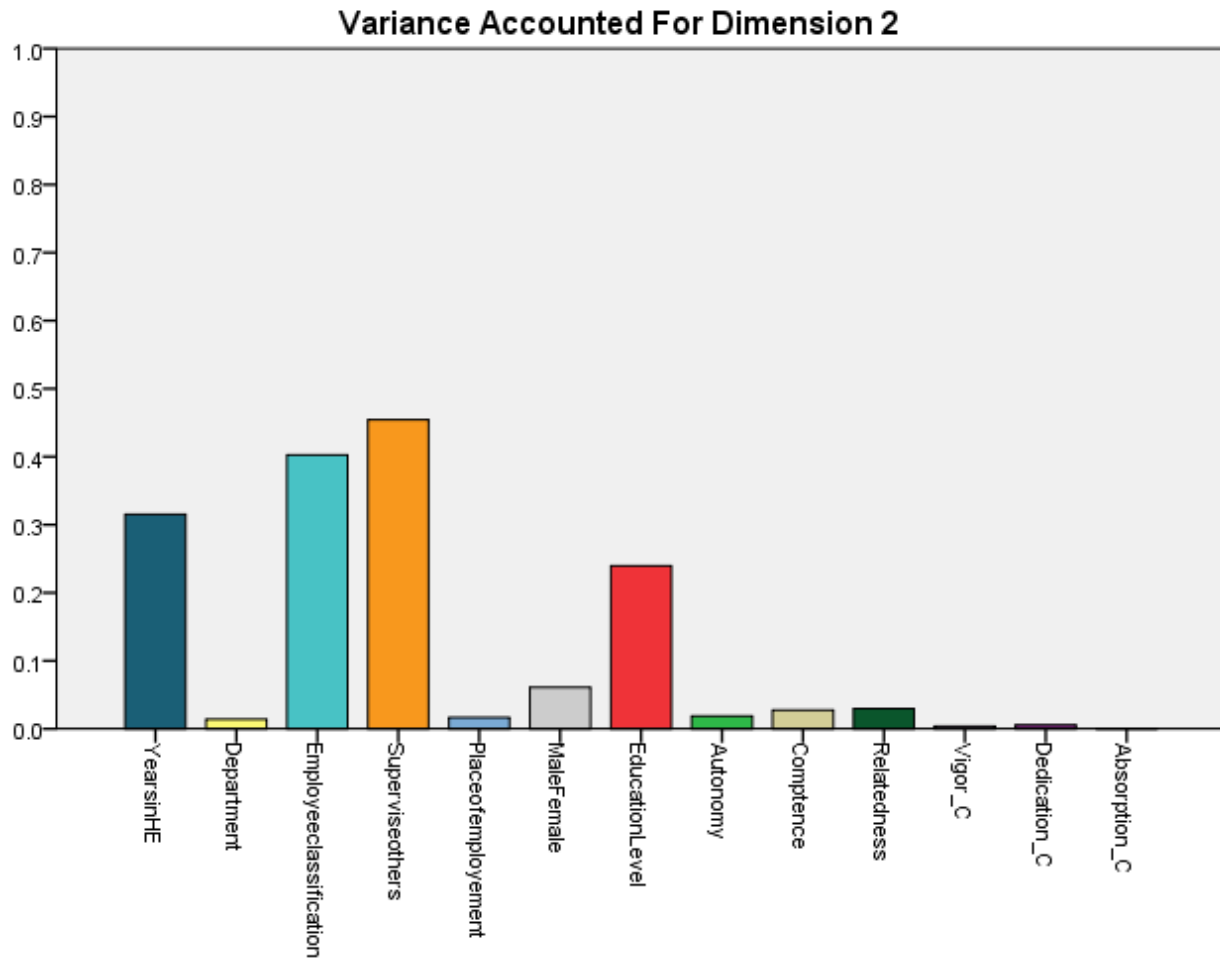


Figure 7. Variance Accounted for Dimension 2.

Figure 7 gives a representation of the variance accounted for each of the seven variables in Work Elements in the SEM model. Supervise other (.674), employee classification (.634), and Years in HE (.562) represented the highest variance accounted for in this model, with Education Level (-.490), Male/Female (-.247) and Department (-.118), are negatively correlated. This indicates that when all seven variables of Work elements are studied in the SEM model together these three education level, gender, and department account for a small portion of the variance accounted for in the model and having minimal impact in variance accounted for dimension 2 (when all seven independent variables are observed together). Interestingly, the independent variable Place of

Employment from research question four displays a negative variance in Dimension 2, meaning that the Place of Employment had a minimal effect in variance accounted for in Dimension 2 (Figure 7). The type of institution (two-year or four-year) does not seem to significantly influence

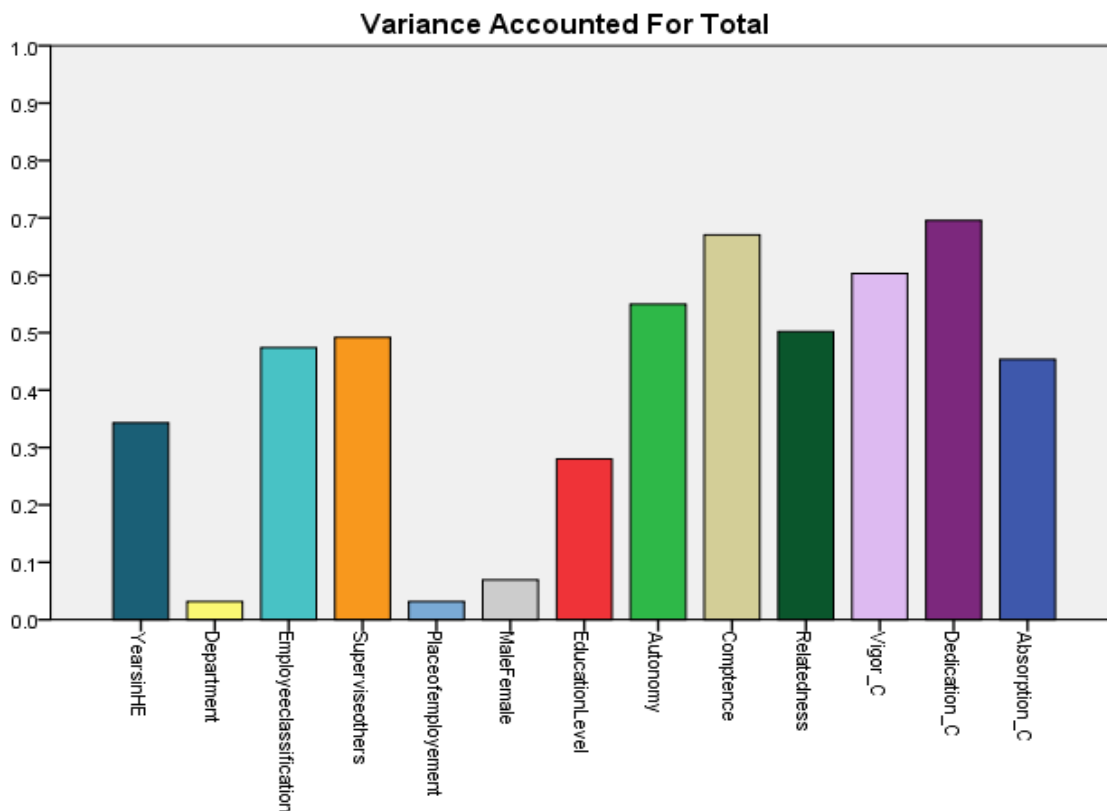


Figure 8. Total Variance Accounted For Total.

an individual's Basic Psychological Needs and Level of Work Engagement when combined with the other six Work Elements in the study. Surprisingly, Level of Education contribution to the overall variance accounted for is low to moderate in this study, meaning that Basic Psychological Needs satisfaction and Levels of Work Engagement likewise are not dependent of level of education with higher education institutional staff (non-faculty).

The overall variance accounted for in Supervise others and Place of Employment were variables hypothesized in research question two, three, and four. Nine of the 12 variables

accounted for most of the variance in both dimensions. The strong variance accounted for totals (figure 8) in the SEM model could be explained by the strength effects of the parameter estimates (Appendix R) which show the significance of each level of the independent variables to each of the six dependent variables.

Table 21

Component Loadings for Dimension 1 and 2.

	Dimension	
	1	2
Dedication	.831	-.075
Competence	.802	-.166
Vigor	.774	-.062
Autonomy	.728	-.137
Relatedness	.687	-.172
Absorption	.673	-.011
Department	-.132	-.118
Supervise others	.193	.674
Employee classification	.267	.634
Years in HE	.166	.562
Education Level	-.201	-.490
Male Female	.091	-.247
Place of employment	-.122	.129

CATPCA also develops the component loading for each of the variables which shows the relative importance in each dimension. The underlying analysis of CATPCA finds the highest weighted variables (component loadings) for dimension 1 and finds a different set of the most important loadings for dimension 2. These loadings are ranked in order of importance as shown in Table 21 Component Loadings.

Variable Principal Normalization.

A graph of the component loadings for both dimensions are presented in Figure 9 Component Loadings Graph. This graphical representation shows the relationship of all

variables in terms of importance. The further away from a central point by the lines indicated means that variable is the most important and the impact of both dimensions is very clear.

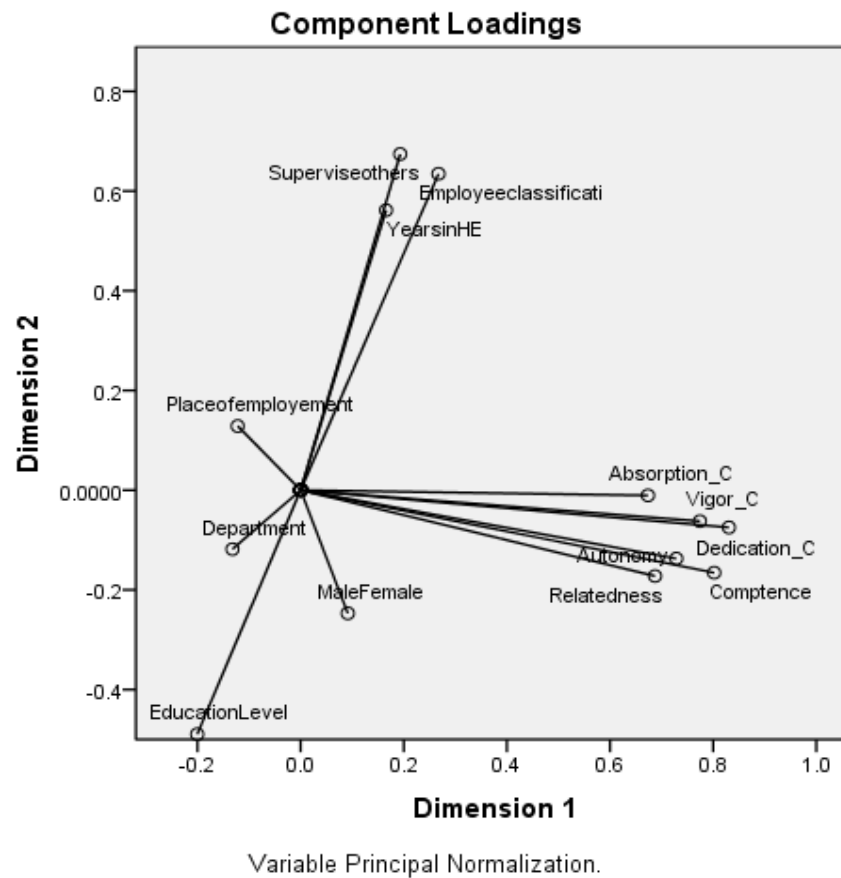


Figure 9. Component Loadings of all 13 Variables.

As mentioned above, Department, Education Level, and Male/Female play a minimal role in the total variance accounted (negative scores) for in the model. Furthermore, Educational Level, Gender, and Department have a minimal influence in predicting Basic Psychological Needs and Levels of Work Engagement. Additionally, whether an individual works at a two-year or four-year institution (RQ4) appears to have a minimal effect on the overall relationship between Basic Psychological Needs and Levels of Work Engagement. Years in higher education, job classification, and supervisory responsibilities (RQ2-3) accounted for the highest variance with the independent variables of Work Elements (Figure 9). Given that in the test of between-

subjects effects there were some significant relationships between individual variables of department and autonomy, relatedness, absorption; Education Level and competence and dedication, and Male/Female with competence and relatedness, these individual relationships have a minimal impact in the overall component loadings. The component loadings would suggest that Department, Gender, Education Level, and Place of Employment (RQ4) were poor predictors of higher levels of Basic Psychological Needs and Levels of Work Engagement.

Summary

The lack of research with higher education non-faculty staff was the motivation for this study. By means of General Linear Model (GLM), MANOVA, and SEM, support was given to support research questions one through four and discover how other independent variables in Work Elements influence the dependent variables and overall model. SEM offered an opportunity to study all the dependent and independent variables as a group and discover the interactions (effects strengths) between them. Via correlations from the Basic Psychological Needs to Level of Engagement (one SEM model path of mediation), we found the correlations between both latent variables were moderate to strong Pearson's r correlations and strong standardized coefficients in the SEM on path model (Figure 2). Furthermore, the six predictor variables (autonomy, relatedness, competence, vigor, dedication, and absorption) were strongly correlated and accounted for the variances expressed in R squared. MANOVA statistics allowed for the rationale of either failing to reject the null hypothesis for the eight hypotheses established in research questions two through four. Finally, CAPTA showed a different understanding of how to interpret research questions as it displayed the variance accounted for (relative importance) of the variables in the overall study model and which appeared to begin to answer the research questions. Understanding how basic psychological need satisfaction can positively

influence levels of work engagement in Idaho public higher education will add to the limited research with higher education professional staff.

CHAPTER V

Discussion of Findings

The purpose of this chapter is to discuss the study's findings in light of previous research and theory. In addition, this chapter will discuss the implications of the findings on STD theory, recommendations for senior leadership, as well as the limitations of the study and recommendations for future research.

Summary of the Study

This study examined self-determination theory (human needs of autonomy, competence, and relatedness) to determine if it provides a theoretical explanation of professional staff work engagement (vigor, dedication, and absorption) by analyzing Idaho public higher education professional staff responses to a survey instrument. This particular group of professional staff include a large section of employees in Idaho public higher education, yet little research has been done on the level of work engagement of these professional staff (non-faculty staff) nationwide. Previous limited research with higher education professional staff has shown that interacting with students, connectedness to the organization, and professional development were significant factors in job satisfaction.

This study, completed with respondents from eight public higher education institutions in Idaho, considered if STD factors would explain the levels of work engagements of university/State College, and community college professional staff members. The literature on work engagement in higher education has been primarily done on faculty, and few studies have focused exclusively on higher education staff. The intention of this study was to close the gap.

Three main areas were explored in this study: demographics and Work Elements (e.g., gender, age, years in higher education, job classification, race, supervisory responsibilities,

department [work area], place of employment), Basic Psychological Needs (autonomy, relatedness, competence), and Levels of Work Engagement (vigor, absorption, dedication). The study was guided by the following research questions:

- What is the relationship between self-determination theory and employee engagement for higher education professional staff?
- To what extent are professional staff with supervisory responsibilities engaged compared to professional staff with no supervisory responsibilities?
- To what extent does professional staff with supervisory responsibilities report basic psychological needs fulfillment compared to professional staff with no supervisory responsibilities?
- Do two-year professional staff perceive need fulfillment and engagement differently than four-year professional staff?

The quantitative methodology (survey) was used to measure the relationship between dependent variables (Basic Psychological Need satisfaction work scale and Utrecht Work Engagement Scale) and the independent variables (demographics – Work Elements).

Respondent Participation

The public higher education professional staff included respondents from four-year and two-year institutions, which provided insightful information between both. Furthermore, the relationship between SDT (motivation) and employee engagement has been shown in several studies cited in the literature review, yet only a couple of studies were conducted with higher education professional staff.

Respondent's Perceptions

The quantitative methodology (survey) was used to measure the relationship between

independent variables (basic psychological need satisfaction work scale) and the dependent variable (Utrecht Work Engagement Scale). 4807 professional higher education staff in the eight public institutions in Idaho were contacted (email) and invited to participate, and 972 completed respondents were used in the study. Due to the small size (eight) of the overall higher education institutions generated in this study, the results may not be applicable to other higher education institutions.

Relationship Between Basic Psychological Needs and Levels of Work Engagement

These relationships were evaluated using the General Linear Model (GLM) -- Multivariate which allows for multiple dependent variables (for this analyses: vigor, absorption, dedication) and the three independent variables (covariates) relatedness, autonomy and competence. All three levels of Basic Psychological Needs (autonomy, relatedness, and competence) revealed significant relationships with Levels of Work Engagement (vigor, absorption, and dedication). Respondents who perceived higher levels of autonomy perceived significant higher levels of vigor and dedication. Surprisingly, there were three relationships that were not significant: Autonomy-Absorption, Relatedness-Absorption, and Relatedness-Dedication (which was significant at $p < .02$). Results showed that autonomy and relatedness were a poor predictor of levels of absorption, yet competence influenced all three dependent variables of vigor, dedication, and absorption. The perception of feeling happy when working intensely, or immersed in work, or carried away with doing your tasks (absorption) appears to be influenced the perception of competence an individual has at work, not the perception of autonomy and relatedness. Having positive relationships (relatedness) and perceiving autonomy in the workplace appear to influence dedication (enthusiasm, inspiration, significance at work)

and vigor (energy, feeling strong) with Idaho public higher education professional staff respondents. Further research is necessary to understand the reasons behind these perceptions.

When employees feel competence (they are told what they do well, develop a sense of accomplishment in their tasks), autonomy (have input, are allowed to express their ideas, allowed to be themselves), and relatedness (enjoy and get along with their colleagues, feel cared for), these individuals respond with increased perceptions of dedication (enthusiasm, inspiration, sense of significance), absorption (immersed in work, feel happy when working intensely), and vigor (energy, strong, and vigorous at work) are positively influenced.

Implications. When studied as a group the study revealed there are significant relationships when the Basic Psychological Needs variables, Levels of Work Engagement variables, and Work Element variables. The SEM model and CAPTCA model displayed strong relationships when all three groups were studied together. In other words, there is no one program or training that could be considered the magic-formula for basic psychological need satisfaction. The study suggests that for these respondents, the combination of factors and opportunities made available to the institutional workforce could positively affect basic psychological needs. Work settings that encourage and sustain relationships built on cooperation, support, trust, partnerships, and supervisors who recognize and respect subordinate employees appear to provide the social context that will support intrinsic motivation (need satisfaction) and encourage positive levels of work engagement.

As this study indicated, competence had a significant relationship with all three variables vigor, dedication, and absorption. Providing positive feedback, (what I am good at) and helping employees develop a sense of accomplishment, can enhance the effect on intrinsic motivation by providing opportunities for enhanced competency, while promoting individual employee sense

of autonomy. Another benefit of encouraging employee competency through feedback and professional development opportunities is it can potentially diminish work anxiety levels in some individuals, promoting higher education staff retention.

Proactively providing opportunities for employee feedback (autonomy) could allow individual employees avenues to express suggestions, comments, concerns, and/or input into daily processes or work improvements, which influence individual employee perceptions of their autonomy, relatedness (Basic Psychological Needs). Results seem to suggest that it could influence positively competence in the work environment. Finally, offering employee rewards and recognition could create organizational engagement which could also lead to positive institutional outcomes.

Supervisory Responsibilities

In both the GLM and the SEM model those respondents who have supervisory responsibilities displayed higher levels of Basic Psychological Needs and Levels of Work Engagement. Respondents who have supervisory responsibilities perceived statistically significant effect strengths compared from those who do not have supervisory responsibilities in relation with autonomy and relatedness. The model showed that the dependent variable of competence in supervise others did not have a significant effect on the model over those who do not supervise others and supervision responsibilities does not contribute significantly to the model. It appears that competence would not be affected on whether an individual is a supervisor or not. Competence appears to be related to a skill set, which any individual in any capacity may possess.

Implications. Higher education institutions potentially benefits when individuals who supervise others would focus on developing open lines of communication with those individuals

they supervise. Building relationships with subordinates based on trust, support, cooperation, and respect can positively increase levels of work engagement. Furthermore, positive relationships can have significant effects on turnover intentions, work performance, and organizational engagement. The results suggest focusing on training, professional development, and skill acquisition opportunities, develops competence and increased levels of work engagement. Supervisors who provide employee recognition, opportunities for professional growth, achieving work-life balance facilitate employees to feel valued in the work place. Finally, the leadership style a supervisor selects is critical. One study has shown that transformational leadership has a strong relationship with competence, autonomy, and relatedness. The study showed the need satisfaction played a mediating role in leadership style (transformational) and employee outcomes (positive). Therefore, it behooves institutional administrators to be cognizant of the institutional influence supervisors can create on the overall positive institutional culture of work engagement by satisfying individual basic psychological needs in Idaho public higher education institutional professional staff.

Place of Employment

The results of this study revealed that Community College (two-year institution) contributed statistically to the model with one of the predictor dependent variable for Level of Work Engagement (dedication), yet not as strong of a relationship with vigor and absorption. Furthermore, Community College (two-year institution) contributed statistically in one predictor dependent variable (Competence).

Implications. As place of employment appears to account for minimal variance (effect) on the overall relationship between Basic Psychological Needs and Level of Work Engagement, this should be interpreted as positive. Both types of institutions (two-year and four-year) offer

individuals a unique platform to pursue their dreams and career goals and perceive the same levels of Basic Psychological Needs Satisfaction and Levels of Work Engagement. Both types of institutions offer professional staff the opportunity to contribute and participate in higher education in Idaho.

Work Elements Perceptions

The additional independent variables (all categorical) added to the model were Years in Higher Education (seven levels), Female/Male (two levels), Education Level (eight levels), Employee Classification (three levels), and Department (11 levels) in which respondents were currently employed. Using the Categorical Principal components Analysis (CAPTA) the study combined all of the work Elements variables to determine the variance accounted for each individual variable in the SEM model. The study suggested that Department, Gender, Education Level, and Place of Employment (RQ4) were poor predictors of higher levels of Basic Psychological Needs and Levels of Work Engagement. However, Years in Higher Education and Job Classification accounted for significant variance in the models (SEM and CAPTA).

Implications. In research, one of the general objectives is to discover potential justifications for statistically significant relationships. However, human beings are composed of a variety of experiences, human relationships, dreams, goals, perceptions, social contexts, and other factors that make individuals unique and distinctive from each other. Creating policies that promote the idea of individual's unique accumulation of experience, responsibilities, education level, and work-related goals as compared to the Department, Gender, or Educational Level may create greater opportunities to satisfy basic psychological needs and results in increased individual levels of work engagement eventually benefiting the institution as a whole. Understanding that satisfying basic psychological needs can occur for any individual regardless

of their experience, responsibilities, and level of education, is a step in the right direction towards engaging the workforce.

Recommendations for Senior Leadership

Given the perceptions of respondents, it is important for institutional leadership to create a positive culture that supports the Basic Psychological Needs satisfaction of autonomy, relatedness, and competence in all its employees. The study has not reveal a new theory in leadership; however, results have emphasized what the literature has been promoting for decades. The most important asset in any institution is its employees, therefore, creating open lines of communication, building a culture of trust, cooperation, supporting professional development, encouraging innovation (autonomy) are vital for a thriving institution. Creating a culture that “emphasizes human capital, selective hiring, reward, development, empowerment, diversity, and participative decision making are critical” (Hong, 2011, p. 73). Heraclitus stated, “Life is Flux” (Mark, 2012), meaning that everything or all things change, including Idaho public higher education. Therefore, creating and changing levels of work engagement in the workforce is a continual process of reinforcing shared values, beliefs, assumptions, and norms (Hong, 2011). Fullan (2008) noted that the six components (secrets) of change (promoting an engaged workforce) are love your employees, connect peers with a purpose, build capacity in employees through development, encourage learning, promote transparency, and develop sustainable systems. Furthermore, satisfying Basic Psychological Needs is reflected in Kouzes and Posner (2008) five practices of exemplary leadership: model the way, inspire a shared vision, challenge the process, enable others to act, and encourage the heart. Promoting an engaged workforce should be the goal of every higher education institution in which work expectation

align with personal employee values and employee strengths to increase probability that the employee cares about the tasks and feels fully utilized on the job (Greguras, et al., 2014).

Limitations and Future Research

Limitations. There are several limitations in the present study. Perhaps the largest limitation was the scope of the research. This study was limited to the state of Idaho public higher education institutions. The study included four public universities and four local community colleges, which limits any conclusions of the study to the participating institutions. A second limitation was that only public institutions were included in the study. Private, not-for-profit institutions were not included, which could have added another dimension of respondents.

Future research. Future research may include how different leadership styles affect basic psychological needs satisfaction. As a previous study showed the positive affect of transformational leadership of STD, are there other leadership styles that have a positive influence on STD?

Other potential research would may include public institutions from a number of western states, gathering perceptions from a broader group of higher education professional staff. It also would provide an understanding of employee work engagement perceptions from a variety of institutions from rural institutions in relation to institutions located in large urban areas, by institutional size, differences in employee financial compensation, or compare U.S. higher education institutions to international higher education institutions. These type of contrast in higher education settings would allow researchers to gain insight in perceptions of respondents in different geographical areas which could impact satisfying basic psychological needs and levels of work engagement. Another potential area of research would be to include a qualitative component to future research, allowing respondents to express their perceptions for improvement

and concerns of their work environment, which could provide invaluable insight to what factors affect basic psychological needs and levels of work engagement. The contribution in understanding basic psychological needs satisfaction and its relationship with levels of work engagement offer higher education administrators a unique opportunity to gain insight into the professional higher education staff they oversee.

Conclusions

This research set out to study if self-determination theory (human needs of autonomy, competence, and relatedness) could provide a theoretical explanation of public higher education professional staff work engagement (vigor, dedication, and absorption) by analyzing professional staff responses in Idaho public higher education institutions. The results of the study showed that employee perceptions of basic psychological needs are strongly correlated to their level of work engagement, which supports other studies showing STD as a strong influence of work satisfaction and engagement.

Recognizing the importance of creating positive and appealing work environments (where individuals have positive human interactions, feel competent in their task, professional development opportunities, and have input on decision making), institutions must seize the moment to engage employees in all departments. Engaged employees are more likely to be friendly, helpful, and dedicated in their interactions with students and with other staff members. As leadership recognizes that the greatest asset of their organization are its employees, knowledgeable higher education professional staff provide a vital source of competitive advantage to higher education institutions. Attracting, motivating, and retaining them should be a constant leadership endeavor.

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Appendix A

Demographic Questions

How long have you worked in higher education? (Include all years if you have worked at more than one institution)

- a. Less than one year
- b. _____ (please round to the nearest year)

Have you only worked at one (current) institution?

- a. Yes (Qualtrics: skip next question)
- b. No (Qualtrics: go to next question)

If you have work at more than one higher education institution, what motivated you to transfer?

(Check all that apply)

- a. Family
- b. Job enrichment
- c. Promotion
- d. Career change
- e. Salary
- f. Position being eliminated
- g. Other _____ (Qualtrics: allow write in)

How long have your worked at your current position?

- a. Less than one year

a. _____ (round to nearest year) (Qualtrics: allow write in)
 What department do you currently work in?

- a. Facilities
- b. Student Services
- c. Student Affairs
- d. Athletics
- e. Other _____ (Qualtrics: allow write in)

Your employee classification is

- a. Classified employee (hourly)
- b. Non-classified employee (salary)
- c. Other _____ (Qualtrics: allow write in)

Do you supervise full-time employees in your current position? (Those that report directly to you)

- a. I do not supervise any full-time employees
- b. Yes. How many? _____ (Qualtrics: allow to write in)

Place of employment

- a. Community College
- b. Four-year institution

Are you male or female?

- a. Female
- b. Male
- c. Other _____ (Qualtrics: allow write in)

What is your age?

- a. _____ (write in)

Ethnicity

- a. Not Hispanic or Latino
- b. Hispanic or Latino
- c. Prefer not to answer

Race

- a. White
- b. Black or African American
- c. Native American or American Indian
- d. Asian
- e. Native Hawaiian/ Other Pacific Islander
- f. Other _____ (Qualtrics: allow participant to write in)
- g. Prefer not to answer

Education: What is the highest degree or level of school you have completed?

- a. High school graduate, diploma or the equivalent (for example: GED)
- b. Some college credit, no degree
- c. Some graduate credit, no graduate degree
- d. Trade/technical/vocational training
- e. Associate degree
- f. Bachelor's degree
- g. Master's degree
- h. Professional degree (Ex. Pharmacy, DPT, etc.)

- i. Advanced Professional Degree (Terminal degree - Ex. PhD, MD, DNP, etc.)

Appendix B

Basic Need Satisfaction at Work: When I Am At Work

The following questions concern your feelings about your job during the last year. (If you have been on this job for less than a year, this concerns the entire time you have been at this job.)

Please indicate how true each of the following statement is for you given your experiences on this job. Please use the following scale in responding to the items.

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

1. I feel like I can make a lot of inputs to deciding how my job gets done.
2. I really like the people I work with.
3. I do not feel very competent when I am at work.
4. People at work tell me I am good at what I do.
5. I feel pressured at work.
6. I get along with people at work.
7. I pretty much keep to myself when I am at work.
8. I am free to express my ideas and opinions on the job.
9. I consider the people I work with to be my friends.
10. I have been able to learn interesting new skills on my job.
11. When I am at work, I have to do what I am told.
12. Most days I feel a sense of accomplishment from working.
13. My feelings are taken into consideration at work.
14. On my job I do not get much of a chance to show how capable I am.
15. People at work care about me.
16. There are not many people at work that I am close to.
17. I feel like I can pretty much be myself at work.
18. The people I work with do not seem to like me much.

19. When I am working I often do not feel very capable.
20. There is not much opportunity for me to decide for myself how to go about my work.
21. People at work are pretty friendly towards me.

Scoring Information. Form three subscale scores by averaging item responses for each subscale after reverse scoring the items that were worded in the negative direction. Specifically, any item that has (R) after it in the code below should be reverse scored by subtracting the person's response from 8. The subscales are:

Autonomy: 1, 5(R), 8, 11(R), 13, 17, 20(R)

Competence: 3(R), 4, 10, 12, 14(R), 19(R)

Relatedness: 2, 6, 7(R), 9, 15, 16(R), 18(R), 21

Please use the following references when using this scale: (Deci, Ryan, Gagné, Leone, Usunov, & Kornazheva, 2001; Ilardi, Leone, Kasser, & Ryan, 1993; Kasser, Davey, & Ryan, 1992).

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Appendix C

Work & Well-being Survey (UWES) ©

The following nine statements are about how you feel at work. Please read each statement carefully and decide if you ever feel this way about your job. If you have never had this feeling, cross the '0' (zero) in the space after the statement. If you have had this feeling, indicate how often you feel it by crossing the number (from 1 to 6) that best describes how frequently you feel that way.

	Almost never	Rarely	Sometimes	Often	Very often	Always
0	1	2	3	4	5	6
Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Every day

1. At my work, I feel bursting with energy* (VI1)
2. At my job, I feel strong and vigorous (VI2)*
3. I am enthusiastic about my job (DE2)*
4. My job inspires me (DE3)*
5. When I get up in the morning, I feel like going to work (VI3)*
6. I feel happy when I am working intensely (AB3)*
7. I am proud of the work that I do (DE4)*
8. I am immersed in my work (AB4)*
9. I get carried away (*with my tasks*) when I'm working (AB5)*

* Shortened version (UWES-9); VI= vigor; DE = dedication; AB = absorption

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Appendix D
First Questionnaire Email

Dear Professional,

My name is Dan Woerner and I am a doctoral candidate at Idaho State University. As part of my doctoral studies, I am conducting research investigating perceptions of employee work engagement in higher education institutions.

You are invited to complete a survey. The survey will take approximately 5-6 minutes to complete. Your responses to the survey will be anonymous to maintain privacy and confidentiality.

Participation is completely voluntary and you may withdraw at any time.

For further information regarding this research please contact Dan Woerner (208) 241-4174, or woerdan@isu.edu

If you have any questions concerning your rights as a research participant, you may contact the Idaho State University Human Subjects Committee at (208) 282-2179.

By completing this survey, you are signifying that you are 18 years or older and that you consent to participate in this study.

As a thank you for completing the survey, **you will be eligible to enter a drawing to win one of five \$25 gift cards.** At the end of the survey you will be offered a link to take you to a separate collector to make this drawing possible. Only your name and email address will be needed to enter the drawing and this information will not be used in any other way.

Thank you in advance for your cooperation and support!

Sincerely,

Dan Woerner
Doctoral Candidate
woerdan@isu.edu
208.241.4174

Follow this link to the Survey:

`{l://SurveyLink?d=Take the Survey}`

Or copy and paste the URL below into your internet browser:

`{l://SurveyURL}`

Follow the link to opt out of future emails:

[Click here to unsubscribe](#)

Appendix E

First Questionnaire Reminder E-mail (send seven days after original email)

Hello,

I am writing to remind you of a survey link that was e-mailed to you one week ago.

As an employee at Idaho State University (and a doctoral student), I am conducting research for my dissertation to gain insight concerning higher education work engagement. The survey will ask questions about your opinions related to your work experiences and motivation. Your responses to the survey will be completely anonymous to maintain privacy and confidentiality.

If you have not completed the survey, please consider taking around 5-6 minutes to complete it now. Your input is needed to make this research accurately reflect issues pertaining to employee work engagement perceptions in higher education.

Thank you for taking time to participate in this research project. As a thank you for completing the survey, **you will be eligible to enter a drawing to win one of five \$25 gift cards.** At the end of the survey you will be offered a link to take you to a separate collector to make this drawing possible. Only your name and email address will be needed to enter the drawing and this information will not be used in any other way.

Your response are greatly appreciated!

Respectfully,

Dan Woerner
 Doctoral Candidate - Idaho State University
 woerdan@isu.edu
 Mobile: 208.241.4174
 Work: 208.282.3900

Follow this link to the Survey:

[\\${l://SurveyLink?d=Take the Survey}](#)

Or copy and paste the URL below into your internet browser:

[\\${l://SurveyURL}](#)

Follow the link to opt out of future emails:

[\\${l://OptOutLink?d=Click here to unsubscribe}](#)

Appendix F

Second Questionnaire Reminder E-mail

Hello,

I recently e-mailed a link to a survey to you. The survey is about higher education employee work engagement perceptions.

I am emailing to provide a final reminder about the survey. In order for the research results to be representative of the survey population, a response from each employee in the survey population is critically important.

I would also like to remind you that your response is entirely **confidential**. No individual names will be associated with the research report and all research findings will only include aggregate data. The survey should take no longer than 5-6 minutes to complete.

I sincerely appreciate your participation in this research project!

The survey will be available until March 16, 2018.

Thank you for your time and support!

Respectfully,

Dan Woerner
Doctoral Candidate
Idaho State University
email: woerdan@isu.edu
work: 208.282.3900
mobile: 208.241.4174

Follow this link to the Survey:

[\\${1://SurveyLink?d=Take the Survey}](#)

Or copy and paste the URL below into your internet browser:

[\\${1://SurveyURL}](#)

Follow the link to opt out of future emails:

[\\${1://OptOutLink?d=Click here to unsubscribe}](#)

Appendix G

Thank you message to Finished Respondents

This is an email to say thank you to all who participated in the survey! I owe you a debt of gratitude.

To all who participated I'm very appreciative of the time you have taken to assist in the survey, and commit to utilizing the information gained to contemplate and implement in my dissertation. Your feedback is critical to understanding employee work engagement in higher education.

Once again, I am extremely grateful for you contributing your valuable time, your honest information, and your thoughtful answers.

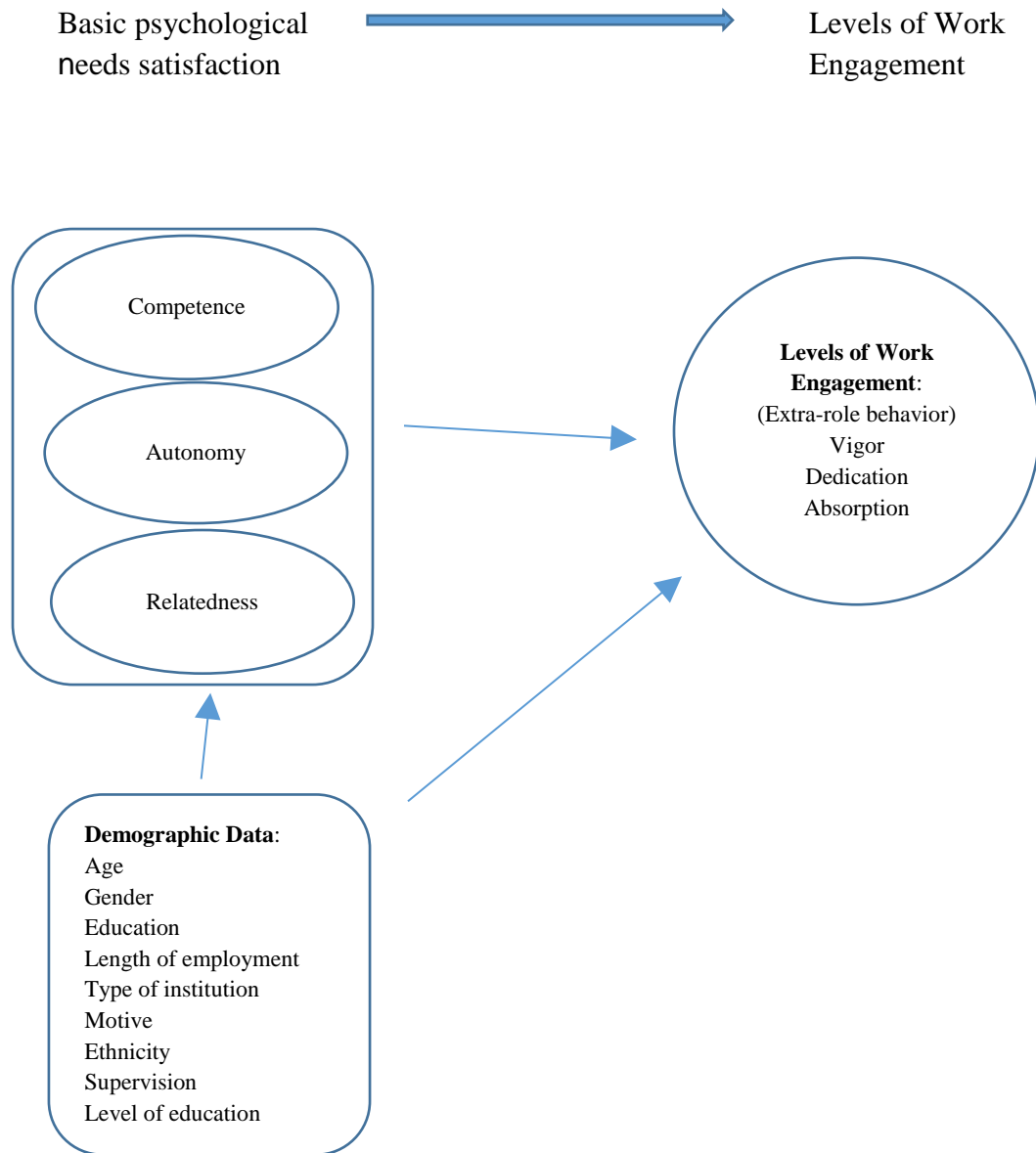
Respectfully,

Dan Woerner
Doctoral Candidate
Idaho State University
email: woerdan@isu.edu
mobile: 208.241.4174
work: 208.282.3900

Follow the link to opt out of future emails:
\${1://OptOutLink?d=Click here to unsubscribe}

Appendix H

Conceptual Framework for Study



Appendix I

Significant Parameter Estimates between dependent variables and independent variables

Dependent Variable	Parameter	BStd.	Error	t	Sig.
Autonomy	[Years in HE=]	5.3720	.414	12.964	.000
	[Years in HE=1 to 5 yrs.]	5.0430	.327	15.431	.000
	[Years in HE=11 to 15 yrs.]	5.1560	.332	15.544	.000
	[Years in HE=16 to 20 yrs.]	5.1850	.334	15.546	.000
	[Years in HE=17 to 25 yrs.]	5.1270	.361	14.215	.000
	[Years in HE=26 to 30 yrs.]	5.2150	.348	14.985	.000
	[Years in HE=31 to 41 yrs.]	5.5370	.36	15.395	.000
	[Years in HE=6 to 10 yrs.]	5.0930	.327	15.561	.000
	[Department=2]	1.3220	.775	1.706	.088
	[Department=Academic Support]	0.2920	.115	2.541	.011
	[Department=Human Resources]	0.6690	.252	2.649	.008
	[Department=Information T Related]	-0.3460	.184	-1.877	.061
	[Department=Student Affairs]	0.3070	.133	2.318	.021
	[Employee Classification=Classified - Hourly]	-0.4950	.206	-2.407	.016
	[Supervise Others=Other]	-1.6640	.636	-2.618	.009
	[Place of Employment=]	1.6640	.639	2.606	.009
Competence	[Years in HE=]	5.5790	.377	14.781	.000
	[Years in HE=1 to 5 yrs.]	5.6970	.298	19.138	.000
	[Years in HE=11 to 15 yrs.]	5.8560	.302	19.381	.000
	[Years in HE=16 to 20 yrs.]	5.7740	.304	19.004	.000
	[Years in HE=17 to 25 yrs.]	5.890	.329	17.927	.000
	[Years in HE=26 to 30 yrs.]	5.9430	.317	18.747	.000
	[Years in HE=31 to 41 yrs.]	6.1450	.328	18.756	.000
	[Years in HE=6 to 10 yrs.]	5.8220	.298	19.528	.000
	[Department=Facilities]	-0.2310	.131	-1.758	.079

Relatedness	[Employee Classification=Classified - Hourly]	-0.3560	.187	-1.9	.058
	[Place of Employment=]	1.5080	.582	2.592	.010
	[Place of Employment=Community College]	0.2740	.097	2.842	.005
	[Male/Female=Female]	-0.1930	.073	-2.635	.009
	[Years in HE=]	5.9460	.368	16.177	.000
	[Years in HE=1 to 5 yrs.]	5.8420	.29	20.151	.000
	[Years in HE=11 to 15 yrs.]	5.9070	.294	20.076	.000
	[Years in HE=16 to 20 yrs.]	5.8610	.296	19.809	.000
	[Years in HE=17 to 25 yrs.]	5.8230	.32	18.202	.000
	[Years in HE=26 to 30 yrs.]	5.8470	.309	18.94	.000
	[Years in HE=31 to 41 yrs.]	6.0820	.319	19.063	.000
	[Years in HE=6 to 10 yrs.]	5.9620	.29	20.534	.000
	[Department=Facilities]	-0.4030	.128	-3.15	.002
	[Department=Human Resources]	0.4420	.224	1.975	.049
	[Department=Other]	-0.1810	.11	-1.653	.099
	[Supervise Others=Other]	-1.9330	.564	-3.428	.001
Vigor	[Place of Employment=]	0.9520	.566	1.68	.093
	[Place of Employment=Community College]	0.1740	.094	1.849	.065
	[Male/Female=Female]	-0.230	.071	-3.226	.001
	[Years in HE=]	5.2860	.487	10.862	.000
	[Years in HE=1 to 5 yrs.]	5.0880	.384	13.257	.000
	[Years in HE=11 to 15 yrs.]	5.2720	.39	13.534	.000
	[Years in HE=16 to 20 yrs.]	5.1860	.392	13.241	.000
	[Years in HE=17 to 25 yrs.]	5.3850	.424	12.713	.000
	[Years in HE=26 to 30 yrs.]	5.4020	.409	13.217	.000
	[Years in HE=31 to 41 yrs.]	5.3320	.422	12.624	.000
	[Years in HE=6 to 10 yrs.]	5.2190	.384	13.578	.000
	[Department=Human Resources]	0.5940	.296	2.003	.045

Dedication	[Employee Classification=Classified - Hourly]	-0.5050	.242	-2.093	.037
	[Place of Employment=]	1.2580	.75	1.677	.094
	[Place of Employment=Community College]	0.2080	.124	1.674	.094
	[Years in HE=]	5.9890	.452	13.241	.000
	[Years in HE=1 to 5 yrs.]	5.9990	.357	16.817	.000
	[Years in HE=11 to 15 yrs.]	6.160	.362	17.015	.000
	[Years in HE=16 to 20 yrs.]	5.9790	.364	16.425	.000
	[Years in HE=17 to 25 yrs.]	6.2770	.394	15.945	.000
	[Years in HE=26 to 30 yrs.]	6.2770	.38	16.523	.000
	[Years in HE=31 to 41 yrs.]	6.3270	.393	16.117	.000
	[Years in HE=6 to 10 yrs.]	6.0480	.357	16.93	.000
	[Department=Athletics]	0.4350	.226	1.93	.054
	[Supervise Others=No Supervision]	-0.1580	.091	-1.737	.083
	[Place of Employment=Community College]	0.2820	.116	2.441	.015
	[Education Level=Bachelor's Degree]	-0.4890	.253	-1.933	.053
Absorption	[Education Level=Some College - No Degree]	-0.5120	.269	-1.905	.057
	[Education Level=Some Grad Credit - No Degree]	-0.5140	.306	-1.678	.094
	[Years in HE=]	5.8610	.405	14.473	.000
	[Years in HE=1 to 5 yrs.]	5.7610	.319	18.036	.000
	[Years in HE=11 to 15 yrs.]	5.8460	.324	18.034	.000
	[Years in HE=16 to 20 yrs.]	5.7260	.326	17.568	.000
	[Years in HE=17 to 25 yrs.]	5.8680	.352	16.65	.000
	[Years in HE=26 to 30 yrs.]	5.9330	.34	17.442	.000
	[Years in HE=31 to 41 yrs.]	5.9680	.352	16.979	.000
	[Years in HE=6 to 10 yrs.]	5.8020	.32	18.14	.000
	[Department=Academic Support]	0.2970	.112	2.644	.008
	[Department=Athletics]	0.3930	.202	1.943	.052

[Department=Human Resources]	0.5150	.247	2.089	.037
[Employee Classification=Classified - Hourly]	-0.5410	.201	-2.694	.007
[Supervise Others=No Supervision]	-0.2070	.081	-2.545	.011
[Place of Employment=Community College]	0.1830	.104	1.764	.078
[Male/Female=Female]	-0.2150	.078	-2.742	.006

Appendix J

Between-Subjects Factors and Multivariate Tests
Years in HE

Years in HE	N
1.0	30
1.5	2
2.0	67
3.0	89
4.0	76
5.0	66
5.5	1
6.0	51
7.0	44
8.0	35
9.0	34
10.0	73
11.0	23
12.0	30
13.0	16
14.0	21
15.0	47
16.0	14
17.0	24
18.0	30
19.0	10
20.0	35
21.0	4
22.0	4
23.0	6
24.0	9
25.0	18
26.0	7
27.0	10
28.0	6
29.0	8
30.0	14
31.0	6
32.0	1

33.0	2
34.0	9
35.0	1
36.0	3
37.0	2
38.0	2
39.0	1
40.0	5
41.0	2

Multivariate Tests^a

Effect		Value	F	Hypothesis		Sig.	Partial Eta Squared
				df	Error df		
Years in HE	Pillai's Trace	1.168	5.030	258.000	5370.000	.000	.195
	Wilks' Lambda	.018	19.822	258.000	5304.485	.000	.488
	Hotelling's Trace	44.925	154.684	258.000	5330.000	.000	.882
	Roy's Largest Root	44.727	930.943 ^b	43.000	895.000	.000	.978

*Pillai's Trace was used for this study

Appendix K

Tests of Between-Subjects Effects – Years in HE

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Model	Autonomy	24386.591 ^a	43	567.130	459.001	.000	.957
	Competence	27958.018 ^b	43	650.186	649.590	.000	.969
	Relatedness	28508.486 ^c	43	662.988	686.086	.000	.971
	Vigor	22079.623 ^d	43	513.480	295.089	.000	.934
	Absorption	28656.170 ^e	43	666.423	449.529	.000	.956
	Dedication	26701.088 ^f	43	620.956	359.733	.000	.945
Years in HE	Autonomy	24386.591	43	567.130	459.001	.000	.957
	Competence	27958.018	43	650.186	649.590	.000	.969
	Relatedness	28508.486	43	662.988	686.086	.000	.971
	Vigor	22079.623	43	513.480	295.089	.000	.934
	Absorption	28656.170	43	666.423	449.529	.000	.956
	Dedication	26701.088	43	620.956	359.733	.000	.945
Error	Autonomy	1105.840	895	1.236			
	Competence	895.822	895	1.001			
	Relatedness	864.869	895	.966			
	Vigor	1557.377	895	1.740			
	Absorption	1326.830	895	1.482			
	Dedication	1544.912	895	1.726			
Total	Autonomy	25492.431	938				
	Competence	28853.840	938				
	Relatedness	29373.355	938				
	Vigor	23637.000	938				
	Absorption	29983.000	938				
	Dedication	28246.000	938				

a. R Squared = .957 (Adjusted R Squared = .955)

b. R Squared = .969 (Adjusted R Squared = .967)

c. R Squared = .971 (Adjusted R Squared = .969)

d. R Squared = .934 (Adjusted R Squared = .931)

e. R Squared = .956 (Adjusted R Squared = .954)

f. R Squared = .945 (Adjusted R Squared = .943)

Appendix L

Parameter Estimates – Years in HE

Dependent Variable	Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
						Lower Bound	Upper Bound	
Autonomy	[YearsinHE=1]	4.978	.203	24.528	.000	4.579	5.376	.402
	[YearsinHE=1.5]	4.900	.786	6.234	.000	3.357	6.443	.042
	[YearsinHE=2]	4.809	.136	35.412	.000	4.542	5.075	.584
	[YearsinHE=3]	5.037	.118	42.753	.000	4.806	5.269	.671
	[YearsinHE=4]	5.248	.128	41.161	.000	4.998	5.498	.654
	[YearsinHE=5]	4.824	.137	35.259	.000	4.556	5.093	.581
	[YearsinHE=5.5]	6.133	1.112	5.518	.000	3.952	8.315	.033
	[YearsinHE=6]	5.259	.156	33.786	.000	4.953	5.564	.561
	[YearsinHE=7]	5.262	.168	31.402	.000	4.933	5.591	.524
	[YearsinHE=8]	5.189	.188	27.615	.000	4.820	5.557	.460
	[YearsinHE=9]	5.114	.191	26.825	.000	4.740	5.488	.446
	[YearsinHE=10]	4.778	.130	36.727	.000	4.523	5.033	.601
	[YearsinHE=11]	5.342	.232	23.048	.000	4.887	5.797	.372
	[YearsinHE=12]	5.327	.203	26.247	.000	4.928	5.725	.435
	[YearsinHE=13]	5.158	.278	18.562	.000	4.613	5.704	.278
	[YearsinHE=14]	5.019	.243	20.692	.000	4.543	5.495	.324
	[YearsinHE=15]	5.060	.162	31.205	.000	4.741	5.378	.521
	[YearsinHE=16]	5.386	.297	18.129	.000	4.803	5.969	.269
	[YearsinHE=17]	5.167	.227	22.771	.000	4.721	5.612	.367
	[YearsinHE=18]	5.140	.203	25.327	.000	4.742	5.538	.417
	[YearsinHE=19]	5.547	.352	15.780	.000	4.857	6.237	.218
	[YearsinHE=20]	5.004	.188	26.632	.000	4.635	5.373	.442
	[YearsinHE=21]	4.733	.556	8.517	.000	3.643	5.824	.075
	[YearsinHE=22]	5.950	.556	10.706	.000	4.859	7.041	.114
	[YearsinHE=23]	5.233	.454	11.532	.000	4.343	6.124	.129
	[YearsinHE=24]	5.119	.371	13.814	.000	4.391	5.846	.176
	[YearsinHE=25]	4.933	.262	18.830	.000	4.419	5.448	.284
	[YearsinHE=26]	5.343	.420	12.717	.000	4.518	6.167	.153
	[YearsinHE=27]	4.813	.352	13.693	.000	4.123	5.503	.173
	[YearsinHE=28]	4.467	.454	9.843	.000	3.576	5.357	.098
	[YearsinHE=29]	5.667	.393	14.419	.000	4.895	6.438	.189

Competence	[YearsinHE=30]	5.181	.297	17.440	.000	4.598	5.764	.254
	[YearsinHE=31]	4.900	.454	10.798	.000	4.009	5.791	.115
	[YearsinHE=32]	5.800	1.112	5.218	.000	3.618	7.982	.030
	[YearsinHE=33]	5.300	.786	6.743	.000	3.757	6.843	.048
	[YearsinHE=34]	5.637	.371	15.214	.000	4.910	6.364	.205
	[YearsinHE=35]	5.867	1.112	5.278	.000	3.685	8.048	.030
	[YearsinHE=36]	5.000	.642	7.791	.000	3.740	6.260	.064
	[YearsinHE=37]	4.900	.786	6.234	.000	3.357	6.443	.042
	[YearsinHE=38]	5.500	.786	6.998	.000	3.957	7.043	.052
	[YearsinHE=39]	6.800	1.112	6.118	.000	4.618	8.982	.040
	[YearsinHE=40]	6.160	.497	12.392	.000	5.184	7.136	.146
	[YearsinHE=41]	6.233	.786	7.931	.000	4.691	7.776	.066
	[YearsinHE=1.	5.197	.183	28.453	.000	4.839	5.556	.475
	[YearsinHE=1.5]	5.208	.707	7.362	.000	3.820	6.597	.057
	[YearsinHE=2]	5.265	.122	43.075	.000	5.025	5.505	.675
	[YearsinHE=3]	5.256	.106	49.559	.000	5.047	5.464	.733
	[YearsinHE=4]	5.522	.115	48.117	.000	5.297	5.747	.721
	[YearsinHE=5]	5.235	.123	42.509	.000	4.993	5.477	.669
	[YearsinHE=5]	6.750	1.000	6.747	.000	4.786	8.714	.048
	[YearsinHE=6]	5.626	.140	40.158	.000	5.351	5.901	.643
	[YearsinHE=7]	5.561	.151	36.868	.000	5.265	5.857	.603
	[YearsinHE=8]	5.760	.169	34.058	.000	5.428	6.091	.564
	[YearsinHE=9]	5.574	.172	32.484	.000	5.237	5.910	.541
	[YearsinHE=10]	5.175	.117	44.192	.000	4.945	5.404	.686
	[YearsinHE=11]	5.475	.209	26.243	.000	5.065	5.884	.435
	[YearsinHE=12]	5.664	.183	31.008	.000	5.305	6.022	.518
	[YearsinHE=13]	5.714	.250	22.844	.000	5.223	6.204	.368
	[YearsinHE=14]	5.544	.218	25.393	.000	5.115	5.972	.419
	[YearsinHE=15]	5.449	.146	37.336	.000	5.162	5.735	.609
	[YearsinHE=16]	5.506	.267	20.592	.000	4.981	6.031	.321
	[YearsinHE=17]	5.372	.204	26.303	.000	4.971	5.772	.436
	[YearsinHE=18]	5.561	.183	30.445	.000	5.203	5.920	.509
	[YearsinHE=19]	6.192	.316	19.571	.000	5.571	6.813	.300
	[YearsinHE=20]	5.219	.169	30.862	.000	4.887	5.551	.516
	[YearsinHE=21]	5.021	.500	10.037	.000	4.039	6.003	.101
	[YearsinHE=22]	6.417	.500	12.827	.000	5.435	7.398	.155
	[YearsinHE=23]	5.528	.408	13.534	.000	4.726	6.329	.170
	[YearsinHE=24]	5.685	.333	17.048	.000	5.031	6.340	.245
	[YearsinHE=25]	5.505	.236	23.343	.000	5.042	5.967	.378
	[YearsinHE=26]	5.774	.378	15.269	.000	5.032	6.516	.207

	[YearsinHE=27]	5.258	.316	16.621	.000	4.637	5.879	.236
	[YearsinHE=28]	4.917	.408	12.038	.000	4.115	5.718	.139
	[YearsinHE=29]	5.833	.354	16.492	.000	5.139	6.528	.233
	[YearsinHE=30]	5.798	.267	21.683	.000	5.273	6.322	.344
	[YearsinHE=31]	5.514	.408	13.500	.000	4.712	6.315	.169
	[YearsinHE=32]	6.667	1.000	6.664	.000	4.703	8.630	.047
	[YearsinHE=33]	6.000	.707	8.481	.000	4.612	7.388	.074
	[YearsinHE=34]	5.815	.333	17.436	.000	5.160	6.469	.254
	[YearsinHE=35]	6.083	1.000	6.081	.000	4.120	8.047	.040
	[YearsinHE=36]	6.500	.578	11.253	.000	5.366	7.634	.124
	[YearsinHE=37]	5.292	.707	7.480	.000	3.903	6.680	.059
	[YearsinHE=38]	6.042	.707	8.540	.000	4.653	7.430	.075
	[YearsinHE=39]	7.000	1.000	6.997	.000	5.036	8.964	.052
	[YearsinHE=40]	5.617	.447	12.553	.000	4.739	6.495	.150
	[YearsinHE=41]	6.250	.707	8.835	.000	4.862	7.638	.080
Relatedness	[YearsinHE=1.0]	5.400	.179	30.088	.000	5.048	5.752	.503
	[YearsinHE=1.5]	4.389	.695	6.314	.000	3.025	5.753	.043
	[YearsinHE=2.0]	5.289	.120	44.036	.000	5.053	5.524	.684
	[YearsinHE=3.0]	5.412	.104	51.938	.000	5.207	5.616	.751
	[YearsinHE=4.0]	5.611	.113	49.761	.000	5.390	5.832	.735
	[YearsinHE=5.0]	5.453	.121	45.064	.000	5.215	5.690	.694
	[YearsinHE=5.5]	6.222	.983	6.330	.000	4.293	8.152	.043
	[YearsinHE=6.0]	5.684	.138	41.294	.000	5.414	5.954	.656
	[YearsinHE=7.0]	5.633	.148	38.008	.000	5.342	5.923	.617
	[YearsinHE=8.0]	5.606	.166	33.740	.000	5.280	5.932	.560
	[YearsinHE=9.0]	5.739	.169	34.039	.000	5.408	6.069	.564
	[YearsinHE=10]	5.389	.115	46.838	.000	5.163	5.615	.710
	[YearsinHE=11]	5.681	.205	27.716	.000	5.279	6.083	.462
	[YearsinHE=12]	5.900	.179	32.874	.000	5.548	6.252	.547
	[YearsinHE=13]	5.486	.246	22.323	.000	5.004	5.968	.358
	[YearsinHE=14]	5.331	.215	24.850	.000	4.910	5.752	.408
	[YearsinHE=15]	5.427	.143	37.846	.000	5.145	5.708	.615
	[YearsinHE=16]	5.619	.263	21.388	.000	5.103	6.135	.338
	[YearsinHE=17]	5.454	.201	27.179	.000	5.060	5.848	.452
	[YearsinHE=18]	5.596	.179	31.182	.000	5.244	5.949	.521
	[YearsinHE=19]	5.639	.311	18.140	.000	5.029	6.249	.269
	[YearsinHE=20]	5.284	.166	31.801	.000	4.958	5.610	.531
	[YearsinHE=21]	5.056	.492	10.286	.000	4.091	6.020	.106
	[YearsinHE=22]	6.167	.492	12.546	.000	5.202	7.131	.150
	[YearsinHE=23]	4.963	.401	12.367	.000	4.175	5.751	.146

Vigor	[YearsinHE=24]	5.858	.328	17.878	.000	5.215	6.501	.263
	[YearsinHE=25]	5.333	.232	23.018	.000	4.879	5.788	.372
	[YearsinHE=26]	5.778	.372	15.551	.000	5.049	6.507	.213
	[YearsinHE=27]	5.383	.311	17.318	.000	4.773	5.993	.251
	[YearsinHE=28]	4.741	.401	11.813	.000	3.953	5.528	.135
	[YearsinHE=29]	6.069	.348	17.463	.000	5.387	6.752	.254
	[YearsinHE=30]	5.222	.263	19.877	.000	4.707	5.738	.306
	[YearsinHE=31]	5.500	.401	13.705	.000	4.712	6.288	.173
	[YearsinHE=32]	6.000	.983	6.104	.000	4.071	7.929	.040
	[YearsinHE=33]	6.139	.695	8.832	.000	4.775	7.503	.080
	[YearsinHE=34]	5.815	.328	17.746	.000	5.172	6.458	.260
	[YearsinHE=35]	6.667	.983	6.782	.000	4.737	8.596	.049
	[YearsinHE=36]	5.389	.568	9.495	.000	4.275	6.503	.092
	[YearsinHE=37]	5.528	.695	7.952	.000	4.164	6.892	.066
	[YearsinHE=38]	5.639	.695	8.112	.000	4.275	7.003	.068
	[YearsinHE=39]	6.167	.983	6.273	.000	4.237	8.096	.042
	[YearsinHE=40]	6.033	.440	13.724	.000	5.171	6.896	.174
	[YearsinHE=41]	5.750	.695	8.272	.000	4.386	7.114	.071
	[YearsinHE=1.0]	4.500	.241	18.685	.000	4.027	4.973	.281
	[YearsinHE=1.5]	5.000	.933	5.360	.000	3.169	6.831	.031
	[YearsinHE=2.0]	4.657	.161	28.896	.000	4.340	4.973	.483
	[YearsinHE=3.0]	4.764	.140	34.071	.000	4.490	5.038	.565
	[YearsinHE=4.0]	4.882	.151	32.261	.000	4.585	5.179	.538
	[YearsinHE=5.0]	4.606	.162	28.367	.000	4.287	4.925	.473
	[YearsinHE=5.5]	6.000	1.319	4.548	.000	3.411	8.589	.023
	[YearsinHE=6.0]	5.176	.185	28.024	.000	4.814	5.539	.467
	[YearsinHE=7.0]	4.955	.199	24.914	.000	4.564	5.345	.410
	[YearsinHE=8.0]	4.857	.223	21.784	.000	4.420	5.295	.346
	[YearsinHE=9.0]	4.912	.226	21.712	.000	4.468	5.356	.345
	[YearsinHE=10]	4.575	.154	29.635	.000	4.272	4.878	.495
	[YearsinHE=11]	4.435	.275	16.123	.000	3.895	4.975	.225
	[YearsinHE=12]	5.267	.241	21.868	.000	4.794	5.739	.348
	[YearsinHE=13]	4.875	.330	14.783	.000	4.228	5.522	.196
	[YearsinHE=14]	4.619	.288	16.046	.000	4.054	5.184	.223
	[YearsinHE=15]	5.064	.192	26.317	.000	4.686	5.441	.436
	[YearsinHE=16]	4.571	.353	12.967	.000	3.880	5.263	.158
	[YearsinHE=17]	5.042	.269	18.724	.000	4.513	5.570	.281
	[YearsinHE=18]	5.067	.241	21.038	.000	4.594	5.539	.331
	[YearsinHE=19]	5.300	.417	12.705	.000	4.481	6.119	.153
	[YearsinHE=20]	4.657	.223	20.887	.000	4.220	5.095	.328

Absorption	[YearsinHE=21]	5.750	.660	8.718	.000	4.456	7.044	.078
	[YearsinHE=22]	5.500	.660	8.339	.000	4.206	6.794	.072
	[YearsinHE=23]	4.667	.539	8.666	.000	3.610	5.724	.077
	[YearsinHE=24]	5.222	.440	11.877	.000	4.359	6.085	.136
	[YearsinHE=25]	4.667	.311	15.009	.000	4.056	5.277	.201
	[YearsinHE=26]	5.286	.499	10.601	.000	4.307	6.264	.112
	[YearsinHE=27]	5.000	.417	11.986	.000	4.181	5.819	.138
	[YearsinHE=28]	5.000	.539	9.285	.000	3.943	6.057	.088
	[YearsinHE=29]	5.250	.466	11.257	.000	4.335	6.165	.124
	[YearsinHE=30]	5.000	.353	14.182	.000	4.308	5.692	.183
	[YearsinHE=31]	4.667	.539	8.666	.000	3.610	5.724	.077
	[YearsinHE=32]	7.000	1.319	5.307	.000	4.411	9.589	.031
	[YearsinHE=33]	4.500	.933	4.824	.000	2.669	6.331	.025
	[YearsinHE=34]	4.444	.440	10.108	.000	3.581	5.307	.102
	[YearsinHE=35]	4.000	1.319	3.032	.002	1.411	6.589	.010
	[YearsinHE=36]	6.667	.762	8.754	.000	5.172	8.161	.079
	[YearsinHE=37]	4.000	.933	4.288	.000	2.169	5.831	.020
	[YearsinHE=38]	5.500	.933	5.896	.000	3.669	7.331	.037
	[YearsinHE=39]	6.000	1.319	4.548	.000	3.411	8.589	.023
	[YearsinHE=40]	4.800	.590	8.137	.000	3.642	5.958	.069
	[YearsinHE=41]	6.000	.933	6.433	.000	4.169	7.831	.044
	[YearsinHE=1.0]	5.567	.222	25.041	.000	5.130	6.003	.412
	[YearsinHE=1.5]	5.500	.861	6.388	.000	3.810	7.190	.044
	[YearsinHE=2.0]	5.209	.149	35.018	.000	4.917	5.501	.578
	[YearsinHE=3.0]	5.494	.129	42.571	.000	5.241	5.748	.669
	[YearsinHE=4.0]	5.645	.140	40.416	.000	5.371	5.919	.646
	[YearsinHE=5.0]	5.561	.150	37.102	.000	5.266	5.855	.606
	[YearsinHE=5.5]	6.000	1.218	4.928	.000	3.610	8.390	.026
	[YearsinHE=6.0]	5.647	.170	33.122	.000	5.312	5.982	.551
	[YearsinHE=7.0]	5.591	.184	30.459	.000	5.231	5.951	.509
	[YearsinHE=8.0]	5.343	.206	25.960	.000	4.939	5.747	.430
	[YearsinHE=9.0]	5.500	.209	26.339	.000	5.090	5.910	.437
	[YearsinHE=10]	5.233	.143	36.720	.000	4.953	5.513	.601
	[YearsinHE=11]	5.522	.254	21.749	.000	5.023	6.020	.346
	[YearsinHE=12]	5.633	.222	25.341	.000	5.197	6.070	.418
	[YearsinHE=13]	5.750	.304	18.890	.000	5.153	6.347	.285
	[YearsinHE=14]	5.381	.266	20.252	.000	4.859	5.902	.314
	[YearsinHE=15]	5.596	.178	31.507	.000	5.247	5.944	.526
	[YearsinHE=16]	5.071	.325	15.585	.000	4.433	5.710	.213
	[YearsinHE=17]	5.292	.249	21.291	.000	4.804	5.779	.336

Dedication	[YearsinHE=18]	5.800	.222	26.091	.000	5.364	6.236	.432
	[YearsinHE=19]	6.200	.385	16.103	.000	5.444	6.956	.225
	[YearsinHE=20]	5.343	.206	25.960	.000	4.939	5.747	.430
	[YearsinHE=21]	6.500	.609	10.677	.000	5.305	7.695	.113
	[YearsinHE=22]	6.000	.609	9.856	.000	4.805	7.195	.098
	[YearsinHE=23]	5.333	.497	10.729	.000	4.358	6.309	.114
	[YearsinHE=24]	5.444	.406	13.415	.000	4.648	6.241	.167
	[YearsinHE=25]	5.722	.287	19.939	.000	5.159	6.285	.308
	[YearsinHE=26]	6.143	.460	13.348	.000	5.240	7.046	.166
	[YearsinHE=27]	5.100	.385	13.246	.000	4.344	5.856	.164
	[YearsinHE=28]	5.167	.497	10.394	.000	4.191	6.142	.108
	[YearsinHE=29]	5.875	.430	13.648	.000	5.030	6.720	.172
	[YearsinHE=30]	5.929	.325	18.219	.000	5.290	6.567	.271
	[YearsinHE=31]	5.667	.497	11.400	.000	4.691	6.642	.127
	[YearsinHE=32]	7.000	1.218	5.749	.000	4.610	9.390	.036
	[YearsinHE=33]	5.500	.861	6.388	.000	3.810	7.190	.044
	[YearsinHE=34]	5.222	.406	12.867	.000	4.426	6.019	.156
	[YearsinHE=35]	4.000	1.218	3.285	.001	1.610	6.390	.012
	[YearsinHE=36]	6.667	.703	9.484	.000	5.287	8.046	.091
	[YearsinHE=37]	5.500	.861	6.388	.000	3.810	7.190	.044
	[YearsinHE=38]	6.500	.861	7.550	.000	4.810	8.190	.060
	[YearsinHE=39]	7.000	1.218	5.749	.000	4.610	9.390	.036
	[YearsinHE=40]	6.000	.545	11.019	.000	4.931	7.069	.119
	[YearsinHE=41]	6.500	.861	7.550	.000	4.810	8.190	.060
	[YearsinHE=1.0]	5.200	.240	21.678	.000	4.729	5.671	.344
	[YearsinHE=1.5]	5.000	.929	5.382	.000	3.177	6.823	.031
	[YearsinHE=2.0]	5.030	.161	31.337	.000	4.715	5.345	.523
	[YearsinHE=3.0]	5.292	.139	38.000	.000	5.019	5.565	.617
	[YearsinHE=4.0]	5.408	.151	35.883	.000	5.112	5.704	.590
	[YearsinHE=5.0]	5.091	.162	31.479	.000	4.774	5.408	.525
	[YearsinHE=5.5]	7.000	1.314	5.328	.000	4.421	9.579	.031
	[YearsinHE=6.0]	5.588	.184	30.375	.000	5.227	5.949	.508
	[YearsinHE=7.0]	5.432	.198	27.424	.000	5.043	5.821	.457
	[YearsinHE=8.0]	5.486	.222	24.702	.000	5.050	5.922	.405
	[YearsinHE=9.0]	5.265	.225	23.365	.000	4.822	5.707	.379
	[YearsinHE=10]	5.014	.154	32.605	.000	4.712	5.315	.543
	[YearsinHE=11]	5.391	.274	19.680	.000	4.854	5.929	.302
	[YearsinHE=12]	5.700	.240	23.763	.000	5.229	6.171	.387
	[YearsinHE=13]	5.250	.328	15.984	.000	4.605	5.895	.222
	[YearsinHE=14]	5.286	.287	18.436	.000	4.723	5.848	.275

[YearsinHE=15]	5.362	.192	27.978	.000	4.986	5.738	.467
[YearsinHE=16]	4.929	.351	14.036	.000	4.239	5.618	.180
[YearsinHE=17]	5.458	.268	20.353	.000	4.932	5.985	.316
[YearsinHE=18]	5.467	.240	22.790	.000	4.996	5.937	.367
[YearsinHE=19]	5.900	.415	14.201	.000	5.085	6.715	.184
[YearsinHE=20]	5.086	.222	22.901	.000	4.650	5.522	.369
[YearsinHE=21]	6.000	.657	9.134	.000	4.711	7.289	.085
[YearsinHE=22]	5.500	.657	8.372	.000	4.211	6.789	.073
[YearsinHE=23]	5.333	.536	9.943	.000	4.281	6.386	.099
[YearsinHE=24]	5.667	.438	12.939	.000	4.807	6.526	.158
[YearsinHE=25]	5.500	.310	17.761	.000	4.892	6.108	.261
[YearsinHE=26]	5.571	.497	11.220	.000	4.597	6.546	.123
[YearsinHE=27]	5.200	.415	12.516	.000	4.385	6.015	.149
[YearsinHE=28]	5.500	.536	10.254	.000	4.447	6.553	.105
[YearsinHE=29]	6.000	.465	12.917	.000	5.088	6.912	.157
[YearsinHE=30]	5.643	.351	16.070	.000	4.954	6.332	.224
[YearsinHE=31]	5.167	.536	9.633	.000	4.114	6.219	.094
[YearsinHE=32]	7.000	1.314	5.328	.000	4.421	9.579	.031
[YearsinHE=33]	5.500	.929	5.920	.000	3.677	7.323	.038
[YearsinHE=34]	4.778	.438	10.910	.000	3.918	5.637	.117
[YearsinHE=35]	4.000	1.314	3.045	.002	1.421	6.579	.010
[YearsinHE=36]	7.000	.759	9.228	.000	5.511	8.489	.087
[YearsinHE=37]	5.000	.929	5.382	.000	3.177	6.823	.031
[YearsinHE=38]	6.000	.929	6.458	.000	4.177	7.823	.045
[YearsinHE=39]	7.000	1.314	5.328	.000	4.421	9.579	.031
[YearsinHE=40]	5.800	.588	9.871	.000	4.647	6.953	.098
[YearsinHE=41]	6.000	.929	6.458	.000	4.177	7.823	.045

Bold = $p < .001$

Appendix M

General Linear Model – MANOVA – Between-Subjects Factors

Work Elements		N
Years in HE		19
	1 to 5 yrs.	336
	11 to 15 yrs.	137
	16 to 20 yrs.	115
	17 to 25 yrs.	44
	26 to 30 yrs.	46
	31 to 41 yrs.	34
	6 to 10 yrs.	241
Department	11	22
	2	2
	8	15
	9	83
	Academic Affairs	30
	Academic Support	172
	Athletics	33
	Facilities	105
	Human Resources	21
	Information Tech	46
	Related	
	Other	133
	Student Affairs	103
	Student Services	207
Employee Classification	Classified - Hourly	381
	Non-Classified - Salary	558
	Other - Faculty, Professionals	33
Supervise Others	No Supervision	653
	Other	3
	Supervision	316
Place of Employment		3
	Community College	128
	Four-Year Institution	841
Male/Female		6
	3	3
	Male	322

Education Level	Female	641
	5	2
	Advanced (Terminal)	53
	Degree	
	Associates Degree	63
	Bachelor's Degree	329
	High School Grad or	25
	Equivalent	
	Master's Degree	329
	Professional Degree	11
	Some College - No	91
	Degree	
	Some Grad Credit - No	43
	Degree	
	Trade/Tech/Vocational	26
	Training	

Appendix N

Box Test of quality of Covariance Matrices

Box's M	217.923
F	1.261
df1	105
df2	2624.832
Sig.	.040

Test the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups. groups.^a

a. Design: Years in HE + Department + Employee Classification + Supervise Others + Place of Employment + Male/Female + Education Level

Appendix O

Multivariate Tests

		Hypothesis				
Effect		Value	F	df	Error df	Sig.
Years in HE	Pillai's Trace	.035	.778	42.000	5604.000	.848
	Wilks' Lambda	.966	.776	42.000	4360.848	.850
	Hotelling's Trace	.035	.775	42.000	5564.000	.852
	Roy's Largest	.012	1.650 ^b	7.000	934.000	.118
	Root					
Department	Pillai's Trace	.123	1.628	72.000	5604.000	.001
	Wilks' Lambda	.882	1.634	72.000	5060.111	.001
	Hotelling's Trace	.127	1.638	72.000	5564.000	.001
	Roy's Largest	.053	4.157 ^b	12.000	934.000	.000
	Root					
Employee Classification	Pillai's Trace	.029	2.291	12.000	1860.000	.007
	Wilks' Lambda	.971	2.302 ^c	12.000	1858.000	.007
	Hotelling's Trace	.030	2.312	12.000	1856.000	.006
	Roy's Largest	.028	4.335 ^b	6.000	930.000	.000
	Root					
Supervise Others	Pillai's Trace	.027	2.121	12.000	1860.000	.013
	Wilks' Lambda	.973	2.119 ^c	12.000	1858.000	.013
	Hotelling's Trace	.027	2.117	12.000	1856.000	.013
	Roy's Largest	.015	2.357 ^b	6.000	930.000	.029
	Root					
Place of Employment	Pillai's Trace	.020	1.526	12.000	1860.000	.108
	Wilks' Lambda	.981	1.527 ^c	12.000	1858.000	.107
	Hotelling's Trace	.020	1.529	12.000	1856.000	.107
	Roy's Largest	.016	2.453 ^b	6.000	930.000	.023
	Root					
Female/Male	Pillai's Trace	.047	2.446	18.000	2793.000	.001
	Wilks' Lambda	.954	2.459	18.000	2628.094	.001
	Hotelling's Trace	.048	2.472	18.000	2783.000	.001
	Roy's Largest	.037	5.772 ^b	6.000	931.000	.000
	Root					
Education Level	Pillai's Trace	.070	1.223	54.000	5604.000	.127
	Wilks' Lambda	.932	1.229	54.000	4741.583	.122
	Hotelling's Trace	.072	1.235	54.000	5564.000	.117
	Roy's Largest	.042	4.372 ^b	9.000	934.000	.000
	Root					

- a. Design: Years in HE + Department + Employee Classification + Supervise Others + Place of Employment + Male/Female + Education Level
- b. The statistic is an upper bound on F that yields a lower bound on the significance level.
- c. Exact statistic

Appendix P

Levene's Test of Equality of Error Variances

	F	df1	df2	Sig.
Autonomy	.891	672	299	.884
Competence	.731	672	299	.999
Relatedness	.938	672	299	.748
Vigor	1.062	672	299	.276
Dedication	.879	672	299	.908
Absorption	.904	672	299	.853

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Years in HE + Department + Employee Classification + Supervise Others + Place of Employment + Male/Female + Education Level

Appendix Q

Modified Tests of Between-Subjects Effects

Source	Dependent Variable	Type III	df	Mean Square	F	Sig.
		Sum of Squares				
Model	Autonomy	25391.995 ^a	38	668.210	572.508	.000
	Competence	28929.388 ^b	38	761.300	786.056	.000
	Relatedness	29611.662 ^c	38	779.254	848.439	.000
	Vigor	22999.088 ^d	38	605.239	375.993	.000
	Dedication	28274.416 ^e	38	744.064	535.118	.000
	Absorption	27909.333 ^f	38	734.456	658.823	.000
Years in HE	Autonomy	9.298	7	1.328	1.138	.337
	Competence	9.222	7	1.317	1.360	.219
	Relatedness	3.588	7	.513	.558	.790
	Vigor	8.176	7	1.168	.726	.650
	Dedication	9.213	7	1.316	.947	.469
	Absorption	3.231	7	.462	.414	.894
Department	Autonomy	42.979	12	3.582	3.069	.000
	Competence	13.459	12	1.122	1.158	.309
	Relatedness	28.661	12	2.388	2.601	.002
	Vigor	23.136	12	1.928	1.198	.280
	Dedication	20.638	12	1.720	1.237	.252
	Absorption	24.550	12	2.046	1.835	.039
Employee Classification	Autonomy	15.571	2	7.786	6.671	.001
	Competence	4.538	2	2.269	2.343	.097
	Relatedness	3.482	2	1.741	1.895	.151
	Vigor	18.338	2	9.169	5.696	.003
	Dedication	13.823	2	6.911	4.971	.007
	Absorption	17.478	2	8.739	7.839	.000
Supervise Others	Autonomy	8.241	2	4.120	3.530	.030
	Competence	2.828	2	1.414	1.460	.233
	Relatedness	11.289	2	5.645	6.146	.002
	Vigor	1.586	2	.793	.493	.611
	Dedication	5.510	2	2.755	1.981	.138
	Absorption	7.313	2	3.657	3.280	.038
Place of Employment	Autonomy	9.968	2	4.984	4.270	.014
	Competence	14.122	2	7.061	7.290	.001
	Relatedness	5.647	2	2.824	3.074	.047
	Vigor	8.904	2	4.452	2.766	.063

Male/Female	Dedication	11.557	2	5.779	4.156	.016
	Absorption	4.675	2	2.338	2.097	.123
	Autonomy	2.826	3	.942	.807	.490
	Competence	12.019	3	4.006	4.137	.006
	Relatedness	11.885	3	3.962	4.313	.005
	Vigor	2.792	3	.931	.578	.629
Education Level	Dedication	5.008	3	1.669	1.201	.308
	Absorption	8.840	3	2.947	2.643	.048
	Autonomy	3.972	9	.441	.378	.946
	Competence	14.846	9	1.650	1.703	.084
	Relatedness	5.889	9	.654	.712	.698
	Vigor	9.813	9	1.090	.677	.730
Error	Dedication	21.671	9	2.408	1.732	.078
	Absorption	3.817	9	.424	.380	.945
	Autonomy	1090.130	934	1.167		
	Competence	904.585	934	.969		
	Relatedness	857.838	934	.918		
	Vigor	1503.467	934	1.610		
Total	Dedication	1298.695	934	1.390		
	Absorption	1041.223	934	1.115		
	Autonomy	26482.124	972			
	Competence	29833.972	972			
	Relatedness	30469.500	972			
	Vigor	24502.556	972			
	Dedication	29573.111	972			
	Absorption	28950.556	972			

a. R Squared = .959 (Adjusted R Squared = .957)

b. R Squared = .970 (Adjusted R Squared = .968)

c. R Squared = .972 (Adjusted R Squared = .971)

d. R Squared = .939 (Adjusted R Squared = .936)

e. R Squared = .956 (Adjusted R Squared = .954)

f. R Squared = .964 (Adjusted R Squared = .963)

Appendix R

Modified Significant Parameter Estimates

Dependent Variable	Parameter	BStd.	Error	t	Sig.
Autonomy	[Years in HE=]	5.3720	.414	12.964	.000
	[Years in HE=1 to 5 yrs.]	5.0430	.327	15.431	.000
	[Years in HE=11 to 15 yrs.]	5.1560	.332	15.544	.000
	[Years in HE=16 to 20 yrs.]	5.1850	.334	15.546	.000
	[Years in HE=17 to 25 yrs.]	5.1270	.361	14.215	.000
	[Years in HE=26 to 30 yrs.]	5.2150	.348	14.985	.000
	[Years in HE=31 to 41 yrs.]	5.5370	.36	15.395	.000
	[Years in HE=6 to 10 yrs.]	5.0930	.327	15.561	.000
	[Department=2]	1.3220	.775	1.706	.088
	[Department=Academic Support]	0.2920	.115	2.541	.011
	[Department=Human Resources]	0.6690	.252	2.649	.008
	[Department=Information T Related]	-0.3460	.184	-1.877	.061
	[Department=Student Affairs]	0.3070	.133	2.318	.021
	[Employee Classification=Classified - Hourly]	-0.4950	.206	-2.407	.016
	[Supervise Others=Other]	-1.6640	.636	-2.618	.009
	[Place of Employment=]	1.6640	.639	2.606	.009
Competence	[Years in HE=]	5.5790	.377	14.781	.000
	[Years in HE=1 to 5 yrs.]	5.6970	.298	19.138	.000
	[Years in HE=11 to 15 yrs.]	5.8560	.302	19.381	.000
	[Years in HE=16 to 20 yrs.]	5.7740	.304	19.004	.000
	[Years in HE=17 to 25 yrs.]	5.890	.329	17.927	.000
	[Years in HE=26 to 30 yrs.]	5.9430	.317	18.747	.000
	[Years in HE=31 to 41 yrs.]	6.1450	.328	18.756	.000
	[Years in HE=6 to 10 yrs.]	5.8220	.298	19.528	.000
	[Department=Facilities]	-0.2310	.131	-1.758	.079

Relatedness	[Employee Classification=Classified - Hourly]	-0.3560	.187	-1.9	.058
	[Place of Employment=]	1.5080	.582	2.592	.010
	[Place of Employment=Community College]	0.2740	.097	2.842	.005
	[Male/Female=Female]	-0.1930	.073	-2.635	.009
	[Years in HE=]	5.9460	.368	16.177	.000
	[Years in HE=1 to 5 yrs.]	5.8420	.29	20.151	.000
	[Years in HE=11 to 15 yrs.]	5.9070	.294	20.076	.000
	[Years in HE=16 to 20 yrs.]	5.8610	.296	19.809	.000
	[Years in HE=17 to 25 yrs.]	5.8230	.32	18.202	.000
	[Years in HE=26 to 30 yrs.]	5.8470	.309	18.94	.000
	[Years in HE=31 to 41 yrs.]	6.0820	.319	19.063	.000
	[Years in HE=6 to 10 yrs.]	5.9620	.29	20.534	.000
	[Department=Facilities]	-0.4030	.128	-3.15	.002
	[Department=Human Resources]	0.4420	.224	1.975	.049
	[Department=Other]	-0.1810	.11	-1.653	.099
	[Supervise Others=Other]	-1.9330	.564	-3.428	.001
Vigor	[Place of Employment=]	0.9520	.566	1.68	.093
	[Place of Employment=Community College]	0.1740	.094	1.849	.065
	[Male/Female=Female]	-0.230	.071	-3.226	.001
	[Years in HE=]	5.2860	.487	10.862	.000
	[Years in HE=1 to 5 yrs.]	5.0880	.384	13.257	.000
	[Years in HE=11 to 15 yrs.]	5.2720	.39	13.534	.000
	[Years in HE=16 to 20 yrs.]	5.1860	.392	13.241	.000
	[Years in HE=17 to 25 yrs.]	5.3850	.424	12.713	.000
	[Years in HE=26 to 30 yrs.]	5.4020	.409	13.217	.000
	[Years in HE=31 to 41 yrs.]	5.3320	.422	12.624	.000
	[Years in HE=6 to 10 yrs.]	5.2190	.384	13.578	.000
	[Department=Human Resources]	0.5940	.296	2.003	.045

Dedication	[Employee Classification=Classified - Hourly]	-0.5050	.242	-2.093	.037
	[Place of Employment=]	1.2580	.75	1.677	.094
	[Place of Employment=Community College]	0.2080	.124	1.674	.094
	[Years in HE=]	5.9890	.452	13.241	.000
	[Years in HE=1 to 5 yrs.]	5.9990	.357	16.817	.000
	[Years in HE=11 to 15 yrs.]	6.160	.362	17.015	.000
	[Years in HE=16 to 20 yrs.]	5.9790	.364	16.425	.000
	[Years in HE=17 to 25 yrs.]	6.2770	.394	15.945	.000
	[Years in HE=26 to 30 yrs.]	6.2770	.38	16.523	.000
	[Years in HE=31 to 41 yrs.]	6.3270	.393	16.117	.000
	[Years in HE=6 to 10 yrs.]	6.0480	.357	16.93	.000
	[Department=Athletics]	0.4350	.226	1.93	.054
	[Supervise Others=No Supervision]	-0.1580	.091	-1.737	.083
	[Place of Employment=Community College]	0.2820	.116	2.441	.015
	[Education Level=Bachelor's Degree]	-0.4890	.253	-1.933	.053
Absorption	[Education Level=Some College - No Degree]	-0.5120	.269	-1.905	.057
	[Education Level=Some Grad Credit - No Degree]	-0.5140	.306	-1.678	.094
	[Years in HE=]	5.8610	.405	14.473	.000
	[Years in HE=1 to 5 yrs.]	5.7610	.319	18.036	.000
	[Years in HE=11 to 15 yrs.]	5.8460	.324	18.034	.000
	[Years in HE=16 to 20 yrs.]	5.7260	.326	17.568	.000
	[Years in HE=17 to 25 yrs.]	5.8680	.352	16.65	.000
	[Years in HE=26 to 30 yrs.]	5.9330	.34	17.442	.000
	[Years in HE=31 to 41 yrs.]	5.9680	.352	16.979	.000
	[Years in HE=6 to 10 yrs.]	5.8020	.32	18.14	.000
	[Department=Academic Support]	0.2970	.112	2.644	.008
	[Department=Athletics]	0.3930	.202	1.943	.052

[Department=Human Resources]	0.5150	.247	2.089	.037
[Employee Classification=Classified - Hourly]	-0.5410	.201	-2.694	.007
[Supervise Others=No Supervision]	-0.2070	.081	-2.545	.011
[Place of Employment=Community College]	0.1830	.104	1.764	.078
[Male/Female=Female]	-0.2150	.078	-2.742	.006

Notes: significant results in bold.

Appendix S

Complete Parameter Estimates Table

Dependent Variable	Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Autonomy	[Years in HE=]	5.372	.414	12.964	.000	4.559	6.185
	[Years in HE=1 to 5 yrs.]	5.043	.327	15.431	.000	4.402	5.684
	[Years in HE=11 to 15 yrs.]	5.156	.332	15.544	.000	4.505	5.807
	[Years in HE=16 to 20 yrs.]	5.185	.334	15.546	.000	4.530	5.839
	[Years in HE=17 to 25 yrs.]	5.127	.361	14.215	.000	4.419	5.834
	[Years in HE=26 to 30 yrs.]	5.215	.348	14.985	.000	4.532	5.898
	[Years in HE=31 to 41 yrs.]	5.537	.360	15.395	.000	4.831	6.243
	[Years in HE=6 to 10 yrs.]	5.093	.327	15.561	.000	4.451	5.735
	[Department=11]	-.025	.247	-.102	.919	-.509	.459
	[Department=2]	1.322	.775	1.706	.088	-.199	2.843
	[Department=8]	-.273	.294	-.929	.353	-.851	.304
	[Department=9]	.101	.143	.704	.481	-.180	.382
	[Department=Academic Affairs]	.132	.213	.618	.537	-.287	.551
	[Department=Academic Support]	.292	.115	2.541	.011	.066	.517
	[Department=Athletics]	-.221	.207	-1.068	.286	-.626	.185
	[Department=Facilities]	-.214	.144	-1.482	.139	-.497	.069
	[Department=Human Resources]	.669	.252	2.649	.008	.173	1.164
	[Department=Information T Related]	-.346	.184	-1.877	.061	-.708	.016
	[Department=Other]	.049	.124	.395	.693	-.194	.291

[Department=Student Affairs]	.307	.133	2.318	.021	.047	.567
[Department=Student Services]	0 ^a	.	.	.	.	.
[Employee Classification=Classified - Hourly]	-.495	.206	-2.407	.016	-.899	-.091
[Employee Classification=Non-Classified - Salary]	-.211	.201	-1.051	.293	-.606	.183
[Employee Classification=Other - Faculty, Professionals]	0 ^a	.	.	.	.	.
[Supervise Others=No Supervision]	.015	.083	.184	.854	-.148	.179
[Supervise Others=Other]	-1.664	.636	-2.618	.009	-2.911	-.417
[Supervise Others=Supervision]	0 ^a	.	.	.	.	.
[Place of Employment=]	1.664	.639	2.606	.009	.411	2.918
[Place of Employment=Community College]	.144	.106	1.361	.174	-.064	.352
[Place of Employment=Four-Year Institution]	0 ^a	.	.	.	.	.
[Male/Female=]	.337	.457	.737	.461	-.560	1.233
[Male/Female=3]	.819	.635	1.291	.197	-.426	2.064
[Male/Female=Female]	-.027	.080	-.340	.734	-.185	.130
[Male/Female=Male]	0 ^a	.	.	.	.	.
[Education Level=5]	.557	.806	.691	.490	-1.025	2.139
[Education Level=Advanced (Terminal) Degree]	.232	.276	.842	.400	-.309	.774

Competence	[Education Level=Associates Degree]	.144	.259	.555	.579	-.364	.651
	[Education Level=Bachelor's Degree]	.141	.232	.606	.544	-.314	.596
	[Education Level=High School Grad or Equivalent]	.087	.313	.278	.781	-.528	.702
	[Education Level=Master's Degree]	.267	.237	1.127	.260	-.198	.732
	[Education Level=Professional Degree]	.104	.404	.258	.796	-.689	.897
	[Education Level=Some College - No Degree]	.234	.246	.950	.342	-.249	.717
	[Education Level=Some Grad Credit - No Degree]	.245	.281	.873	.383	-.306	.795
	[Education Level=Trade/Tech/Vocational Training]	0 ^a	.	.	.	.	.
	[Years in HE=]	5.579	.377	14.781	.000	4.839	6.320
	[Years in HE=1 to 5 yrs]	5.697	.298	19.138	.000	5.113	6.282
	[Years in HE=11 to 15 yrs]	5.856	.302	19.381	.000	5.263	6.449
	[Years in HE=16 to 20 yrs]	5.774	.304	19.004	.000	5.177	6.370
	[Years in HE=17 to 25 yrs]	5.890	.329	17.927	.000	5.245	6.534
	[Years in HE=26 to 30 yrs]	5.943	.317	18.747	.000	5.321	6.566
	[Years in HE=31 to 41 yr]	6.145	.328	18.756	.000	5.502	6.788
	[Years in HE=6 to 10 yrs]	5.822	.298	19.528	.000	5.237	6.407
	[Department=11]	-.167	.225	-.742	.458	-.608	.274

[Department=2]	.472	.706	.669	.504	-.913	1.857
[Department=8]	-.101	.268	-.376	.707	-.627	.425
[Department=9]	.049	.131	.378	.705	-.207	.306
[Department=Academic Affairs]	.096	.194	.495	.621	-.285	.478
[Department=Academic Support]	.169	.105	1.618	.106	-.036	.375
[Department=Athletics]	-.020	.188	-.106	.916	-.389	.350
[Department=Facilities]	-.231	.131	-1.758	.079	-.489	.027
[Department=Human Resources]	.376	.230	1.634	.103	-.076	.827
[Department=Information T Related]	-.055	.168	-.328	.743	-.385	.274
[Department=Other]	-.022	.113	-.193	.847	-.243	.199
[Department=Student Affairs]	.060	.121	.493	.622	-.177	.297
[Department=Student Services]	0 ^a	.	.	.	.	.
[Employee Classification=Classified - Hourly]	-.356	.187	-1.900	.058	-.724	.012
[Employee Classification=Non-Classified - Salary]	-.238	.183	-1.299	.194	-.597	.122
[Employee Classification=Other - Faculty, Professionals]	0 ^a	.	.	.	.	.
[Supervise Others=No Supervision]	-.050	.076	-.663	.508	-.199	.099
[Supervise Others=Other]	-.946	.579	-1.635	.102	-2.082	.190
[Supervise Others=Supervision]	0 ^a	.	.	.	.	.
[Place of Employment=]	1.508	.582	2.592	.010	.366	2.650

	[Place of Employment=Comm unity College]	.274	.097	2.842	.005	.085	.464
	[Place of Employment=Four- Year Institution]	0 ^a	.	.	.	.	.
	[Male/Female=]	.600	.416	1.442	.150	-.217	1.416
	[Male/Female=3]	.877	.578	1.518	.129	-.257	2.012
	[Male/Female=Fema le]	-.193	.073	-2.635	.009	-.336	-.049
	[Male/Female=Male]	0 ^a	.	.	.	.	.
	[Education Level=5]	-.095	.734	-.129	.898	-1.536	1.347
	[Education Level=Advanced (Terminal) Degree]	.095	.252	.379	.704	-.398	.589
	[Education Level=Associates Degree]	.077	.236	.325	.745	-.386	.539
	[Education Level=Bachelor's Degree]	-.170	.211	-.806	.421	-.585	.244
	[Education Level=High School Grad or Equivalent]	-.012	.285	-.043	.966	-.572	.548
	[Education Level=Master's Degree]	.109	.216	.503	.615	-.315	.533
	[Education Level=Professional Degree]	-.251	.368	-.682	.495	-.973	.471
	[Education Level=Some College - No Degree]	-.112	.224	-.500	.618	-.552	.328
	[Education Level=Some Grad Credit - No Degree]	-.200	.256	-.784	.433	-.702	.301
	[Education Level=Trade/Tech/V ocational Training]	0 ^a	.	.	.	.	.
Relatedness	[Years in HE=]	5.946	.368	16.177	.000	5.225	6.668

[Years in HE=1 to 5 yrs]	5.842	.290	20.151	.000	5.273	6.411
[Years in HE=11 to 15 yrs]	5.907	.294	20.076	.000	5.330	6.485
[Years in HE=16 to 20 yrs]	5.861	.296	19.809	.000	5.280	6.441
[Years in HE=17 to 25 yrs]	5.823	.320	18.202	.000	5.195	6.451
[Years in HE=26 to 30 yrs]	5.847	.309	18.940	.000	5.242	6.453
[Years in HE=31 to 41 yr]	6.082	.319	19.063	.000	5.456	6.709
[Years in HE=6 to 10 yrs]	5.962	.290	20.534	.000	5.392	6.532
[Department=11]	-.021	.219	-.096	.924	-.450	.408
[Department=2]	1.028	.687	1.495	.135	-.321	2.377
[Department=8]	-.249	.261	-.955	.340	-.762	.263
[Department=9]	-.102	.127	-.804	.421	-.352	.147
[Department=Academic Affairs]	-.113	.189	-.600	.549	-.485	.258
[Department=Academic Support]	.088	.102	.863	.389	-.112	.288
[Department=Athletics]	.067	.183	.364	.716	-.293	.427
[Department=Facilities]	-.403	.128	-3.150	.002	-.654	-.152
[Department=Human Resources]	.442	.224	1.975	.049	.003	.882
[Department=InformationT Related]	-.237	.164	-1.451	.147	-.558	.084
[Department=Other]	-.181	.110	-1.653	.099	-.396	.034
[Department=Student Affairs]	.134	.118	1.136	.256	-.097	.364
[Department=Student Services]	0 ^a	.	.	.	.	.
[Employee Classification=Classified - Hourly]	-.276	.182	-1.513	.131	-.634	.082

[Employee Classification=Non-Classified - Salary]	-.155	.178	-.868	.385	-.505	.195
[Employee Classification=Other - Faculty, Professionals]	0 ^a	.	.	.	.	.
[Supervise Others=No Supervision]	-.080	.074	-1.079	.281	-.225	.065
[Supervise Others=Other]	-1.933	.564	-3.428	.001	-3.039	-.826
[Supervise Others=Supervision]	0 ^a	.	.	.	.	.
[Place of Employment=]	.952	.566	1.680	.093	-.160	2.063
[Place of Employment=Community College]	.174	.094	1.849	.065	-.011	.358
[Place of Employment=Four-Year Institution]	0 ^a	.	.	.	.	.
[Male/Female=]	-.011	.405	-.028	.978	-.806	.784
[Male/Female=3]	.772	.563	1.372	.170	-.332	1.877
[Male/Female=Female]	-.230	.071	-3.226	.001	-.369	-.090
[Male/Female=Male]	0 ^a	.	.	.	.	.
[Education Level=5]	.328	.715	.459	.647	-1.075	1.731
[Education Level=Advanced (Terminal) Degree]	.070	.245	.287	.774	-.410	.551
[Education Level=Associates Degree]	-.067	.229	-.292	.770	-.517	.383
[Education Level=Bachelor's Degree]	-.100	.206	-.488	.626	-.504	.303
[Education Level=High School Grad or Equivalent]	.258	.278	.928	.354	-.288	.803

Vigor	[Education Level=Master's Degree]	.029	.210	.140	.889	-.383	.442
	[Education Level=Professional Degree]	-.139	.358	-.387	.699	-.842	.565
	[Education Level=Some College - No Degree]	-.087	.218	-.399	.690	-.516	.341
	[Education Level=Some Grad Credit - No Degree]	.047	.249	.189	.850	-.441	.536
	[Education Level=Trade/Tech/Vocational Training]	0 ^a	.	.	.	.	.
	[Years in HE=]	5.286	.487	10.862	.000	4.331	6.241
	[Years in HE=1 to 5 yrs.]	5.088	.384	13.257	.000	4.335	5.841
	[Years in HE=11 to 15 yrs.]	5.272	.390	13.534	.000	4.508	6.036
	[Years in HE=16 to 20 yrs.]	5.186	.392	13.241	.000	4.417	5.955
	[Years in HE=17 to 25 yrs.]	5.385	.424	12.713	.000	4.553	6.216
	[Years in HE=26 to 30 yrs.]	5.402	.409	13.217	.000	4.600	6.204
	[Years in HE=31 to 41 yrs.]	5.332	.422	12.624	.000	4.503	6.161
	[Years in HE=6 to 10 yrs.]	5.219	.384	13.578	.000	4.465	5.973
	[Department=11]	.297	.290	1.025	.306	-.271	.865
	[Department=2]	.459	.910	.505	.614	-1.327	2.245
	[Department=8]	.148	.346	.427	.669	-.531	.826
	[Department=9]	.011	.168	.064	.949	-.320	.341
	[Department=Academic Affairs]	.351	.251	1.399	.162	-.141	.842
	[Department=Academic Support]	.217	.135	1.610	.108	-.048	.482
	[Department=Athletics]	.334	.243	1.378	.169	-.142	.811

[Department=Facilities]	-.029	.169	-.172	.864	-.361	.303
[Department=Human Resources]	.594	.296	2.003	.045	.012	1.176
[Department=Information Tech Related]	-.212	.217	-.981	.327	-.637	.212
[Department=Other]	.020	.145	.137	.891	-.265	.305
[Department=Student Affairs]	.256	.156	1.647	.100	-.049	.562
[Department=Student Services]	0 ^a	.	.	.	.	.
[Employee Classification=Classified - Hourly]	-.505	.242	-2.093	.037	-.979	-.031
[Employee Classification=Non-Classified - Salary]	-.190	.236	-.806	.420	-.654	.273
[Employee Classification=Other - Faculty, Professionals]	0 ^a	.	.	.	.	.
[Supervise Others=No Supervision]	-.068	.098	-.697	.486	-.260	.124
[Supervise Others=Other]	-.578	.746	-.774	.439	-2.042	.887
[Supervise Others=Supervision]	0 ^a	.	.	.	.	.
[Place of Employment=]	1.258	.750	1.677	.094	-.214	2.729
[Place of Employment=Community College]	.208	.124	1.674	.094	-.036	.452
[Place of Employment=Four-Year Institution]	0 ^a	.	.	.	.	.
[Male/Female=]	.182	.536	.339	.734	-.871	1.235
[Male/Female=3]	.948	.745	1.273	.204	-.514	2.411
[Male/Female=Female]	.003	.094	.033	.973	-.182	.188

	[Male/Female=Male]	0 ^a	.	.	.	.	.
	[Education Level=5]	-1.240	.947	-1.309	.191	-3.097	.618
	[Education Level=Advanced (Terminal) Degree]	-.163	.324	-.502	.616	-.799	.474
	[Education Level=Associates Degree]	-.047	.304	-.156	.876	-.644	.549
	[Education Level=Bachelor's Degree]	-.205	.272	-.753	.451	-.739	.329
	[Education Level=High School Grad or Equivalent]	.135	.368	.368	.713	-.587	.858
	[Education Level=Master's Degree]	-.063	.278	-.227	.821	-.610	.483
	[Education Level=Professional Degree]	.200	.474	.422	.673	-.731	1.132
	[Education Level=Some College - No Degree]	-.215	.289	-.743	.458	-.782	.353
	[Education Level=Some Grad Credit - No Degree]	-.161	.329	-.489	.625	-.808	.486
	[Education Level=Trade/Tech/Vocational Training]	0 ^a	.	.	.	.	.
Dedication	[Years in HE=]	5.989	.452	13.241	.000	5.101	6.876
	[Years in HE=1 to 5 yrs.]	5.999	.357	16.817	.000	5.299	6.699
	[Years in HE=11 to 15 yrs.]	6.160	.362	17.015	.000	5.449	6.870
	[Years in HE=16 to 20 yrs.]	5.979	.364	16.425	.000	5.265	6.694
	[Years in HE=17 to 25 yrs.]	6.277	.394	15.945	.000	5.504	7.049
	[Years in HE=26 to 30 yrs.]	6.277	.380	16.523	.000	5.531	7.022

[Years in HE=31 to 41 yrs.]	6.327	.393	16.117	.000	5.557	7.098
[Years in HE=6 to 10 yrs.]	6.048	.357	16.930	.000	5.347	6.749
[Department=11]	-.162	.269	-.603	.547	-.690	.366
[Department=2]	.585	.846	.692	.489	-1.075	2.245
[Department=8]	-.268	.321	-.836	.403	-.899	.362
[Department=9]	.054	.157	.346	.730	-.253	.361
[Department=Academic Affairs]	.286	.233	1.227	.220	-.171	.743
[Department=Academic Support]	.104	.125	.829	.407	-.142	.350
[Department=Athletics]	.435	.226	1.930	.054	-.007	.878
[Department=Facilities]	-.253	.157	-1.606	.109	-.562	.056
[Department=Human Resources]	.198	.276	.717	.474	-.343	.738
[Department=Information Tech Related]	-.179	.201	-.888	.375	-.574	.216
[Department=Other]	-.022	.135	-.165	.869	-.287	.242
[Department=Student Affairs]	.126	.145	.871	.384	-.158	.410
[Department=Student Services]	0 ^a	.	.	.	.	.
[Employee Classification=Classified - Hourly]	-.433	.224	-1.928	.054	-.873	.008
[Employee Classification=Non-Classified - Salary]	-.158	.219	-.720	.472	-.589	.273
[Employee Classification=Other - Faculty, Professionals]	0 ^a	.	.	.	.	.
[Supervise Others=No Supervision]	-.158	.091	-1.737	.083	-.337	.020
[Supervise Others=Other]	-.794	.694	-1.144	.253	-2.155	.568

[Supervise Others=Supervision]	0 ^a	.	.	.	.	.
[Place of Employment=]	1.095	.697	1.571	.117	-.273	2.463
[Place of Employment=Comm unity College]	.282	.116	2.441	.015	.055	.509
[Place of Employment=Four- Year Institution]	0 ^a	.	.	.	.	.
[Male/Female=]	.372	.498	.746	.456	-.606	1.350
[Male/Female=3]	.661	.693	.954	.340	-.698	2.020
[Male/Female=Fema le]	-.118	.088	-1.348	.178	-.290	.054
[Male/Female=Male]	0 ^a	.	.	.	.	.
[Education Level=5]	-.310	.880	-.353	.724	-2.037	1.416
[Education Level=Advanced (Terminal) Degree]	-.164	.301	-.544	.586	-.756	.427
[Education Level=Associates Degree]	-.097	.282	-.342	.732	-.651	.457
[Education Level=Bachelor's Degree]	-.489	.253	-1.933	.053	-.986	.007
[Education Level=High School Grad or Equivalent]	-.142	.342	-.416	.678	-.813	.529
[Education Level=Master's Degree]	-.249	.259	-.963	.336	-.757	.259
[Education Level=Professional Degree]	-.228	.441	-.517	.605	-1.093	.637
[Education Level=Some College - No Degree]	-.512	.269	-1.905	.057	-1.039	.015
[Education Level=Some Grad Credit - No Degree]	-.514	.306	-1.678	.094	-1.115	.087

Absorption	[Education Level=Trade/Tech/Vocational Training]	0 ^a	.	.	.	.	.
	[Years in HE=]	5.861	.405	14.473	.000	5.066	6.656
	[Years in HE=1 to 5 yrs.]	5.761	.319	18.036	.000	5.134	6.387
	[Years in HE=11 to 15 yrs.]	5.846	.324	18.034	.000	5.210	6.482
	[Years in HE=16 to 20 yrs.]	5.726	.326	17.568	.000	5.087	6.366
	[Years in HE=17 to 25 yrs.]	5.868	.352	16.650	.000	5.177	6.560
	[Years in HE=26 to 30 yrs.]	5.933	.340	17.442	.000	5.265	6.600
	[Years in HE=31 to 41 yrs.]	5.968	.352	16.979	.000	5.279	6.658
	[Years in HE=6 to 10 yrs.]	5.802	.320	18.140	.000	5.175	6.430
	[Department=11]	-.105	.241	-.436	.663	-.578	.368
	[Department=2]	.649	.757	.857	.391	-.837	2.136
	[Department=8]	-.043	.288	-.148	.883	-.607	.522
	[Department=9]	.113	.140	.804	.422	-.162	.388
	[Department=Academic Affairs]	.331	.208	1.586	.113	-.078	.740
	[Department=Academic Support]	.297	.112	2.644	.008	.077	.517
	[Department=Athletics]	.393	.202	1.943	.052	-.004	.789
	[Department=Facilities]	-.183	.141	-1.300	.194	-.460	.093
	[Department=Human Resources]	.515	.247	2.089	.037	.031	.999
	[Department=Information Tech Related]	.135	.180	.752	.452	-.218	.489
	[Department=Other]	.118	.121	.975	.330	-.119	.355
	[Department=Student Affairs]	.184	.130	1.419	.156	-.070	.438
	[Department=Student Services]	0 ^a	.	.	.	.	.

[Employee Classification=Classified - Hourly]	-.541	.201	-2.694	.007	-.936	-.147
[Employee Classification=Non-Classified - Salary]	-.245	.196	-1.248	.212	-.631	.140
[Employee Classification=Other - Faculty, Professionals]	0 ^a	.	.	.	.	.
[Supervise Others=No Supervision]	-.207	.081	-2.545	.011	-.367	-.047
[Supervise Others=Other]	-.341	.621	-.548	.584	-1.560	.878
[Supervise Others=Supervision]	0 ^a	.	.	.	.	.
[Place of Employment=]	.666	.624	1.066	.287	-.559	1.890
[Place of Employment=Community College]	.183	.104	1.764	.078	-.021	.386
[Place of Employment=Four-Year Institution]	0 ^a	.	.	.	.	.
[Male/Female=]	-.281	.446	-.629	.530	-1.157	.595
[Male/Female=3]	.176	.620	.283	.777	-1.041	1.393
[Male/Female=Female]	-.215	.078	-2.742	.006	-.369	-.061
[Male/Female=Male]	0 ^a	.	.	.	.	.
[Education Level=5]	-.542	.788	-.688	.492	-2.088	1.004
[Education Level=Advanced (Terminal) Degree]	-.023	.270	-.086	.932	-.553	.507
[Education Level=Associates Degree]	.064	.253	.252	.801	-.432	.560
[Education Level=Bachelor's Degree]	-.051	.227	-.227	.821	-.496	.393

[Education Level=High School Grad or Equivalent]	.227	.306	.741	.459	-.374	.828
[Education Level=Master's Degree]	-.019	.232	-.082	.934	-.474	.436
[Education Level=Professional Degree]	.111	.395	.282	.778	-.664	.886
[Education Level=Some College - No Degree]	-.129	.241	-.537	.591	-.601	.343
[Education Level=Some Grad Credit - No Degree]	-.053	.274	-.192	.848	-.591	.486
[Education Level=Trade/Tech/Vocational Training]	0 ^a	.	.	.	.	.

a. This parameter is set to zero because it is redundant.

Appendix T

Variance Accounted For

	Centroid Coordinates			Total (Vector Coordinates)		
	Dimension		Mean	Dimension		Total
	1	2		1	2	
Dedication	.695	.007	.351	.690	.006	.696
Competence	.645	.029	.337	.643	.027	.670
Vigor	.601	.004	.303	.599	.004	.603
Autonomy	.532	.020	.276	.531	.019	.550
Relatedness	.475	.031	.253	.472	.030	.502
Absorption	.462	.000	.231	.454	.000	.454
Department	.019	.016	.018	.017	.014	.031
Supervise others	.037	.454	.246	.037	.454	.492
Employee classification	.073	.403	.238	.071	.403	.474
Years in HE	.030	.316	.173	.027	.315	.343
Education Level	.041	.240	.141	.040	.240	.280
Female/Male	.008	.061	.035	.008	.061	.069
Place of employment	.016	.017	.016	.015	.017	.031
Active Total	3.636	1.599	2.617	3.606	1.589	5.195