Data Analysis Final Project: Methods, Results, and a Research Proposal

Alissa Kowalski

Niagara University

ADS820: Advanced Quantitative Analysis

Dr. Treadway

December 2, 2022

Research Model

Utilizing the provided survey data from a multi-unit restaurant company, a series of research questions were developed to explore the potential interactions between role overload, pay satisfaction, and perceived job alternatives and their overall connection to intention to quit. For this study, the following two hypotheses were constructed:

1. The relationship between role overload and intention to quit is moderated by perceived job alternatives in that, when role overload is high, perceived job alternatives will strengthen the relationship between role overload and intention to quit.

2. The relationship between pay satisfaction and intention to quit is moderated by perceived job alternatives in that, when pay satisfaction is low, perceived job alternatives will strengthen the relationship between pay satisfaction and intention to quit.

Figure 1

Initial Research Model
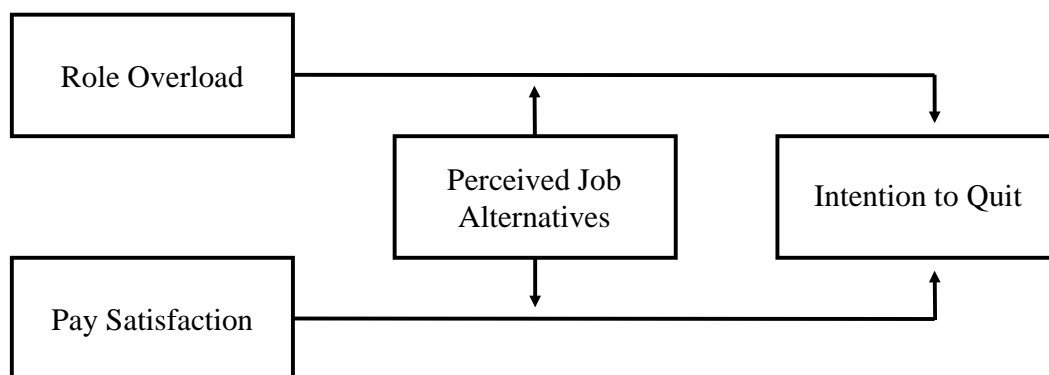
Methods

Participants

The total number of individuals sampled was 178, with 103 completed surveys utilized for analysis resulting in a 58% response rate. Surveys that only included employee information but did not contain any responses to the survey questions were excluded. Of the individuals who responded, 75% were female and 25% were male. Participants ranged in age from 18 to 76, with the highest concentration of respondents in the 18-20 age range. At the time this data was collected, there were seven distinct positions within the company: crew, supervisor, baker, assistant manager, manager, district manager, and administrator. 81 individuals were classified as crew for a total of 79% overall. Of the remaining 22 individuals, eight were supervisors, four were bakers, three were assistant managers, three were managers, and four were administrations. There were no completed surveys from district managers. Of the 103 surveyed individuals, 91 were still active within the company at the time the information was collected while four were inactive and eight had been terminated. This resulted in 88% of responses coming from current employees and 12% from former employees. See Tables A1-A4 in Appendix A for more information about the surveyed participants.

Measures

The survey consists of 161 questions beyond demographic reporting exploring work behaviors and job satisfaction, most of which utilize a 1-5 Likert scale with one being "strongly disagree" and five being "strongly agree." Supervisors responded to additional questions that were not utilized in this analysis. The research model is composed of four constructs with a total of twelve scaled questions from the survey being utilized in the analysis. Role overload and intention to quit include four questions each while pay satisfaction and perceived alternatives

include two questions each. See Table A5 in Appendix A for the list of survey questions included in each construct.

An analysis using Cronbach's alpha was performed on the twelve survey question included in the constructs in order to determine the reliability of the items. The reliability statistics for the full list of items resulted in a Cronbach's alpha of .62, which is below the acceptable level of .70. In order to determine if any of the constructs met the acceptable level, reliability analyses for each group of construct questions was performed. Three constructs were reliable with Cronbach's alphas at .70 or higher: intention to quit = .71, perceived alternatives = .76, and role overload = .87. Pay satisfaction did not meet the reliability minimum with a .57. For the purposes of this assignment, pay satisfaction has remained a variable within the research model despite being below reliability standards. See Appendix A for both the total reliability analysis table and the individual analyses tables.

Results

Evaluation of Assumptions

Within this research study, it is assumed that the data provided was accurately coded within the Excel document to the best of the researcher's abilities and that all efforts were made to collect survey responses from as many employees as possible. It is also assumed that all ethical standards of research collection using human subjects were followed, and that participants willingly consented to supplying their responses to the initial researcher gathering the data. It is assumed that some degree of convenience sampling was performed based on access to the company and the employees.

Not being involved in the development of the original research model or the survey caused minor limitations as the data guided the research model rather than the reverse.

Additionally, although there was demographic information for 178 individuals, there were only 103 completed surveys. Although this is a 58% response rate, when examining the demographics, there was a gap as none of the district managers completed the survey. As this research model was not dependent on demographic data for analysis, this was not necessarily a concern. However, it is still a limitation of the data if this study progressed as not all parties are represented and there are research scenarios in which enrollment position would be an important variable.

Data Analysis

To determine the relationship between a single dependent variable and multiple predictor variables, linear regression can be utilized to predict or explain the significance and the weight of each variable. This research model consists of a single dependent variable – intention to quit – and several predictor variables – role overload, pay satisfaction, and the moderating variable perceived job alternatives. Because of this, linear regression was the appropriate choice to examine the extent of the interaction between these variables, as well as making predictions for the dependent variable. Although ANOVA could have provided insight into the relationship, it is generally utilized in situations where there is no relationship between variables or when the relationship is unclear. With this study, the identified variables are related and the intent is to determine the full weight of their interactions.

A regression analysis was conducted to test the previously developed hypotheses related to the interactions between intention to quit, role overload, pay satisfaction, and perceived job alternatives. Model one focused on the relationship between individual predictor variables and intention to quit, and showed significance at $p. = .00$. For the variables, the model shows $R^2 = .22$, $F(3, 94) = 8.98$, $p < .01$, meaning the relationship between the individual variables accounts

for 22% of the variance. Model two – testing the interaction between (1) role overload and perceived job alternatives and (2) pay satisfaction and perceived job alternatives – is nonsignificant at $p. = .13$ with the interaction model showing $R^2 = .26$, $F(2, 92) = 2.06$, with only an additional 3% of the variance explained. These models show that the interaction between the variables is nonsignificant above and beyond the control variables. See Table A8 Appendix A for the complete model summary.

Table A9 in Appendix A shows coefficient alpha, beta coefficients, and zero-order correlation. Model one in coefficient alpha showed significance with perceived alternatives at $p. < .01$ and slight significance with role overload at $p. < .05$. Within model two, there is again slight significance at $p. < .05$, this time with pay satisfaction. The beta coefficients show a negative interaction between pay satisfaction in both models and the zero-order correlation shows that there is a negative correlation with intention to quit and pay satisfaction which means that a lower rating of pay satisfaction will result in a higher intention to quit. The zero-order correlation also suggests that the best predictor of intention to quit is the role overload and perceived alternatives interaction at .46. The next best predictors are perceived job alternatives as a standalone variable at .36 and pay satisfaction at -.34.

With these findings in mind, both hypothesis one and hypothesis two are partially supported, but not accepted as proposed. Using the regression analysis as well as coefficient alpha, beta coefficients, and zero-order correlation, the data supports that there is a relationship between the individual variables and intention to quit, but the interaction and moderation among these variables is nonsignificant. Within these results, there is a negative correlation between pay satisfaction and intention to quit, but it is not clear if it is moderated by perceived job alternatives. Additionally, the reliability analysis of the pay satisfaction construct did not meet

the minimum standard so there would not have been additional tests performed on the construct without adjustments to the variables or model.

Research Proposal

Future Research Model

Within higher education institutions, understanding the relationship between academic performance, attendance, and persistence rates is vital for the success of the organization. This can be examined broadly by looking at overall persistence, retention, and graduation rates, or the analysis can be performed to determine the viability of particular programs. Knowing where specific programs fall within the overall persistence rates of the institution ensure that informed decisions are being made as far as allocating support and resources, or even whether or not programs or majors should be discontinued. Cumulative GPA and attendance rates can be predictors of overall academic success and persistence. For this study, the following two hypotheses were constructed:

1. Students with higher cumulative GPAs will have a stronger persistence rate; therefore, programs with higher cumulative GPAs overall will have a stronger persistence rate overall as well.

2. Students with higher class attendance will have a stronger persistence rate; therefore, programs with higher class attendance overall will have a stronger persistence rate overall as well.

Figure 2

Future Research Model
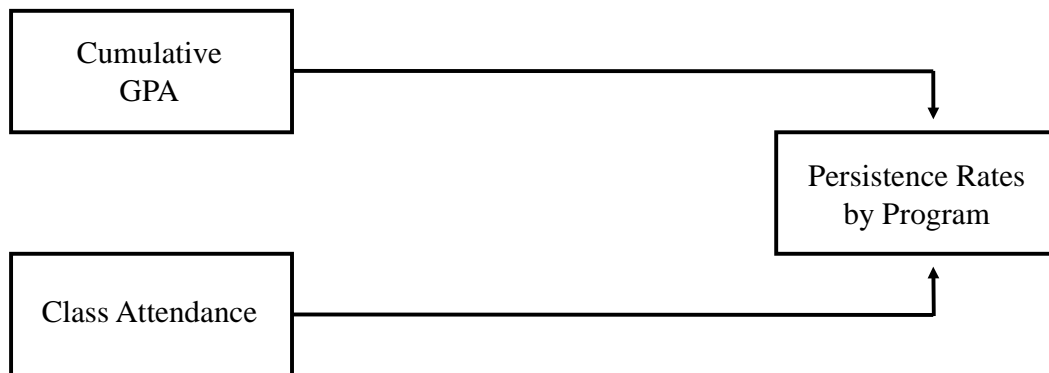
Constructs

For this research model, there are three constructs: cumulative GPA, class attendance, and persistence rates by program. In order to accurately measure these constructs within the research model, they need to be analyzed on the same scale and therefore should be adjusted to percentiles divided by each semester. Cumulative GPA should be included on a 0-100% scale rather than a 4.0 or letter grade scale. Class attendance should be gathered as the total number of classes attended divided by the total number of classes possible in order to create a percentage for the semester. Persistence rates by program can be measured in a variety of manners depending on how an institution defines persistence. In this case, persistence will be gathered by taking the number of students who either registered for the subsequent semester, or have met all graduation requirements and will be matriculating, and dividing it by the number of students eligible within those same parameters. In this way, all three constructs will be formatted

similarly and measured on the same scale. Including the information about persistence rates specifically by program will allow the researcher to examine the results on both an institutional and programmatic basis.

Method of Analysis

If demographic data is available, frequencies and means should be established and presented in the data reporting. If demographic data is not available, population size, sample size, and data collection methods should still be addressed. In order to test the research model hypotheses, linear regression can be utilized to identify the relationship between the dependent variable of persistence rates and multiple predictor variables like cumulative GPA or class attendance. Prior to performing the linear regression analysis, a reliability analysis should be performed with Cronbach's alpha to ensure there is internal consistency within the constructs. There should also be a factor analysis performed to identify variance. Once reliability and variance are established, a regression analysis can be performed to examine the interactions developed in the research model and hypotheses.

Within the regression analysis, attention should be paid to the significance column within the model summary to identify constructs at $p. < .01$. Additionally, the R^2 should be examined to show what percentage of the variance can be explained by the constructs and the interaction. Utilizing the coefficient alpha table from the regression, significance within the constructs should be identified at $p. < .01$. The zero-order correlation should be utilized to identify which of the variables is the best predictor of persistence.

The collection and interpretation of this data should allow the researcher to answer each hypothesis and identify the overall relationship between cumulative GPA, class attendance, and persistence rates. These analysis steps should be done for both institution wide persistence rates

and individual program persistence rates. This will help identify which programs are performing at or above the institutional average and which programs are performing comparatively worse. By continuing to perform this analysis each semester, the researcher can track performance over time and have additional evidence supporting the viability of the research model, potentially expanding the use to other institutions.

Appendix A

Research Model Tables

Table A1

Gender of Participants

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
female	77	74.8	74.8	74.8
male	26	25.2	25.2	100.0
Total	103	100.0	100.0	

Table A2

Employment Position of Participants

Crew Position	Frequency	Percent	Valid Percent	Cumulative Percent
crew	81	78.6	78.6	78.6
sup	8	7.8	7.8	86.4
bake	4	3.9	3.9	90.3
assist	3	2.9	2.9	93.2
manage	3	2.9	2.9	96.1
admin	4	3.9	3.9	100.0
Total	103	100.0	100.0	

Table A3

Employment Status of Participants

Employment Status	Frequency	Percent	Valid Percent	Cumulative Percent
active	91	88.3	88.3	88.3
inactive	4	3.9	3.9	92.2
terminated	8	7.8	7.8	100.0
Total	103	100.0	100.0	

Table A4

Age of Participants

Age	Frequency	Percent	Valid Percent	Cumulative Percent
18	18	17.5	17.5	17.5
19	13	12.6	12.6	30.1
20	11	10.7	10.7	40.8
21	7	6.8	6.8	47.6
22	5	4.9	4.9	52.4
23	4	3.9	3.9	56.3
24	2	1.9	1.9	58.3
25	2	1.9	1.9	60.2
26	1	1.0	1.0	61.2
27	3	2.9	2.9	64.1
28	7	6.8	6.8	70.9
31	2	1.9	1.9	72.8
33	1	1.0	1.0	73.8
35	2	1.9	1.9	75.7
38	1	1.0	1.0	76.7
39	1	1.0	1.0	77.7
40	2	1.9	1.9	79.6
44	4	3.9	3.9	83.5
45	1	1.0	1.0	84.5
46	1	1.0	1.0	85.4
47	2	1.9	1.9	87.4
48	2	1.9	1.9	89.3
49	2	1.9	1.9	91.3
50	1	1.0	1.0	92.2
51	1	1.0	1.0	93.2
52	1	1.0	1.0	94.2
54	1	1.0	1.0	95.1
60	2	1.9	1.9	97.1
61	2	1.9	1.9	99.0
76	1	1.0	1.0	100.0
Total	103	100.0	100.0	

Table A5

Survey Questions within Constructs

Construct	Survey Code	Survey Question
Intention to Quit	s3a2	I will probably look for a new job in the future.
	s3a3 (reverse)	I do not intend to quit my job.
	s3a7	All things considered, I'd like to find a comparable job somewhere else.
	s3a10 (reverse)	It is unlikely that I will seek employment elsewhere within the next year.
Pay Satisfaction	s3a11	I feel I am being paid a fair amount for the work I do.
	s3c11	I feel satisfied with my chances for salary increases.
Role Overload	s3c3	There is a need to reduce some parts of my role.
	s3c7	I feel overburdened in my role.
	s3c9	I have been given too much responsibility.
	s3c14	My workload is too heavy.
Perceived Alternatives	s3a15	I could easily find a job with a company as good as this one.
	s3c16	It would be very easy for me to find a job with another employer that is as good as the job I have here.

Table A6

Total Reliability Analysis

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.621	.614	12

Table A7.1

Intention to Quit Reliability Analysis

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.714	.721	4

Table A7.2

Pay Satisfaction Reliability Analysis

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.568	.599	2

Table A7.3

Perceived Alternatives Reliability Analysis

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.759	.813	2

Table A7.4

Role Overload Reliability Analysis

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.872	.871	4

Table A8

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.472[a]	.223	.198	.80161	.223	8.979	3	94	.000
2	.506[b]	.256	.216	.79271	.033	2.061	2	92	.133

a. Predictors: (Constant), RoleOverload, PercAltern, PaySatis
b. Predictors: (Constant), RoleOverload, PercAltern, PaySatis, Overload_Alternatives, Pay_Alternatives
c. Dependent Variable: IntentQuit

Table A9

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	1.902	.533		3.566	.001			
	PaySatis	-.129	.080	-.167	-1.616	.109	-.341	-.164	-.147
	RoleOverload	.155	.066	.222	2.337	.022	.295	.234	.212
	PercAltern	.191	.069	.276	2.783	.007	.363	.276	.253
2	(Constant)	3.748	1.065		3.520	.001			
	PaySatis	-.437	.206	-.566	-2.124	.036	-.341	-.216	-.191
	RoleOverload	-.046	.161	-.066	-.287	.774	.295	-.030	-.026
	PercAltern	-.375	.288	-.542	-1.301	.197	.363	-.134	-.117
	Overload_Alternatives	.066	.050	.427	1.327	.188	.459	.137	.119
	Pay_Alternatives	.095	.058	.552	1.640	.104	.151	.169	.147

a. Dependent Variable: IntentQuit

Appendix B

SPSS Output

Attachment B1: Demographics Final Project

SPSS Output for Demographic Data (Gender, Age, Employment Position, Employment Status)

Attachment B2: Reliability Final Project

SPSS Output for Reliability Analysis (Analysis of Individual Constructs and Total Constructs)

Attachment B3: Factor Analysis Final Project

SPSS Output for Factor Analysis of Constructs

Attachment B4: Regression Final Project

SPSS Output for Linear Regression with Coefficient Alpha