Research, Teaching, and Service

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Research, Teaching, and Service

The life of an academic is centered upon three tenets: teaching, service, and research – if one is in an R1 university, then preferably not in that order. The importance of each of these three creeds varies from person to person. Importantly, according to needs-based theories, if there is a mismatch between what an employee wants (adequacy of a need) and what an employee actually received (need amount received), then there is an opportunity for negative consequences to arise. An example of such a consequence is turnover intention. How is turnover intention affected by fit and misfit in needs-supplies for research, teaching, and service in academia? Given the research on needs-based theories, we propose that mismatches between adequacy of a need (research desired, teaching desired, and service desired) and actual received amount of needs (research needs, teaching needs, and service needs) are predictors of turnover intentions. Findings from this study make a theoretical contribution by extending the Person-Environment Fit theoretical framework to the academic profession. On a more practical level, the findings indicate that certain types of misfit in research, teaching, and service needs are more likely to engender turnover intentions in academics. This knowledge is useful to both persons hiring for academic professions as well as current professors in academia by stressing the importance of fit in needs and need fulfillment of the three academic tenets, research, teaching, and service.

Although primarily used as measures for tenure review at universities, on a personal level, research, teaching, and service are valued at different degrees from person to person. Needs-based theories provide a framework for understanding the importance of research, teaching, and service needs-fulfillment on outcomes such as turnover intentions. Person-Environment Fit (PE Fit) Theory specifically lays the foundation that can be used to predict fit and misfit outcomes on turnover intentions pending on the needs-fulfillment of research, teaching, and service. PE Fit states that complementary fit occurs when needs-supplies align or “fit” (Kristof-Brown & Guay, 2011; Krtif-Brown & Billsberry, 2013). There are two types of fit. The first occurs when both needs and supplies are high, known as “high-high” fit (Kristof-Brown & Guay, 2011). For example, a professor wants to do a lot of research and is their university provides the resources to do so, a high-high fit scenario. The second type of fit occurs when both needs and supplies are low, known as “low-low” fit (Kristof-Brown & Guay, 2011). For example, a professor wants to do little teaching and the university only requires her to teach a couple courses over an academic year, a low-low fit scenario. For scenarios of fit, across independent variables (research, teaching, and service), we expect that fit will be related to low turnover intentions.

Hypothesis 1a: Low-low fit across research, teaching, and service will be related to low turnover intentions.

Hypothesis 1b: High-high fit across research, teaching, and service will be related to low turnover intentions.

In contrast to the two types of fit, two types of misfit can also occur in needs-supplies fulfillment. The first type of misfit occurs when the needs are high, but the supplies are low, known as high-low needs deficiency (Kristof-Brown & Guay, 2011; Lambert, et al., 2012). For example, a professor wants to do a lot of research, but the university does not provide the resources to meet those research needs. Finally, the second type of misfit occurs when needs are low, but supplies are high, known as low-high needs excess (Kristof-Brown & Guay, 2011; Lambert, et al., 2012). For example, a professor has low service needs, but the university requires a lot of service to be completed. Importantly, each of these misfit scenarios has different effects on the outcome variable, turnover intentions. In misfit scenarios of low-high needs deficiency, turnover intentions will be moderate. We theorize that the deficiency in needs fulfillment will be frustrating, leading to moderate turnover intentions. In contrast, in misfit scenarios of high-low needs excess, turnover intentions will be high. We theorize that an oversupply of research, teaching, and service will be very stressful and lead to high turnover intentions.

Hypothesis 2: In scenarios of low-high needs deficiency in research, teaching, and service, turnover intentions will be moderate.

Hypothesis 3: In scenarios of high-low needs excess in research, teaching, and service, turnover intentions will be high.

Method

Participants

An archival data set was used to answer the present research question and test the hypotheses. The data set was originally obtained via survey data from faculty members across departments of an unnamed, large southeastern university. Across all survey questions, including demographic questions, the average response rate was approximately sixty percent. The following demographic statistics are from the participants who responded to the questions. A box and whisker plot was ran to check for outliers in the demographic responses. A response for an age of 10,000 years was removed. After removing that response, the average respondent's age was 47. The sample was almost evenly split between males (48%) and females (52%). The demographic breakdown of the sample is as follows: African American (3.9%), Caucasian/ White (84.8%), Indigenous American (.001), Hispanic (.01), Asian (.06) and Other (.04).

Procedure

Professors at a large, southeastern university were randomly invited to participate in a survey online via Qualtrics. Questions on the survey asked how much research, teaching, and service the participant felt was needed and how much the participant actually had to complete (see *Appendix A* for the measures used). Three questions were asked for each construct (research wanted, research done, and turnover intentions). The responses for each construct's set of three questions were later averaged and then used to represent each construct for analysis. Since some questions did not receive responses from all participants, the sample size for each question varied between n=140 and n=370.

Results

In order to accurately test the hypothesis and capture the fit relationship, we ran polynomial regressions to test each independent variable's effect on turnover intentions. Polynomial regressions are more accurate than difference scores regressions because they include the squared needs, squared supplied, and needs-supply interaction term. Thus, preserving more information in the needs-supply relationship than difference scores regressions (Edwards, 2002). Put simply, a difference means scores regression compares fit versus misfit whereas the polynomial regression compares the two types of fit, high-high and low-low, as well as two types of misfit, high-low and low-high. Moreover, the polynomial is quadratic in nature which allows for any curvilinear relationships to be captured effectively (Edwards, 2002). Ultimately, the polynomial regression allows for a three-dimensional model to be created. This three-dimensional model will depict the effects of the needs-supplies fit relationship of research, teaching, and service, respectively, on turnover intention.

Hypothesis Testing for Research, Teaching and Service

We tested which of the following two models would be most effective to use, to test the effect of Research, Teaching and Service on Turnover Intention.

H_0: b1 = -b2
Ha: b1 ≠ -b2

1) b1 = 0.147, b2 = -0.161

Thus, we reject H0, and accept Ha. We decided to use Model 2 to check the effect of Research on Turnover Intention.

Effect of Research on Turnover Intention (after controlling for Service and Teaching)

To examine the effects research needs-supplies has on turnover intentions, we first controlled for teaching and service needs-supplies. The primary regression including teaching desired, teaching done, service desired, and service done explained 10% of the variance in turnover intentions (R2=.10, F(4,320)=8.48, p=.000). The secondary regression model was a polynomial regression for research including research desired and research done, the interaction term, and each term squared in addition to the aforementioned controls. Thus, the change in r-squared was .02 and F change (5,315)=1.67, which was not significant at 0.140. The effect of research needs-supplies on turnover intentions was thus, not significant after controlling for teaching and service. This full model explained 11.9% of the variance (R2=.119, F(9,315)=4.74, p=.000).

Regression Equation: $Z = b_0 + b_1X + b_2Y + b_3X^2 + b_4XY + b_5Y^2 + e$

Z = -1.063 - 0.065 (Research done) + 0.104 (Research desired) + 0.288 (Research done)^2 - 0.521 (Research done * Research desired) + 0.192 (Research desired)^2

Overall, for Model 2, F (9,315) = 4.74. This was significant at 0.000. The effect of research needs-supplies on turnover, without controlling for teaching and service, is thus significant.

2) b1 = 0.451, b2 = -0.399

Thus, we reject H0, and accept Ha. We decided to use Model 2 to check the effect of Teaching on Turnover Intention.

To examine the effects teaching needs-supplies has on turnover intentions, we first controlled for research and service needs-supplies. The primary regression including research desired, research done, service desired, and service done explained 8.4% of the variance in turnover intentions (R2=.084, F(4,320)=7.29, p=.000). The secondary regression model was a polynomial regression for teaching including teaching desired and teaching done, the interaction term, and each term squared in addition to the aforementioned controls. This full model explained 12% of the variance (R2=.12, (9,315)=5.132, p=.000). The change in r-squared was .037 and F change (5, 315) =2.64 was significant at p=.023.

Regression Equation: $Z = b_0 + b_1X + b_2Y + b_3X^2 + b_4XY + b_5Y^2 + e$

Z = -1.167 + 0.192 (Teaching done) - 0.134 (Teaching desired) + 0.181 (Teaching done)^2 - 0.282 (Teaching done * Teaching desired) + 0.163 (Teaching desired)^2

F change value for Model 2 = 2.64. F change significance value =0.023. The effect of teaching needs-supplies on turnover, after controlling for research and service, is significant.

Overall, for Model 2, F (9,315) = 5.132. This was significant at 0.000. The effect of teaching needs-supplies on turnover, without controlling for research and service, is thus significant.

3) b1 = 0.421, b2 = -0.468

Thus, we reject H0, and accept Ha. We decided to use Model 2 to check the effect of Service on Turnover Intention.

To examine the effects service needs-supplies has on turnover intentions, we first controlled for research and teaching needs-supplies. The primary regression including research desired, research done, teaching desired, and teaching done explained 6.3% of the variance in turnover intentions (R2=.063, F(4,320)=5.39, p=.000). The secondary regression model was a polynomial regression for service including service desired and service done, the interaction term, and each term squared in addition to the aforementioned controls. This full model explained 12.8% of the variance (R^2=.128, F(9,315)=5.13, p=.000). Thus, the change in r-squared was .06 F change(3, 315)= 4.67 was significant at p =0.05

Regression Equation: $Z = b_0 + b_1X + b_2Y + b_3X^2 + b_4XY + b_5Y^2 + e$

Z = -0.994 + 0.310 (Service done) – 0.398 (Service desired) + 0.131 (Service done)^2 - 0.450 (Service done * Service desired) + 0.157 (Service desired)^2

F change value for Model 2 = 4.67. F change significance value was 0.000. The effect of service needs-supplies on turnover, after controlling for research and teaching, is significant.

Overall, for Model 2, $F(9,315) = 5.13$. This was significant at 0.000. The effect of service needs-supplies on turnover, without controlling for research and teaching, is significant.

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Discussion

Limitations and Future Directions

Our paper has discussed how fit on the three tenets of research, teaching, and service influence turnover intentions. However, there are a few limitations that we would like to point out. First, the data set we obtained is archival data. Because we did not collect the data ourselves, we can only use information from the measures that have been collected. For example, the number of years for the tenure clock could be a factor that would be important or interesting to control for, but we do not have this information. Second, the data set has a high response rate, but there are many questions with missing data so that overall, we have a large range of sample size for each variable. We could not do anything about this other than imputing the data or excluding respondents who did not answer all the questions we were interested in. Third, the data is cross-sectional. Due to the nature of the data, it could have given differing results if we could observe the outcomes over a longer period of time since attitudes regarding research, teaching, and service will vary during an academic’s lifetime. Lastly, the sample was collected from one university in the southeastern region of the United States. This characteristic of the data creates limitations because we cannot analyze if the effects we found are due to the independent variables or if they are influenced by the setting. Thus, our study was limiting in the aspect of characteristics in the dataset, but we mitigated these limitations to the extent that they could be addressed.

We believe there are a number of future directions that can be addressed relating to this area of research. First, as we discussed in the limitations, the data for this study were collected from one institution. Thus, given data from different universities, researchers can analyze whether organizational culture has a significant influence on turnover intentions within academia with relation to research, teaching, and service. If culture is a factor, employees who do not perceive good fit between their needs and supplies may still choose to stay at the institution because they like the organizational culture. For example, an employee may like that the culture is very encouraging and supportive of colleagues, which creates a pleasant environment to work in. Second, other important outcomes that may be significant are psychological well-being, job satisfaction, and stress. These factors are often just as important as turnover intention in capturing a snapshot of what employees' attitudes are towards their work and whether they will leave or not. Turnover intentions are not always the most precise indicator of actual turnover. Third, factors such as workplace friendships and team member exchange could be significant influences on turnover intentions over time. For example, regarding workplace friendships, an employee may have very low fit with regards to research, teaching, and service, but they do not want to leave that particular university because of the friends they have made and the community that they have developed from working there. Lastly, longitudinal studies that collect data from employees across various universities during their career could give us more insights into these three tenets of the academic career.

Conclusion

Hypothesis 1 was supported. Turnover intentions were higher during misfits in needs-supplies for research, teaching, and service. Both types of misfit in research and teaching (high desire-low amount done and low desire-high amount done) were about equally correlated with strong turnover intentions. Interestingly, a misfit in low desire-high amount of service done was more strongly correlated with turnover intentions than a misfit in high desire-low amount of service done.

References

Edwards, J. R. (2002). Alternatives to difference scores: Polynomial regression analysis and response surface methodology. In F. Drasgow & N. W. Schmitt (Eds.), *Advances in Measurement and Data Analysis* (pp. 350-400). San Francisco: Jossey-Bass.

Kristof-Brown, A. L., Billsberry, J. (2013). Fit for the future (Chapter 1) in *Organizational Fit: Key Issues and New Directions*. pp. 1-18. Wiley Blackwell.

Kristof-Brown, A. L., Guay, R. P. (2011). Person-Environment Fit. Chapter in S. Zedeck (Ed.) *American Psychological Association Handbook of Industrial and Organizational Psychology*. pp. 1-50. American Psychological Association.

Lambert, L. S., Tepper, B. J., Carr, J. C., Holt, D. T., & Barelka, A. J. (2012). Forgotten but not gone: an examination of fit between leader consideration and initiating structure needed and received. *J Appl Psychol*, *97*(5), 913-930. doi:10.1037/a0028970

Appendix A. Survey Questions

Note: This is not the survey in its entirety. Please contact the authors for the full survey. Questions asking for “adequacy” of a need are measuring the research, teaching, and service needed. Questions asking for research, teaching, and service“done” are measuring the environment’s supply of that need.

(*On the web version, the numerical responses were anchored as follows: -3 = strongly disagree, -2 = disagree, -1 = somewhat disagree, 0 = neither agree nor disagree, 1 = somewhat agree, 2 = agree, 3 = strongly agree*)

Turnover Intent:

1. I am planning to leave my position. -3 -2 -1 0 +1 +2 +3
2. I would like to quit this position. -3 -2 -1 0 +1 +2 +3
3. I often think of quitting this position. -3 -2 -1 0 +1 +2 +3

(*On the web version, the numerical responses will be anchored as follows: 1 = none, 2 = hardly any, 3 = some, 4 = a moderate amount, 5 = quite a bit, 6 = a considerable amount, 7 = a great amount*)

Teaching:

1. The teaching load you have.

   How much do you personally feel is <u>adequate</u>? 1 2 3 4 5 6 7

   How much have you actually <u>done</u>? 1 2 3 4 5 6 7

2. The number of sections and courses you teach.

How much do you personally feel is <u>adequate</u>? 1 2 3 4 5

6 7

How much have you actually <u>done</u>? 1 2 3 4 5

6 7

3. The amount of teaching you do.

How much do you personally feel is <u>adequate</u>? 1 2 3 4 5

6 7

How much have you actually <u>done</u>? 1 2 3 4 5

6 7

Research:

1. The amount of research you do.

How much do you personally feel is <u>adequate</u>? 1 2 3 4 5

6 7

How much have you actually <u>done</u>? 1 2 3 4 5

6 7

2. How much research you perform.

How much do you personally feel is <u>adequate</u>? 1 2 3 4 5

6 7

How much have you actually <u>done</u>? 1 2 3 4 5

6 7

3. The quantity of research you accomplish.

How much do you personally feel is <u>adequate</u>? 1 2 3 4 5

6 7

How much have you actually <u>done</u>? 1 2 3 4 5

6 7

Service:

1. The amount of service you do.

   How much do you personally feel is <u>adequate</u>? 1 2 3 4 5

   6 7

   How much have you actually <u>done</u>? 1 2 3 4 5

   6 7

2. Service you contribute to your department, college, university and profession.

   How much do you personally feel is <u>adequate</u>? 1 2 3 4 5

   6 7

   How much have you actually <u>done</u>? 1 2 3 4 5

   6 7

3. How much service you perform.

   How much do you personally feel is <u>adequate</u>? 1 2 3 4 5

   6 7

   How much have you actually <u>done</u>? 1 2 3 4 5

   6 7

Table 1. Correlation Tables between Variables

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DATASET ACTIVATE DataSet2.
DATASET CLOSE DataSet1.
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  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT TOI_avg_corrected
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  /METHOD=ENTER ZRESD_avg ZRESW_avg R_XX R_XY R_YY.
```

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
TOI_avg_corrected	-.9944	1.77346	328
R_XX	.9990	1.25329	328
R_XY	.7812	1.38882	328
R_YY	.9977	1.61079	328
Zscore(RESD_avg)	-.0017378	1.00103020	328
Zscore(RESW_avg)	-.0051293	1.00036294	328

Correlations

		TOI_avg_corrected	R_XX	R_XY	R_YY	Zscore(RESD_avg)	Zscore(RESW_avg)
Pearson Correlation	TOI_avg_corrected	1.000	-.045	-.133	-.106	.047	.051
	R_XX	-.045	1.000	.851	.763	-.459	-.511
	R_XY	-.133	.851	1.000	.932	-.463	-.572
	R_YY	-.106	.763	.932	1.000	-.495	-.533
	Zscore(RESD_avg)	.047	-.459	-.463	-.495	1.000	.783
	Zscore(RESW_avg)	.051	-.511	-.572	-.533	.783	1.000
Sig. (1-tailed)	TOI_avg_corrected	.	.206	.008	.028	.200	.177
	R_XX	.206	.	.000	.000	.000	.000
	R_XY	.008	.000	.	.000	.000	.000
	R_YY	.028	.000	.000	.	.000	.000
	Zscore(RESD_avg)	.200	.000	.000	.000	.	.000
	Zscore(RESW_avg)	.177	.000	.000	.000	.000	.
N	TOI_avg_corrected	328	328	328	328	328	328
	R_XX	328	328	328	328	328	328
	R_XY	328	328	328	328	328	328
	R_YY	328	328	328	328	328	328
	Zscore(RESD_avg)	328	328	328	328	328	328
	Zscore(RESW_avg)	328	328	328	328	328	328

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	R_YY, R_XX, R_XY[b]	.	Enter

2	Zscore(RESD_avg), Zscore(RESW_avg)[b]		.	Enter

a. Dependent Variable: TOI_avg_corrected
b. All requested variables entered.

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	.197[a]	.039	.030	1.74661	.039	4.376	3	324	.005
2	.204[b]	.042	.027	1.74942	.003	.481	2	322	.618

a. Predictors: (Constant), R_YY, R_XX, R_XY
b. Predictors: (Constant), R_YY, R_XX, R_XY, Zscore(RESD_avg), Zscore(RESW_avg)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.048	3	13.349	4.376	.005[b]
	Residual	988.414	324	3.051		
	Total	1028.462	327			
2	Regression	42.994	5	8.599	2.810	.017[c]
	Residual	985.468	322	3.060		
	Total	1028.462	327			

a. Dependent Variable: TOI_avg_corrected
b. Predictors: (Constant), R_YY, R_XX, R_XY
c. Predictors: (Constant), R_YY, R_XX, R_XY, Zscore(RESD_avg), Zscore(RESW_avg)

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	-1.045	.130		-8.038	.000		
	R_XX	.375	.148	.265	2.527	.012	.269	3.711
	R_XY	-.687	.238	-.538	-2.889	.004	.085	11.702
	R_YY	.213	.167	.193	1.274	.203	.129	7.739
2	(Constant)	-1.048	.138		-7.576	.000		
	R_XX	.398	.152	.282	2.623	.009	.258	3.871
	R_XY	-.774	.254	-.606	-3.045	.003	.075	13.303
	R_YY	.260	.176	.236	1.482	.139	.117	8.551
	Zscore(RESD_avg)	.147	.165	.083	.891	.374	.343	2.912
	Zscore(RESW_avg)	-.161	.172	-.091	-.931	.353	.314	3.181

a. Dependent Variable: TOI_avg_corrected

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	R_XX	R_XY	R_YY	Zscore(RESD_avg)	Zscore(RESW_avg)
1	1	3.190	1.000	.03	.01	.01	.01		
	2	.614	2.279	.72	.00	.01	.01		
	3	.156	4.516	.12	.68	.01	.18		
	4	.039	9.053	.14	.31	.98	.80		
2	1	3.686	1.000	.01	.01	.00	.01	.01	.01
	2	1.459	1.589	.09	.00	.00	.00	.08	.07
	3	.449	2.864	.62	.00	.02	.02	.11	.02
	4	.216	4.133	.03	.00	.00	.01	.66	.78
	5	.156	4.860	.12	.66	.00	.16	.00	.00
	6	.034	10.449	.13	.32	.97	.80	.15	.12

a. Dependent Variable: TOI_avg_corrected

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Zscore(RESD_avg)	.020[b]	.311	.756	.017	.732	1.365	.085
	Zscore(RESW_avg)	-.027[b]	-.411	.681	-.023	.670	1.492	.083

a. Dependent Variable: TOI_avg_corrected

b. Predictors in the Model: (Constant), R_YY, R_XX, R_XY

<u>Teaching</u>

```
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT TOI_avg_corrected
  /METHOD=ENTER T_XX T_XY T_YY
  /METHOD=ENTER ZTCHD_avg ZTCHW_avg T_XX T_XY T_YY.
```

Descriptive Statistics

	Mean	Std. Deviation	N
TOI_avg_corrected	-.9864	1.76933	331
T_XX	1.0000	1.15993	331
T_XY	.5939	1.24241	331
T_YY	1.0002	1.51059	331

Zscore(TCHD_avg)	-.0002028	1.00150717	331
Zscore(TCHW_avg)	-.0034080	1.00162547	331

Correlations

		TOI_avg_corrected	T_XX	T_XY	T_YY	Zscore(TCHD_avg)	Zscore(TCHW_avg)
Pearson Correlation	TOI_avg_corrected	1.000	.058	-.082	-.002	.138	-.082
	T_XX	.058	1.000	.646	.510	-.190	-.286
	T_XY	-.082	.646	1.000	.702	-.270	.028
	T_YY	-.002	.510	.702	1.000	.022	.203
	Zscore(TCHD_avg)	.138	-.190	-.270	.022	1.000	.594
	Zscore(TCHW_avg)	-.082	-.286	.028	.203	.594	1.000
Sig. (1-tailed)	TOI_avg_corrected	.	.146	.067	.488	.006	.068
	T_XX	.146	.	.000	.000	.000	.000
	T_XY	.067	.000	.	.000	.000	.307
	T_YY	.488	.000	.000	.	.347	.000
	Zscore(TCHD_avg)	.006	.000	.000	.347	.	.000
	Zscore(TCHW_avg)	.068	.000	.307	.000	.000	.
N	TOI_avg_corrected	331	331	331	331	331	331
	T_XX	331	331	331	331	331	331
	T_XY	331	331	331	331	331	331
	T_YY	331	331	331	331	331	331
	Zscore(TCHD_avg)	331	331	331	331	331	331
	Zscore(TCHW_avg)	331	331	331	331	331	331

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	T_YY, T_XX, T_XY[b]	.	Enter
2	Zscore(TCHD_avg), Zscore(TCHW_avg)[b]	.	Enter

a. Dependent Variable: TOI_avg_corrected

b. All requested variables entered.

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	.179[a]	.032	.023	1.74869	.032	3.613	3	327	.014
2	.259[b]	.067	.053	1.72226	.035	6.057	2	325	.003

a. Predictors: (Constant), T_YY, T_XX, T_XY

b. Predictors: (Constant), T_YY, T_XX, T_XY, Zscore(TCHD_avg), Zscore(TCHW_avg)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.142	3	11.047	3.613	.014[b]
	Residual	999.936	327	3.058		
	Total	1033.078	330			
2	Regression	69.073	5	13.815	4.657	.000[c]
	Residual	964.004	325	2.966		
	Total	1033.078	330			

a. Dependent Variable: TOI_avg_corrected

b. Predictors: (Constant), T_YY, T_XX, T_XY

c. Predictors: (Constant), T_YY, T_XX, T_XY, Zscore(TCHD_avg), Zscore(TCHW_avg)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.147	.133		-8.647	.000		
	T_XX	.278	.109	.182	2.541	.012	.576	1.735
	T_XY	-.375	.123	-.263	-3.041	.003	.396	2.526
	T_YY	.105	.090	.090	1.171	.243	.502	1.991
2	(Constant)	-1.097	.132		-8.305	.000		
	T_XX	.110	.125	.072	.880	.379	.426	2.349
	T_XY	-.155	.137	-.109	-1.130	.259	.310	3.222
	T_YY	.091	.095	.078	.967	.335	.441	2.270
	Zscore(TCHD_avg)	.451	.134	.255	3.366	.001	.500	2.001
	Zscore(TCHW_avg)	-.399	.141	-.226	-2.822	.005	.448	2.233

a. Dependent Variable: TOI_avg_corrected

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance	VIF	Minimum Tolerance
1	Zscore(TCHD_avg)	.119[b]	2.016	.045	.111	.837	1.194	.351
	Zscore(TCHW_avg)	-.055[b]	-.873	.383	-.048	.750	1.333	.394

a. Dependent Variable: TOI_avg_corrected

b. Predictors in the Model: (Constant), T_YY, T_XX, T_XY

Collinearity Diagnostics[a]

				Variance Proportions					
Model	Dimension	Eigenvalue	Condition Index	(Constant)	T_XX	T_XY	T_YY	Zscore(TCHD_avg)	Zscore(TCHW_avg)
1	1	2.916	1.000	.04	.03	.03	.03		
	2	.607	2.192	.56	.00	.14	.04		
	3	.297	3.132	.07	.53	.02	.54		
	4	.180	4.022	.33	.43	.80	.39		
2	1	2.938	1.000	.03	.02	.02	.03	.00	.00
	2	1.641	1.338	.00	.00	.00	.01	.14	.13
	3	.680	2.079	.33	.01	.09	.03	.09	.07
	4	.400	2.711	.39	.09	.00	.01	.41	.23

5	.215	3.692	.00	.21	.15	.86	.00	.16
6	.126	4.832	.24	.66	.74	.07	.37	.40

a. Dependent Variable: TOI_avg_corrected

SERVICE

```
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT TOI_avg_corrected
  /METHOD=ENTER S_XX S_XY S_YY
  /METHOD=ENTER ZSERVD_avg ZSERVW_avg S_XX S_XY S_YY.
```

Descriptive Statistics

	Mean	Std. Deviation	N
TOI_avg_corrected	-.9897	1.78052	341
S_XX	.9999	1.30036	341
S_XY	.6139	1.20625	341
S_YY	1.0018	1.37273	341
Zscore(SERVD_avg)	.0039544	1.00143613	341
Zscore(SERVW_avg)	-.0024289	1.00236164	341

Correlations

		TOI_avg_corrected	S_XX	S_XY	S_YY	Zscore(SERVD_avg)	Zscore(SERVW_avg)
Pearson Correlation	TOI_avg_corrected	1.000	-.040	-.169	-.096	.104	-.129
	S_XX	-.040	1.000	.723	.464	-.497	-.356
	S_XY	-.169	.723	1.000	.769	-.389	-.131

	S_YY	-.096	.464	.769	1.000	-.119	.041
	Zscore(SERVD_avg)	.104	-.497	-.389	-.119	1.000	.613
	Zscore(SERVW_avg)	-.129	-.356	-.131	.041	.613	1.000
Sig. (1-tailed)	TOI_avg_corrected	.	.231	.001	.038	.028	.008
	S_XX	.231	.	.000	.000	.000	.000
	S_XY	.001	.000	.	.000	.000	.008
	S_YY	.038	.000	.000	.	.014	.225
	Zscore(SERVD_avg)	.028	.000	.000	.014	.	.000
	Zscore(SERVW_avg)	.008	.000	.008	.225	.000	.
N	TOI_avg_corrected	341	341	341	341	341	341
	S_XX	341	341	341	341	341	341
	S_XY	341	341	341	341	341	341
	S_YY	341	341	341	341	341	341
	Zscore(SERVD_avg)	341	341	341	341	341	341
	Zscore(SERVW_avg)	341	341	341	341	341	341

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	S_YY, S_XX, S_XY[b]	.	Enter
2	Zscore(SERVW_avg), Zscore(SERVD_avg)[b]	.	Enter

a. Dependent Variable: TOI_avg_corrected
b. All requested variables entered.

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	.221[a]	.049	.040	1.74424	.049	5.763	3	337	.001
2	.306[b]	.094	.080	1.70782	.045	8.264	2	335	.000

a. Predictors: (Constant), S_YY, S_XX, S_XY

b. Predictors: (Constant), S_YY, S_XX, S_XY, Zscore(SERVW_avg), Zscore(SERVD_avg)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.599	3	17.533	5.763	.001[b]
	Residual	1025.282	337	3.042		
	Total	1077.881	340			
2	Regression	100.803	5	20.161	6.912	.000[c]
	Residual	977.078	335	2.917		
	Total	1077.881	340			

a. Dependent Variable: TOI_avg_corrected

b. Predictors: (Constant), S_YY, S_XX, S_XY

c. Predictors: (Constant), S_YY, S_XX, S_XY, Zscore(SERVW_avg), Zscore(SERVD_avg)

Coefficients[a]

Model		Unstandardized Coefficients: B	Std. Error	Standardized Coefficients: Beta	t	Sig.	Collinearity Statistics: Tolerance	VIF
1	(Constant)	-1.053	.135		-7.804	.000		
	S_XX	.268	.108	.196	2.493	.013	.457	2.188
	S_XY	-.602	.161	-.408	-3.743	.000	.238	4.204

	S_YY	.164	.110	.127	1.489	.137	.391	2.559
2	(Constant)	-1.064	.135		-7.896	.000		
	S_XX	.211	.113	.154	1.858	.064	.395	2.532
	S_XY	-.446	.164	-.302	-2.724	.007	.220	4.551
	S_YY	.135	.112	.104	1.207	.228	.365	2.740
	Zscore(SERVD_avg)	.421	.131	.237	3.200	.002	.495	2.021
	Zscore(SERVW_avg)	-.468	.122	-.263	-3.844	.000	.576	1.736

a. Dependent Variable: TOI_avg_corrected

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance	VIF	Minimum Tolerance
1	Zscore(SERVD_avg)	.082[b]	1.296	.196	.071	.702	1.424	.227
	Zscore(SERVW_avg)	-.144[b]	-2.474	.014	-.134	.818	1.223	.238

a. Dependent Variable: TOI_avg_corrected

b. Predictors in the Model: (Constant), S_YY, S_XX, S_XY

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	S_XX	S_XY	S_YY	Zscore(SERVD_avg)	Zscore(SERVW_avg)
1	1	2.973	1.000	.03	.03	.02	.02		
	2	.583	2.257	.61	.00	.08	.01		
	3	.341	2.951	.01	.46	.00	.33		
	4	.102	5.389	.34	.51	.91	.63		
2	1	3.116	1.000	.02	.02	.01	.02	.01	.00
	2	1.595	1.398	.03	.00	.00	.01	.12	.16
	3	.606	2.268	.43	.00	.06	.02	.04	.13
	4	.339	3.033	.12	.01	.01	.09	.56	.65

5	.246	3.558	.13	.55	.01	.26	.22	.01
6	.098	5.649	.28	.42	.91	.61	.05	.04

a. Dependent Variable: TOI_avg_corrected

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.599	3	17.533	5.763	.001[b]
	Residual	1025.282	337	3.042		
	Total	1077.881	340			
2	Regression	100.803	5	20.161	6.912	.000[c]
	Residual	977.078	335	2.917		
	Total	1077.881	340			

a. Dependent Variable: TOI_avg_corrected
b. Predictors: (Constant), S_YY, S_XX, S_XY
c. Predictors: (Constant), S_YY, S_XX, S_XY, Zscore(SERVW_avg), Zscore(SERVD_avg)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.053	.135		-7.804	.000		
	S_XX	.268	.108	.196	2.493	.013	.457	2.188
	S_XY	-.602	.161	-.408	-3.743	.000	.238	4.204
	S_YY	.164	.110	.127	1.489	.137	.391	2.559
2	(Constant)	-1.064	.135		-7.896	.000		
	S_XX	.211	.113	.154	1.858	.064	.395	2.532
	S_XY	-.446	.164	-.302	-2.724	.007	.220	4.551
	S_YY	.135	.112	.104	1.207	.228	.365	2.740

	Zscore(SERVD_avg)	.421	.131	.237	3.200	.002	.495	2.021
	Zscore(SERVW_avg)	-.468	.122	-.263	-3.844	.000	.576	1.736

a. Dependent Variable: TOI_avg_corrected

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance	VIF	Minimum Tolerance
1	Zscore(SERVD_avg)	.082[b]	1.296	.196	.071	.702	1.424	.227
	Zscore(SERVW_avg)	-.144[b]	-2.474	.014	-.134	.818	1.223	.238

a. Dependent Variable: TOI_avg_corrected

b. Predictors in the Model: (Constant), S_YY, S_XX, S_XY

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	S_XX	S_XY	S_YY	Zscore(SERVD_avg)	Zscore(SERVW_avg)
1	1	2.973	1.000	.03	.03	.02	.02		
	2	.583	2.257	.61	.00	.08	.01		
	3	.341	2.951	.01	.46	.00	.33		
	4	.102	5.389	.34	.51	.91	.63		
2	1	3.116	1.000	.02	.02	.01	.02	.01	.00
	2	1.595	1.398	.03	.00	.00	.01	.12	.16
	3	.606	2.268	.43	.00	.06	.02	.04	.13
	4	.339	3.033	.12	.01	.01	.09	.56	.65
	5	.246	3.558	.13	.55	.01	.26	.22	.01
	6	.098	5.649	.28	.42	.91	.61	.05	.04

a. Dependent Variable: TOI_avg_corrected

Figure 1. Response Surface for Research Needs-Supplies Fit on Turnover Intentions

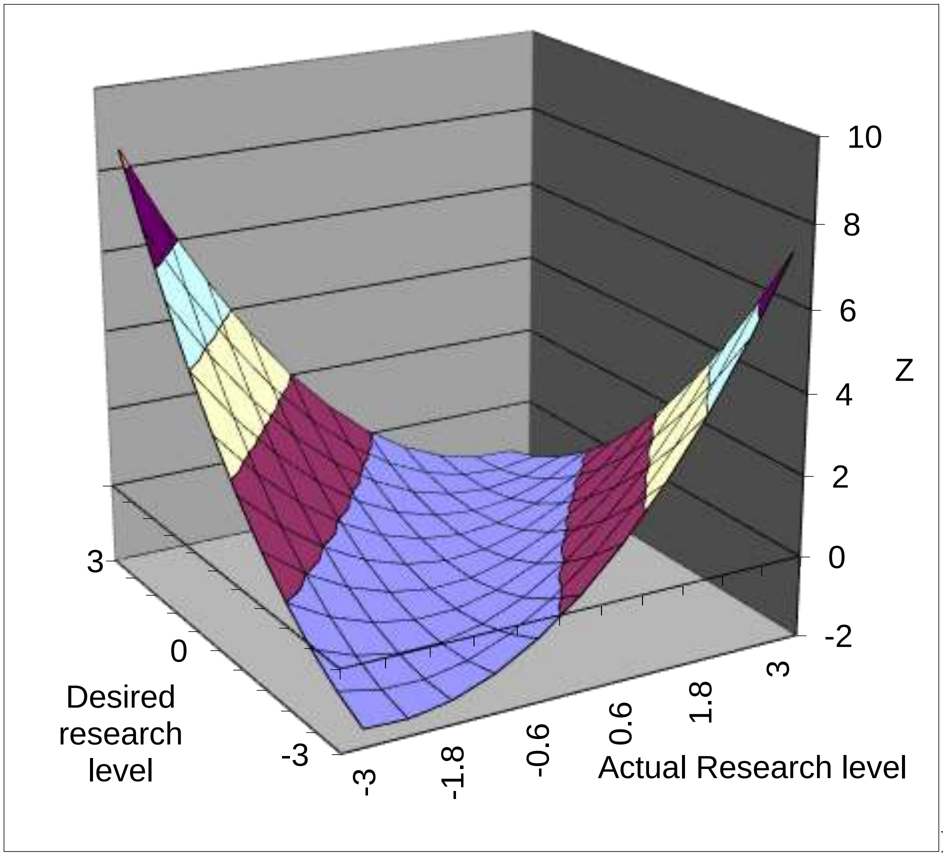

Figure 2. Response

Surface for Teaching Needs-Supplies Fit on Turnover Intentions

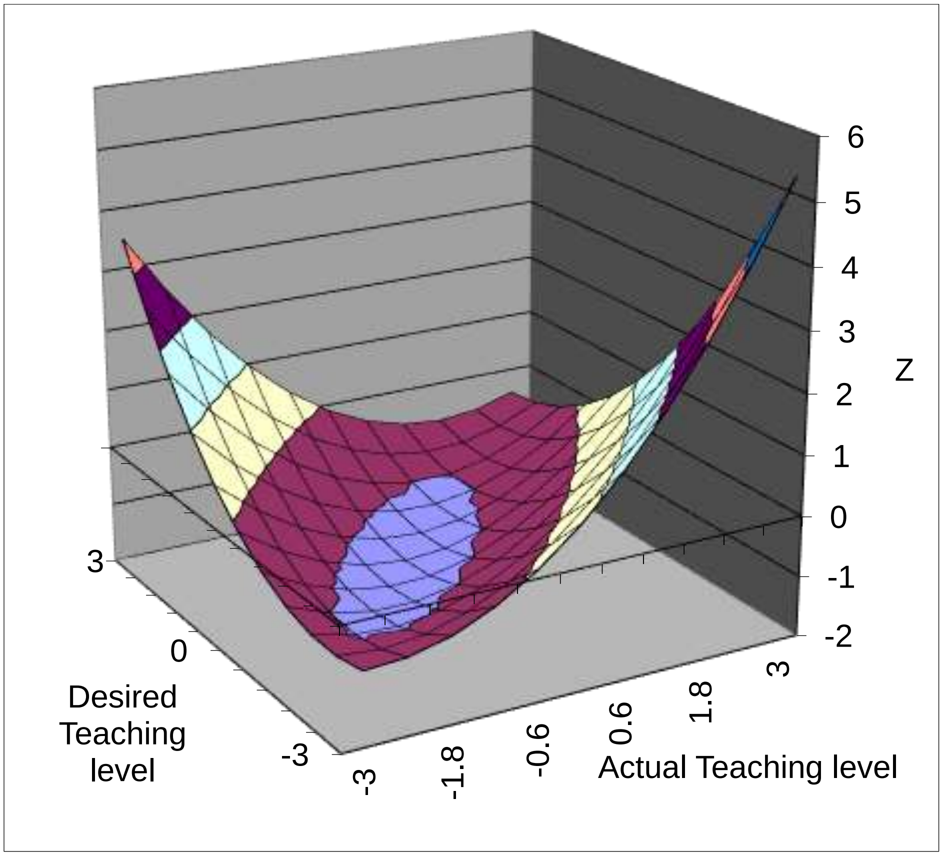

Figure 3. Response Surface for Service Needs-Supplies Fit on Turnover Intentions