

Examining the Relationship between Expectation-Disconfirmation and Faculty Vitality: An Empirical Study

Jian Li, Jinhui Xu

Abstract – In current academic situation, more and more faculty is facing with the stressful career. It is critically significant for the sustainable development of faculty vitality. In this study, based on Faculty Vitality Index by IUSM, included three measurements: Professional Engagement (PE), Career Satisfaction (CS) the Productivity (CP), the purpose of this study is to investigate the relationship between expectation–disconfirmation and faculty vitality. It highlights that the expectation is directly influenced the faculty vitality. Additionally, the track of faculty has profound impact on the expectation. This research has provided a new insight into the variances in overall Faculty Vitality Index. Briefly, this study also suggested that equitable funding resource allocation, supportive academic peers and collegial work environment could be incentives power to enhance the positive relationship between expectation and faculty vitality.

Keywords – Faculty Vitality, Self-Expectation, Teacher Effectiveness. Higher Education, Faculty Learning.

I. INTRODUCTION

Due to institutional accountability and flexibility, the pressure on faculty involves in intense competition for grand and research funding, simultaneously, seeking for obtaining higher scholarly performance for tenure-track and academic advancement. According to the data of National Institutes of Health (NIH), the rate of funding allocation decreased from 32% in 1999 to 10% in 2015. Thus, there existed extensively pressures on faculty research performance in academic medicine. Such pressures are correlated with increasing stressful factors. Specifically, Schindler et al. (2006) [1] indicated that there is 20% of the faculty among almost 3,000 people in four U.S. medical schools have same symptoms of pressure and depression in academic medicine. Additionally, Kelly et al. (2007) [2] suggested that 42% of faculty have not sufficient and ample time to arrange academic research in academic medicine schools. Other relevant study has shown physician faculty was little satisfied with stressful situation that lagged behind peers in processing academic rank and tenure status (Buckley et al. 2000) [3]. The rising concern about how to balance academic and clinical engagement catches researcher attention to alleviate imbalance situation. Shanafelt et al. (2009) [4] highlighted that the shortage of time to manage the schedules between research and clinical could be associated with emotional exhaustion.

In accordance with the concept of faculty vitality, many scholars have various discussions in higher education field. However, there are still unclear definitions of “faculty vitality” in higher education and academic

medicine. Specifically, Clark et al. (1985) [5] identified that, intangible positive qualities of individuals and institutions that enable purposeful production. Baldwin (1990) [6] made comparisons between productivity and satisfaction among faculty. Sambunjak et al. (2006) [7] conducted research on mentoring in academic medicine faculty performance and satisfaction. Indeed, there are some limitations of prior definition models, considering beyond descriptive and categorical. (Mary E. Dankoski et al. (2012)) [8]. Based on prior research on faculty vitality, this survey was conduct by the school of Medicine, Indiana University, developing the conceptual model of faculty vitality that was identified as “the synergy between high level of satisfaction, productivity, and engagement that enables the faculty member to maximize her/his professional success and achieve goals in concert with institutional goals.” According to the definition of faculty

Vitality by IUSM, the purpose of this study is to figure out the relationship between expectation–disconfirmation and faculty vitality.

II. CONCEPTUAL FRAMEWORK

A. Expectancy–disconfirmation Theory

Stemming from the field of consumer behavior research, expectancy – disconfirmation theory refers to develop different expectation of service quality associated with personal experience, advertising, or on other ways (Cardozo, 1965; Erevelles & Levitt, 1992) [9] [10]. Anderson et al. (1993) [11] noted that expectation disconfirmation has been served as a determinant of consumer satisfaction in the study of product and service. Additionally, it has been associated by a wide variety of public management. More fundamentally, this theory can provide a theoretical basis on empirical research about the determinants of personal satisfaction with specific types of service. Liu et al (2012) [12] suggested that expectancy – disconfirmation theory could provide a comprehensive insight into coping with some issues about declining resource or service cutback that were faced by public managers and policy makers.

Oliver (1980) [13] and Ryzin (2004) [14] have shown that expectancy– disconfirmation model and related crucial hypothesis (See Figure1). As seen in this figure, it is worth noting that high expectation leads to more negative disconfirmation and high performance produce more positive disconfirmation. In the meanwhile, the disconfirmation caused relevant positive effect on satisfaction. Thus, it highlights that the positive disconfirmation makes positive satisfaction; the negative disconfirmation makes negative satisfaction. More

specifically, the correlation between expectation and performance could have a positive effect on the satisfaction. Excellence performance has positively and significantly influence on satisfaction. Additionally, Poister & Thomas (2011) [15] indicated that expectancy – disconfirmation could be considered as a mechanism of performance part. Cardozo (1965) [13] suggested that the prior expectation as a baseline or beginning point produced and formulate personal satisfaction judgment on evaluating task is ambiguous or tough. Thus, the chain of expectation might lead to positive or negative influence on satisfaction. The study of Public management adopted and conducted expectancy –disconfirmation theory in recent years. Van Ryzin (2004) [14] showed that expectation was definitely correlated with disconfirmation and performance as one part of overall citizen satisfaction. In addition, using the statewide data from Georgia, Roch et al (2009) [16] had concluded that citizen satisfaction with public service, such as schools, policing and trash collection, was relatively higher when perceived performance exceeded their expectation and otherwise significantly lower when it did not. Thus, it important to note that the fact that the relationship between expectation and satisfaction might be indirect-oriented or direct-oriented still cannot accurately measured. However, according to recent research by Morgenson (2012) [17], using data from the American Customer satisfaction Index, found final results and outcomes that were similar to the results of Van Ryzin research about local government satisfaction.

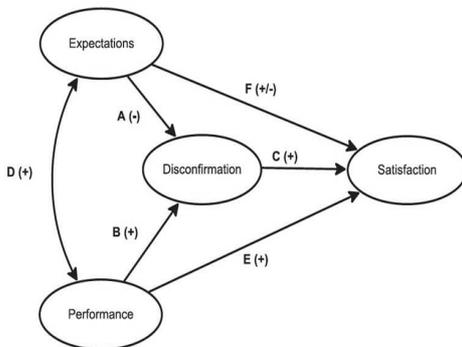


Fig. 1. Expectancy-Disconfirmation Model [14]

According to the Expectancy–disconfirmation Theory, expectation has a significantly effect on satisfaction. Specifically, Barnes et al. (1998) [18] suggested that there are two primary factors affecting satisfaction of faculty in academic life, including collegiality and a sense of community. Moreover, faculty members have significantly pressure on the development of academic, with publishing extensively, securing prestigious grants, and arranging in variety of activities and programs.

Therefore, the dissatisfaction occurred in many academic units, concerning about complicated obstacles of academic field. Thus, in accordance with the literature review on faculty vitality, it is true that new model of faculty vitality is needed instead of prior patterns. More specifically, Expectancy –disconfirmation Theory has provided an insight to investigate new faculty vitality index pattern. Based on the Expectancy –disconfirmation

Theory as mentioned before, theoretical frame in this study was shown in Figure 2. Generally, expectation has significantly effect on satisfaction.

More specifically, the disconfirmation led to relevant considerable effect on satisfaction. In academic background, three key expectations, which contain funding, publications and peer contact, directly or indirectly influence the satisfaction of faculty. In another word, the positive disconfirmation of funding, publication and peer contact makes positive satisfaction of academic performance; otherwise, the negative disconfirmation makes negative satisfaction of academic development. Hence, the purpose of the study is to investigate the relationship between expectation and faculty vitality, served as structural independent variables and academic expectation that served as latent variables by using structural equation modeling (SEM) analysis.

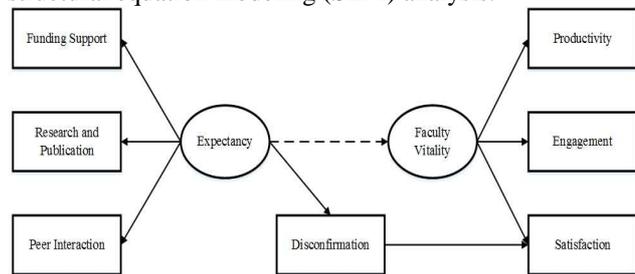


Fig. 2. Theoretical Framework in this study

B. Method

Based on the sample obtained in spring 2014 from IUSM Faculty Vitality Development Coordinating Committee, all data were analyzed using Mplus6.0 statistical software. Random sampling was used to select different departments from each program. A total of 1135 faculty participants were recruited. This study was approved by the IU School of Medicine. Of the 1002 respondents, 33(3%) were the missing data. As shown in Table1, female was over 38% of final sampling; male was 62% of final sampling. Three quarters (77%) of the faculty in this study is White (non-Hispanic), with 8% Asian/Pacific Islander. 9% of the faculty had an MD, 79% of sampling had PHD, and the remaining 12% reported to MA/MS. 38% of the faculty was fixed term track and remaining 62% of the sampling was Tenure/ Tenure track.

Table 1. Descriptive statistics of demographic characteristics of the participants

Variable	N	Percentage
Sex	1102	
Male	683	61.98%
Female	419	38.02%
Race	937	
Asian/ Pacific Islander	88	7.99%
White (Non-Hispanic)	849	77.04%
Degree	1101	
MD	99	8.98%
Ph.D	870	78.95%
MA / MS	132	11.98%
Track	1101	
Fixed Term	418	37.93%
Tenured/ Tenure Track	683	61.98%

C. Statistical Analysis

A structural equation model was used to test and estimate the relationship among observed variables and latent variables. The hypothesized structure of this model was depicted in Figure 3. The structural equation model contained two sectors, a measurement modeling and a structural modeling. The measurement modeling concentrated on the relationship between measurement and latent variables and then structural modeling focused on the relationship between observed and latent variables.

Missing data patterns were checked and considered in the whole dataset. A total of 33 values out of 1135 were missing (3% of the total number of values). Rubin (1976) [19] defined three types of missing data mechanism, including missing completely at random (MCAR), missing at random (MAR), and missing not at random (MNAR). Specifically, the data of IUSM was the type of missing at random (MAR) with merely deleting the missing data could fall in a biased estimation. The method that addressing this problem on missing data refers to conduct multivariate imputation by chained equations (MICE). Additionally, MICE could lead to significantly flexibility in making multivariate models, and efficiently works in some specific applications, which a shortage in suitable multivariate distribution could be found and used. The predictors for the variables of missing data were selected by matching the predictive mean in the MICE method. Under the rule of Rubin, combing the outcomes by multiple imputed sets of data is to estimate the parameter of the data set. A diagonal weight matrix with standard errors and a mean-and variance was used to estimate the least square parameter, with involving binary and ordered categorical dependent variables. Accounting for improper parameter constrains with the DELTA, this model could be estimated by the THETA parameterization. Meanwhile, Chi-square test, root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker-Lewis index (TLI) were used to evaluate whether this assuming models fit the data well or not. T-test and bootstrap resampling method was used to evaluate the relationship between observed and latent variables and calculate at 95% confidence intervals with replacement and making phantom samples for the statistic of interest.

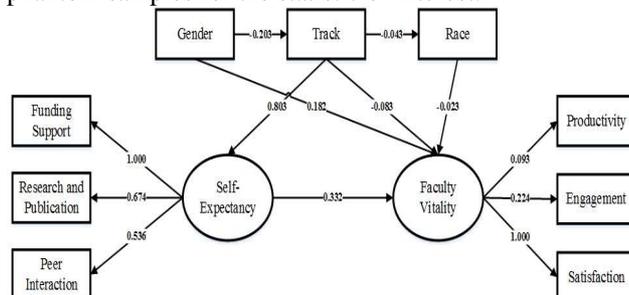


Fig. 3. Hypothetical model tested in this study

III. FINDINGS

Table 2 has shown the descriptive statistics. In the model fit, the chi-square value was large (518.586), and the test result was significant ($p < 0.01$), (RMSEA = 0.065,

CFI = 0.947, TLI = 0.922). The relevant result could suggest that the structural equation modeling did not fit very well. Because the result that RMSEA 0.065 was greater than 0.05 and CFI 0.947, TLI 0.922 were higher than 0.09 was indicated to desirable for this model. Thus, as shown in Figure 3, according to the statistic results, the initial hypothetical model and paths were required to modify. Specifically, the results of the modeling tests have shown that the path of expectation on gender was not significant and removed from this hypothesis model.

Additionally, expectation on track as insignificant path was deleted to the modeling. The factor loading of this model was shown in Table 2. A significant chi-square test result (228.568, $p < 0.01$) demonstrated a good fit and in the other fit index tests with the RMSEA (0.045) was lower than 0.06, and both CFI (0.978) and TLI= (0.968) were above 0.95. According to Hu and Bentler (1999) [20], this model was suggested to be desirable for model selection. In other word, this measurement model fit the data very well by remove variables associated with gender and race,

The results of structural testing model were shown in Table 3. The results demonstrated that the hypothesis that expectation provided significantly effect on faculty vitality and the track also influenced the expectation.

Furthermore, self-expectation have a significantly effect on satisfaction of faculty. However, there is on significant relationship among gender, race and expectation.

IV. DISCUSSION

The study of faculty vitality is associated with the expectation toward funding, publication, and peer contact. Furthermore, gender and race were also found to negatively affect on expectation of faculty in academic filed. In this research, the findings of current study support the hypothesis that there are definitely correlation between faculty vitality and expectation. It is notable that gender and race was not significant in this study with relevant literature about gender and race difference in academic performance and faculty vitality. Implementation of the project on the improvement of the women and Asian faculty in IUSM might mitigate the negative effect from gender and race stance. Palmer et al (2010) [21] noted that multiple initiatives associated with faculty development and the advancement of gender has provided by OFAPD.

V. LIMITATIONS

Based on Faculty Vitality Survey of IUSM, Indianan University, there still have specific limitations. On the one hand, this IUSM survey required to refined and improved for structural equation modeling analysis with the constrains that this questionnaire of faculty vitality was not focused on the measurement of SEM. On the other hand, only Indian University data set was provided to analysis the relationship between expectation and satisfaction in faculty vitality. However, due to IUSM is one of the most largest medicine's schools in U.S. Therefore, the findings may be generalized to the whole part of medicine schools. Furthermore, these results

demonstrated the other indexes that might affect the measurements of faculty vitality. More importantly, the findings of this study provided crucial scientific evidence for policy makers to manage relevant administrative policy to improve the productivity, engagement, satisfaction and expectation for the development of faculty academic performance.

VI. CONCLUSIONS

It highlights that the expectation is directly influenced the satisfaction of faculty. Additionally, the track of faculty has profound impact on the expectation. Specifically, considering the pattern of a competitive pay and benefit structure that based on the faculty performance and ranks, this salary allocation structure could motivate faculty members to perform at higher levels. However, in conjunction with this salary pattern, the pressure and dissatisfaction toward external funding, academic performance and administrative affairs lead to negatively perform in academic productivity. Additionally, Norman (2005) [22] indicated that, "The salary of senior faculty members "generally acts as a catalyst in decisions to leave when compounded by other, more powerful sources of dissatisfaction" (p. 813). Hence, there are specific and complicated discussion on the expectation and satisfaction of different classification of faculty. Moreover, Gappa et al (2007) [23] demonstrated that "faculty members choose an academic career because it offers autonomy, intellectual challenges, and freedom to pursue personal interests" (pp. 105). It is worth noting that autonomy, intellectual competition and personal interested also have profound impact on the relationship between expectation and faculty vitality.

The findings provided significantly understanding of the concept of faculty vitality. It is worth noting that the negative pressure and dissatisfaction of current academic environment that influencing productivity and development of faculty should be considered by policymakers and administrators. This study also suggested that equitable funding resource allocation, supportive peers and collegial work environment could incentive the positive relationship between expectation and faculty vitality. Therefore, institutions should foster the rational, collaborative and comprehensive mechanisms to encourage healthy improvement of faculty vitality.

ACKNOWLEDGMENT

This project was support by the Project on Academic, Center of Postsecondary Research, Indiana University.

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