# Assessing Preservice Teachers Passion for Teaching

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## Abstract

The present study analyzed the Passion for Teaching Scale using a Partial Credit Rasch Model. The passion scale was anchored on the framework by Vallerand et al. (2003) with dimensions harmonious and obsessive passion. The model was contextualized for teaching and items were written pertaining to preservice teachers' passion for teaching. The scale was administered to 137 preservice teachers taking a course in education in a private university in Manila. The results of the Partial Credit Model showed that the scale calibration for both the harmonious and obsessive passion were monotonic. The scale categories are ordered appropriately based on the responses of preservice teachers. There are equal probabilities along the categories measured by each scale. The scales also shows measurement precision based on the Test Information Function.

## Introduction

Passion has been studied in variety of context such as sports and the arts. Passion can also be explored in an academic setting such as students' inclination towards their course such as a course in education. There is a need to study passion in other context such as teaching in order to test the generalizability of the variable across different situations. Preservice teachers can be passionate about their teaching. Passion is a strong inclination toward an activity (such as teaching) that people like, they find important, and which

they invest time and energy is termed as passion (Vallerand et al., 2003, 2008, 2010). Passion in teaching occurs when the activity defines the identity of the individual ("I am a teacher," "I am an educator," "I am a trainer"). Some teachers who teach controls the appropriate situation when to engage in it (autonomous internalization of the activity) while some individuals are overpowered by the activity because of their extreme engagement (controlled internalization of the activity). Given this scenario, Vallerand (2003) distinguished two kinds of passion: Harmonious passion (HP) and obsessive passion (OP). Vallerand et al. (2003, p. 7575) defined harmonious passion as:

> Harmonious passion results from an internalization of the activity into the person's identity. An autonomous internalization occurs when individuals have freely accepted the activity as important for them without any contingencies attached to it… Individuals are not compelled to do the activity but rather they freely choose to do so. With this type of passion the activity occupies a significant but not overpowering space in the person's identity and is in harmony with other aspects of the person's life.

On the other hand, obsessive passion is defined as (Vallerand et al., 2003, p. 757):

> Obsessive passion (OP)… results from a controlled internalization of the activity into one's identity. Such internalization originates from intrapersonal and/or interpersonal pressure either because certain contingencies are attached to the activity such as feelings of social acceptance or self-esteem, or because the sense of excitement derived from activity engagement becomes uncontrollable. Thus, although individuals like the activity, they feel compelled to engage in it because of these internal contingencies that come to control them. They cannot help but to engage in the passionate activity. The passion must run in its course as it controls the person. Because activity engagement is out of the person's control, it eventually takes disproportionate space in the person's identity and causes conflict with other activities in the person's life.

Harmonious passion is demonstrated by a teacher who will stop teaching when they are tired and needs to eat lunch. However, a teacher that is obsessively passionate with teaching will continue to teach and will skip eating to continue teaching.

The distinction between harmonious and obsessive passion was theoretically tested by Vallerand et al. (2003) by first devising a pool of items that reflects the definition of the two constructs. An exploratory factor analysis was conducted and the hypothesized items that loaded to two factors that explain 54.7% of the total variance. The items loaded appropriately under harmonious and obsessive passion as hypothesized. The two latent variables were further tested using a Confirmatory Factor Analysis (CFA) where the items under each factor served as indicators. The results of the EFA showed all items loaded significantly under their respective factor and the model showed to have adequate fit.

The model of passion by Vallerand has been contextualized in task such as sports, arts, gambling, and leisurely activities but not in teaching. The present study will adapt the two models of passion by Vallerand by contextualizing it on preservice teachers passion for teaching.

Since the conception of the dualistic model of passion and the creation of the passion scale (Vallerand et al., 2003), researches have been widespread to look into the applicability of passion across many different fields, occupations, and activities (see Vallerand, 2010 for a review). For example, a validation of the passion scale among Spanish workers employed in different entrepreneurial companies showed that the two-factor structure of passion can be observed in the workplace, and that harmonious passion was seen to have a robust correlation to job satisfaction (Ramos, Ales, & Gonclves, 2014). In sports, a study validated the applicability of the passion scale among individuals who frequently (e. g., 8 times a week) visits the fitness centers to fulfill their exercise regimen. The results showed that the passion scale was a valid instrument to measure passion. It was given to exercising participants who confirmed the dualistic model of passion (Parastatidou, Doganis, Theodorakis, & Vlachopoulos, 2012). In relationships, couples who were seen to have obsessive passion experience problems (i. e. fights) in their relationship, and couples exhibiting obsessive passion experience otherwise (Levesque, Lyne, Lalibertea, Pelletier, Blanchar, & Vallerand, 2006).

The studies used the passion scale to measure obsessive and harmonious passion for different life activities. Previously, the passion scale was used and construed with the similar findings through different activities (Schellenberg, Gunnell, Mosewich, & Bailis, 2014). However, since the researches in passion spawned to different occupations and life activities, it is argued that the use and interpretation of the passion scale across different occupations and life activities needs to be tested in other context. Each activity

and occupation is distinct from the other considering the complexity and the diverse demands of each activity.

The present study addresses the need to construct a perspective of passion in a specific occupations and academic activity, specifically teaching. The present study constructed a passion for teaching scale using the theoretical framework of the dualistic model of passion conceptualized by Vallerand and colleagues (2003). Aside from contextualizing passion for teaching, an Item Response theory was used to analyze the items. More specifically, a Partial Credit Rasch model was applied. Majority of the analysis conducted for the passion scale only made use of Classical Test Theory like the principal components analysis to look at the sources of the variations among the items. For example, Vallerand et al. (2003) extracted the two-factor model using a maximum likelihood approach with an oblimin solution. The exploratory factor analysis showed that the two-factor solution had 5.62 and 2.05 eigenvalues which explains 54% of the total variance. In the same study, the two factor solution was tested using Confirmatory Factor Analysis, the model attained a good fit with RMSEA=.073, CFI=.93, and NNFI=.91. External validity was also conducted for the passion scale with other measures such as the Positive and Negative Affect Schedule (PANAS) (r= -.03 for HP and r=.49 for OP), flow (r=.38, r=.16, r=.24 for harmonious passion). Divergent validity was also established between harmonious and obsessive passion when contextualized in sports (.49). The analysis conducted for the passion scale was mostly based on the classical test theory approach. The Item Response Theory approach can provide further support about the accuracy of the scale. In a Partial Credit Rasch Model, detection of the uniformity of the distribution of response frequencies for the four point scale is made possible. In addition, the Partial Credit Model can test the step calibration in a monotonic fashion, and the fit of the items to the model is assessed.

## Method

### Participants

A total of 137 undergraduate students enrolled in different preservice education programs in a university in Manila participated in the study. Among these subjects, 95 (69.3%) were females and 42 (30.7%) were males. Participants' ages ranged from 18 to 22, with an average age of 18.8 (SD= .85). All the participants are majoring in secondary education with a focus on social science teaching and English teaching.

## Instrument

The present research utilized the 60-item Passion for Teaching Scale (PTS) developed by Magno and Mamauag (2013). The PTS assesses a preservice teacher's harmonious passion towards teaching (i. e., I will surely gain a sense of fulfillment when I start teaching; $\alpha=.86$) and obsessive passion towards teaching (i. e., I cannot sleep thinking about my class the next day; $\alpha=.70$). Participants rated the items using a 4-point Likert scale from 1= Strongly Agree to 4=Strongly Disagree. The internal reliability of the scale was $\alpha=.76$.

## Procedure

A graduate student served as an examiner in the in the administration of the scale among the participants. The examiner briefed the participants about the purpose of the study, the voluntary nature of their participation, the confidentiality of their responses, and the general instructions in answering the instrument. The participants took approximately 30 minutes to complete the questionnaire. After the data collection phase of the research, the responses of the participants were encoded for data analysis.

## Data Analysis

The Rasch model is used to determine the items that are highly and less endorsed, items that are easy and difficult, and items that fit the Partial Credit Rasch model. The primary output of Rasch analysis is a set of item difficulty and person ability values placed along a single interval scale. Items with higher difficulty scores are less likely to be endorsed, and items with lower scores are more likely to be endorsed, and those with lower ability are less likely to posses the characteristic (Magno & Ouano, 2009). Rasch analysis (a) estimates the difficulty of polytomous items as the natural logarithm of the odds of answering each item correctly (a log odds, or logit score), (b) typically scales these estimates to mean = 0, then (c) estimates person ability scores on the same scale. In the analysis of polytomous items, item difficulty and person ability are defined such that when they are equal, there is 50% chance of high response, as person ability exceeds item difficulty, the chance of a high response increases as a logistic ogive function, and as item difficulty exceeds

person ability , the chance of success decreases. The formal relationship among response probability, person ability, and item difficulty is given in the mathematical equation by Bond and Fox (2001, p 201). A graphic plot of this relationship, known as item characteristic curve (ICC), is given for three items of different difficulty levels.

## Results

The 60 items of the passion of teaching scale was initially tested as a two-factor model using a Confirmatory Factor Analysis (CFA). The two-factor model in the CFA did not attain a good fit with indicators RMSEA=.13, PGI=.46, GFI=.39. Another CFA was tested where the items that were not significant in the initial CFA were removed resulting to 17 items of harmonious passion and 15 items of obsessive passion. The residuals of the 17 items of harmonious passion were correlated and the same procedure was done among the items of the obsessive passion. This procedure assumes that the commonalities among the items for each factor accounts for explaining the latent variable (Cole, Ciesla, & Steiger, 2007). In the second CFA, the fit of the two-factor model of passion for teaching attained fit with RMSEA=.06, PGI=.94, GFI=.96. The comparative fit index also improved from the initial model to the modified model. The fit indices for the first model areAIC=33.34, SBC=35.93, BCC=34.78 and the values for the modified model are AIC=7.81, SBC=7.34, and BCC=9.24. The Cronbach's alpha is .87 for harmonious passion and .64 for obsessive passion. Convergent validity was obtained for the two factors with a correlation of r=.74, p<.01.

The Partial Credit Rasch Model was used each for the harmonious passion and obsessive passion scale. The point measure correlation of the items for harmonious range from .34 to .75 and for obsessive passion the values range from .26 to .63 which suggest that the items are dependent on each other. This also indicates that the items for the harmonious and obsessive passion contribute to define a common construct. The measurement error ranged from 0.1 to 0.12 and 0.1 to 0.11 respectively for harmonious and obsessive passion which indicates dependence among the data. Separate reliabilities are obtained for the Rasch model for persons and items. The person reliability for the harmonious passion is .85 and the item reliability is .96. For obsessive passion, person reliability is .56 and the item reliability is .95. The high values indicate consistency of responses per items and consistency of

person responses in the scale. The infit indices for the items of harmonious and obsessive passion were determined.

Majority of the items for the harmonious and obsessive passion showed to fit the Rasch model with expected infit values of 0.5 to 1.5. The items showed an indication of the absence of redundancy and the presence of homogeneity. Both harmonious and obsessive passion scales also show unidimensionality of the data that tends to support the contribution of items in defining a central construct for the internal structure of the scale.

Table 1
*Item Calibration for the Harmonious Passion Scale*

| Items | MEASURE | IN.MSQ | IN.ZSTD | OUT.MSQ | OUT.ZSTD | PTMA |
|---|---|---|---|---|---|---|
| 61. Becoming a teacher drives me to do equally interesting activities. | -0.61 | 0.86 | -1.31 | 0.84 | -1.28 | 0.64 |
| 62. I can see myself as a teacher as I move to higher levels of education. | 0.29 | 1.03 | 0.36 | 0.98 | -0.15 | 0.75 |
| 63. I gain memorable experiences as I go through my teacher education subjects. | -0.24 | 0.96 | -0.31 | 0.91 | -0.81 | 0.74 |
| 65. My family wants to see me become a successful teacher someday. | -0.69 | 1.17 | 1.49 | 1.34 | 2.46 | 0.34 |
| 66. My teachers look forward to my pursuit of a teaching career. | 0.06 | 0.69 | -3.31 | 0.70 | -2.95 | 0.57 |
| 68. I love teaching as I can do other things simultaneously. | 0.61 | 1.33 | 2.79 | 1.26 | 2.06 | 0.60 |
| 70. My talents will be of good use when I eventually teach. | 0.08 | 0.71 | -3.04 | 0.70 | -2.95 | 0.57 |
| 74. While studying in college, I am able to balance fun and studies. | -0.71 | 1.14 | 1.19 | 1.08 | 0.62 | 0.54 |
| 96. I think I will enjoy teaching. | 0.29 | 1.17 | 1.53 | 1.11 | 1.02 | 0.62 |
| 97. I will gain a sense of fulfillment when I start teaching. | 0.13 | 0.92 | -0.78 | 0.88 | -1.08 | 0.70 |
| 98. I believe that passionate teachers are good teachers. | -0.64 | 1.50 | 4.03 | 1.43 | 3.11 | 0.44 |
| 99. I believe I can be a source of inspiration to others. | -0.23 | 0.68 | -3.34 | 0.64 | -3.63 | 0.58 |
| 100. I believe teaching is like organizing a show. | -0.54 | 0.69 | -3.10 | 0.72 | -2.51 | 0.61 |
| 101. I believe that teachers must put their students as the focus of learning. | 0.59 | 1.50 | 4.06 | 1.41 | 3.11 | 0.56 |
| 117. I make sure that whatever happens, I come to class on time. | 0.09 | 0.98 | -0.20 | 1.04 | 0.43 | 0.38 |
| 118. My schooling in college will be meaningless if I will not become a teacher. | 0.2 | 0.64 | -3.91 | 0.71 | -2.92 | 0.45 |
| 120. I CANNOT imagine myself doing an | 1.35 | 1.18 | 1.38 | 1.17 | 1.10 | 0.39 |

administrative job.

Table 2
*Item Calibration for the Obsessive Passion Scale*

| ENTRY | MEASURE | IN.MSQ | IN.ZSTD | OUT.MSQ | OUT.ZSTD | PTMA |
|---|---|---|---|---|---|---|
| 76. I believe that teachers exist to serve their students. | -0.33 | 0.59 | -4.80 | 0.58 | -4.77 | 0.63 |
| 78. I feel very elated when I start imitating my favorite teacher. | 0.41 | 1.14 | 1.33 | 1.09 | 0.93 | 0.51 |
| 79. I have a strong urge to become a good teacher someday. | 0.09 | 0.68 | -3.70 | 0.68 | -3.65 | 0.62 |
| 82. I am engrossed with the idea of people listening to me when I talk. | -0.22 | 1.32 | 3.00 | 1.28 | 2.60 | 0.51 |
| 83. I will feel incomplete if I think I can never become a teacher. | 0.85 | 0.95 | -0.40 | 1.01 | 0.14 | 0.43 |
| 85. I like extending help to my classmates even when it is late. | -0.89 | 0.53 | -4.96 | 0.52 | -4.58 | 0.47 |
| 89. I am too exacting in my schoolwork. | 0.24 | 0.71 | -3.24 | 0.71 | -3.20 | 0.39 |
| 91. As I grow in the teaching profession, I will commit to my own teaching motto. | -0.53 | 0.85 | -1.47 | 0.83 | -1.60 | 0.61 |
| 92. I am NOT very excited about becoming a teacher. | -0.14 | 1.37 | 3.46 | 1.49 | 4.34 | 0.19 |
| 93. I attend enthusiastically to all my classes. | 0.03 | 0.68 | -3.74 | 0.66 | -3.90 | 0.46 |
| 94. A teacher works hard to be a good example to the students. | -0.52 | 0.72 | -3.03 | 0.73 | -2.67 | 0.43 |
| 112. I will not leave the teaching profession as long as I have a choice. | 0.22 | 1.46 | 9.90 | 2.68 | 9.90 | -0.33 |
| 113. I get upset when I miss a class. | 0.5 | 0.80 | -2.02 | 0.78 | -2.23 | 0.47 |
| 115. I believe that teaching ends after class hours. | 0.28 | 0.90 | -1.04 | 0.89 | -1.09 | 0.26 |

The validity of the two scales was also assessed using the Partial Credit Rasch model. More specifically, the categories of the response scale were assessed based on the criteria provided by Linacre (2002). The functionality of the scale categories needs to have the following: (a) uniform distribution of the response frequencies throughout the different categories with a minimum of 10 observations in each; (b) monotonic progression of the mean measure observed and step calibration throughout the response categories; and (c) an outfit mean square (MNSQ), which is more sensitive than the infitfor unexpected responses, of the response categories of less than 2.0.For the harmonious passion scale, the response frequency ranges from 496 to 669

which are above the requirement of 10. The mean measure observed are .69, 1.34, 1.91, and 2.40 and the step calibration values are -4.67, .49, 1.53, and 2.65which both show monotonic progression in their values. The outfit mean square values are .96, .91, .99, and 1.08which are all below the requirement value of 2.0. Substantial validity is supported for the functioning of the response categories of the harmonious passion scale. As for the obsessive passion scale, the same pattern is observed corresponding to the three criteria. The response frequencies range from 280 to 609 which are more than the requirement of 10. The mean measures observed are .99, 1.15, 1.65, and 1.85 and the step calibration values are -3.73, .31, 1.45, and 1.97 which indicates monotonic progression. The outfit mean square values are also less than 2.0 with values 1.09, .71, 71, and 1.13. The response categories of the obsessive passion scale also showed evidence of substantial validity.

For the harmonious passion scale, the mean of the person infit is .99 and the standard deviation is .37 while the person outfit is 1.00 and the standard deviation is .43. The scale based on person fit statistics assumes good model fit because the number of people with infit and/or outfitabove 1.5 is low. The estimates are also precise for most of the people given the person separation reliability value of .87. This means that there is only a small amount of proportion of people variance that is not explained by measurement error. The same pattern is observed for the obsessive passion scale with values of 1.01 and .37 respectively for the mean person infit and standard deviation, and 1.00 and .37 respectively for the mean person outfit and standard deviation. The values provide evidence of good fit because the number of people with infit and/or outfit above 1.5 is low. Given the value of .87 for person separation reliability, a small amount of proportion of people variance is not explained by the measurement.

Table 3
*Response Category Statistics of the Harmonious and Obsessive Passion Scale*

| | Harmonious Passion | | | | Obsessive Passion | | | |
|---|---|---|---|---|---|---|---|---|
| Category | Observed Frequency | Observed Mean Measure | OUTFIT MNSQ | Step Calibration | Observed Frequency | Observed Mean Measure | OUTFIT MNSQ | Step Calibration |
| 1 | 496 | .69 | .96 | -4.67 | 280 | .99 | 1.09 | -3.37 |
| 2 | 601 | 1.34 | .91 | .84 | 609 | 1.15 | .71 | .31 |
| 3 | 669 | 1.91 | .99 | 1.49 | 575 | 1.65 | .71 | 1.45 |
| 4 | 560 | 2.40 | 1.08 | 2.34 | 451 | 1.85 | 1.13 | 1.97 |

The Test Information Function (TIF) of the harmonious and obsessive passion scales was also analyzed. The amount of precision at different levels of passion varies to some degree between the scales. Greatest precision for the harmonious passion scale is within 5SD below the mean and 1SD above the mean while for obsessive passion precision is 4SD below the mean and 1SD above the mean. The harmonious passion has greater precision than the obsessive passion scale.
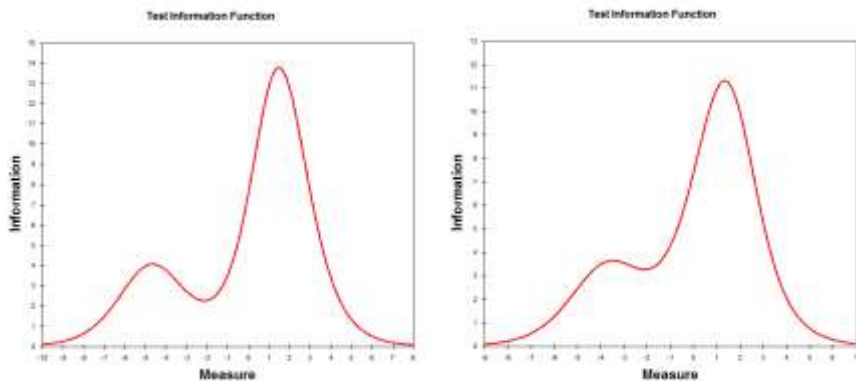


TIF for Harmonious Passion                    TIF for Obsessive Passion

*Figure 1.* TIF for Harmonious and Obsessive Passion

## Discussion

The purpose of the study is to provide further evidence on the validity and reliability of the passion for teaching scale using the Partial Credit Rasch Model. The analysis was conducted each for the harmonious and obsessive passion of the scales. Previous studies has shown the factor structure and internal consistency of the items based on a Classical Test Theory approach. The present study provided further evidence for the scales by analyzing the contribution of the items in a common construct, dependency of the items,

separate estimates for person and item reliability, homogeneity of the items, the functionality of the scale categories, and precision of the measurement of the scale.

First, both the harmonious and obsessive passion showed that the items contributed to define a common construct of passion. This was evidenced by moderate to high values of point measure correlations. This was also supported by small standard error of measurement attained for the model. The small standard errors for each item indicates small amount of noise in the distribution. Validity is defined when items share a common construct or consistent behavior of items (Messick, 1995). The parameters obtained in the items' point measure correlation and standard errors support the validity of the items measuring a single construct of passion.

Second, the reliability of the passion for teaching scale was also adequate for both persons and items. The reliabilities show consistency on the responses of the items and the consistencies of the persons' responses. This is similar in the concept of internal consistency reliability in the case of Classical Test Theory. However, separate estimates of reliability are obtained in the Rasch Model.

Third, the homogeneity of the items to have few redundancies though the estimates of item infit and outfit. This result also supports the unidimensionality of the harmonious scale. The same result was obtained for the obsessive passion scale which indicates unidimensionality. The infit estimates are within the boundaries required in the model which shows that the difficult items are highly endorsed by respondents who have characteristics of passion (ability). Difficult items are those items with positive logit measures and easy items are those with negative logit measures. The most difficult item with a logit measure of 1.35 indicates assuming oneself doing an administrative job. This item is not highly endorsed because the students still see themselves as teachers and not yet as administrators. They are presently mastery the science of teaching and they have not yet progressed in managing other teachers. On the other hand, the easiest item is balancing fun and studying while in college. Balance between fun and study is highly endorsed as explained by the developmental level of the teachers. Most of the respondents are within 17 to 19 years old and the characteristic is typical of this age group.

Fourth, is the functionality of the scale categories are strongly supported. The evidence of the appropriateness of the scale categories fulfilled the criteria set by Linacre (2002). There were more than enough respondents distributed within the four categories of the scale. When these quantities were transformed into logit measures, the four categories showed to have

monotonic increase indicating fit of the categories in the model. The Partial Credit Model assumes that for a scale to be substantially valid, the parameters should be interpreted with difficulties within the steps. The more the participant agrees to the items, the higher is the logit attained showing that the categories are well ordered.

Lastly, the scale showed to be a precise measure of passion as indicated by the Test Information Function (TIF). The harmonious passion scalescovered about 6 SD of the curve and the obsessive passion scale covered about 5 SD of the curve. The large coverage within the curve means that the items also have high degree of precision contributing to the high precision of the entire scale.

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