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An Investigation of the Relationship between the Fear of Receiving Negative Criticism and of Taking Academic Risk through Canonical Correlation Analysis

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Abstract

The aim of this study is to examine the relationship between the fear of receiving negative criticism and taking academic risk through canonical correlation analysis-in which a relational model was used. The participants of the study consisted of 215 university students enrolled in various programs at Dicle University's Ziya Gökalp Faculty of Education during the 2011-2012 spring semester. Of the total 215 participants, 122 were female and 93 were male. The Brief Fear of Negative Evaluation Scale and the Academic Risk Taking Scale were used as data collection tools. In order to properly analyze this relationship, the data set fear of receiving negative criticism was divided into straight forward items and reverse scored item variables whereas the data set academic risk-taking was into a multitude of variables; including, (a) the tendency to manifest negativity after experiencing failure, (b) the tendency to prefer difficult actions, (c) recovery after failure and the tendency to become active again, and (d) the tendency to skip homework. The results of the canonical correlation analysis revealed that significant relationships existed between the fear of receiving negative criticism and academic risk taking behavior. The common variance shared between the two has been calculated at 35%.

Key Words

Academic Risk Taking, Canonical Correlation, Fear of Negative Criticism, Negativeness after Failure, Recovery From A Failure, Skipping Homework.

Students' academic success is influenced both by their cognitive entry behaviors and by their affective characteristics (Senemoğlu, 2005). Cognitive entry behaviors comprise things previously learned which are considered to be prerequisites for learning a specific unit (Bloom, 1979). Affective characteristics, on the other hand, are the source from which students draw their desire and

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motivation to participate in the learning process (Erden & Akman, 2011; Özkan, 2005; Tok, 2008). With this in mind, it is clearly understood that affective factors play a leading role in the realization of effective and permanent learning (Aydın, 2007; Demirbaş & Yağbasan, 2006; Kılıç, 2002; Tekin, 2009). Yet, there are certainly factors which may impede affective characteristics from becoming fully manifest; including, (1) a disorganized inclusion of affective domain related behaviors into the curricula after introducing behaviors related to the cognitive domain (Turgut, 1997) and (2) the difficulty of identifying and evaluating affective factors (Bacanlı, 2006; Senemoğlu, 2005; Tekin, 2009) on account of their complicated nature (Lebens, Graff, & Mayer, 2011). An investigation of affective factors' influence on academic reveals that the following variables are at the forefront: (1) anxiety (Akbaş & Kan, 2007; Gömleksiz & Yüksel, 2003; Hembree, 1990; Hortwitz, 2001; Richardson & Suinn, 1972), (2) attitude (Hemmings, Grootenboer, & Kay, 2011; Lucas, 1998; White, Way, Perry, & Southwell, 2006), (3) interest (Heinze, Reiss, & Rudolph, 2005; Jones, 1964; Koller, Baumert, & Schnabel, 2001; Kuzgun, 2006; Renninger, Hidi, & Krapp, 1992; Sing, Granwiller, & Dika, 2002), and (4) motivation (Akbaba, 2006; Middleton & Spanias, 1999; Wigfield & Wentzel, 2007). However, the strong influence of affective characteristics on fulfilling learning-teaching objectives (Chastain, 1975; Gömleksiz, 2003; Ellez, Gümüş, & Seferov, 2009; Oral, 2010; Tobias, 1991) necessitates one to consider different affective characteristics; particularly, (1) perfectionism degree (Altun & Yazıcı, 2010; İlhan & Öner Sünkür, 2012; Parker, 2000; Ram, 2005; Soleymani & Rekabdar, 2010; Stoober & Rambow, 2007; Tsui & Mazzocco, 2006) and (2) the level of hopelessness one feels toward a specific course (Yenilmez, 2010). In this vein, one of the affective characteristics necessitating consideration in student behaviors in the teaching-learning process is the fear of receiving negative criticism and evaluation (Dinnel et al., 2002; Kocovski & Endler, 2000).

The fear of receiving negative criticism is defined as feeling excessive and constant anxiety (Aydın, 2008; Leary, 1983; Weeks, Heimberg, & Rodebaugh, 2008) that one will be criticized in a negative and hostile way by others (Leary, 1983). This leads the individual to believe that (1) s/he will be evaluated in undesirable manners while preparing for or participating in a social event (Weeks et al., 2005), (2) the belief that others expect highly of him/her in situations requiring social performance, (3) doubting one's own talent and ability to perform (Rapee & Heimberg, 1997), and (4) the formation of conditional beliefs that s/he will be isolated if s/he makes a mistake (Clark & Wells, 1995). As a result of such beliefs, an individual who has such fears of being negatively evaluated will avoid social contexts and situations requiring social performance in order not to experience rejection, seeking instead behaviors that do not take him/her out of his safety zone (Rapee & Heimberg, 1997). The fear of being negatively evaluated also has influence over an individual's behaviors during the learning and teaching process. The fear of receiving negative criticism leads to the several subsequent problems; such as, (1) fear of failure which further decreases the student's tendency to learn (McKinney, 2003; VandeWalle, 1997), (2) a decrease in his/her level of academic self-esteem (Dinnel et al., 2002; Kocovski & Endler, 2000) and academic success (Kuhl & Kraska, 1989), and (3) an increase in both his/her levels of performance goal orientation (McKinney, 2003; VandeWalle, 1997) and of exam anxiety (Dinnel et al., 2002).

Apart from the fear of receiving negative criticism, academic risk taking behavior is another significant factor exerting influence on students' classroom behaviors. Academic risk taking behavior is defined as sharing ideas whose accuracy is not certain, asking questions, and the willingness to attempt both novel and alternative solutions to problems (Beghetto, 2009). In other words, academic risk taking behavior comprises considering both the known and unknown results of participating in a learning act followed by a decision as to whether s/he should participate in the learning process or not (Robinson, 2011). Academic risk taking behavior is explained by Korkmaz (2002) as Recovery After Failure and the Tendency to Become Active Again (RFFTBA), the Tendency to Prefer Difficult Actions (TPDA), the Tendency toward Negativity After Experiencing Failure (TNAF), and the Tendency to Skip Homework (TSH). It may be argued that students whose TNAF and TSH are low, but whose RFFTBA and TPDA are high are more willing to take academic risks (Öner Sünkür, İlhan, Kinay, & Kılınç, 2013). Students whose academic risk taking level is high (1) are willing to participate in in-class activities even if there is risk of failure (Strum, 1971), (2) enjoy the learning process, (3) have a high level of motivation in the learning context (Clifford, 1988; House, 2002) and problem solving skills (Tay, Özkan, & Akyürek Tay, 2009), and (4) attempt to overcome difficulties they face during the learning process (Clifford, 1988). Moreover, such students' learned helplessness feelings (Esen Kıran, 2005; Neihart, 2010) and level of stress related to academic expectancies is low (İlhan & Çetin, 2013). In addition, students who have higher tendency of taking academic risks are more likely to learn (Ames, 1992) and study in order to acquire new knowledge and skills as well as in order to hone their existing talents (Ames & Archer, 1988; Braten & Strømsø, 2004; Dupeyrat & Mariné, 2005). These facilitatory effects (Clifford, 1991) render students who are more willing to take risks in the learning environment to reach higher levels of academic success than those students who are unwilling to do the same (Clifford, 1991; Clifford & Chou, 1991; House, 2002). In this sense, just as supporting academic risk taking behaviors is absolutely critical in terms of its contribution to academic success, so is identifying which variables influence academic risk taking behavior and the degree to which this influence might successfully guide students to increase their academic risk taking behaviors.

An analysis of the literature reveals that individuals who fear negative criticism avoid undertaking personal endeavors involving risk (Boztaş & Sungur, 2001; Durmuş, 2008). In other words, individuals with such fears do not want take the risk of performing certain acts since they assume that they will be unable to bear what they perceive to be dangerous results of said acts (Boyer, 2006; Halstead & Taylor, 1996). This means that academic risk taking behavior is directly influenced by the fear of receiving negative criticism. However, there is been no study as to yet which examines to what extent and in which way the fear of receiving negative criticism influences academic risk taking behavior. As such, the present study aims to examine this specific relationship.

Method

In the present study, a relational model has been used. Relational screening models are study patterns that determine the presence and level of joint variances between two or more variables (Karasar, 2009).

Participants

The population of the study was comprised of a total of 215 university students, 122 (56.7%) being female and the remaining 93 (43.3%) being male, all of whom studying Primary School Teaching at Dicle University's Ziya Gökalp Faculty of Education during the spring semester of the 2011-2012 academic year. Participants were distributed across the faculty's various departments as follows: 48 participants (22.30%) were from the Department of Science Teaching, 60 participants (27.90%) from the Department of Primary School Math Teaching, 21 participants (9.80%) from the Department of Preschool Teaching, 44 participants (20.50%) from the Department of Classroom Teaching, and 42 participants (19.50%) from the Department of Social Studies Teaching. To ensure the reliability of the findings obtained from a canonical correlation analysis, it is recommended that the number of participants to be included in the population be twenty times larger than the number of variables in the data sets (Stevens, 2009). The study contained two variables in the data set *fear of receiving negative criticism;* namely, SFI and RSI and whereas an additional four variables were included in the data set *academic risk-taking;* namely, RFFTBA, TPDA, TNAF, and TSH. Due to the number of variables, the study should have at least 120 participants so as to ensure the reliability of the findings; a criteria which has been fulfilled.

Data Collection Tools

Data for the study were collected through the Brief Fear of Negative Evaluation Scale and the Academic Risk Taking Scale.

Brief Fear of Negative Evaluation Scale (BFNES): The BFNES was developed by Leary (1983) and then adapted into Turkish by Çetin, Doğan, and Sapmaz (2010). The scale was based on a 5-point Likert type scale whose original form contained 12 items. Eight of these items were related to fear and worries about being evaluated negatively. A sample item of this scale: "I am frequently afraid of other people noticing my shortcomings." The remaining four items were comprised of items related to lack of fear and worry about negative evaluation and were scored reversely; as visible in the sample item: "I am unconcerned even if I know people are forming an unfavorable impression of me." The discriminatory index of the fourth item in the original scale was negative, leading to this item being removed from the Turkish form of the scale. Since the original form of the BFNES resulted in both two-factor and single-factor results in separate studies; at first, the results of the basic component method and direct oblimin rotation method factor analyze has been limited with two-factor. Afterwards, a construct explaining 51.50% of the total variance was obtained. In this structure, the first factor, named *straight forward* *items* (SFI) for the purposes of this study, included 8 items whereas the second factor, named *reverse scored items* (RSI), contained three items. As a result of the single factor restriction, a structure explaining 40.19% of the total variance was obtained. A CFA was applied to determine whether the original form was in line with the Turkish sample. With the applied DFA fit, indexes of both the single-factor and two-factor models were researched. Additionally, it was ascertained that the two-factor model's goodness-of-fit index values are better than those of the single-factor model's goodness-of-fit. For this reason, it was decided that the BFNES be used with the two-factor structure in the present study.

In the adaptation study by Çetin et al. (2010), the reliability coefficients related to the Turkish form of the BFNES were calculated only for the single-factor structure. The reliability coefficient for the single-factor structure was found to be .84 through the internal consistency method, while the split-half reliability coefficient was found to be .83 and the test-retest coefficient to be .82. Since the BFNES was used in the two-factor structure in the present study, the reliability coefficients of both the first factor-SFI and the second factor-RSI were calculated. The internal consistency coefficients were calculated at .84 for the first factor, including SFI, and .57 for the second factor, RSI. It is accepted that scales having a reliability coefficient of .70 and higher are reliable (Büyüköztürk, 2010; Nunnaly & Bernstein, 1994), indicating that the reliability of the first factor, including SFI, is satisfactory. As for the scales with a few number items, either a reliability coefficient of .60 and over (Sipahi, Yurtkoru, & Çinko, 2010) or an inter-item correlation coefficient of between .20 and .40 (Briggs & Cheek, 1986) is considered to a score proving the scale's reliability. In the present study, the correlations among the RSI items varied between .26 and .34, meaning that the reliability coefficients for the second factor, which includes RSI, are within acceptable limits.

The Academic Risk-taking Scale: Designed by Clifford (1991) and translated into Turkish by Korkmaz (2002), this scale measures both students' level of courage and their willingness/reluctance to cope with difficulties during the educational process. This five-point Likert type scale contains a total of 36 items whose original form consists of three sub-dimensions; namely, RFFTBA, TPDA, and TNAF. While adapting the scale into Turkish, Korkmaz added an additional dimension called TSH (the tendency to skip homework). In the Turkish version, 11 items are included in the dimension RFFTBA. A sample item from this scale is: "If I get a low grade at school, I work on my mistakes and attempt to deal with the questions again." The second dimension, TPDA, contains 10 items. Sample item: "Difficult school assignments are more entertaining than easy ones." There are 12 items in the third dimension, the TNAF. Sample item: "I get discouraged if I make a mistake in a subject that I have been trying to learn." The additional dimension, TSH, contains three items. Sample item: "If my school assignment is difficult, I attempt to pass the class without doing it." For this scale, one can obtain either separate scores for each sub-dimension or a total score for the whole scale. In addition, Korkmaz tested the reliability of the Turkish version on both university and primary school students. The internal consistency coefficients were .89 and .90 for the former and latter, respectively. The reliability coefficient for the academic risk taking scale as a whole was .81. The internal consistency coefficients were .71, .75, .73, and .64 for the sub-dimensions RFFTBA, TPDA, TNAF, and TSP, respectively. Since it is acknowledged that scales with a reliability coefficient of .70 and higher are reliable (Pallant, 2005; Tezbaşaran, 1997), this scale, both as a whole and all of its sub-dimensions, with the exception of the tendency to skip homework, is considered reliable. However, there is also grounds to consider the additional sub-dimension TSA reliable, for it is acknowledged that it is enough for scales with a small number of items to have a reliability coefficient of .60 and higher to reach sufficient reliability (Sipahi et al., 2010).

Data Analysis

The data were analyzed using SPSS 17.0. A canonical correlation analysis was conducted to study the correlation between the fear of receiving negative criticism and taking academic risk. Canonical correlation analyses are used for studying the correlation between two data sets with at least two variables [(X1, X2, …, Xn and Y1, Y2, …, Ym) and ($n \geq 2$ and $m \geq 2$)] (Bordens & Abbott, 2011). In this method, the correlation between two data sets is revealed through a single analysis. Such analyses, therefore, enables one to control Type 1 errors that can intervene in the measurement (Stangor, 2010). If it is theoretically possible to divide two the data sets into dependent and independent sets, then the canonical correlation analysis can be considered an attempt to identify whether the latter has an influence on the former. Even so, it is not an obligation to divide the two data sets into dependent and independent sets to perform a successful analysis using this method (Albayrak, 2010). In this case, two data sets have been named Set1 and Set2 and the objective of the canonical correlation analysis is to identify the correlation between them (Stevens, 2009).

When performing any canonical correlation analysis, the first thing to do is to determine which linear composites will maximize the correlation between the two data sets (Leech, Barlett, & Morgan, 2005). These new variables derived from the linear composites of the variables are called canonical variables (Afifi & Clark, 2004). The canonical variables on the right and left-hand sides of the canonical correlation equation are called a pair of canonical variables (Tabachnick & Fidell, 2007). The correlation between pairs of canonical variables is called canonical function or canonical root (Sherry & Henson, 2005). Each canonical function consists of two canonical variables (Hair et al., 2010). In a canonical correlation analysis, the maximum number of pairs of canonical variables is equal to the number of variables in the set containing the fewest number of variables (Cohen, Cohen, West, & Aiken, 2003). The first pair of canonical variables derived from the canonical correlation analysis should be calculated in such a way so as to maximize the correlation between sets of variables (Afifi & Clark, 2004). Next, the second pair of canonical variables must be derived. The second pair exhibits the maximum correlation between two canonical variables unaccounted for by the first pair of canonical variables (Stevens, 2009). The canonical correlation decreases in value with each new function derived from the two canonical variables (Hair et al., 2010). In practice, one interprets only the functions with statistically significant differences between the two canonical variables (Tabachnick & Fidell, 2007). Figure 1 presents a general illustration of a canonical correlation analysis.

The purpose of this study is to reveal the correlation between the data set *fear of receiving negative criticism*, which is comprised of the weighted combinations of the variables SFI and RSI, and the data set *academic risk-taking*, comprised of the weighted combinations of the variables RFFTBA, TPDA, TNAF, and TSH. The two data sets contain two and four variables, respectively, meaning that the maximum number of pairs of canonical variables is 2.

Findings

This section of the paper presents the findings reported by the canonical correlation analysis. While performing a canonical correlation analysis, the first thing to do is to study the results of the multivariate tests of significance that exhibit whether the canonical model is statistically significant or not. These tests include Wilks' lambda, Pillai's trace, Hotelling' trace, and Roy's largest root. The significance of the canonical model can also be tested through a transformation of each of these testes into a more common test, the F-test. Considering that each of these four tests rests on a different theoretical basis, each yields different F values. Therefore, authors generally chose to interpret the results on the basis of Wilk's λ, due to its higher level of practicality (Sherry & Henson, 2005).

Table 1.
Multivariate Tests of Significance

Test Name	Value	Approx. F	Hypothesis df	Error df	Significance of F
Pillai's	.35910	11.48929	8.00	420.00	.000
Hotelling's	.52601	13.67622	8.00	416.00	.000
Wilk's	.64960	12.57801	8.00	418.00	.000
Roy's	.33296				

S = 2, M = 1/2, N = 103 1/2

The findings suggest the canonical model obtained in the study to be statistically significant [Wilks's λ=

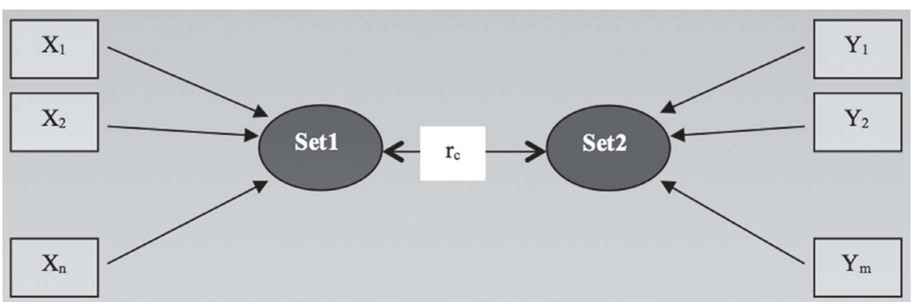

Figure 1.
General Illustration of a Canonical Correlation Analysis

.64960, F(8, 418.00) =12.57801, *p*<.001] (Table I). Even so, the significance of these tests tells nothing of the strength of the correlation. Considering that even very small F values considered insignificant in practice may turn out to be statistically significant in studies with a large number of participants, it is essential that any canonical correlation analysis include an evaluation of effect size independent of the significance of the model. In order to perform such an analysis, researchers use Wilk's λ which is called adverse effect size. Wilk's λ refers to the variance that cannot be accounted for by the canonical variables in the model. Therefore, "1-λ" represents the amount of variance shared by canonical variables and is able to be interpreted in a similar way as R^2 during regression analysis. The "1-λ" value for Wilk's λ in the table was .3504. Thus, the amount of shared variance between the data sets *fear of receiving negative criticism* and *academic risk-taking* was 35%.

In addition to the significance of the canonical model, canonical correlation analyses require each canonical function to be evaluated individually in terms of their significance. Cumulative values of canonical functions are used for testing the significance of the canonical model obtained from a canonical correlation analysis. Therefore, it is possible for a limited number of canonical functions to be significant while others are statistically insignificant in a canonical model in which the cumulative values of the canonical functions are statistically significant. This is the reason behind the necessity to test the significance both of each canonical function individually and of the entire canonical model. The eigenvalues concerning the canonical functions and canonical correlation values are used to decide which canonical functions are significant (Sherry & Henson, 2005). Two canonical functions were derived from the canonical correlation analysis between the data sets *fear of receiving negative* criticism and *academic risk-taking*. Table 2 presents both the eigenvalues of these functions and their canonical correlation values.

The canonical correlation value for the first canonical function was .57703 (Table 2), indicating that the amount of shared variance between the data sets *fear of receiving negative criticism* and *academic risk-taking* in the first function was 33.296%. The second canonical correlation exhibited the maximum correlation between the two canonical variables unaccounted for by the first canonical function. This value for the second canonical function was .16166, suggesting that the amount of shared variance between the two data sets in the second function is 2.614%.

An individual assessment of the significance of each canonical function in the canonical correlation analysis sheds light on the decision as to which function derived from the canonical correlation analysis should be interpreted. Tabachnick and Fidell (2007) maintain that one should interpret only statistically significant canonical functions while performing a canonical correlation analysis. However, Sherry, and Henson (2005) hold that one should square the canonical correlation value calculated for each function, adding these values together and then finally comparing them with the "1-λ" value. The number of functions to be interpreted is determined by the ranking of the function equal to the "1-λ" value when the squares of the values in question are added together. According to this calculation method proposed by Sherry and Henson (2005), the amount of shared variance between canonical variables for the whole model might be lower than the total amount of shared variances obtained from the entirety of canonical functions. This is caused by the nature of the orthogonal/uncorrelated functions. During canonical correlation analyses, the second pair of canonical variables exhibits the maximum correlation between the two canonical variables unaccounted for by the first pair of canonical variables. The second canonical function must be the orthogonal of the first canonical function. Similarly, each calculated canonical function should be the orthogonal of the preceding canonical functions. Thus, the sum total of the canonical correlations squared obtained for all functions might be larger than the amount of shared variance between the canonical variables for the canonical model.

A canonical correlation analysis may also include a dimension reduction analysis used to identify to what extent each canonical function is able to account for the shared variance between data sets. In this type of analysis, canonical functions

Table 2.
Eigenvalues and Canonical Correlations

Root No.	Eigenvalue	Percentage	Cumulative Percentage	Canonical Correlation	Canonical Correlation Squared
1	.49917	94.8903	94.8903	.57703	.33296
2	.02684	5.10197	10.0000	.16166	.02614

are ordered hierarchically in accordance to the level of correlation between canonical variables. A look at the first row in the table concerning the dimensionality reduction analysis enables one not only to decide whether the canonical model is statistically significant, but also to identify the amount of shared variance between data sets. On the other hand, the second row in the table excludes the first function with the highest correlation between canonical variables, thereby providing one both with the opportunity to decide whether the correlation between data sets in the remaining canonical functions is significant and to identify the amount of shared variance between data sets. The process continues thusly until the final row, which indicates the amount of shared variance between data sets for the canonical function with the lowest correlation between canonical variables. In general, the correlation between canonical variables for this function is not statistically significant (Sherry & Henson, 2005). Table 3 presents the results of the dimensionality reduction analysis of the data sets *fear of receiving negative criticism* and *academic risk-taking*.

Table 3.
Dimension Reduction Analysis

Roots	Wilk's L.	F	Hypothesis sd	Error sd	Significance Value of F
1 to 2	.64960	12.57801	8.00	418.00	.000
2 to 2	.97386	1.87857	3.00	210.00	.134

The figures suggest that the canonical model consisting of the cumulative values of the two canonical functions derived from the analysis (function 1 to 2) was statistically significant [Wilks's λ=.64960, F(8, 418.00) =12.57801, $p<.001$] (Table 3). There is no statistically significant correlation between the data sets *fear of receiving negative criticism* and *academic risk-taking* for the second canonical function (function 2 to 2) after the first canonical function calculated in a way that would maximize the correlation between the canonical variables was excluded from the evaluation [Wilks's λ=.97386, F(3, 210.00)= 1.87857, $p>.05$]. Wilk's λ concerning the second canonical function indicates that the amount of shared variance between the data sets *fear of receiving negative criticism* and *academic risk-taking* is 2.614% ["1- λ"=.02614]. In this study, it was necessary to interpret both of the canonical functions derived from the analysis using the calculation method proposed by Sherry and Henson (2005).

Another question answered through canonical correlation analyses is to what extent variables included in data sets contribute to the correlation between canonical variables. An attempt is made to answer this question using standardized coefficients and structural coefficients regarding canonical functions. The present study includes an evaluation of the standardized coefficients and structural coefficients of the first and second canonical functions in order to determine their contribution to the correlation between canonical variables. For the data set *fear of receiving negative criticism*, both SFI and RSI variables were tested, whereas RFFTBA, TPDA, TNAF, and TSH were tested for *academic risk-taking*. The findings are presented in Table 4. In the table, while 'Sc' and 'r_s' stand for standardized coefficients and structural coefficients, respectively, r_s^2 represents the amount of variance that the variables SFI and RSI share with the data set *fear of receiving negative criticism* whereas the variables RFFTBA, TPDA, TNAF, and TSH serve the same function with the data set *academic risk-taking*. One can calculate the amount of variance that the variables share with their respective data sets by adding together r_s^2 values of the variables SFI, RSI, RFFTBA, TPDA, TNAF, and TSH in the first and second canonical functions. This value is expressed as h^2. The benchmark for deciding whether the amount of variance that the variables share with the sets in which they are included is significant or not is .45. In other words, if variables with r_s and h^2 values of .45 and higher, they contribute in a significant way to the data set in which they are included. This benchmark is based on the idea that items with a factor loading of .45 and higher are acceptable in factor analysis (Sherry & Henson, 2005).

Table 4.
Canonical Analysis for the First and Second Canonical Functions concerning the Correlation between Fear of Receiving Negative Criticism and Academic Risk-Taking

Variable	1st Canonical Function			2nd Canonical Function			
	Sc	r_s	r_s^2 (%)	Sc	r_s	r_s^2 (%)	h^2 (%)
SFI	-283	.65	42.72	1.077	.76	57.28	100.00
RSI	-.843	-.97	93.55	.728	.25	6.45	100.00
$\boldsymbol{R_c^2}$			**33.29**			**2.61**	
RFFTBA	-.876	-.95	91.44	-.316	.004	.001	91.44
TPDA	.235	.25	6.25	.207	-.48	23.39	29.64
TNAF	.322	.17	2.89	.554	.61	37.13	40.02
TSH	-.096	-.48	23.04	.934	.82	66.91	89.95

r_s and h^2 values higher than |.45| are underlined.

According to the findings presented in Table 4, both the SFI and RSI variables contributed to the data set fear of negative evaluation by more than .45 in the first canonical function. In this case, for the first canonical function, both SFI and RSI variables contribute significantly to the data set *fear of receiving negative criticism*. As for the data set *academic risk-taking*, while the variables RFFTABA and TSH contributed by more than .45 in the first canonical function, the variables TPDA and TNAF had a structural coefficient of less than .45 (Table 4). In this case, the level of contribution by the variables RFFTABA and TSH was of greater significance to the data set *academic risk taking* than was that of the variables TPDA and TNAF.

In canonical functions derived from canonical correlation analyses, one is also able to conclude from the variables that contribute significantly to the data set in which they are included (i.e. the variables with a structural coefficient of .45 or higher) whether the correlation between these variables is positive or negative. Hence, in the first canonical function where the structural coefficients belonging to both SFI and RSI are significant, there is a negative relationship between SFI and RSI. This negative relationship between SFI and RSI variables can be explained by the presence of items contributing *the fear of receiving negative criticism* in the SFI variables and items not contributing *the fear of receiving negative criticism* in the RSI variables. An analysis of the variables related to *academic risk taking* in the first canonical function reveals that both RFFTBA and TSH, whose structural coefficients are significant, are signed as negative. There is a positive relationship between RFFTBA and TSH variables in the first canonical function. Table 4 also shows that there is both a negative relationship between SFI and RFFTBA and TSH and a positive relationship between RSI and RFFTBA and TSH. These results indicate that as one's fear of receiving negative criticism increases, so do RFFTBA and TSH.

The first canonical function had an r_s^2 value of 33.29 (Table 4), indicating that the amount of shared variance between the data sets *fear of negative evaluation* and *academic risk-taking* in the first canonical function was 33.29%. Figure 2 presents the structural coefficients concerning the first canonical function and the canonical correlation coefficient between these two data sets for this function.

An analysis of the findings on the second canonical function suggests that SFI variables contributed to the data set *fear of negative evaluation* by more than .45 whereas RSI variables contributed to the same data set by less than .45. In this case, SFI variables contributed more significantly to the data set fear of negative evaluation than the variable RSI. Whereas the variables TPDA, TNAF, and TSH contributed to the data set *academic risk taking* by more than .45 in the second canonical function, the variable RFFTBA contributed to the same data set by less than .45. In this case, the variables TPDA, TNAF and TSH contributed more significant to the data set academic risk taking than the variable RFFTBA.

In the second canonical function, an analysis of the signs of the variables TPDA, TNAF, and TSH belonging to SFI variables and of TPDA, TNAF, and TSH signs belonging to the data set *academic risk taking* shows that the variables SFI, TNAF, and TSH are positive while the TPDA variable is negative. Thus, there is a positive relationship between SFI, TNAF, and TSH variables and is a negative relationship between SFI, TNAF, TSH, and TPDA. This result shows that as one's fear of receiving negative criticism increases, TNAF and TSH also increase whereas TPDA decreases.

The second canonical function had an r_s^2 value of 2.61 (Table 4), indicating that the amount of shared variance between the data sets *fear of negative evaluation* and *academic risk-taking* in the second canonical function was 2.61%. Figure 3 presents the structural coefficients concerning the second canonical function and the canonical correlation coefficient between these two data sets for this

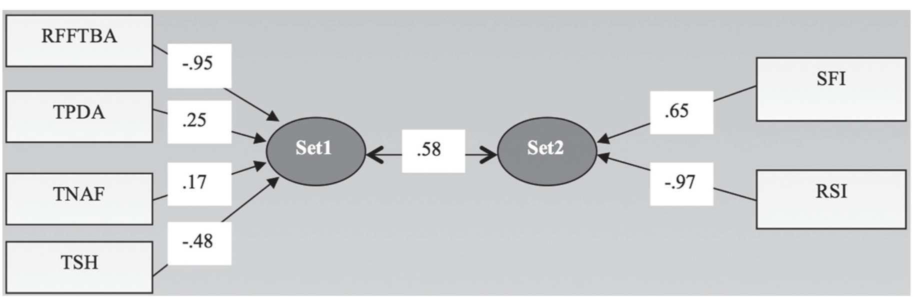

Figure 2.

Structural Coefficients and Canonical Correlation Value for the First Canonical Function concerning the Correlation between Fear of Receiving Negative Criticism and Academic Risk-Taking

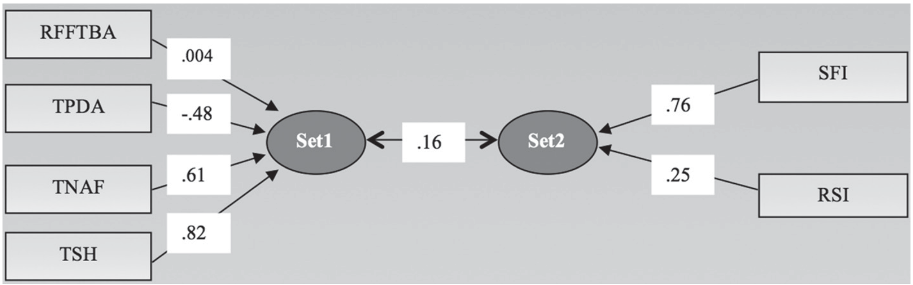

Figure 3.

Structural Coefficients and Canonical Correlation Value for the Second Canonical Function concerning the Correlation between Fear of Receiving Negative Criticism and Academic Risk-Taking

function.

According to the findings revealed by the canonical correlation analysis, the amount of shared variance between the data sets of *fear of negative evaluation* and *academic risk-taking* was 35%. In this respect, the correlation between the two data sets may be expressed as follows:

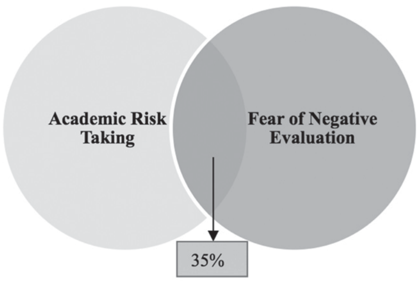

Figure 4.

Amount of Shared Variance between the Data Sets Fear of Negative Evaluation and Academic Risk-Taking

Discussion, Conclusion and Implications

The present paper is a study on the correlation between the fear of receiving negative criticism and academic risk-taking through canonical correlation analysis. The results of the canonical correlation analysis have demonstrated there to be significant relationships between the fear of receiving negative criticism and academic risk taking behavior. The common variance shared between the data sets *fear of receiving negative criticism* and *academic risk taking* has been calculated as 35%. The canonical function findings reveal that the fear of receiving negative criticism has a positive relationship with TNAF and a negative relationship with RFFTBA and TPDA. There is a negative relationship between the fear of receiving negative criticism and TSH in the first canonical function and a positive relationship in the second canonical function. It is generally accepted that students whose TNAF and TSH are low, but whose RFFTBA and TPDA are high, are more willing to take academic risks. Therefore, in general, as the fear of negative criticism increases, the tendency to take academic risks decreases. The fact that individuals who fear negative criticism avoid social contexts and situations which require social performance so as not be exposed to rejection, instead seeking secure behaviors (Rapee & Heimberg, 1997) may one explanation for this finding. In other words, individuals who fear receiving negative criticism avoid taking the risk of performing certain tasks since they feel that they will not be able to bear the potentially harmful results brought on by these acts (Boyer, 2006; Halstead & Taylor, 1996), which thereby results in their avoiding taking academic risks in a classroom environment. This result points to the fact that if a class environment were to be formed in which students were able to witness that their fear of receiving negative criticism were not realistic while also being aware that precautions have been taken to reduce this fear, students' tendency to take academic risks would increase. In this respect, students should be encouraged to participate in class activities in which process based, rather than product based, evaluations are used so as to allow them to witness that their learning related efforts are, in fact, valuable. Moreover, students should be informed of the scoring criteria used during the evaluation process so that their fear of receiving negative criticism may be alleviated and their courage to take academic risks promoted.

The literature demonstrates that fear of receiving negative criticism and academic risk taking may be interrelated constructs. However, before this study, there had been no research examining the relationship between fear of negative evaluation and academic risk taking empirically. The present study, therefore, analyzes the relationship between the fear of receiving negative criticism and academic risk taking by means of canonical correlation in an attempt to fill this gap in the literature. In addition, the study has its limitations, which can be overcome through further research. Of these limitations, the most important is that the research has been limited to the fear of receiving negative criticism and academic risk taking, which are among the affective characteristics influencing students' behaviors in the classroom environment. Considering the fact that there is significant relationship between academic risk taking and fear of receiving negative criticism and the fact that students who take academic risks have increased levels of motivation (Clifford, 1988; House, 2002), problem solving skills (Tay et al., 2009), positive perfectionism characteristics (Öner Sünkür et al., 2013), while also having decreased learned helplessness feelings (Esen Kıran, 2005; Neihart, 2010) and negative perfectionism characteristics (Öner Sünkür et al., 2013), it is hypothesized these variables have a significant relationship with one's fear of receiving negative criticism. However, in order to pinpoint the relationship between fear of receiving negative criticism and its related variables, further research is needed. Similarly, there is both a positive relationship between the fear of receiving negative criticism and the fear of failure, performance-avoidance goal orientation, performance-approach goal orientation, and exam anxiety (Dinnel et al., 2002) and a significant relationship between these variables and academic risk taking behavior. Understanding this, it is suggested that further research be carried out on the relationship between academic risk taking behaviors and the fear of failure, achievement goal orientations, and exam anxiety.

Another limitation is the use of qualitative methods by means of self-reporting data collection instruments. Instruments which are based on providing information about oneself are questionable in terms of the reliability of the data collected (Johnston & Pennypacker, 1993). Although research reveals that university students reflect their real feelings and ideas when responding to measurement instruments through self-reporting instruments (O'Neill, Walters, Rasheed, & Johnston, 1975), the use of different data sources is highly important in terms of assuring reliability. In this respect, further research into the fear of receiving negative criticism and academic risk taking should be carried out by means of quantitative data collection tools, such as interviews and observations. By doing so, more detailed information can be obtained in relation to the academic risk taking behaviors of individuals whose fear of receiving negative criticism differs.

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