ABSTRACT

Recent studies have examined how dimensions of perfectionism are associated with statistics anxiety in students who are enrolled in statistics-related courses. The Positive Achievement Striving (PAS) dimension is associated with intrinsic motivation and academic achievement whereas the Multidimensional Extrinsic Compensation (MEC) subscale is associated with anxiety and distress. The purpose of this study is to examine the relationship between the specific dimensions of the Multidimensional Perfectionism Scale (Frost et al., 1990) and statistics anxiety, intrinsic and extrinsic motivation. When multiple regression analysis was employed, the results showed that PAS was positively correlated with both intrinsic and extrinsic motivation and negatively correlated with statistics anxiety. Although the results differed from our hypothesis, our findings were consistent with a study conducted in 2002 by Mills and Blankstein. They explained that despite setting high standards for themselves, individuals who scored high in subscales of PAS were still primarily motivated by extrinsic compensation and recognition from others.

INTRODUCTION

Perfectionism has been conceptualized as a personality style that is characterized by striving for excessively high standards accompanied by overly critical evaluations of oneself (Flett & Hewitt, 2000; Flett et al., 1995). Flett et al. (1993) consolidated both the Hewit and Flett and the Frost et al. Multidimensional Perfectionism Scale (Frost et al., 1990) into a two-dimensional model consisting of Positive Achievement Striving (PAS) and Maladaptive Evaluative Concerns (MEC). PAS is characterized by the setting of high standards for oneself. MEC can be identified by overly critical evaluation of one’s own behavior, an inability to derive satisfaction from achievement, and chronic concerns over one’s performance and accomplishments.

Researchers studying perfectionism have become increasingly interested in its relationships to academic motivation, effort, achievement and distress. Studies have demonstrated that PAS is associated with intrinsic motivation, high effort and high achievement. (Bielli et al., 2012; Stöber and Rambow, 2006; Stöber et al., 2007). The MEC subscale is associated with extrinsic motivation, researchers found that it is predominately related to extrinsic motivation and higher stress.

Statistics anxiety, or anxiety related to a host of demands typically associated with this type of math class, often predicts poorer performance or greater stress and distress associated with taking a math-related course. Only a few studies have explored the relationship between perfectionism and this specific domain of learning. Past research have shown that the fear of negative evaluation is a factor in predicting students’ anxiety (Wajah & Ugumbu-Agwunobi, 2002; Onwuasor & Daley, 1999). Studies have only sampled students who have taken statistics-related courses in the past. But for students in other disciplines, anxiety may deter them from ever taking a course that involves statistics.

In our study we hypothesized that in a sample of students who may or may not have taken statistics courses before, PAS will strongly correlate with intrinsic motivation and negatively predict anxiety, MEC will strongly correlate with extrinsic motivation and positively predict anxiety. We planned to use partial correlation to control for the overlap of PAS and MEC. We also hypothesized that intrinsic and extrinsic motivations will have a significant mediating effect on the relationship between dimensions of perfectionism and statistics anxiety.

METHODS

Participants and Procedure

A total of 272 female students completed an online questionnaire. Participants’ ages ranged from 18 to 52 years, with a mean age of 20.14 (SD = 4.08) years. The ethnic composition was: 63.1% White/Caucasian, 6.4% African-American, 15.6% Asian/Pacific Islander, 3.0% Hispanic, and 1.7% preferred not to answer. Of the participants, 62% have never taken a statistics course, 30.4% have taken an introductory statistics course, and 7.6% have taken advanced statistics courses.

Measures

Multidimensional Perfectionism Scale (FMPs; Frost et al., 1990). The FMPs was used to assess the two dimensions of perfectionism: Positive Achievement Striving (PAS) and Maladaptive Evaluative Concerns (MEC). The pure personal standards (PPS) subscale was used (r = 0.79) to measure MEC. The Overcome Concerns scale (d = 0.91) and Doubts about Actions (d = 0.74) subscales were used to evaluate MEC.

Statistics Anxiety Rating Scale (STARS; Cruise & Cruyss, 1985). We utilized four of the six STARS subscales: (1) Test and class anxiety, which assesses the anxiety experienced when taking a statistics test or attending a statistics class (r = 0.85); (2) Interpretation anxiety, which measures anxiety when interpreting statistical results (r = 0.89); (3) Fear of evaluation, which applies to the context of a statistics course, and (4) Computation self-concept, which is designed to assess a person’s self-belief in their ability to cope with the statistics calculations and mathematics (r = 0.87).

Work Preference Inventory—Student Version (WPI; Amabile et al., 1994). The WPI was designed to evaluate students’ overall intrinsic and extrinsic motivation towards their major field of study. The scale consists of two dimensions: (1) Intrinsic motivation, which assesses levels of self-determination, competence, task involvement, curiosity, enjoyment, and interest (r = 0.75), and (2) extrinsic motivation, which measures concerns with competition, evaluation, recognition, grades, and constraint by others (r = 0.79).

RESULTS

We used the Pearson correlation coefficients to examine the relationships between perfectionism dimensions, motivation and statistics anxiety. PAS significantly correlated (r = .05) with both intrinsic (r = .275) and extrinsic motivation (r = .354), but was not significantly correlated with statistics anxiety. MEC was significantly correlated with extrinsic motivation (r = .550), and it was positively correlated with statistics anxiety (r = .418). Intrinsic motivation and statistics anxiety were negatively correlated (r = -.221), but extrinsic motivation and statistics anxiety were positively correlated (r = .276). In a stepwise multiple regression analysis, MEC was the most significant predictor of statistics anxiety (r = .181, p = .001) and intrinsic motivation (r = .116, p = .041). Extrinsic motivation was not a significant predictor.

The correlational analyses showed that PAS and MEC significantly predicted intrinsic and extrinsic motivations and statistics anxiety. Both intrinsic and extrinsic motivations were also correlated with anxiety. To better understand the relationship among the three variables, we conducted multiple mediation analysis to explore the mediating effects of intrinsic and extrinsic motivation in the relationship between dimensions of perfectionism and statistics anxiety. Given the overlap between PAS and MEC (r = .36), when each perfectionism dimension was considered as the IV in the mediation analysis, the other dimension was covered out. The analysis showed that PAS had a significant negative direct and total effect on anxiety, while holding MEC as a covariate. Intrinsic and extrinsic motivation did not mediate this relationship: MEC had a significant positive direct and total effect on anxiety, while holding PAS as a covariate. Intrinsic and extrinsic motivations were both significant mediators in the relationship between MEC and anxiety. Both extrinsic and intrinsic motivation were related to anxiety, but the indirect effects of intrinsic and extrinsic motivations were equally strong in this relationship (see Table 1).

To check for reverse causal effects, we explored the independent variable (statistics anxiety) with the dependent variable (dimensions of perfectionism) and tested for effects in the other direction. Anxiety had a significant direct and total effect on PAS, although it was smaller than the effect of PAS on anxiety. The indirect effect of anxiety and extrinsic motivation was not significant. Anxiety also had a significant positive direct and total effect on MEC, again smaller than the effect of MEC on anxiety. The indirect effects were significant: bootstrap results showed that extrinsic motivation had a stronger indirect effect than intrinsic motivation.

Table 1: Sobel and bootstrap analyses (1,000 resamples) of the indirect effects of intrinsic and extrinsic motivation on the variables in the relationships between dimensions of perfectionism and statistics anxiety.

<table>
<thead>
<tr>
<th>IV</th>
<th>MT</th>
<th>M2</th>
<th>DV</th>
<th>Total Effect (c)</th>
<th>Direct Effect (c')</th>
<th>Indirect Effect (c-c')</th>
<th>Semi-partial (c)</th>
<th>95% CI of the Indirect Effect (c-c*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAS</td>
<td>Intrinsic</td>
<td>Extremist</td>
<td>Anxiety</td>
<td>-1.261***</td>
<td>-1.286***</td>
<td>-0.0645</td>
<td>N/A</td>
<td>-0.3123-0.2084</td>
</tr>
<tr>
<td>MEC</td>
<td>Intrinsic</td>
<td>Extremist</td>
<td>Anxiety</td>
<td>0.978***</td>
<td>0.832***</td>
<td>-0.476**</td>
<td>-0.0619</td>
<td>0.0306-0.2814</td>
</tr>
<tr>
<td>MEC</td>
<td>Intrinsic</td>
<td>Extremist</td>
<td>Anxiety</td>
<td>-0.0512***</td>
<td>-0.0439***</td>
<td>-0.0497</td>
<td>N/A</td>
<td>-0.1891-0.0008</td>
</tr>
<tr>
<td>MEC</td>
<td>Intrinsic</td>
<td>Extremist</td>
<td>MEC</td>
<td>0.2309***</td>
<td>0.1688***</td>
<td>0.0621*</td>
<td>-0.0512*</td>
<td>0.0323-0.0930</td>
</tr>
</tbody>
</table>

REFERENCES


