A Comparison of the Relationship Between Adaptive vs. Maladaptive Perfectionism and Academic Performance in STEM vs. non-STEM Majors

Gwyneth L. Pudner, Harvey J. Langholtz
Department of Psychological Sciences, William & Mary
Zoom Office Hours: https://cwm.zoom.us/j/93049348111

Abstract

This study examines the relationship between adaptive vs. maladaptive perfectionism and academic performance and compares this relationship between STEM and non-STEM majors. We found a positive correlation between adaptive perfectionism and academic performance in the overall sample and non-STEM majors, but not in STEM majors. There was not a significant correlation between maladaptive perfectionism and academic performance.

Introduction

Perfectionism is a multidimensional personality trait that includes high personal standards, excessive concern over making mistakes, doubts over the quality of one's actions, emphasis on organization, and perception of high parental expectations and criticism (Frost et al., 1990). Perfectionism can be both adaptive and maladaptive, where adaptive perfectionists feel a sense of satisfaction from their efforts, but maladaptive perfectionists do not (Hamachek, 1978, as cited in Zhang et al., 2007). There is previous research on perfectionism and academic performance that did not consider major (Madigan, 2019; Rice et al., 2013), as well as research with only STEM students (Park et al., 2020), but there has not been research on whether major affects the relationship between perfectionism and academic performance.

We hypothesized that STEM majors would score higher in perfectionism compared to non-STEM majors. We expected that adaptive perfectionism would be associated with higher academic performance, while maladaptive perfectionism would be associated with lower academic performance. We also expected these relationships to be stronger in STEM majors compared to non-STEM majors.

Method

Participants:
47 undergraduate students (35 females, 12 males; average age = 20.13 years)

Procedure:
Academic performance was measured by self-reported overall college GPA. Major was measured with the binary categories of STEM and non-STEM. Perfectionism was measured using the the Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990). Adaptive perfectionism was represented by the personal standards and organization subscales of the FMPS and maladaptive perfectionism was represented by the concerns over mistakes and doubts about actions and parental expectations and criticism subscales of the FMPS.

Results

Perfectionism and Major
- Adaptive Perfectionism: not a statistically significant difference between STEM majors ($M = 3.72$, $SD = 0.71$) and non-STEM majors ($M = 3.84$, $SD = 0.50$), $t(40) = -0.71$, $p = .48$
- Maladaptive Perfectionism: not a statistically significant difference between STEM majors ($M = 2.63$, $SD = 0.60$) and non-STEM majors ($M = 2.67$, $SD = 0.53$), $t(40) = -0.26$, $p = .80$

Adaptive Perfectionism and Maladaptive Perfectionism
- Positive correlation $r(40) = .33$, $p = .03$

Adaptive Perfectionism and GPA
- Overall: positive correlation $r(39) = .41$, $p = .007$
- Non-STEM majors: positive correlation $r(23) = .53$, $p = .007$
- STEM majors: the correlation was not statistically significant $r(14) = .32$, $p = .23$

Maladaptive Perfectionism and GPA
- Overall: the correlation was not statistically significant $r(39) = -.07$, $p = .67$
- Non-STEM majors: the correlation was not statistically significant $r(23) = .09$, $p = .69$
- STEM majors: the correlation was not statistically significant $r(14) = -.31$, $p = .24$

Discussion

The data support that there is a positive correlation between adaptive perfectionism and academic performance $r(39) = .41$, $p = .007$. The subscales that comprise adaptive perfectionism are personal standards and organization. It makes sense that high personal standards are associated with high academic achievement because students with high personal standards might be more likely to spend time studying in order to get high grades.

The hypothesis that maladaptive perfectionism would have a negative correlation with academic performance was not supported by the data. One possible explanation is that since there is a correlation between adaptive perfectionism and maladaptive perfectionism $r(40) = .33$, $p = .03$, the effects of adaptive perfectionism may have canceled out any effects of maladaptive perfectionism when an individual had high levels of both adaptive perfectionism and maladaptive perfectionism.

The hypothesis that the correlation between perfectionism and academic achievement would be higher in STEM majors was not supported by the data, in fact the opposite was true; there was a positive correlation between adaptive perfectionism and academic performance for non-STEM majors, but not for STEM majors. Overall (non-STEM and STEM majors combined), there was a positive correlation between adaptive perfectionism and GPA $r(39) = .41$, $p = .007$. For non-STEM majors, there was a positive correlation between adaptive perfectionism and GPA $r(23) = .53$, $p = .007$. There was not a statistically significant correlation between adaptive perfectionism and GPA for STEM majors. These data indicate that the overall positive correlation between adaptive perfectionism and GPA is caused by the non-STEM majors, not the STEM majors. An explanation for this difference is that perhaps there is some element of non-STEM classes that is benefitted by adaptive perfectionism that is not present in many STEM classes.

The hypothesis that STEM majors would have higher perfectionism scores was not supported by the data, since there was not a statistically significant difference between major and perfectionism for neither adaptive perfectionism, nor maladaptive perfectionism.

Conclusions

This study provides evidence that adaptive perfectionism is positively correlated with academic performance for non-STEM majors, but not for STEM majors. Since academic performance is associated with positive outcomes, such as higher earnings after graduation (Jones and Jackson, 1990), it is important to learn more about factors that are correlated with academic performance. In the context of academic performance, it may be beneficial to develop adaptive perfectionistic traits but try to prevent the development of maladaptive perfectionistic traits.

Future Research
- Conduct a longitudinal study to investigate whether perfectionism is consistent throughout childhood and adolescence, and factors that may influence the development of adaptive perfectionistic traits.
- Investigate if the correlation between adaptive perfectionism and GPA is really because perfectionists perform better in school, or if there is another factor involved such as course selection.
- Identify why adaptive perfectionism predicts academic performance for non-STEM majors but not for STEM majors.

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