

2013

Mediating Effects of Perfectionism, Locus of Control, and  
Stereotype Threat on Test Performance

Ann-Kathrin Honigfort.

Running head: STEREOTYPE THREAT, PERFECTION AND PERFORMANCE

BARRY UNIVERSITY

Mediating Effects Of Perfectionism, Locus Of Control, And Stereotype Threat On Test  
Performance

by

Ann-Kathrin Honigfort

A THESIS

Submitted to the Faculty of  
Barry University in partial fulfillment  
of the requirements for the degree of  
Master of Science

Miami Shores, Florida

October 5<sup>th</sup>, 2013

### Abstract

Perfectionism and locus of control (LOC) have been found to influence academic performance. The purpose of this research was to identify how different dimensions of both constructs influence math performance of women under stereotype threat and non-stereotype threat conditions. A total of 64 participants were randomly assigned to either a stereotype threat condition or a non-stereotype threat condition and completed measures of perfectionism, locus of control, as well as math and verbal performance. The emerging data revealed that no significant differences could be observed between the two conditions. An analysis of the personality variables of perfectionism and locus of control (LOC) indicated that socially prescribed perfectionism and locus of control significantly predicted verbal performance in female participants but did not predict math performance. Theoretical implications regarding these findings are emphasized.

### Mediating Effects of Stereotype Threat and Perfectionism on Test Performance

It has been hypothesized that perfectionism plays a significant role in a great number of psychopathologies. Defining perfectionism has proven difficult, however, and the definition has undergone some significant changes over the decades. The definition of perfectionism currently used stems from that presented by Hamachek (1978) that perfectionism is a multidimensional trait that is comprised of adaptive as well as maladaptive characteristics. Today's definition of perfectionism states that the trait is generally characterized by "a need to reach flawlessness" (Hewitt & Flett, 2002), and it has been linked to high performance standard (Burns, 1980; Frost, Marten, Lahart, & Rosenblate, 1990; Hamachek, 1978). It is now considered to be a multidimensional trait consisting of both inter-personal and intrapersonal dimensions, all of which have an effect on the psychological adjustment of an individual (Enns, Cox, Sareen, & Freeman, 2001; Rice, Vergara, & Aldea, 2006). It was Hamachek (1978) who was one of the first to suggest that a distinction had to be made between characteristics of perfectionism which are adaptive and characteristics which are maladaptive to an individual. He used the terms "normal perfectionism" and "neurotic perfectionism" to distinguish between the two. Hamachek (1978) suggested that normal perfectionists enjoyed pursuing perfectionistic strivings while neurotic perfectionists suffered from them instead. Hence, both normal and neurotic perfectionists tend to set high standards for themselves and strive to meet them; however, it is the neurotic perfectionist who always believes that the efforts made are never quite good enough. Hewitt & Flett (2002), two pioneers in this area and supporters of Hamachek's (1978) proposition, accordingly defined the perfectionism trait as being linked to a tendency to set performance standards which are

excessively high and an inclination to evaluate one's own behavior in an overly critical manner.

While the personality trait perfectionism is recognized as a multidimensional trait today, this has not always been the case. Historically, prior to Hamachek (1978), perfectionism was conceptualized as one-dimensional and associated with pathology and maladjustment. The perfectionism trait was linked to a number of clinically relevant problems in the past (Adler, 1956). Being a perfectionist carried with it a connotation of negativity. Accordingly, perfectionism had been considered to be a one-dimensional trait, a view which had been held for several decades in the psychological literature. While Hamachek (1978) was one of the first proponents of multidimensional perfectionism in the 1970's and 1980's, the majority of researchers supported the view that perfectionism was one-dimensional and therefore strongly associated with only negative characteristics such as psychopathology and disordered personalities. This view becomes evident in a statement made by Pacht (1984) stating that "the insidious nature of perfectionism leads me to use the label only when describing a kind of psychopathology" (p. 387). Studies in support of this view have repeatedly linked the perfectionism trait to depression (Burns, 1980), increased anxiety (Flett, Hewitt, & Dyck, 1989), and to obsessive-compulsive disorders (Frost & Gross, 1993) and the view of perfectionism being a maladaptive trait had stubbornly prevailed despite Hamachek's (1978) proposal. The fact that perfectionism was viewed as one-dimensional for so long can be in part explained by the way in which it had been assessed. The majority of studies evaluated the perfectionism trait using one-dimensional measures of assessment. For instance, it was determined that individuals with depression were also found to show increased levels of perfectionism. It

has to be taken into consideration however that these results were obtained by using a one-dimensional assessment scale. This scale included items derived from Weissman & Beck's (1978) Dysfunctional Attitudes Scale – a scale which was originally designed to assess attitudes of individuals diagnosed with depression. The findings that depression and perfectionism were found to be linked are therefore not startling. Taking this into consideration, it also comes as no surprise that the idea of perfectionism as a one-dimensional trait has stubbornly remained for so long.

The psychological literature today no longer views the perfectionism trait as a one-dimensional construct but instead accepts the multidimensional structure it actually appears to have. Accordingly, the proposition made by Hamachek (1978), that a distinction has to be made between adaptive and maladaptive characteristics of the trait, is recognized by researchers at present. The newly accepted view has led to new research studies which now focused on the multidimensional qualities of the trait and the potentially positive characteristics of perfectionism which have been ignored by past research for so long. The recent shift in research has also given rise to a number of new perfectionism models which now assess the trait from a multidimensional angle. A number of new perfectionism models has emerged, with two of the most frequently used models being the Frost Multidimensional Perfectionism Scale (FMPS; Frost, Marten, Lahart & Rosenblate, 1990) and Hewitt & Flett's Multidimensional Perfectionism Scale (Hewitt & Flett, 1991). While the scale created by Frost (Frost et al., 1990) proposed six different dimensions of the trait, Hewitt & Flett (1991) proposed that the perfectionist trait consisted of three different dimensions namely self-oriented perfectionism, other-oriented perfectionism, and socially-prescribed perfectionism. Although both Frost (Frost

et al., 1990) and Hewitt & Flett (1991) were among the first to propose multidimensional scales of perfectionism, the differences between the two are clear because they are focusing on different dimensions of the trait. Chang (2006) created another multidimensional model which focused on the adaptive and maladaptive characteristics of performance perfectionism. The model was based on four dimensions termed positive socially prescribed perfectionism, negative socially prescribed perfectionism, positive self-oriented perfectionism, and negative self-oriented perfectionism. The studies done by Chang (2006) revealed that negative dimensions of performance perfectionism had a greater correlation with negative outcomes for an individual while the positive dimensions of the trait had a greater correlation with positive outcomes for an individual. Chang's (2006) research helped built rapport for the newly forming conceptualization that perfectionism may be a multifunctional trait and therefore may not always have only maladaptive consequences for an individual. While more recent research has begun to provide data supporting the distinction between adaptive and maladaptive characteristics of the perfectionism trait, a wide range of terms used to describe this distinction can also be observed. For example, the adaptive and maladaptive characteristics have also been referred to as positive and negative (Terry-Short, Owens, Slade, & Dewey, 1995), functional and dysfunctional (Rhéaume, Freeston, et al., 2000), active and passive (Adkins & Parker, 1996) and as adaptive and maladaptive (Rice, Ashby, & Slaney, 1998) throughout recent research studies and the terms are often used interchangeably.

Today the consensus has been reached that perfectionism is a multidimensional trait which has both adaptive and maladaptive characteristics. An individual with the perfectionism trait may therefore be influenced by that trait in either a positive or in a

negative way. There is still a significant amount of discussion in regards to the measurement of the perfectionism trait however. There is a current debate over the assessment of the perfectionism construct, specifically over whether it should be considered a categorical construct or a dimensional construct instead. A dimensional construct of perfectionism is based on the concept that perfectionists fall on a scale that is continuous. One end of this scale represents normal functioning while the opposite end represents abnormal or maladaptive functioning. Accordingly, an individual with the perfectionism trait will fall somewhere along the dimension based on his or her level of functioning (Burns, 1980; Hollender, 1978). The difficulties with a dimensional construct are related to the fact that methods have to be devised which allow researchers to determine where a perfectionist falls on the perfectionism dimension. On the contrary, a categorical construct of perfectionism states that a clear distinction exists between adaptive and maladaptive and that individuals fall into the category of either adaptive perfectionism or maladaptive perfectionism (Enns & Cox, 2002). A difficulty with the categorical construct is that valid procedures have to be created in order to make it possible to assign perfectionists into the appropriate category. In the past, the perfectionism trait has predominantly been considered to be a dimensional construct. Hence, what determined whether a perfectionist displays adaptive or maladaptive characteristics was dependent on where they fell on the perfectionism dimension. The higher or more extreme the degree of perfectionism was, the higher the likelihood of it having a negative psychological impact on an individual. Thus, a person with overly high or extreme levels of perfectionism also had an increased likelihood to be more self-critical of him - or herself and of his or her performance. This, in turn, increases their

susceptibility to undesired psychological issues. The fact that the dimensional construct of measurement has been more popular in past decades is directly linked to the popular belief that perfectionism was a one-dimensional and negative trait which had been held for so long. Since the trait was thought to only be associated with maladaptive characteristics and the concept of multidimensional perfectionism had not yet been explored, perfectionists were thought to only fall on the high end of the dimensional scale of perfectionism, the end associated with maladjustment and pathology.

A more recent trend with researchers tends to favor the categorical construct of perfectionism, which assumes that there are two different forms of perfectionism in existence, an adaptive form of the trait and a maladaptive form (Stober & Otto, 2006). Data in support of the categorical approach to perfectionism has been produced using cluster analysis which recognized two different groups of perfectionists. While the categorical construct of perfectionism appears to be slightly favored over the dimensional construct in recent research, no agreement has been reached on which conceptualization of the trait is more accurate and more appropriate. The empirical question of whether the perfectionistic trait is made up of one dimension on which perfectionists fall to a specific degree or whether it can be distinguished into two distinct forms can have an important impact on how perfectionism has to be investigated and assessed. Reaching some type of consensus over this debate is therefore of utmost importance.

### **The Multidimensional Perfectionism Scale and the three Dimensions of Perfectionism**

With the new conceptualization of perfectionism as a multidimensional rather than a one-dimensional trait, a number of innovative and more sophisticated measures

have emerged. Developed as a multidimensional model of perfectionism by Hewitt and Flett (1991), the 45-item Multidimensional Perfectionism Scale represents one of the most widely used measures of perfectionism and distinguishes between the three perfectionistic dimensions: self-oriented perfectionism, socially prescribed perfectionism, and other-oriented perfectionism. While it has been evident that perfectionism has been predominantly considered to be a maladaptive disposition in the literature, the Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991, 2004) offered more of a multidimensional form of assessment incorporating both personal as well as interpersonal facets. This rather new assessment approach made it feasible to analyze the personality dimension from a more positive point of view by taking into consideration that the perfectionism trait may not only contain maladaptive aspects but also adaptive or beneficial aspects which can act on the perfectionistic individual. Research has demonstrated that the Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991, 2004) has satisfactory validity as well as reliability. It has further been indicated that the scale is free from response biases making it appropriate as a tool to assess perfectionism (Hewitt & Flett, 1989; 1991a, 1991b). Originally created by using a population of college students, the MPS has satisfactory levels of temporal stability for all three of the MPS subscales (Hewitt & Flett, 1991b). Past research has indicated that the different perfectionistic dimensions can have a varying effect on an individual making it evident that distinguishing between the three dimensions is necessary.

Self-oriented perfectionism, comprising one dimension of the MPS scale, is characterized by the consistent evaluation of the self in a very critical manner. In addition, self-oriented perfectionism is typified by a tendency to set extraordinarily high

standards for oneself. Individuals high in self-oriented perfectionism have a tendency to be strongly personally motivated and generally experience an intense urge to be perfect. A study by Enns and Cox (2002), focusing solely on self-oriented perfectionism, has indicated that the dimension should be considered to have a dual effect. The dimension has been linked to negative personality characteristics such as negative affect (Kobori & Tanno, 2005) as well as to a negative correlation with subjective well-being (Bartsch, 2007). At the same time there has also been research indicating that self-oriented perfectionism has been associated with positive personality characteristics and favorable outcomes for a perfectionist. Taking this into consideration, self-oriented perfectionism may appropriately be considered to be a vulnerability factor which could potentially impact a person in a negative way but could just as much influence an individual in a positive way (Flett & Hewitt, 2007).

On the contrary, it is evident that socially prescribed perfectionism is particularly debilitating to an individual. Those perfectionists high in socially prescribed perfectionism generally display the belief that others impose extremely high standard on them. A positive correlation has been discovered repeatedly between socially prescribed perfectionism and distress, suicide ideation, as well as depressive tendencies. Several explanations have been offered for why self-oriented and socially prescribed perfectionism can have such distinctly different consequences for an individual. Gilbert, Durrant, and McEwan (2006) considered variations in self-critical tendencies between the two dimensions to be a possible explanation. In contrast, Hewitt and Flett (1996) regarded dissimilarities in control perception and in the way different individuals cope to be a potential justification for the distinctly different consequences. One explanation

which appear to receive support from recent research is based on the notion that the two dimensions of perfectionism are built on different beliefs about the interaction between a sense of self-worth and achievement. While both dimensions incorporate a conditional sense of self-worth, self-oriented perfectionism is based on the notion that the acceptance of the self is dependent on whether or not excessively high personal standards are met. Socially prescribed perfectionism on the contrary is based on the notion that acceptance of the self as well as the acceptance by others is dependent on the excessively high standards which are external and imposed by other people (Enns & Cox, 2002; Hewitt & Flett, 1991). As indicated, both of these dimensions include a conditional sense of self-worth and personal acceptance.

In comparison to both self-oriented and socially prescribed perfectionism, the dimension of other-oriented perfectionism is marked by the setting of unrealistically high standards for others (Hewitt & Flett, 1991). An individual high in other-oriented perfectionism generally has an expectation that other people will be perfect and he or she continuously evaluates the performance of others. What further differentiates this dimension of perfectionism from the self-oriented and socially prescribed dimensions is that an individual high in other-oriented perfectionism projects his or her evaluated performance standards onto other individuals instead of applying them to him- or herself. It has been determined by research that the other-oriented dimension of perfectionism is associated with interpersonal frustration (Burns, 1983), hostile behavior, and distrust. While a great amount of research is focused on the self-oriented dimension of perfectionism, the socially prescribed dimension, or a comparison of the two, only a limited number of studies have focused solely on the other-oriented dimension of the

trait. Based on these findings the self-oriented dimension and the socially prescribed dimension will be discussed in greater detail.

The findings that both the self-oriented dimension and the socially prescribed dimension of multidimensional perfectionism incorporate a conditional aspect on which self acceptance and the sense of worth depend could potentially explain why both dimensions can have a negative influence on an individual. It has been shown that having a sense of conditional self-acceptance is significantly linked to psychological issues and problems with affect (Flett, Besser, Davis, & Hewitt, 2003; Hill, Hill, Appleton & Kozub, 2008). Having self-worth which is contingent is considered to be based on reaching inter-personal as well as intra-psychic expectations (Deci & Ryan, 1995). Individuals who have true self-worth, which is non-contingent, on the other hand do not make the sense of self-worth dependent on such inter-personal and intra-psychic expectations. Those who do not rely on a conditional sense have a tendency to be more secure in their self-worth. Psychological well-being and adjustment is therefore influenced by whether an individual has self-worth which is contingent or non-contingent.

Crocker, Luhtanen, Cooper, & Bouvrett (2003) created a model which distinguishes between the different consequences of contingent self-worth. It distinguishes itself from previous models which were focused on assessing and comparing the different consequences of having contingent versus non-contingent self-worth. The new model, focusing solely on contingencies of self-worth, identified several important and common contingencies of personal worth. Some of these contingencies identified which reappeared most frequently include the approval by other individuals, physical appearance, personal competencies, and the amount of affection a person has

within the family environment. Crocker & Park (2004) identified that having such contingencies of self-worth and attempting to please them will lead to the thwarting of psychological needs as well as to diminished health (Crocker & Park, 2004). Some contingencies may be more disruptive to an individual than others. It is not surprising that those contingencies which involve external acceptance, for example the validation by other people, have the potential of leading an individual to more maladjustment than those contingencies more internally centered such as an individual's sense of his or her personal competencies. Hence, aspects of self-oriented and socially prescribed perfectionism which differentiate the two dimensions contribute to the differences in the contingencies of self-worth. While there are detectable differences between the two dimensions of perfectionism, there are also some notable similarities.

Both dimensions of multidimensional perfectionism have been determined to be coupled to performance goals, specifically the need to show off ones comparative skills as a sign of personal success (Speirs Neumeister & Finch, 2006). As a result, both the individuals with self-oriented perfectionism as well as the individuals with socially prescribed perfectionism establish self-worth at least in part by achieving superior performance and by inter-personal competitiveness. What differentiates self-oriented perfectionism from socially prescribed perfectionism is that socially prescribed perfectionism is also linked to contingencies of self-worth that are dependent on the approval of other people. This means that socially prescribed perfectionism is partially based on contingencies that require acceptance by other people, which results from a neurotic urge to please the standards of others as is characteristic of socially prescribed perfectionism. Hewitt and Flett (1991) further determined that individuals high in socially

prescribed perfectionism are characterized by a strong urge to get the approval of other people and they often show signs of anxiety associated with potentially negative evaluation. However, the self-oriented dimension has been linked to specific facets of the Type A personality which are related to a preoccupation with one's accomplishments (Flett, Hewitt, Blankstein, & Dynin, 1994). In comparison, a perfectionist who is high in self-oriented perfectionism has more contingencies relating to internal competencies. It has also been indicated in research that the self-oriented dimension is not really linked to a need to receive approval from others or to anxiety resulting from potentially negative evaluation.

As indicated by past research, the previously described dimensions of perfectionism can have divergent effects on an individual. In a study done by Blankstein, Lumley, and Crawford (2007) assessing dimensions of perfectionism and hopelessness as well as the mediating effect they have on suicide ideation in a sample of 205 university students it was indicated that socially prescribed perfectionism was a significant predictor of suicide ideation, as well as interpersonal and achievement hopelessness in both males and females. This suggests that socially prescribed perfectionists appear to have an increased vulnerability to suicide risk. Such vulnerability may be attributable to the individual perceiving the need to meet the unattainable high standards of others, to the individual perceiving the resulting inability to meet such standards, to the sense that others are not satisfied with the individual's performance, as well as to the fear of potential failure. While socially prescribed perfectionism was associated with distress and hopelessness, self-oriented perfectionism did not appear to be connected to either. In addition, self-oriented perfectionism was also not found to be related to suicide risk.

Other oriented perfectionism was found to be negatively related to interpersonal hopelessness and suicide ideation. However; this was only found to be true in men suggesting that males who are high in other-oriented perfectionism have a reduced suicide risk when compared to their female counterparts. The reduced suicide risk may be attributable to the fact that other-oriented perfectionists focus on others more than on the self, therefore attributing certain situations more to outside factors, which in turn makes them less likely to experience depression. It is evident that the dimensions of perfectionism have divergent consequences which vary from one individual to the next. Which dimension predominates can lead to a mainly negative array of characteristics, but it can also lead to the expression of an array of positive characteristics in the perfectionist. Past research focusing on the expression of the three different perfectionistic dimensions and the potential differences in the effect they may have on an individual in regards to pathology clearly indicates that whether a perfectionistic individual is more vulnerable or less vulnerable to certain risks depends on which of the three dimensions of perfectionism predominates. It becomes evident that the dimensions of self-oriented perfectionism, other-oriented perfectionism, and socially prescribed perfectionism can be considered to play a mediating role in the life of the perfectionist making the person either more vulnerable or less vulnerable in regards to specific issues such as suicide ideation.

### **Perfectionism and Academic Achievement**

Studies have consistently indicated that a relationship exists between perfectionism and academic achievement. Witcher, Alexander, Onwuegbuzie, Collins, and Witcher (2007) conducted a study which indicated that whether perfectionism has a

positive or a negative impact on academic performance further appears to depend on the dimension that predominates in any given individual. The impact perfectionism has on academic achievement is largely dependent on whether an individual is found closer towards the adjusted or maladjusted side of the perfectionism spectrum. More specifically, how academic achievement is influenced by perfectionism is dependent on whether a perfectionistic individual predominantly displays characteristics of self-oriented, other-oriented, or socially prescribed perfectionism. A number of studies have assessed the impact of the three perfectionistic dimensions on different areas of academic achievement, including test performance. For example, the study conducted by Witcher et al. (2007) focused on the assessment of differences between all three dimensions of perfectionism and their impact on course achievement in graduate students. The research demonstrated that the dimension of perfectionism that predominated in a perfectionist is a predicting factor of academic performance and at the same time indicative of whether perfectionism is adaptive or maladaptive. Study results revealed that graduate students with self-oriented and other oriented perfectionism outperformed graduates with socially prescribed perfectionism, as measured by achievement. Furthermore; graduates with self-oriented perfectionism showed the greatest understanding of concepts, their applications, and methodologies. Data therefore indicated that self-oriented perfectionism was the best predictor of academic performance in a graduate sample.

### **Self-oriented perfectionism and academic achievement**

It is evident that different dimensions of the perfectionism trait have a varying effect on academic performance. For example, self-oriented perfectionism has been identified as a predictor of good performance when compared to both other-oriented as

well as socially prescribed perfectionism. As previously mentioned, self-oriented perfectionists are characterized by setting and pursuing extraordinarily high standards they have set for themselves. Furthermore, it has been established that the self-oriented dimension of perfectionism has been characterized as bi-directional in nature as a result of research indicating that the dimension can affect an individual in either a positive or a negative way. In other words, self-oriented perfectionism may still be considered to be equivocal. Past literature focused on self-oriented perfectionism and achievement has indicated that the dimension facilitates optimal achievement as well as psychological adjustment (Powers et al., 2005; Stoeber & Otto, 2006). Verner-Filion and Gaudreau (2010) were particularly interested in investigating the relationship between the self-oriented dimension of the perfectionism trait and academic adjustment while also analyzing the potentially mediating role achievement goals may play. The emerging data revealed that self-oriented perfectionism was positively related to academic performance for undergraduate students. The same relationship was found between the perfectionistic dimension and academic satisfaction indicating that self-oriented perfectionism may be adaptive in relation to academic achievement. A longitudinal study by Blankstein and Winkworth (2004) conducted on the dimensions of perfectionism and attributions for academic problems revealed slightly different results to those of other similar studies. Using the Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991, 2004), they observed that self-oriented perfectionism was linked to higher course grades in males. However, no significant relationship was detected between the self-oriented dimension of the trait and final course grade for women. Research focused specifically on female undergraduate students and self-oriented perfectionism found that the dimension was not

significantly related to actual test performance (Flett, Blankstein, & Hewitt, 2009). The literature focusing specifically on the self-oriented dimension of perfectionism and academic achievement in existence to date yields evidence in support of the currently held assumption that the dimension is bi-directional in nature. Accordingly, a self-oriented perfectionist can be positively or negatively influenced by the trait in the academic domain.

### **Socially prescribed perfectionism and academic achievement**

However, not all of the three dimensions of perfectionism may be adaptive in relation to academic achievement. The socially prescribed perfectionist is generally preoccupied with a belief that significant others are imposing extremely high standards on them. Accordingly, individuals high in socially prescribed perfectionism pursue perfection as a result of experiencing pressure from those around them. Previous studies focused on the interaction between the socially prescribed dimension of the trait and academic achievement have indicated that a negative relationship exists between the dimension and subjective as well as objective indicators of achievement, specifically, in the area of academia (Blankstein & Winkworth, 2004; Powers et al., 2005). Socially prescribed perfectionism does not only appear to have a negative impact on academic achievement however. Some research has indicated that the perfectionistic dimension also appears to affect the way a perfectionist reacts to achievements which have been made. Stoeber and Yang (2010) were interested in assessing how the socially prescribed dimension of perfectionism would predict the emotional reactions of college students to what they have achieved. Their research focused on observing the impact of both perfectionistic dimensions for situation in which student made perfect achievements and

in situations in which student made achievements which were flawed. The study outcome indicated that students high in socially prescribed perfectionism revealed a positive correlation with a reaction of dissatisfaction regardless of the actual achievement outcome. These findings indicate that a socially prescribed perfectionist will be dissatisfied with what he or she has achieved academically regardless of whether the performance was perfect or flawed. Students who were high in self-oriented perfectionism on the contrary showed signs of a positive correlation with satisfaction as well as pride after making perfect achievements. However, this was only seen when the students were also low in socially prescribed perfectionism at the same time and a positive correlation was not detected for self-oriented perfectionism and satisfaction or pride if the students also showed signs of high levels of socially prescribed perfectionism. These observations indicate that socially prescribed perfectionism may prevent students who are high in self-oriented perfectionism from experiencing a sense of satisfaction or pride after perfect achievements.

### **High standards and discrepancy**

Two other dimensions of multidimensional perfectionism have also been identified as having an influence on certain aspects of academic performance. High standards, which assess perfectionistic standards held by an individual as well as held expectations about the performance at hand, is one of these identified dimensions. It has been shown that the high standards dimension is linked to conscientiousness (Rice, Ashby, & Slaney, 2007). The second dimension determined to affect performance is discrepancy, which captures the belief that one is incapable of meeting perfectionistic expectations the individual has set for him- or herself. Discrepancy has frequently been

associated with negative emotions such as fear of inadequacy, self-doubt, and frustration. Research has also pointed to a connection between discrepancy and neuroticism. Accordingly, discrepancy has been negatively correlated to performance while high standards have been found to have a positive correlation. Ishida (2005) assessed the relationship between perfectionism and efficiency in the academic setting, specifically in the area of problem solving. As indicated, individuals high in perfectionism scored lower on tasks that required problem solving when compared to non-perfectionists. This underperformance was attributed to perfectionists spending more time focusing on information that was irrelevant to the task at hand. These findings indicate that perfectionism reduces efficiency which results in a diminished academic performance in perfectionists (Ishida, 2005). An investigation of the impact of high standards and discrepancy on a proof-reading performance revealed that perfectionistic individuals with high standards are more likely to incorrectly detect mistakes. Not only were they likely to detect errors which were actually right, but their high standards also negatively affected their performance efficiency. In contrast, individuals high in discrepancy were less likely to correctly detect errors suggesting that perfectionists who are high in discrepancy are more conservative and less willing to find mistakes even when errors are present. These findings provide empirical support for the concept of perfectionism being inversely related to academic performance efficiency. Furthermore, it indicates that whether a perfectionistic individual displays traits of high standards will have an effect on the individuals' efficiency. More specifically, the higher the standards a perfectionist has, the lower his or her efficiency in performing will be (Aronson, Lustina, Good, Keough, Steele, & Brown, 1999).

**Achievement goals**

In contrast, other dimensions of the perfectionistic trait have been found to have a negative impact on performance in the academic setting. Perfectionism has been determined to be inversely related to efficiency, particularly if an individual displays signs of high standards (Aronson, Lustina, Good, Keough, Steele, & Brown, 1999). Another concept that has repeatedly received some attention in relation to both perfectionism and academic performance is that of achievement goals. Ames (1992) identified the achievement goals construct as beliefs, emotions, and attributions which generate the intentions of behavior. Accordingly, individuals who differ in their achievement goals also vary in the way they approach achievement type activities such as school projects, how they complete such activities, and how they feel about it in the process. Differences in achievement goals also lead to variations in the type of goals people set for themselves. Past research done on achievement goals has predominantly focused on the mastery orientation, performance avoidance goals, as well as on the performance approach an individual takes. Individuals who are more mastery oriented have a tendency to feel strongly about their competencies and have a secure focus on the self. Since these people are securely self focused they do not care much about their status in comparison to other people. Research has identified a correlation between the mastery orientation and the ability to actively focus on a task at hand. Mastery therefore appears to benefit the individual. When compared to mastery, the performance goal orientation incorporates a social aspect the mastery orientation is lacking. A person with performance goals defines performance by evaluating it relative to either the performance of others or to the accepted performance norm. What differentiates the performance goals

approach from the performance avoidance goals approach is that individuals with performance goals operate out of a need to show ones capabilities whereas individuals with performance avoidance goals perform out of a fear to appear inadequate or incompetent. Hence, a person with the performance approach acts in a way that will increase the possibility of achieving success, while the individual with the performance avoidance goals acts in a way that will reduce the possibility that they will experience failure (Conroy & Elliot, 2004). Performance approach goals have been identified as being of benefit to an individual, particularly in relation to achievement. Performance avoidance goals on the contrary have repeatedly been linked to negative academic outcomes. Hanchon (2010) sought to assess whether differences exist between the goal orientation of adaptive and maladaptive perfectionists in the academic context. Results revealed that maladaptive perfectionists were more likely to have a self focus in relation to their strengths and weaknesses. In addition, they were also more likely to doubt themselves. On the contrary, adaptive perfectionists were not affected by concerns of self-doubt and were better equipped to focus solely on a given task (Hanchon, 2010).

Past research focused on the interaction between the multidimensional trait perfectionism and academic performance has indicated that a relationship between the two exists. More recent studies have indicated that different dimensions of the perfectionistic trait influence performance in a variety of different ways. Hence, which dimensions of perfectionism are predominantly seen in an individual as well as which type of achievement goals predominate will have an influence on whether perfectionism is of advantage or of disadvantage in regards to academic performance.

### **Perfectionism and Test Performance**

As it has been indicated by past research, all perfectionistic dimensions of the trait appear to have a significant impact on several aspects of academic achievement.

Perfectionism is of particular relevance to education because the trait itself and the associated role standards play can have an impact on a student's level of motivation, his or her cognitions and emotions, and ultimately on the student's performance. Although some research on the role the perfectionistic trait plays in academia already exists to date, the influence of perfectionism on students and their actual test performance has not yet been assessed in detail and further investigation is needed. Brown et al. (1999) conducted a study with the intention of examining the relationship between perfectionism and performance in the classroom. Using the Frost Multidimensional Perfectionism Scale (FMPS; Frost, Marten, Lahart, & Rosenblate, 1990) the research was focused on assessing the two subscales of personal standards and concerns over mistakes. From a conceptual standpoint, the personal standards subscale of the Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990) is very similar to the self-oriented dimension of perfectionism as seen in the Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991, 2004) created by Hewitt and Flett. The performance of the students was assessed via final exam scores and reported grade point averages. Research outcomes indicated that a positive relationship exists between higher final exam scores and higher grade point averages and elevated scores on the personal standards subscale. In contrast, the concern over mistakes subscale did not appear to predict test performance. Since the personal standards subscale and the self-oriented dimension of perfectionism have been

found to be similar, these findings suggest that self-oriented perfectionism may be a predictor of test performance.

A similar, longitudinal study intended to assess perfectionism in relation to test performance was conducted by Bieling, Israeli, Smith, and Anthony (2003). For the purpose of the study, both the Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990) as well as Hewitt and Flett's Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991, 2004) were used. Instead of assessing separate results for each of the perfectionistic dimensions, Bieling et al. (2003) assessed study outcomes for two factors termed "adaptive perfectionism" and "maladaptive perfectionism." The factor of "adaptive perfectionism" was comprised of the personal standards and organization subscales of the FMPS (Frost et al., 1990) along with the self-oriented and other-oriented dimensions of the MPS (Hewitt & Flett, 1991, 2004). The factor of "maladaptive perfectionism" was comprised of the remaining subscales of the FMPS, which were parental expectations, concerns over mistakes, doubts about actions, and parental criticism as well as the socially prescribed dimension of perfectionism. The emerging data showed a small yet significant positive relationship between the adaptive factor of perfectionism and performance on the exam. Furthermore, a non-significant negative relationship was observed between the maladaptive factor and exam performance. In 2004, Blankstein and Winkworth further investigated perfectionism and test performance as part of a broader research study which was focused on assessing the perfectionism trait in relation to both depression and academic issues. Using the Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991, 2004) as an assessment tool, the investigation revealed that self-oriented perfectionism was related to higher grades for

males while socially prescribed perfectionism was related to lower grades. Very similar results emerged in more recent research as well. Using Hewitt and Flett's MPS (MPS; Hewitt & Flett, 1991, 2004), the relationship between student performance and both midterm and final grades were assessed. Again, a significant relationship was observed between test performance and self-oriented perfectionism. More specifically, the higher students scored in self-oriented and other-oriented perfectionism and the lower they scored in socially prescribed perfectionism, the better their performance.

Although further research is still needed, the data that exists to date on perfectionism and test performance in college students appears to indicate that the self-oriented dimension of the trait is generally associated with better test performance while it appears that the socially prescribed dimension tends to be predominantly associated with poorer test performance. These findings indicate that perfectionism can significantly affect the performance of college student. In addition, they further indicate that whether this influence is positive or negative depends on the dimension that predominates in an individual.

### **Perfectionism and Locus of Control**

Research on perfectionism and test performance has shown that the different dimensions of the trait can affect academic performance differently. In addition, the perfectionistic dimension that is predominantly seen in an individual can also influence whether that person's perfectionism is adaptive or maladaptive. Another variable that has received a significant amount of attention and continues to reappear in the literature in relation to perfectionism is locus of control. As a dimensional construct, locus of control reflects the degree to which a person perceives external life events to be the consequence

of either their own actions or of fate or external occurrences (Rotter, 1966). Rotter (1954, 1966) further identified locus of control as the perceived ability to influence the outcome of external events occurring in life. Individuals with an internal locus of control believe that events taking place throughout their lives are the direct result of their own actions. They consider themselves to have more control over life events and experience a greater personal responsibility when compared to individuals with an external locus of control. Externals consider themselves to be more powerless over life events and they perceive fate as well as other external factors to control their lives (Taylor, 1982).

Several research studies have focused on the relationship between the multidimensional trait perfectionism and the dimensional construct of locus of control. The data emerging in recent years appears to support the conceptualization that whether an individual has an internal or an external locus of control may have an influence on whether an individual's functioning is predominantly adaptive or maladaptive (Periasamy & Ashby, 2002). Perfectionists are particularly attuned to analyze the feedback they receive from the environment as well as the feedback they receive from other people. It has been a question of interest whether differences in thought patterns associated with an individual having an internal or external locus of control may affect perfectionistic thinking and perfectionistic behavior in different ways. Recent data provides evidence supporting the notion that differences in attributional explanations associated with an internal or external locus of control may also be linked to whether a perfectionist displays signs of the adaptive or signs of the maladaptive form of the multidimensional trait. Several of these differences in attributional explanations of life events between internals and externals have been identified. For example, an internal locus of control has been

associated with better emotional adjustment and more active coping when compared to an external locus of control, which is in part attributable to the belief that one has control over or an impact on significant life events (Ashby et al, 1999). The perfectionist with an internal locus of control believes that he or she can control, at least in part, the events occurring throughout life. This concept held by internals allows them to be emotionally adjusted and stable because they do not have a sense of powerlessness or helplessness in regards to occurrences taking place throughout their lives. Accordingly, individuals with an internal locus of control describe themselves as feeling more in control of situations and as having a strong sense of personal responsibility.

The external locus of control, in contrast, has been linked to feelings of powerlessness over life events. This feeling of powerlessness can be attributed to the believe externals carry that they are not actually in control over their life events, but instead what happens in the perfectionists life is controlled by fate or some other external factor. Accordingly, externals are usually not as securely adjusted emotionally as internals and they often feel less of a personal responsibility compared to perfectionists with an internal locus of control. Levenson (1972, 1974) differentiated between two categories of external locus of control: an external control from powerful others and an external control resulting from chance. Levenson (1972, 1974) made this distinction in order to identify and distinguish externals who predominantly attribute life events to other people in life and those externals who attribute them to fate. External control from powerful others is characterized by an individual having a strong sense that powerful others are in control of the person's life events. External control by chance differs based

on the concept that the individual believes that external events are controlled by chance or fate alone and not by oneself or other people.

In a study assessing the relationship between locus of control and adaptive and maladaptive perfectionism, Periasamy (2002) hypothesized that a higher internal locus of control would be associated more with adaptive perfectionism, while a higher external locus of control would be indicative of maladaptive perfectionism based on the observation made in previous research that individuals with an internal locus of control show better emotional adjustment than their counterparts with an external locus of control. The study separated external locus of control (LOC) into the external-powerful others LOC and the external-chance LOC. Results revealed that adaptive and maladaptive perfectionists both had higher levels of an internal locus of control compared to non-perfectionists respectively. Additionally, those individuals with maladaptive perfectionism showed significantly higher rates of external-powerful others locus of control than individuals with the adaptive form of perfectionism and non-perfectionists. No data was found supporting the hypothesis that adaptive perfectionists would have a higher internal locus of control while maladaptive perfectionists would show signs of a higher external locus of control. The finding that both adaptive and maladaptive perfectionists display higher levels of an internal locus of control when compared to non-perfectionists may be due to the fact that both types of perfectionists have a similar need to meet high standards (Hamachek, 1978). This urge to meet high standards may lead individuals with perfectionism to experience a greater sense of control over life events than non-perfectionistic individuals. The finding that maladaptive perfectionists have significantly higher levels of an external locus of control by powerful others may be an

indication that externals are more inclined to show signs of maladaptive perfectionism because they see themselves as hopeless and because they attribute their life events to be controlled by other people.

As indicated by maladaptive perfectionists showing a heightened level of external locus of control- powerful others, differences in motivation for meeting high standards exists between adaptive and maladaptive perfectionism. While both adaptive perfectionism and maladaptive perfectionism appear to be more often associated with a greater internal locus of control attributable to a heightened sensitivity to feedback from the environment or others, maladaptive perfectionism has been specifically linked to an external locus of control focused on the believe in powerful others. These findings suggest that adaptive perfectionists and maladaptive perfectionists are more motivated to meet high standards than non-perfectionists. Maladaptive perfectionists appear to be more externally driven to meet such standards; more specifically they seem to be most motivated by the perception of others wanting them to meet their standards or their expectations (Periasamy & Ashby, 2002). Such findings suggests that locus of control may be a potential discriminator between adaptive and maladaptive perfectionism.

Having an external locus of control, especially if associated with a preoccupation of meeting the standards of other people and with a believe that others are in control of one's life events, appears to be indicative of the maladaptive form of perfectionism. Individuals who display this form of the perfectionistic trait evaluate themselves and their performance by comparing themselves to others. By doing so all control is given to other people leaving the perfectionist with a sense of powerlessness and lack of control. Because the maladjusted perfectionist believes that approval and acceptance are out of his

or her hands and instead in the hands of other people, the urge to meet these expectations is often associated with heightened levels of stress, fear, and dissatisfaction supporting the observation that externals have worse emotional adjustment than internals which has been demonstrated in past research. In addition, what constitutes a success or failure is also based on meeting the standards of others or on “outdoing” them leaving the maladjusted perfectionist constantly seeking approval without ever experiencing the satisfaction of reaching it. Because a sense of acceptance and approval is more internal in perfectionists with an internal locus of control, a sense of reaching a level of satisfaction is more easily achieved.

Locus of control may be a potential discriminator between adaptive and maladaptive perfectionism. Accordingly, whether a perfectionist displays adaptive or maladaptive characteristics of the trait could be at least in part influenced by whether the individual has an internal or external locus of control. However, researchers have also been interested in the relationship between locus of control and test performance. Individuals with an internal locus of control have been identified as being strongly personally motivated and it has been shown that individuals with an internal locus of control have a higher likelihood of changing a behavior after being exposed to reinforcement than individuals with an external locus of control (Marks, 1998). Taking this into consideration it has been predicted that internals are likely to perform better than externals academically. Chang and Ho (2009) conducted research supporting this prediction. When comparing the academic performances of individuals with an internal locus of control and an external locus of control it was determined that internals performed better than externals on a comprehension test. In addition, the students with an

internal locus of control also outperformed those with an external locus of control on measures of self-efficacy. According to Jerusalem (1990), an individual with low self-efficacy has an inclination to assess performance-related requirements as ego threats which go along with anxiety and other emotions of negative nature. On the contrary, an individual who has high self-efficacy has an inclination to assess performance demands from a positive point of view and relates them to constructive and optimistic emotions. Past research has indicated that individuals with an internal locus of control consider themselves to be more in control over life events and believe themselves to have a greater personal responsibility (Taylor, 1982) than those with an external locus of control. The findings that internals are higher in self-efficacy when compared to externals (Chang and Ho, 2009) therefore support previous research. Differences in self-efficacy between internals and externals may impact academic achievement, specifically test performance. For example, a study conducted by Bandura (1997) found that students who were low in self-efficacy had a tendency to act with greater vulnerability when faced with performance requirements.

### **Stereotype Threat**

Claude Steele and his colleagues developed the Stereotype Threat Theory according to which a performance situation creates an extra burden for a member of a stereotyped group if the situation is infused with cues about the devaluation of the individual's social identity (Steele & Aronson, 1995). In essence, stereotype threat occurs to an individual experiencing anxiety during circumstances which have the potential of confirming some negative stereotype about the social group the person is a member of.

For instance, an individual may become fearful in a performance situation that could potentially validate a negative performance stereotype.

A study which assessed the concept of the stereotype threat theory with African American students produced data supporting the concept that one of the reasons these individuals have a tendency to perform worse when compared to Caucasian students is partially explained by anxiety within African American students which stems from the experience of stereotype threat. Fear and anxiety distract these students thereby inhibiting them from performing to their full potential (Steele, 1997). Over the years, research similar to the studies conducted by Steele and his colleagues has been performed in relation to stereotype threat, with a common theme emerging: A person's performance will suffer if he or she believes that a stereotype is targeting the group the person is a member of. Evidently, stereotype threat becomes a source of stress for the individual experiencing it.

According to the theory (Steele & Aronson, 1995) once exposed to stereotype threat, a person begins to make an identity-threat appraisal leading to a stress response which is involuntary in nature. The exposure to the threat leads to a physiological stress response as the individual begins to fear failing the group he or she belongs to. The increase in arousal resulting from the stressful experience as well as the increase in the number of distracting thoughts begins to take up the working memory which has limited capacity. While the stress response resulting from an individual's fear of failing the group is predominantly involuntary, he or she actively begins to make use of coping strategies. The person is motivated to counter the stereotype threat, to disconfirm it, and attempts to perform well despite the negatively charged circumstances. Yet, once the individual

begins to face the risk of not performing well enough to meet the standards of the social group, the mechanism utilized to suppress such thoughts and the coping strategies applied to control the fear of inadequacy further consume the limited working memory. The exposure to stereotype threat leads to inefficiencies in the processing of incoming information resulting from an individual being incapable of successfully managing external stressors which are occurring in the form of a stereotype threat. While a person generally has enough executive control to focus it on any given task, the stereotype threat consumes the majority of this control. The individual no longer has the option of focusing the executive control entirely on the task at hand, but instead has to use it to manage the effects imposed by stereotype threat. The inability to devote all of the executive control on the given task leads to a worsening of performance. Lustina and Aronson (1998) determined that the increased awareness of a present stereotype, also referred to as “stigma consciousness”, can lead to an underperformance in testing conditions. Taking this into consideration, stereotype threat may not have as great of a negative impact on performance if an individual could learn to compensate for the inefficient processing of information resulting from exposure to such threat. Therefore, it is possible for the person who is exposed to stereotype threat to perform on the same level as the person who is not exposed to the threat if enough effort is made. If an exposed individual learns to compensate well enough for the processing inefficiency and learns to cope with the physiological stressors associated with the stereotype threat, it is possible for the person to perform well. However, to do so both more energy and greater effort are required, which will lead to an individual exposed to stereotype threat always having to work harder than the non-exposed counterpart to achieve or perform on the same level. While

the extra effort to compensate for the inefficiency of information processing and the division of executive control can lead the individual to still perform relatively well, this investment of energy exhausts the exposed individual over time, depleting him or her to the point where performance on future tasks will suffer, particularly if they require a great amount of effort.

Since stereotype threat could, in its most basic form, be considered a stressor which depletes the exposed individual of the executive control essential for a good performance, having adequate coping skills and improved self-control could potentially mediate the negative effect of such threat on task performances. In order to counter stereotype threat, an individual needs to make use of coping strategies to adequately manage the fear and anxiety associated with it. Similarly, self-control has to be exerted in order to remain focused on the task at hand and in order to suppress intruding thoughts. Since both coping strategies and self-control require a great amount of energy, the individual is quickly drained of both leading to the inability to exert proper self-control or apply adequate coping strategies at a later point. Stereotype threat can therefore be considered a stressor which not only robs the individual of the effective use of executive control in the processing of information but also continuously depletes the person of the energy needed to cope with other stressors making the person more vulnerable to perform worse on future tasks as well. Past research has shown that stigmatized groups in particular undermine their own performance when exposed to stereotype threat. This impairing of performance is attributable to the stereotyped groups experiencing a sense of devaluation of their identity. For example, Howard and Hammond (1985) argued that when Black students were exposed to the stereotype that they are inferior to other groups

of students academically, this lead to demotivation and decreases in self-efficacy. Over the years several studies have revealed a number of stereotyped groups, all of which performed worse when exposed to stereotype threat than when no such threat was present. Some of the most widely known groups and their associated stereotypes include women and the believe that they perform worse than men in different academic areas such as mathematics (Spencer, Steele, & Quinn, 1999), individuals from low socioeconomic backgrounds performing worse academically than individuals from a higher socioeconomic background (Croizet & Claire, 1998), as well as Asian Americans having intellectual abilities which surpass those of other racial groups in the sciences (Niemann, Jennings, Rozelle, & Baxter,1994). Stereotype threat predominantly appears to surround the issue of gender differences in performance as well as minority groups and their intellectual abilities. Stereotype threat, depending on the type of threat an individual is exposed to, generally tends to have a negative impact on the stereotyped group.

The underperformance of ethnic minorities in the college and university setting has been well-documented in past research on stereotype threat. Recent studies have indicated that Hispanic as well as Black college students underperform on exams, receive lower grades, and graduate less frequently than would be expected when SAT scores, the parental level of acquired education, and socioeconomic status were considered (Espenshade & Wallon-Radford, 2009). Since ethnic minorities in particular are exposed to the label of being intellectually inferior to other groups, one may assume that such a history of stigmatization as well as the internal feelings acquired as a result of long-term exposure to it may predispose these groups to be particularly vulnerable to the effects of stereotype threat or that such stigmatization has to occur in order for a stereotype threat to

have an impact. However, it has been shown that stereotype threat can negatively affect all social groups and that intellectual performance can be impaired in the majority of people exposed to it (Crocker, Major, & Steele, 1997). For example, white males expected to perform high on mathematics performance tasks undermined their performance after being exposed to stereotype threat indicating that a group does not have to be chronically targeted by stigmatization in order for stereotype threat to have an effect. Additionally, it was revealed that in order for stereotype threat to have an impact, an individual has to show enough concern about a given performance to be affected by such a threat (Aronson, Lustina, Good, Keough, Steele, & Brown, 1999).

### **Stereotype Threat and Gender Differences**

While a number of stereotypes exist about both gender and race, one repeatedly studied and still prevalent in society today is the concept that women do not perform as well as men in the academic domain of mathematics (Sekaquaptewa & Thompson, 2003; Spencer et al., 1999). The idea that women are inferior to men in these areas appears to be a stereotype threat which is particularly well known, one which appears to be especially difficult to eliminate, and one that has been the center of interest in many research studies with the intent of assessing its effects. Furthermore, it has been shown that gender differences and the associated gender stereotypes begin to form relatively early in life. At a young age children begin to differentiate between what society considers being female and male characteristics and behaviors. Gaining the awareness of what it means to be female and what it means to be male leads them to also become aware of the stereotypes associated with the two different genders. As soon as young children begin to make a distinction between the sexes they start creating stereotypes.

McKown and Weinstein (2003) determined that young children develop an awareness of stereotypes at some point between the ages of six and ten, particularly if they have been stigmatized academically. Individuals who are members of a group which is negatively stereotyped in social settings struggle with difficulties members of other groups do not. Their performance will be assessed by others based on the prevailing stereotype. If the performance should match the stereotype, the behavior serves as a confirmation of the stereotype to the individual, leading him or her to experience stereotype threat.

Stereotype threat and its effects appear to be salient as early as the third grade and continue throughout high school as well as the college career (Muzatti & Agnoli, 2007). In the college setting gender differences, particularly those related to achievement in mathematics, become apparent (Hall & Davis, 1999). It has been well documented that the presence of stereotype threat has a negative influence on academic performance. Stereotype threats, such as the believe that women are inferior to men in mathematics, form when a woman begins to consider that she is at risk of being judged based on the existing stereotype (Steele, 1997). The fear of such judgment and the anxiety associated with it cause the woman to underperform as a result. Women are especially likely to perform below their academic abilities if the academic environment and their parents confirm the present stereotype (Jacobs & Eccles, 1992). Underperformance resulting from stereotype threat can be detected until later adulthood and appears to further impact future career choices, as indicated by only 10 % of women choosing career fields such as mathematics or engineering (Hyde, Fennema, & Lamon, 1990). Aptitude appears to play a crucial role in the phenomenon of the gender differences in mathematics performances. A meta-analysis (Hyde et al., 1990) revealed that the gender disparity in regards to

mathematic ability is slight when no stereotype threat is present, although men are slightly favored over women in terms of performance. While female students perform slightly better in mathematics until grade six, once high school level is reached male students outperform their female counterparts to a considerable degree (Hyde et al., 1990). This performance difference remains stable throughout adulthood. Performance differences are particularly large for tasks which require complex problem solving. The question of what causes stereotype threat remains unanswered. Over the years there have been both psychosocial as well as biological models which tried to explain how a stereotype threat develops. The psychosocial models are generally based on concepts such as learned helplessness and cultural values while biological models attribute the development of stereotype threat to natural factors including genetics and hormones. Stereotype threat has been further considered to be a social psychological state which developed as a result of situational prompts (Contrada, Ashmore, Gary, Coups, Egeth, Sewell, Ewell, Goyal, & Chasse, 2000).

The previously mentioned stereotype threat model (Steele & Aronson, 1995) is based on the notion that an individual will perform below their abilities on difficult performance tasks if he or she fears that they could potentially confirm a stereotype. The psychological distress and pressure experienced in turn leads the individual to underperform. Stereotype threat has a negative effect on a person's intellectual performance particularly when the individual experiences the threat to be high. It has been documented that the likelihood of women losing their problem solving skills was positively correlated with the severity of the stereotype threat. Yet, if a stereotype threat is removed entirely, gender differences in math performance diminish (Oswald &

Harvey, 2000-2001). Evaluative scrutiny is one factor which has been identified to play a crucial role in the development of stereotype threat and the stereotype threat theory.

Individuals, who have to perform as they would in an academic testing situation, identify their gender as well as the composition of the group they are performing with prior to beginning the task at hand (Inzlicht & Ben-Zeev, 2000). Additionally, when women are in a group and exposed to the idea that they may not perform well on a math task as a group, they begin to fear that their behavior could potentially substantiate the stereotype in the eyes of other people (Inzlicht & Ben-Zeev, 2000).

In an experiment designed to assess the influence of an increased salience of negative stereotype expectations on a mathematics task, Keller (2002) found not only that women performed worse than a female control group when exposed to heightened salience of negative expectations associated with stereotype threat, but it was also found that such threat led women to handicap themselves which in turn led to a diminished performance. A woman exposed to stereotype threat may unconsciously inhibit herself from successfully performing on a math task by lowering her self-esteem or by losing faith in her capabilities as a result of exposure to the threat.

Another factor which may play the role of a contributor to the stereotype threat is the concept of implicit associations. Female college students in general hold an implicit association between masculinity and the areas of mathematics and other sciences which is relatively strong (Nosek, Banaji & Greenwald, 2002). The female individual is less likely to form secure implicit associations between mathematical ability and femininity, in part caused by stereotype threat, with the result of less women taking on the roles of

mathematicians, scientists, and engineers. The rarity of female individuals taking such positions only further strengthens the experienced stereotype threat.

It has been well established in relation to academic achievement that the exposure to stereotype threat leads to an underperformance of women on mathematics tasks.

Another aspect of stereotype threat and performance that has received interest in recent research is whether exposure to the threat will also negatively affect a woman's ability to learn. While only limited research has been done on the influence of stereotype threat on learning, results from other closely related research suggests a possible correlation between these two variables. For example, data suggests that exposure to the threat leads to a reduction in performance on a perceptual categorization test. When the two genders were compared in relation to task completion, it was revealed that it took female participants longer to meet specific criteria than it took participating males (Grimm, Markman, Maddox, & Baldwin, 2009). While stereotype threat has been studied in relation to performance, its effects on learning have not been explored in great detail. There are two reasons why stereotype threat induced effects on learning have not been assessed much to this day. For one, there is generally no variation between the male and the female gender in terms of performance if no stereotype threat is evoked. Since men and women perform equally well on mathematics tasks when no stereotype threat is present one may assume that there are also no differences in learning between the two genders. However, such an assumption disregards other potentially mitigating factors.

One such factor which should be taken into consideration is the fact that the majority of the research done in this area of interest made use of university populations, therefore female participants must have already had a certain level of ability to complete

certain math entrance examinations in order to attend college. Another potentially mitigating factor could be resulting from women attempting to strengthen their mathematics skills. For example, some women may be aware of the held stereotype threat and attempt to disprove it by learning additional mathematics skills in order to improve their performance (Jamieson & Harkins, 2007). A second reason for why past research has not assessed stereotype threat-induced effects on learning is that differentiating between what constitutes performance and what constitutes the learning process is often quite difficult. In general, learning paradigms measure the learning progress by measuring a person's capacity to perform a task which has been learned. As a result of the exposure to stereotype threat reducing performance when learning is controlled statistically, one cannot only assess learning from measures of performance alone. In order to accurately measure the potential effects of stereotype threat on learning, several different measures have to be used in order to make an assessment of how much is learned.

It is widely known and it has been repeatedly shown by past research that the exposure to stereotype threats, such as the one of women being inferior to men in mathematics, leads to an underperformance by the individual because it compromises the ability to properly execute an acquired skill (Schmader et al., 2008). As previously mentioned, anxiety about possibly confirming a stereotype and the resulting increase in arousal, as well as the distraction which keeps an individual from focusing solely on the given task, will lead to a performance below what can be achieved. A study conducted in 2010 sought to learn more about the previously unexplored relationship between stereotype threat and learning. Rydell, Rydell & Boucher (2010) found evidence that

stereotype threat also negatively affects performance in another way: by reducing learning. This indicates that stereotype threat further decreases the possibility of a good performance by negatively affecting the acquisition of new skills. The conducted research showed that information which was learned in a condition free from stereotype threat was better retained than information which was learned while being exposed to stereotype threat. Additionally, an associative measure of learning intended to assess learning revealed that female participants learned relatively little when exposed to stereotype threat. Finally, as a result of inefficient learning of information during the exposure to stereotype threat, women underperformed on a mathematical task (Rydell, Rydell, & Boucher, 2010).

Findings suggest that the exposure to stereotype threat negatively impacts the learning process in women. Accordingly, they further suggest that stereotype threat does not need to be experienced during performance in order to negatively influence an individual, if he or she was previously exposed to the threat during the learning process. Thus, stereotype threat may not only negatively affect women in mathematical test performances because it leads to anxiety, increased arousal, and working-memory deficiencies, but it may also hinder a female in performance situations in which stereotype threat has been eliminated if exposure to the threat occurred during the learning process (Rydell, Rydell, & Boucher, 2010).

The pervasiveness of the issue of the stereotype threat and the effects on the performance of those groups affected by it, particularly minority groups, has been extensively demonstrated in research. However, only very few studies have made an attempt to assess possible vulnerability factors which could make an individual more

susceptible to the effects of stereotype threat. The limited research that does exist on this topic of interest has identified three variables which appear to lead to individual differences in the vulnerability to stereotype threat. Schmader (2002) conceptualized that the degree to which an individual identified with a specific group makes up one of these variables. Based on the concept of the Social Identity Theory, those individuals who identified with a group the most would also be most affected by a given stereotype threat. The study done revealed that females who identified with their group to a high degree showed a declined performance on a math task thereby confirming group identification as a moderator for the effects of stereotype threat (Schmader, 2002). A possible explanation as to why higher group identification has been identified to lead to greater impact of stereotype threat on an individual may be that those group members who highly identify with their group may also experience greater anxiety about possibly confirming the present stereotype when compared to the other group members.

Pinel (2002) identified a second factor which appears to have a moderating impact on the effects of stereotype threat on an individual. Stigma consciousness refers to the extent to which a person is consciously aware of the stereotype threat associated with the group he or she is a member of. Research assessing the relationship between stigma consciousness and performance threat revealed that female study participants who were highly stigma conscious performed lower on a mathematics task after being exposed to stereotype threat than a group of females who had also been exposed to the same threat but scored lower in terms of stigma consciousness (Brown & Pinel, 2003). These findings supported Pinel's (2002) hypothesis of stigma consciousness being a mediating factor of performance under stereotype threat conditions. The final variable identified to play the

role of a mediator in regards to the impact of stereotype threat and the variable of focus for the present work is locus of control. Several studies have identified that the significance a person attributes to the appropriate performance domain plays an important role (Aronson, Lustina, Good, Keough, Steele, & Brown, 1999). Such studies consistently found that individuals who believed the performance domain to be of significance were also the individuals who were impacted the greatest by stereotype threat. On the contrary, individuals who were lower in their level of motivation and less knowledgeable also appeared to be less affected by the present stereotype threat.

As previously stated individuals who are characterized by a high internal locus of control have a tendency to feel more of a personal responsibility to perform well (Taylor, 1982) and therefore may feel more stressed than individuals with an external locus of control. Taking this into consideration, internals meet the characteristics which have been identified as making individuals more susceptible to stereotype threat. According to the locus of control theory, an individual with an internal locus of control is more likely to attribute events occurring throughout life to his or her own actions while an individual with an external locus of control has a tendency to attribute life events to be controlled by fate, chance, or external factors. A significant amount of research has accumulated in regards to locus of control and achievement in the academic setting. It has been shown that those students with an internal locus of control not only score higher on tests compared to their external counterparts, but they also appear to receive higher grades overall (Johnson & Kanay, 1980; Maqsud, 1983). It has been suggested that the central element in an individual's beliefs about locus of control is the amount of motivation with which an individual approaches a school related activity (Chapman, Skinner, & Baltes,

1990). Rajamohan (1978) conducted a study which led to results supporting this conceptualization. Study results revealed that individuals with an internal locus of control scored higher in terms of academic motivation than individuals with an external locus of control. In addition, internals further significantly outperformed externals. A similar study focusing on locus of control and the likelihood of reaching academic milestones done by Otten (1977) indicated that those individuals enrolled in school who were internals were more likely to receive their doctoral degree than enrolled externals. These two studies along with a great amount of other research (Chapman, Skinner, & Baltes, 1990; Skinner, Wellborn, & Connell, 1990; Rajamohan, 1978) have consistently shown that having an internal locus of control is generally associated with higher levels of academic motivation and a tendency to be slightly more knowledgeable when compared to those with an external locus of control. Internals therefore tend to outperform externals as a result of higher competency levels as well as because of higher levels of motivation. At the same time evidence has accumulated indicating that individuals who are knowledgeable or competent and show higher levels of motivation in regards to their performance domains appear to be particularly vulnerable to the effects of stereotype threat (Steele, Spencer, & Aronson, 2002). This can be seen as an indication that students with an internal locus of control will be affected more by stereotype threat than students with an external locus of control. Since internals are characterized by the believe that they are in control of their life events and accordingly accountable for their success, it is likely that they are more concerned with their performance than externals and therefore feel greater pressure not to confirm a negative stereotype. Although this observation and its potential cause have not yet been fully explored, Cadinu and colleagues (2003)

conducted a study which revealed that internals showed signs of diminished performance expectancies after they had been exposed to a threat indicating that the effect of stereotype threat may have the greatest impact on internals because it negatively affects an individual's felt responsibility to perform.

### **Summary**

In summary, perfectionism has been defined as a multidimensional trait which consists of both adaptive and maladaptive characteristics (Hamachak, 1978) which influence the psychological adjustment of an individual (Enns et al., 2001; Rice et al., 2006). After being seen as a one-dimensional trait in the past, the current view of perfectionism as multidimensional has sparked researchers' interest in the possibly positive characteristics of the trait which have been ignored in the literature in the past. A perfectionist may therefore be influenced by the trait in either a positive or a negative way. Hewitt and Flett created the Multidimensional Perfectionism Scale (Hewitt & Flett, 1991) proposing that the trait consists of the three dimensions of self-oriented perfectionism, other-oriented perfectionism, and socially prescribed perfectionism and allowing for a more multidimensional assessment of perfectionism. Research has indicated that these three dimensions of perfectionism can have divergent effects on individuals, thus they can have an either positive or a negative effect. Perfectionism has been studied extensively in relation to academic achievement. It has been shown that whether perfectionism has a positive or negative influence on academic achievement is dependent on which dimension of the trait predominates in a person (Witcher et al., 2007). While research has been conducted on perfectionism in relation to academic

achievement, the literature on the trait's influence on actual test performance is still limited and further investigation is needed.

The perfectionistic trait has also been studied in relation to locus of control (LOC). According to Rotter (1966), LOC is a dimensional construct that represents the degree to which individuals perceives life events to be the consequence of their own actions or of external factors and the perceived ability to influence the outcome of events occurring throughout life. It has been shown in the literature that whether individuals have an internal or an external LOC may influence whether they functioning is predominantly adaptive or maladaptive (Perisamy & Ashby, 2002), yet whether differences in thought patterns associated with an internal or external LOC have an influence on perfectionistic thinking and behavior has remained a question of interest. Recent research has provided evidence in support of the notion that differences in the way individuals with an internal LOC and individuals with an external LOC attribute explanations may also be linked to whether the individual displays adaptive or maladaptive characteristics of the perfectionism trait. Accordingly, LOC may be a discriminator between adaptive and maladaptive perfectionism.

Stereotype threat constitutes the concern or anxiety an individual is experiencing in situations which have the potential of confirming a negative stereotype threat about the social group he or she is a member of. According to the Stereotype Threat Theory, developed by Steele and Aronson (1995), performance situations will create an extra burden for the member of a stereotyped group if the situation contains cues about the devaluation of an individual's social identity. The literature has demonstrated that performance will suffer if he or she believes that a stereotype is targeting the group the

person is a member of. Studies have shown that stereotype threat constitutes, in its most basic form, a stressor which depletes an individual of the executive control necessary for a good performance. One stereotype threat which is particularly prevalent in society today is that men outperform women in the domains of mathematics and science. It has been indicated by research that exposure to this stereotype threat leads women to perform below their abilities in these domains.

### **Rationale**

Since perfectionism has been accepted as a multidimensional trait with different dimensions, the concept of perfectionism being either purely adaptive or maladaptive has changed as well. Although the trait has been studied extensively in relation to academic achievement, how the individual dimensions of perfectionism affect specific academic tasks, such as test performance, has not been assessed in great detail. The current study intends to explore how the three dimensions of self-oriented perfectionism, other-oriented perfectionism, and socially prescribed perfectionism influence the performance of women on math and verbal tasks under a normal testing condition and a stereotype threat condition. The intention is to identify which of the three dimensions best predicts academic achievement. Identifying whether certain dimensions of the trait have a protective quality under a stereotype threat condition or make an individual more susceptible to its negative impact may further the understanding of the mechanisms underlying both perfectionism and stereotype threat as they influence women in the academic setting.

The dimensional construct locus of control (LOC) has been found to have an influence on academic performance and has further been identified as having an influence

on whether an individual displays predominantly adaptive or maladaptive characteristics of perfectionism, making it a potential discriminator. To date, it is still a question of interest whether differences in thought patterns associated with having an internal or external locus of control (LOC) may affect perfectionistic thinking and in turn academic performance. This study intends to assess the potential mediating effect locus of control may have on academic performance under stereotype threat and non-stereotype threat conditions.

### **Hypotheses**

Hypothesis 1: In a multiple regression under a stereotype threat condition, an external locus of control and socially prescribed perfectionism will be the best predictors of low test performance.

Hypothesis 2: In a multiple regression under a non-stereotype threat condition, an internal locus of control and self-oriented perfectionism will be the best predictors of high test performance.

### **Method**

#### **Participants**

A sample of 64 women participated in the study. The sample was recruited through flyers posted on the Barry University campus and through the participant pool in the Department of Psychology. Ages ranged from 18 to 36 years ( $M = 21.73$ ,  $SD = 4.11$ ). The ethnic breakdown of the sample is as follows: 46.9% Caucasian, 29.7% African-American, 20.3% Hispanic, and 3.1% identified themselves as other.

#### **Procedure**

Participants were recruited through flyers (See Appendix A) posted in the psychology department of a small private university in South Florida, as well as through

e-mails distributed by the secretary of the department to the student body. Participants were given a consent form (See Appendix B) as well as one of two data packets, data packet A or data packet B. Both data packets contained a demographic questionnaire (See Appendix C), a 45-item perfectionism scale (MPS; Hewitt & Flett, 1991) (See Appendix D), a 13-item Locus of Control Scale (Rotter, 1966) (See Appendix E), as well as the same set of 10 math and 10 verbal questions (See Appendix F). Participants who received data packet A were then instructed to read a stereotype-threat inducing paragraph about women performing worse in mathematics than men prior to being instructed to complete the math and verbal section (See Appendix G). Participants who received data packet B were instructed to read a control paragraph containing general information about the university prior to being instructed to complete the same math and verbal section (See Appendix H). All participants were asked to complete a set of eight follow-up questions following the math and verbal section (See Appendix I). These follow-up questions were identical in both packets. After completing their data packets, all participants were asked to provide their e-mail address on a separate, blank sheet of paper so that they could be informed of the purpose of the study after data collection was concluded.

## **Materials**

**Demographic Questionnaire.** A demographic questionnaire assessed the variables of age, grade level, school major, GPA, and race.

**Perfectionism.** *Multidimensional Perfectionism Scale.* The Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991) is a self-report questionnaire consisting of 45 items that are rated on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). The MPS has three subscales of 15 items each designed to assess the dimensions

of self-oriented perfectionism (e.g., When I am working on something, I cannot relax until it is perfect), other-oriented perfectionism (e.g., If I ask someone to do something, I expect it to be done flawlessly), and socially prescribed perfectionism (e.g., My family expects me to be perfect). Research has shown satisfactory internal consistency for the three subscales in clinical samples with the coefficients alpha being .88 for the self-oriented subscale, .74 for the other-oriented subscale, and .81 for the socially prescribed subscale (Hewitt & Flett, 1991b). Some of the scales items are reverse keyed. Higher scores on the subscales are indicative of greater perfectionism. The score for each subscale is calculated by summing the 15 items on that subscale. Scores can range from 15 to 105.

**Locus of Control.** *Rotter's Locus of Control Scale (1966).* The Locus of Control Scale (Rotter, 1966) is a 13-item questionnaire intended to assess generalized expectancies for locus of control. For each item participants select the statement with which they agree the most. Scores range from 0 to 13. Higher scores on the questionnaire are indicative of an external locus of control while lower scores are indicative of an internal locus of control.

**Performance.** *Math and Verbal section.* Participants were asked to complete a set of 10 math questions followed by a set of 10 verbal questions. (See Appendix Y and Appendix Z). The answers were scored right or wrong and given a value of 1 or 0.

**Stereotype Threat.** *Stereotype Threat Condition.* Participants in the stereotype threat condition were presented with a brief paragraph indicating that women are inferior to men in the area of mathematics prior to completing a set of 10 math questions and a set of 10 verbal questions. This condition was created by the use of the following statement:

### Why do women underperform in Math?

A significant amount of research has been conducted on gender and math performance. Results reveal that men consistently outperform women when it comes to math. The following is a breakdown of SAT performance over the past 4 years (College Board, 2012):

| Year        | Gender | Number of Test Takers | Average Math Score |
|-------------|--------|-----------------------|--------------------|
| 2008 - 2012 | Male   | 1,000,000             | 533                |
|             | Female | 1,000,000             | 499                |

Additional studies have indicated that males outperform females on math tests and the performance gap we see widens throughout college and into adulthood (Armstrong, 1981; Hyde et al., 1990)

In response to this observable difference in math performance, Harvard University's president Lawrence H. Summers made the statement that women may not have the same innate abilities as men in mathematics (Cambridge Academic Conference, 2005)

### Results

An independent sample T-test was used to test the difference in math scores between the two conditions in Packet A and Packet B. No significant differences were observed between the two conditions on math performance indicating that no stereotype threat was induced by the condition contained in data packet A,  $t(62) = -.330, p = .743$ . On average, participants who received data packet A ( $M = 5.91, SD = 2.68$ ) did not perform worse on the math portion of the packet than participants who received data packet B ( $M = 6.13, SD = 2.62$ ).

Since no significant differences were observed between the two conditions in regards to math performance, it was collapsed across the two conditions with the intent to

assess whether self-oriented perfectionism, other-oriented perfectionism, socially prescribed perfectionism, and locus of control predicted math and verbal performance.

A multiple regression analysis was conducted to explore how well the three dimensions of perfectionism and locus of control predicted math performance. The linear combination of all variables was not significantly related to math performance,  $F(4, 59) = 0.372$ ,  $p = .827$  and none of the independent variables significantly predicted math performance (see Table 1)

Table 1

*Regression Analysis Summary with Math Performance as Dependent Variable.*

| Predictor                         | <i>B</i> | Std. Error | <i>Beta</i> | <i>t</i> |
|-----------------------------------|----------|------------|-------------|----------|
| Self-oriented Perfectionism       | .009     | .047       | .035        | .190     |
| .850                              |          |            |             |          |
| Other-oriented Perfectionism      | .013     | .047       | .052        | .281     |
| .780                              |          |            |             |          |
| Socially prescribed Perfectionism | .036     | .041       | .123        | .874     |
| .386                              |          |            |             |          |
| Locus of Control                  | .050     | .163       | .043        | .309     |
| .758                              |          |            |             |          |

*Note.*  $N = 64$ .

A second multiple regression analysis was conducted to explore how well self-oriented perfectionism, other-oriented perfectionism, socially prescribed perfectionism and locus of control predicted verbal performance. The linear combination of all variables was significantly related to verbal performance,  $F(4, 59) = 2.825$ ,  $p = .033$ . However, not all four of the independent variables significantly predicted verbal performance. Socially prescribed perfectionism ( $\beta = -.367$ ,  $p = .007$ ) and locus of control

( $\beta = -.292, p = .026$ ) predicted verbal performance but self-oriented perfectionism ( $\beta = .138, p = .418$ ) and other-oriented perfectionism ( $\beta = .034, p = .843$ ) did not. The data suggests that socially prescribed perfectionism is the best predictor of verbal performance (see Table 2).

Table 2

*Regression Analysis Summary with Verbal Performance as Dependent Variable.*

| Predictor                         | <i>B</i> | Std. Error | <i>Beta</i> | <i>t</i> |
|-----------------------------------|----------|------------|-------------|----------|
| Self-oriented Perfectionism       | .021     | .026       | .138        | .816     |
|                                   | .418     |            |             |          |
| Other-oriented Perfectionism      | .005     | .026       | .034        | .199     |
|                                   | .843     |            |             |          |
| Socially prescribed Perfectionism | .062     | .022       | -.367       | -2.805   |
|                                   | .007     |            |             |          |
| Locus of Control                  | -.202    | .089       | -.292       | -2.283   |
|                                   | .026     |            |             |          |

*Note.*  $N = 64$ .

## Discussion

### Stereotype Threat

As indicated, no stereotype threat was created through the stereotype threat condition introduced in packet A. The reason for this is unclear. Previous literature suggests that a large stereotype threat effect on academic performance is most likely to be observed when the test item difficulty is high and individuals are pushed to the limits of their abilities as well as when the individuals highly identify with the domains in question (Aronson et al., 1999). It is possible that the level of difficulty of the administered math questions was not high enough for the participants to experience their capability limits

being reached. Out of forty-six participants, only 7.8 % rated the math portion as being very difficult. A second potential explanation may be that participants did not identify with the math performance domain. All participants were recruited from a psychology department and may have not identified with the domain of women performing worse than men in mathematics. Psychology students may be more aware of stereotype threat and its effects than the general population and accordingly their self-concept may not have been as heavily tied to the ability domain questioned by the stereotype threat condition. Out of the sixty-four participants, only 3.1% strongly agreed with the stereotype threat of women performing worse than men in mathematics.

### **Self-oriented Perfectionism**

Research findings on self-oriented perfectionism and test performance were consistent with previous literature which suggested that the self-oriented dimension of perfectionism is bidirectional in nature and can have either a positive or a negative effect on test performance. Although self-oriented perfectionism has been found to facilitate optimal achievement (e.g., Powers et al., 2005) and has been positively linked to academic performance (e.g., Verner-Filion & Gaudreau, 2010), studies which made use of the Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991, 2004) as an assessment tool observed this link to be only true for men and not for women (e.g., Blankstein & Winkworth, 2004). The findings of this study appear to yield further support for the bidirectional nature of the self-oriented dimension of perfectionism suggesting that self-oriented perfectionism may be predictive of optimal achievement and academic performance for men but not for women.

**Other-oriented Perfectionism and test performance**

The current literature on other-oriented perfectionism and its effects on academic achievement is limited. The few available studies have indicated that other-oriented perfectionists, along with self-oriented perfectionists, outperform individuals high in socially-prescribed perfectionism on measures of achievement (Witcher et al., 2007). A proposed explanation for these findings is that an individual high in other-oriented perfectionism has control over the standards set for others and can change these standards proactively. On the contrary, socially-prescribed perfectionism stems from the perception that others impose high standards on a person therefore making it a reactive process. This suggests that perception of controllability (Hewitt & Flett, 1991a) may have an influence on academic achievement and that other-oriented perfectionism leads to a better academic performance when compared to socially prescribed perfectionism due to higher levels of perceived control. In the current study, no significant relationship was observed between other-oriented perfectionism and math performance or verbal performance. These results appear to coincide with past empirical findings that have been mixed. Although some studies suggest that a positive relationship exists between other-oriented perfectionism and academic performance, others have found no relationship between the perfectionistic dimension and performance highlighting the need for future research.

**Socially prescribed perfectionism and test performance**

Past literature has repeatedly linked the socially prescribed dimension of perfectionism to low achievement (Sideridis, 2006) indicating that a negative relationship between the dimension and academic achievement exists (Blankstein & Winkworth, 2004, Powers et al., 2005). A statistically significant negative relationship was observed

between socially prescribed perfectionism and verbal performance indicating that participants who scored low on the socially prescribed dimension of the Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991, 2004) also performed better on the verbal task. These findings are consistent with the previous literature. However, socially prescribed perfectionism was not found to have a statistically significant relationship with math performance. The underlying reasons for this are unclear. One possible explanation may be that the verbal section and the math section did not have the same level of difficulty. In fact, 7.8% of participants rated the math portion to be *very difficult*, while only 1.6 % rated the verbal section as being *very difficult*. These findings suggest that the math questions may have been more difficult than the verbal questions. The higher level of difficulty of the math questions may explain why a significant negative relationship was observed between socially prescribed perfectionism and verbal performance but not with math performance.

### **Locus of Control and Performance**

The majority of the available research studies on locus of control and test performance have indicated that individuals who have a high internal locus of control score higher on academic tests and receive higher grades overall when compared to individuals who have a high external locus of control (Johnson & Kanay, 1980; Maqsd, 1983). These findings have suggested that an internal locus of control is favorable over an external locus on control in regards to academic performance. A statistically negative relationship was observed between locus of control and verbal performance indicating that participants with a more external locus of control will perform better on the verbal section. This was not found to be the case for math performance. These findings may be

explained by the observed difference in difficulty level between the verbal and the math section. Participants rated the math section to be more difficult than the verbal section. Since the verbal section was rated as being easier, it is possible that participants performed well on this section even if they were characterized as having an external locus of control. The same statistical significant may not have been observed for the math section due to its higher level of difficulty. Individuals with an internal locus of control have been found to have a tendency to experience a higher personal responsibility to perform well (Taylor, 1982) which has been attributed to a higher amount of motivation internals experience when approaching school related activities (Chapman, Skinner, & Baltes, 1990). These findings may suggest that individuals with an external locus of control performed well on the verbal section because it was comparatively easy but did not perform as well on the math section because the section was more difficult and required both an increased personal responsibility to perform well as an increased level of motivation.

### **Limitations**

The findings of this study have to be viewed under consideration of several limitations. One of these limitations is sample size. With only forty-six female participants, the sample size of this research study was rather small. Accordingly, caution should be given when generalizing these results. Since only females participated in the research, study results are only applicable to women. In addition, the small sample size permits only for limited generalization of the findings. Future studies may aim at increasing the sample size in order to avoid limited generalizability.

A second limitation of this research study is that no stereotype threat was induced or the problems were too simple. The available literature on stereotype threat conditions has indicated that stereotype threats are most likely to impact academic performance and have an effect when item difficulty is high and requires participants to test their abilities (Aronson et al., 1999). Although participants generally rated the math portion of the data packets as more difficult than the verbal portion, the overall level of difficulty of all test items was likely not high enough to induce a stereotype threat condition. Future studies with the intention of assessing the impact of stereotype threat on academic performance should therefore ensure that the testing material has an adequate level of difficulty that pushes participants to the limits of their abilities.

The current study provided further support of the available literature which suggests that self-oriented perfectionism is bi-directional in nature and can have either a positive or a negative effect on academic performance. Previous studies have found the self-oriented dimension of perfectionism to be a predictor of optimal achievement and academic performance in men but not in women. The underlying reasons for this are still largely unknown. It may be of interest for future research to further compare the influence of self-oriented perfectionism on the academic performance of both male and female participants and to explore in more detail why the dimension appears to have a positive association with performance in men but not in women.

### References

- Adkins, K. K., & Parker, W. (1996). Perfectionism and Suicidal Preoccupation. *Journal of Personality, 64*, 529-540.
- Adler, A. (1956). Striving for superiority. In H. Ansbacher & R. R. Ansbacher (Eds.), *The individual psychology of Alfred Adler: A systematic presentation in selections from his writings*. New York: Basic Books.
- Ames, C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84*, 261–271.
- Aronson, J., Lustina, M. J., Good, C., Keough, K., Steele, C. M., & Brown, J. (1999). When white men can't do math: Necessary and sufficient factors in stereotype threat. *Journal of Experimental Social Psychology, 35*, 29-46.
- Ashby, F. G., Isen, A. M., & Turken, A.U. (1999). A neuropsychological theory of positive affect and its influence on cognition. *Psychological Review, 106*, 529-550.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bartsch, D. (2007). Prevalence of body dysmorphic disorder symptoms and associated clinical features among Australian university students. *Clinical Psychologist, 11*, 16-23.
- Bieling, P. J., Israeli, A. L., Smith, J., & Antony, M. M. (2003). Making the grade: The behavioral consequences of perfectionism in the classroom. *Personality and Individual Differences, 35*, 163-178.
- Blankstein, K. R., Lumley, C., & Crawford, A. (2007). Perfectionism, hopelessness, and suicide ideation: Revisions to diathesis-stress and specific vulnerability models. *Journal of Rational-Emotive & Cognitive Behavior Therapy, 25*, 279-319.

Blankstein, K. R., & Winkworth, G. R. (2004). Dimensions of perfectionism and levels of attributions for grades: Relations with dysphoria and academic performance.

*Journal of Rational-Emotive and Cognitive-Behavior Therapy, 22*, 271-299.

Brown, E. J., Heimburg, R. G., Frost, R. O., Makris, G. S., Juster, H. R., & Leung, A. W. (1999). Relationship of perfectionism to affect, expectations, attributions and performance in the classroom. *Journal of Clinical Psychology, 18*, 98-120.

Brown, R. P., & Pintel, E. C. (2003). Stigma on my mind: Individual differences in the experience of stereotype threat. *Journal of Experimental Social Psychology, 39*, 626–633.

Burns, D. (1980). The Perfectionist's Script for Self-Defeat. *Psychology Today, 34*-52.

Burns, D. (1983). The spouse who is a perfectionist. *Medical Aspects of Human Sexuality, 17*, 219-230.

Cadinu, M., Maass, A., Frigerio, S., Impagliazzo, L., & Latinotti, S. (2003). Stereotype threat: The effect of expectancy on performance. *European Journal of Social Psychology, 33*, 267-285.

Chang, E. C. (2006). Perfectionism and dimensions of psychological well-being in a college student sample: A test of a stress-mediation model. *Journal of Social and Clinical Psychology, 25*, 1001-1022.

Chapman, M., Skinner, E. A., & Baltes, P. B. (1990). Interpreting correlations between children's perceived control and cognitive performance: Control, agency, or means-ends beliefs? *Developmental Psychology, 26*, 246-253.

Conroy, D. E., & Elliot, A. J. (2004). Fear of failure and achievement goals in sport: Addressing the issue of the chicken and the egg. *Anxiety, Stress, & Coping, 17*, 271-285.

Contrada, R. J., Ashmore, R. D., Gary, M. L., Coups, E., Egeth, J. D., Sewell, A., Ewell, K., Goyal, T., & Chasse, V. (2000). Ethnicity-related sources of stress and their effects on well-being. *Current Directions in Psychological Science, 9*, 136-139.

Crocker, J., Luhtanen, R. K., Cooper, M. L., & Bouvrette, A. (2003). Contingencies of self-worth in college students: Theory and measurement. *Journal of Personality and Social Psychology, 85*, 894-908.

Crocker, J., Major, B., Steele, C. (1998). Social stigma. In: D. T. Gilbert, S. T. Fiske, et al. (Eds.). *The handbook of social psychology, Vol. 2* (4th ed.). Boston: McGraw-Hill.

Crocker, J., & Park, L. E. (2004). The costly pursuit of self-esteem. *Psychological Bulletin, 130*, 392-414.

Croizet, J. C., & Claire, T. (1998). Extending the concept of stereotype threat to social class: The intellectual underperformance of students from low socioeconomic backgrounds. *Personality and Social Psychology Bulletin, 24*, 588-594.

Deci, E. L., & Ryan, R. M. (1995). Human autonomy: The basis for true self-esteem. In M. Kernis (Ed.), *Efficacy, agency, and self-esteem* (pp. 31-49). New York: Plenum Publishing Co.

Enns, M. W., & Cox, B. J. (2002). "The Nature and Assessment of Perfectionism: A critical analysis." In G.L. Flett and P.L. Hewitt (Eds.), *Perfectionism: Theory, research, and treatment* (pp. 33-62). Washington, DC: American Psychological Association.

Enns, M. W., Cox, B. J., Sareen, J., & Freeman, P. (2001). Adaptive and maladaptive perfectionism in medical students: A longitudinal investigation. *Medical Education, 35*, 1034-1042.

Espenshade, Thomas J. and Alexandria Walton Radford. No Longer Separate, Not Yet Equal: Race and Class in Elite College Admission and Campus Life. Princeton, NJ: Princeton University Press, 2009.

Flett, G. L., Besser, A., Davis, R. A., & Hewitt, P. L. (2003). Dimensions of perfectionism, unconditional self-acceptance, and depression. *Journal of Rational-Emotive and Cognitive-Behavior Therapy, 21*, 119-1338.

Flett, G. L., Blankstein, K. R., & Hewitt, P. L. (2009). Perfectionism, performance, and state positive affect and negative affect after a classroom test. *Canadian Journal of School Psychology, 24*, 4-18.

Flett, G. L., Hewitt, P. L., Blankstein, K. R. & Dynin, C. B. (1994). Dimensions of perfectionism and type a behaviour. *Personality and Individual Differences, 16*, 477-485.

Flett, G. L., & Hewitt, P. L. (2007). Cognitive and self-regulating aspects of perfectionism and their implications for treatment: Introduction to the special issue. *Journal of Rational-Emotive & Cognitive Behavior Therapy, 25*, 227-236.

Flett, G. L., & Hewitt, P. L. (Eds.). (2002). Perfectionism. Theory, Research and Treatment. American Psychological Association: Washington, DC.

Flett, G. L., Hewitt, P. L., & Dyck, D. G. (1989). Self-oriented perfectionism, neuroticism and anxiety. *Personality and Individual Differences, 10*, 731-735.

Frost, R. O., & Gross, R. C. (1993). The hoarding of possessions. *Behaviour Research and Therapy*, *31*, 367-381.

Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research*, *14*, 449-468.

Gilbert, P., Durrant, R., & McEwan, K. (2006). Investigating relationships between perfectionism, forms and functions of self-criticism, and sensitivity to put-down. *Personality and Individual Differences*, *41*, 1299-1308.

Grimm, L. R., Markman, A. B., Maddox, W. T., & Baldwin, G. C. (2009). Stereotype threat reinterpreted as a regulatory mismatch. *Journal of Personality and Social Psychology*, *96*, 288-304.

Hanchon T. A. (2010). The relations between perfectionism and achievement goals. *Personality and Individual Differences*, *49*, 885-890.

Hamachek, D. E. (1978). Psychodynamics of normal and neurotic perfectionism. *Psychology: A Journal of Human Behavior*, *15*, 27-33.

Hewitt, P. L., & Flett, G. L. (1989). The Multidimensional Perfectionism Scale: Development and validation. *Canadian Psychology*, *30*, 339.

Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology*, *60*, 456-470.

Hewitt, P. L., & Flett, G. L. (1996). The Multidimensional Perfectionism Scale. Toronto: Multi-Health Systems Inc.

Hewitt, P. L., & Flett, G. L. (2004). The Multidimensional Perfectionism Scale: Manual. Toronto: Multi-Health Systems.

Hill, A.P., Hall, H. K., Appleton, P. R., & Kozub, S. A. (2008). Perfectionism and burnout in junior elite soccer players: The mediating influence of unconditional self-acceptance. *Psychology of Sport and Exercise, 9*, 630-644.

Hollender, M. H. (1978). Perfectionism: A neglected personality trait. *Journal of Clinical Psychiatry, 39*, 384.

Howard, J., & Hammond, R. (1985). Rumors of inferiority. *New Republic, 72*, 18-23.

Hyde, J. S., Fennema, E., & Lamon, S. (1990). Gender differences in mathematics performance: A meta-analysis. *Psychological Bulletin, 107*, 139-155.

Hyde, J. S., Fennema, E., Ryan, M., Frost, L. A., & Hopp, C. (1990). Gender comparisons of mathematics attitudes and affect. *Psychology of Women Quarterly, 14*, 299-324.

Inzlicht, M., & Ben-Zeev, T. (2000). A threatening intellectual environment: Why females are susceptible to experiencing problem-solving deficits in the presence of males. *Psychological Science, 11*, 365-371.

Ishida, H. (2005). College students' perfectionism and task-strategy inefficiency: Why their efforts go unrewarded? *Japanese Journal of Social Psychology, 20*, 208-215.

Jacobs, J., & Eccles, J. (1992). The impact of mothers' gender-role stereotypic beliefs on mothers' and children's ability perception. *Journal of Personality and Social Psychology, 63*, 932-944.

Jamieson, J. P., & Harkins, S. G. (2007). Mere effort and stereotype threat performance effects. *Journal of Personality and Social Psychology, 93*, 544-564.

Keller, J. (2002). Blatant stereotype threat and women's math performance: Self-handicapping as a strategic means to cope with obtrusive negative performance expectations. *Sex Roles, 47*, 193-198.

Kobori, O., & Tanno, Y. (2005). Self-oriented perfectionism and its relationship to positive and negative affect: The mediation of positive and negative perfectionism cognitions. *Cognitive Therapy and Research, 29*, 559-571.

Levenson, H. (1972). Distinction within the concept of internal-external control: Development of a new scale. *Proceedings of the Annual Convention of the American Psychological Association, 7*, 261-262.

Levenson, H. (1974). Activism and powerful others: Distinctions within the concept of internal-external control. *Journal of Personality Assessment, 38*, 377-383.

Lustina, M., & Aronson, J. (1998). Measuring and predicting stereotype vulnerability. Unpublished manuscript. University of Texas at Austin.

Maqsud, M. (1983). Relationships of locus of control to self-esteem, academic achievement, and prediction of performance among Nigerian secondary school pupils. *British Journal of Educational Psychology, 53*, 215-221.

Marks, L. (1998). Deconstructing locus of control: Implications for practitioners. *Journal of Counseling and Development, 76*, 251-260.

McKown, C., & Weinstein, R. S. (2003). The development and consequences of stereotype-consciousness in middle childhood. *Child Development, 74*, 498-515.

Muzzatti, B., & Agnoli, F. (2007). Gender and mathematics: Attitudes and stereotype threat susceptibility in Italian children. *Developmental Psychology, 43*, 747-759.

Niemann, Y. F., Jennings, L., Rozelle, R. M., Baxter, J. C., & Sullivan, E. (1994). Use of free responses and cluster analysis to determine stereotypes of eight groups.

*Personality and Social Psychology Bulletin*, 20, 379-390.

Nosek, B. A., Banaji, M. R., & Greenwald, A. G. (2002). Math = male, me = female, therefore math  $\neq$  me. *Journal of Personality and Social Psychology*, 83, 44-59.

Oswald, D. L., & Harvey, R. D. (2000-2001). Hostile environments, stereotype threat, and math performance among undergraduate women. *Current Psychology: Developmental, Learning, Personality, Social*, 19, 338-356.

Otten, M. W. (1977). Inventory and expressive measures of locus control and academic performance: A 5-year outcome study. *Journal of Personality Assessment*, 41, 644-649.

Pacht, A. (1984). Reflections on Perfection. *American Psychologist*, 39, 386-390.

Periasamy, S., & Ashby, J. S. (2002). Perfectionism and locus of control. *Journal of College Student Psychotherapy*, 17, 75-86.

Pinel, E. C. (2002). Stigma consciousness in intergroup contexts: The power of conviction. *Journal of Experimental Social Psychology*, 38, 178-185.

Rajamohan, G. (1978). A study of the relationship between locus of control and academic motivation among college students. *Asian Journal of Psychology and Education*, 3, 52-55.

Rheume, J., Freeston, M. H., Ladouceur, R., Bouchard, C., Gallant, L., Talbot, F., et al. (2000). Functional and dysfunctional perfectionists: Are they different on compulsive-like behaviors? *Behaviour Research and Therapy*, 38, 119-128.

Rice, K. G., Ashby, J. S., & Slaney, R. B. (1998). Self-Esteem as a mediator between perfectionism and depression: A structural equations analysis. *Journal of Counseling Psychology, 45*, 304-314.

Rice, K. G., Ashby, J. S., & Slaney, R. B. (2007). Perfectionism and the five-factor model of personality. *Assessment, 14*, 385-398.

Rice, K. G., Vergara, D. T., & Aldea, M. A. (2006). Cognitive-affective mediators of perfectionism and college student adjustment. *Personality and Individual Differences, 40*, 463-473.

Rotter, J. B. (1954). *Social learning and clinical psychology*. Englewood Cliffs, NJ: Prentice Hall.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs, 80*.

Rydell, R. J., Rydell, M. T., & Boucher, K. L. (2010). The effect of negative performance stereotypes on learning. *Journal of Personality and Social Psychology, 99*, 883-896.

Schmader, T. (2002). Gender identification moderates stereotype threat effects on women's math performance. *Journal of Experimental Social Psychology, 38*, 194-201.

Schmader, T., Johns, M., & Forbes, C. (2008). An integrated process model of stereotype threat effects on performance. *Psychological Review, 115*, 336-356.

Sekaquaptewa, D., & Thompson, M. (2003). Solo status, stereotype threat, and performance expectancies: Their effects on women's performance. *Journal of Experimental Social Psychology, 39*, 68-74.

Sideridis, G. D. (2006). Goal orientations and strong oughts: Adaptive or maladaptive forms of motivation for students with and without suspected learning disabilities? *Learning and Individual Differences, 16*, 61-77.

Skinner, E. A., Wellborn, J. G., & Connell, J. P. (1990). What it takes to do well in school and whether I've got it: A process model of perceived control and children's engagement and achievement in school. *Journal of Educational Psychology, 82*, 22-32.

Speirs Neumeister, K. L., & Finch, W. H. (2006). Perfectionism in high ability students: Relational precursors and implications for achievement. *Gifted Child Quarterly, 50*, 238-251.

Spencer, S. J., Steele, C. M., & Quinn, D. M. (1999). Stereotype threat and women's math performance. *Journal of Experimental Social Psychology, 35*, 4-28.

Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist, 52*, 613-629.

Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology, 69*, 797-811.

Steele, C. M., Spencer, S. J., & Aronson, J. (2002). Contending with group image: The psychology of stereotype and social identity threat. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 34, pp.379 – 440). New York, NY: Academic Press.

Stober, J., & Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence, challenges. *Personality and Social Psychology Review, 10*, 295-319.

Stoeber, J., & Yang, H. (2010). Perfectionism and emotional reactions to perfect and flawed achievements: Satisfaction and pride only when perfect. *Personality and Individual Differences, 49*, 246-251.

Terry-Short, L. A., Owens, R. G., Slade, P. D., & Dewey, M. E. (1995). Positive and negative perfectionism. *Personality and Individual Differences, 18*, 663-668.

Verner-Filion, J., & Gaudreau, P. (2010). From perfectionism to academic adjustment: The mediating role of achievement goals. *Personality and Individual Differences, 49*, 181-186.

Weissman, A. N., & Beck, A. T. (1978, August–September). Development and validation of the Dysfunctional Attitude Scale: A preliminary investigation. Paper presented at the 86th annual convention of the American Psychological Association, Toronto, Ontario, Canada.

Witcher, L. A., Alexander, E. S., Onwuegbuzie, A. J., Collins, K. M. T., & Witcher, A. E. (2007). The relationship between psychology students' levels of perfectionism and achievement in a graduate-level research methodology course. *Personality and Individual Differences, 43*, 1396-1405.

Appendix A



Appendix B

## **Barry University Informed Consent Form**

Your participation in a research project is requested. The title of the study is Personality and Math Performance. The research is being conducted by Ann-Kathrin Honigfort, a student in the Psychology department at Barry University, and is seeking information that will be useful in the field of Cognitive Psychology. The aims of the research are to assess how personality affects academic performance. In accordance with these aims, the following procedures will be used: Participants will be asked to complete a packet of personality questions and will be asked to complete a math and a verbal section. We anticipate the number of participants to be 120.

If you decide to participate in this research, you will be asked to do the following: Complete a packet of personality questions and perform a math and a verbal operation. It will require approximately 45 minutes to complete the research procedures.

Your consent to be a research participant is strictly voluntary and should you decline to participate or should you choose to drop out at any time during the study, there will be no adverse effects on your grades.

There are no known risks to you associated with this study. Although there are no direct benefits to you, your participation in this study may help our understanding of how personality influences academic performance.

As a research participant, information you provide will be held in confidence to the extent permitted by law. Any published results of the research will refer to group averages only and no names will be used in the study. Data will be kept in a locked file in the researcher's office for a time period of 3 years. Your signed consent form will be kept separate from the data. All data will be destroyed after 3 years.

If you have any questions or concerns regarding the study or your participation in the study, you may contact me, Ann-Kathrin Honigfort, at (239) 537-9171, my supervisor, Dr. Muscarella, at (305) 899-3275, or the Institutional Review Board point of contact, Barbara Cook, at (305)899-3020. If you are satisfied with the information provided and are willing to participate in this research, please signify your consent by signing this consent form.

### **Voluntary Consent**

I acknowledge that I have been informed of the nature and purposes of this experiment by Ann-Kathrin Honigfort and that I have read and understand the information presented above, and that I have received a copy of this form for my records. I give my voluntary consent to participate in this experiment.

\_\_\_\_\_  
*Signature of Participant*

\_\_\_\_\_  
*Date*



Appendix C

Thank you for your Participation!

Please provide the following information:

1. What is your age? \_\_\_\_\_
2. Grade Level?      First year       Second year       Third year         
Fourth year
3. School Major?      \_\_\_\_\_
4. GPA?      \_\_\_\_\_
5. Race?      Black       Hispanic       White Non-  
Hispanic
- Other

Appendix D

## Multidimensional Perfectionism Scale (MPS; Hewitt &amp; Flett, 1991)

Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide whether you agree or disagree and to what extent. If you strongly agree, circle 7. If you strongly disagree, circle 1. If you feel somewhere in between, circle one of the numbers between 1 and 7. If you feel neutral or undecided, the midpoint is 4.

1. When I am working on something, I cannot relax until it is perfect.  
Disagree Agree

1            2            3            4            5            6            7

2. I am not likely to criticize someone for giving up too easily.  
Disagree Agree

1            2            3            4            5            6            7

3. It is not important that the people I am close to are successful.  
Disagree Agree

1            2            3            4            5            6            7

4. I seldom criticize my friends for accepting second best.  
Disagree Agree

1            2            3            4            5            6            7

5. I find it difficult to meet others' expectations of me.  
Disagree Agree

1            2            3            4            5            6            7

6. One of my goals is to be perfect in everything I do.  
Disagree Agree

1            2            3            4            5            6            7

7. Everything that others do must be of top-notch quality.  
Disagree Agree

1            2            3            4            5            6            7

8. I never aim for perfection in my work.  
Disagree Agree

1            2            3            4            5            6            7

9. Those around me readily accept that I can make mistakes too.  
Disagree 1 2 3 4 5 6 7 Agree
10. It doesn't matter when someone close to me does not do their absolute best.  
Disagree 1 2 3 4 5 6 7 Agree
11. The better I do, the better I am expected to do.  
Disagree 1 2 3 4 5 6 7 Agree
12. I seldom feel the need to be perfect.  
Disagree 1 2 3 4 5 6 7 Agree
13. Anything I do that is less than excellent will be seen as poor work by those around me.  
Disagree 1 2 3 4 5 6 7 Agree
14. I strive to be as perfect as I can be.  
Disagree 1 2 3 4 5 6 7 Agree
15. It is very important that I am perfect in everything I attempt.  
Disagree 1 2 3 4 5 6 7 Agree
16. I have high expectations for the people who are important to me.  
Disagree 1 2 3 4 5 6 7 Agree
17. I strive to be the best at everything I do.  
Disagree 1 2 3 4 5 6 7 Agree
18. The people around me expect me to succeed at everything I do.  
Disagree Agree

- |  |   |   |   |   |   |       |
|--|---|---|---|---|---|-------|
| 1  | 2 | 3 | 4 | 5 | 6 | 7     |
| 19. I do not have very high standards for those around me.                 |   |   |   |   |   |       |
| Disagree   |   |   |   |   |   | Agree |
| 1  | 2 | 3 | 4 | 5 | 6 | 7     |
| 20. I demand nothing less than perfection of myself.                       |   |   |   |   |   |       |
| Disagree   |   |   |   |   |   | Agree |
| 1  | 2 | 3 | 4 | 5 | 6 | 7     |
| 21. Others will like me even if I don't excel at everything.               |   |   |   |   |   |       |
| Disagree   |   |   |   |   |   | Agree |
| 1  | 2 | 3 | 4 | 5 | 6 | 7     |
| 22. I can't be bothered with people who won't strive to better themselves. |   |   |   |   |   |       |
| Disagree   |   |   |   |   |   | Agree |
| 1  | 2 | 3 | 4 | 5 | 6 | 7     |
| 23. It makes me uneasy to see an error in my work.                         |   |   |   |   |   |       |
| Disagree   |   |   |   |   |   | Agree |
| 1  | 2 | 3 | 4 | 5 | 6 | 7     |
| 24. I do not expect a lot from my friends.                                 |   |   |   |   |   |       |
| Disagree   |   |   |   |   |   | Agree |
| 1  | 2 | 3 | 4 | 5 | 6 | 7     |
| 25. Success means that I must work even harder to please others.           |   |   |   |   |   |       |
| Disagree   |   |   |   |   |   | Agree |
| 1  | 2 | 3 | 4 | 5 | 6 | 7     |
| 26. If I ask someone to do something, I expect it to be done flawlessly.   |   |   |   |   |   |       |
| Disagree   |   |   |   |   |   | Agree |
| 1  | 2 | 3 | 4 | 5 | 6 | 7     |
| 27. I cannot stand to see people close to me make mistakes.                |   |   |   |   |   |       |
| Disagree   |   |   |   |   |   | Agree |
| 1  | 2 | 3 | 4 | 5 | 6 | 7     |
| 28. I am perfectionistic in setting my goals.                              |   |   |   |   |   |       |
| Disagree   |   |   |   |   |   | Agree |





Appendix E

## Rotter Locus of Control Scale (Rotter, 1966)

For each question please select the statement that you agree with the most. Please check one box for each number!

1.

- Children get into trouble because their parents punish them too much.
- The trouble with most children nowadays is that their parents are too easy with them.

2.

- Many of the unhappy things in people's lives are partly due to bad luck.
- People's misfortunes result from the mistakes they make.

3.

- One of the major reasons why we have wars is because people don't take enough interest in politics.
- There will always be wars, no matter how hard people try to prevent them.

4.

- In the long run people get the respect they deserve in this world.
- Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.

5.

- The idea that teachers are unfair to students is nonsense.
- Most students don't realize the extent to which their grades are influenced by accidental happenings.

6.

- Without the right breaks one cannot be an effective leader.
- Capable people who fail to become leaders have not taken advantage of their opportunities.

7.

- No matter how hard you try some people just don't like you.
- People who can't get others to like them don't understand how to get along with others.

8.

- Heredity plays a major role in determining one's personality.
- It is one's experiences in life which determine what they're like.

9.

- I have often found that what is going to happen will happen.
- Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10.

- In the case of the well prepared student there is rarely if ever such a thing as an unfair test.
- Many times exam questions tend to be so unrelated to course work that studying is really useless.

11.

- Becoming a success is a matter of hard work; luck has little or nothing to do with it.
- Getting a good job depends mainly on being in the right place at the right time.

12.

- When I make plans, I am almost certain that I can make them work.
- It is not always wise to plan too far ahead because many things turn out to be a matter of luck anyway.

13.

- What happens to me is my own doing.
- Sometimes I feel that I don't have enough control over the direction my life is taking.

Appendix F

The following set of questions examines these gender differences. Please complete **without** the use of a calculator:

1. How many blankets can be made from 20 meters of cloth if each blanket requires 2.5 meters?

2. If  $x = -2$  and  $y = 3$ , then  $-x - xy^2 = ?$

3. Perform the indicated operation.

$$-2(3 - 4)^3 - 2$$

4. Add or subtract as indicated, and express the answer in simplest form.

$$\frac{5}{7} - \frac{2}{21}$$

5. What is 15% of 40?

6. If  $x = -2$ ,  $y = 4$ , and  $z = -3$ , evaluate the following expression.

$$7(x + y + z)$$

7. Solve the following equation.

$$2x + 2(3x + 2) - 9 = (3x - 9) + 3$$

8. Solve for  $x$ :  $12x + 7y = 5$

9. Perform the indicated operation.

$$(3x + 1)(2x + 5)$$

10. Solve the following quadratic equation.

$$x^2 + 9 = 6x$$

Next, please complete the verbal section.

11. Although some think the terms "bug" and "insect" are ----- , the former term actually refers to ----- group of insects.

- A) parallel . . an identical
- B) precise . . an exact
- C) interchangeable . . a particular
- D) exclusive . . a separate

12. Read the entire sentence carefully but quickly, paying attention to underlined choices (A) through (D). Select the underlined word or phrase that needs to be changed to make the sentence correct. Some sentences contain no error at all.

The students A have discovered that B they can address issues more effectively C through letter-writing campaigns D and not through public demonstrations. E No error E

13. If he A had begun B earlier, he might have succeeded C in finishing the D extremely complex project before the deadline. E No error

14. His pale \_\_\_\_\_ made some wonder if he was actually ill.

- A) complexion
- B) astute
- C) relevancy
- D) ego
- E) ethic

15. Illiteracy is an enormous problem, A it affects B millions of people worldwide, C and is an impediment to D social progress. E No error.

- A)
- B)
- C)
- D)
- E)

16. Find two words, one from each group, that are closest in meaning.

Group A

raise  
floor

Group B

top  
elevate

stairs

basement

- A. raise and elevate
- B. raise and top
- C. floor and basement
- D. stairs and top
- E. floor and elevate

17. Library is to book as book is to

Binding Copy Page Cover

- A. page
- B. copy
- C. binding
- D. cover

18. Early \_\_\_\_\_ of hearing loss is \_\_\_\_\_ by the fact that the other senses are able to compensate for moderate amounts of loss, so that people frequently do not know that their hearing is imperfect.

- A) discovery . . indicated
- B) development . . prevented
- C) detection . . complicated
- D) treatment . . facilitated
- E) incidence . . corrected

19. One word in this list doesn't belong to the same group: Yen, Pound, Franc, Penny, Mark.

- A) Yen
- B) Pound
- C) Franc
- D) Penny
- E) Mark

20. All formal complaints or \_\_\_\_\_ should be redirected to the proper \_\_\_\_\_.

- A) suggestions ... edifices
- B) grievances ... authorities
- C) condemnations ... contemporaries
- D) visitors ... offices
- E) advances ... principals

Appendix G

### Why do women underperform in Math?

A significant amount of research has been conducted on gender and math performance. Results reveal that men consistently outperform women when it comes to math. The following is a breakdown of SAT performance over the past 4 years (College Board, 2012):

| Year        | Gender | Number of Test Takers | Average Math Score |
|-------------|--------|-----------------------|--------------------|
| 2008 - 2012 | Male   | 1,000,000             | 533                |
|             | Female | 1,000,000             | 499                |

Additional studies have indicated that males outperform females on math tests and the performance gap we see widens throughout college and into adulthood (Armstrong, 1981; Hyde et al., 1990)

In response to this observable difference in math performance, Harvard University's president Lawrence H. Summers made the statement that women may not have the same innate abilities as men in mathematics (Cambridge Academic Conference, 2005).

Appendix H

Please read the following paragraph about Barry University.

South Florida has several of the nation's best colleges and universities that offer both undergraduate and graduate education that will fit all the interest and educational needs a person can have. Some of these schools include the University of Miami, Barry University, Florida Atlantic University, Nova Southeastern University, and Miami-Dade College.

Barry University was founded in 1940 and enrolls 2,747 full-time undergraduate students as well as 3,748 graduate students today. The university has several academic support services to ensure that you, the students, have all the help needed to reach your goals available to you. The Monsignor William Barry Memorial Library contains more than 950,000 items to assist you with your research. In addition, the Glenn Hubert Learning Center offers tutoring as well as assistance in writing, math, and reading. With all of the services Barry University has to offer, all doors are open for academic success!

Appendix I



8. Rate yourself compared to other men:

|     |   |   |   |      |
|-----|---|---|---|------|
| 1   | 2 | 3 | 4 | 5    |
| Bad |   |   |   | Good |