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Perfectionism, motivational orientation and academic performance

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Perfectionism, Motivational Orientation and Academic Performance

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Abstract

The present study examined the association between perfectionism and academic performance, as well as how motivational orientations (fear of failure and achievement motivation) and achievement goals (performance-approach, performance-avoidance, and mastery goals) are interrelated in predicting marks. Two hundred and eight university students completed a questionnaire package that included eight perfectionism subscales, and measures of achievement motivation, trait test anxiety, and achievement goal scales early in the fall semester. Marks in Introduction to Psychology (December exam) were used as a measure of academic performance. Perfectionism made independent contributions to the prediction of marks above and beyond that accounted for by motivational orientations and achievement goals, with significant unique contributions made by the personal standards, parental expectations, and organization perfectionism subscales. Students who had higher personal standards, lower parental expectations and lower organization attained higher marks. In addition, those who had a fear of failure orientation, as well as those who endorsed performance-avoidance goals generally obtained lower grades.

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Perfectionism, Motivational Orientation, and Academic Performance

While academic success is generally thought to be a function of cognitive factors such as intelligence, recent studies have drawn attention to the importance of motivational and personality factors, such as achievement motivation and fear of failure (Cock & Halvari, 1999; Herman, 1990). The personality trait of perfectionism has usually been considered a negative factor associated with psychopathology (Flett, Hewitt, & De Rosa, 1996), however, some recent studies have distinguished between adaptive and maladaptive perfectionism (Rheaume, Freeston, Ladouceur, Bouchard, Gallant, Talbot, & Vallieres, 2000; Slaney, Ashby, & Trippi, 1995). Adaptive perfectionism has been linked with higher academic achievement, whereas maladaptive perfectionism was related to lower academic performance (Arthur & Hayward, 1997; Brown, Heimberg, Frost, Makris, Juster, & Leung, 1999). While theorists have speculated about the relationships between maladaptive perfectionism and fear of failure, and between adaptive perfectionism and achievement motivation (Hamachek, 1978; Hollender, 1965), only a few empirical studies have been conducted to test these suppositions. The purpose of the current study was to examine how perfectionism, achievement motivation, fear of failure, and achievement goals interrelate in predicting academic performance.

Perfectionism

Early conceptualizations of perfectionism were unidimensional in that researchers focussed exclusively on self-directed cognitions. This self-oriented view encompassed the setting of excessively high self-standards, stringent self-evaluations, and a focus on flaws in ones' performance (Burns, 1980; Hollender, 1965; Pacht, 1984). Pacht (1984),

for example, construed perfectionism as an inherently destructive pursuit of unattainable goals that keeps people in turmoil. Similarly, Burns (1980) conceptualized perfectionism as a cognitive pattern of expectations of oneself characterized by rigid standards for performance, determination of self-worth through performance, and the setting of unrealistic standards. Moreover, perfectionists tend to have a strong need for impeccable performance, often experience excessive concern about failing, and overemphasize precision and order.

Recent research viewed perfectionism as a multidimensional concept. Although perfectionism for the self is an essential component of the perfectionism construct, it has been found that perfectionism includes interpersonal aspects as well (Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991). Thus, recent studies have made a distinction between personal and social aspects of perfectionism. Hewitt and Flett (1991) proposed that perfectionism has interpersonal components, and that these aspects are critical in adjustment difficulties. In accordance with their multi-faceted conceptualization of perfectionism, Hewitt and Flett (1991) constructed an empirical measure of this construct. A reliable set of items that were derived from psychological theory were used to develop the Multidimensional Perfectionism Scale (HMPS). According to Hewitt and Flett (1991), perfectionism can be described along three dimensions: self-oriented, other-oriented, and socially prescribed perfectionism. The essential distinction among these components is not the pattern of standards or beliefs, but rather the object to whom the perfectionist behaviour is aimed, or to whom the behaviour is attributed. Self-oriented perfectionism includes setting high standards for oneself, and the rigorous evaluation of one's own performance, while other-oriented

perfectionism involves unrealistic expectations and standards for others, and stringent evaluations of their behaviours. Socially prescribed perfectionism entails the perceived need to meet the overly high standards imposed by significant others in order to win approval. These subscales are relatively distinct and are not alternate forms of the same dimension. Furthermore, the dimensions can be assessed in a reliable and valid manner (Hewitt & Flett, 1991).

Comparable research by Frost and his associates (1990) has resulted in the development of another multifaceted perfectionism scale, the Frost Multidimensional Perfectionism Scale (FMPS). Although this scale does not include an assessment of other-oriented perfectionism, it does provide measures of both the personal aspects of perfectionism, as well as the external pressures perceived to produce perfectionism. Thus, both the FMPS and the HMPS highlight the important difference between self-determined and imposed standards of perfection (Flett, Blankstein, Hewitt, & Koledin, 1992). The FMPS has five dimensions that were derived by factor analysis and an overall perfectionism score. This scale assesses the following dimensions of perfectionism: concern over mistakes, which reflects negative reactions to mistakes and the tendency to interpret mistakes as equivalent to failure; personal standards, which reflects the setting of extremely high standards and the excessive importance placed on these standards for self evaluation; parental expectations, involving the tendency to believe that ones' parents set very high goals for oneself; parental criticism, which entails the perception that ones' parents are overly critical; organization, involving the excessive importance placed on order and organization; and finally, doubts about actions, capturing a vague sense of doubt about the quality of one's performance and a sense that a

performance was somehow unsatisfactory. Each dimension has adequate reliability and validity (Frost et al., 1990).

Perfectionism and Psychopathology

Research on perfectionism has implicated this personality dimension in many psychopathologies. Hewitt and Flett (1991), for example, cite studies reporting significant relationships between perfectionism and alcoholism, eating disorders, chronic pain, and Type A behaviour pattern. In general, studies have revealed that perfectionism was an important predictor of negative psychological outcome (Chang, 2000; Flett, Hewitt, Blankstein, & Gray, 1998; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993). There are clinical findings that suggested a relationship between perfectionism and obsessive-compulsive disorder (Frost & Steketee, 1996), as well as studies that found a link between perfectionism and obsessive-compulsive symptoms among non-clinical populations (e.g., Rheaume et al., 2000). Furthermore, research using college students has consistently found greater levels of perfectionism to be associated with more psychological symptoms and greater suicidal risk (Chang, 1998).

Recently, however, several researchers have noted that investigations designed to examine perfectionism and psychopathology have been limited by the assumption that perfectionism is a unidimensional construct (Flett, Hewitt, Blankstein, & Mosher, 1995). Accordingly, they addressed this issue by investigating perfectionism and psychosocial adjustment using a multidimensional measure (Flett, Hewitt, & De Rosa, 1996). The investigators discovered that only socially prescribed perfectionists were likely to suffer from shyness and fear of negative evaluation. A similar study using a clinical population found that individuals with social phobia scored higher on socially prescribed

perfectionism (Bieling & Alden, 1997), while another investigation revealed that this dimension of perfectionism was associated with submissive behaviour, shame, and defeat (Wyatt & Gilbert, 1997). Hewitt, Flett, and Turnbull-Donovan, (1992b) found that socially prescribed perfectionism was the only perfectionism measure that was associated with increased levels of suicide potential. In addition, regression analyses indicated that this dimension predicted unique variance in suicide threat and intent that was not accounted for by depression and feelings of hopelessness. In a study designed to examine burnout in competitive junior tennis players, Gould, Udry, Tuffey, and Loehr (1996) found that these athletes differed on a variety of perfectionism subscales of the FMPS. In particular, players experiencing burnout perceived greater amounts of parental expectations and criticism, had lower personal standards, had higher needs for organization, and experienced greater concern over mistakes. Furthermore, studies have shown that dimensions of perfectionism are related to personality disorder symptoms. For example, other-oriented perfectionism was linked with histrionic features, while socially prescribed perfectionism was found to be associated with borderline personality disorder (Hewitt, Flett, & Turnbull-Donovan, 1992a; Hewitt, Flett, & Turnbull-Donovan, 1994). These researchers provided evidence for the differential relationship between perfectionism and psychopathology.

Positive Aspects of Perfectionism

While the multidimensional aspect of perfectionism encompass inter- and intra-personal components, perfectionism also includes positive and negative domains. The pioneering work of Hamachek (1978) suggested that the concept of perfectionism is more than simply a unidimensional construct based on setting excessively high standards of

performance. Instead, he postulated that perfectionism has both positive and negative attributes. Hamachek (1978) labelled the former as normal perfectionism, which involves setting realistic and reasonable self-expectations, with strivings accompanied by a sense of satisfaction. The latter dimension, neurotic perfectionism, is characterized by the setting of unrealistically high targets, and is driven by a fear of failure that leads to psychological distress. Thus, perfectionism may benefit individuals who pursue high standards with conscientiousness, but may also impair those who are never satisfied with their accomplishments. The benefits of perfectionism have also been documented in the personality literature. Hill, McIntire, and Bacharach (1997) discovered that the Big Five personality factors of neuroticism, agreeableness, and conscientiousness were predictors of self-oriented perfectionism, while the depression subscale of the neuroticism factor was a significant predictor of socially prescribed perfectionism. In explaining these outcomes, they concluded that self-oriented perfectionism appeared primarily adaptive, while socially prescribed perfectionism appeared predominantly maladaptive. Using the HMPS as a measure of perfectionism, several investigators have found that self-oriented and other-oriented perfectionism were associated with higher levels of perceived personal control, and greater levels of desire for control (Flett et al., 1995). Likewise, self-oriented and other-oriented dimensions were positively correlated with self-efficacy (Martin, Flett, Hewitt, Krames, & Szanto, 1996).

Measures of Positive and Negative Perfectionism

Various types of perfectionists have been delineated in an attempt to gain a more comprehensive understanding of this construct (e.g., Rheaume et al., 2000). Recently, several researchers have attempted to operationalize the positive and negative dimensions

by using various subscales of the perfectionism measures. Slaney and others (1995), for instance, used a principal components factor analysis to investigate the relationships among the subscales of various measures of perfectionism. Two latent dimensions were identified: the first factor represented adaptive perfectionism, and the second factor was labelled maladaptive perfectionism. A comparable study used the FMPS and the Almost Perfect Scale (APS; Slaney & Johnson, 1992) as measures of perfectionism. Using confirmatory factor analysis to assess the adaptive and maladaptive perfectionism constructs, Rice, Ashby, and Slaney (1998) found an adaptive component consisting of high personal standards, organization, order, and low procrastination. Maladaptive perfectionism describes individuals who experience excessive concerns about making mistakes, doubt their actions, and tend to procrastinate, feel anxious, and report having highly critical parents who had unrealistic expectations for them. Further support for the existence of adaptive aspects of perfectionism is evidenced in the development of a more recent instrument that emphasized the positive factors of perfectionism (Slaney & Johnson, 1992).

According to Frost and his colleagues (1990), the combination of high standards and overconcern for mistakes are associated with a positive and negative dimension of perfectionism, respectively. They argued that concern over mistakes stimulate neurotic perfectionists to work toward goals out of a fear of failure. Normal perfectionists, who are thought to be less likely to interpret mistakes as indicating inadequacy, are presumed to strive for goals out of a need for achievement. To investigate this line of thought, Frost et al. (1993) carried out a factor analysis of the subscales for both the FMPS and HMPS. In support of their proposition, the results showed two dimensions underlying

perfectionism. They labelled the first factor "maladaptive evaluation concerns" and found it to be related to depression. The second factor, "positive striving" was significantly correlated with positive affect. A dichotomous distinction was made between "positive achievement strivings" and "maladaptive evaluation concerns". The first factor was determined by high loadings on the personal standards, self-oriented perfectionism, organization, and other-oriented perfectionism subscales. The latter, more pathological factor, was determined by high loadings on the remaining subscales, including concern over mistakes, parental criticism, parental expectations, doubts about actions, and socially prescribed perfectionism. Similar results were found by Norman, Davies, Nicholson, Cortese, and Malla (1996). They proposed that the distinction between the positive and negative components of perfectionism are likely to be related to the distinction between basic behavioural symptoms, such as the motive to achieve success and the motive to avoid failure.

Adkins and Parker (1996) proposed that active perfectionism, a positive component of perfectionism, describes individuals who are motivated by their achievement strivings, while passive perfectionism, a negative aspect of perfectionism, is related to an excessive fear of making mistakes. To assess passive perfectionism, Lynd-Stevenson and Hearne (1999) combined the concern over mistakes and doubts about actions subscales of the FMPS. Since the scales had unequal items, both were standardized to give them equal weighting. The measure of active perfectionism was constructed by adding the standardized scores for personal standards and parental expectations, and parental criticism. The scores of the organization subscale were left unchanged. Using a regression analysis, these investigators found that passive, but not

active perfectionism was a predictor of depression. Thus, these findings provide support for the speculations made by Adkins and Parker (1996). However, such results contrast with the formulations made by Frost and his colleagues (1993) who, using a factor analysis, reported that parental expectations and parental criticisms loaded heavily on a negative component of perfectionism. Adkins and Parker, on the contrary, viewed these two subscales as part of active perfectionism, a positive aspect of perfectionism.

Parker (1997) has identified three groups that he labelled healthy perfectionists, dysfunctional perfectionists, and non-perfectionists. He used a cluster analysis of the FMPS and empirically derived three independent groups that differed on several different inventories. He found that non-perfectionists had low total perfectionism scores, with particularly low scores on the personal standards and organization subscales. Dysfunctional perfectionists had high total perfectionism scores, with high scores on concern over mistakes, doubts about actions, parental expectations, and parental criticism. Finally, Parker (1997) found that healthy perfectionists had moderate total perfectionism scores, with high scores on organization, and lower scores on concern over mistakes, parental criticism, and doubts about actions.

In sum, not only is perfectionism a multidimensional construct involving intra- and inter-personal aspects, it also consists of positive and negative components that can be operationalized using the existing perfectionism measures.

Motivational Orientation

Motives render a person active in pursuing a goal by energizing and orienting subsequent behaviour (Biernat, 1989). Two contrasting motivational orientations have been identified as the desire for success (achievement motivation) and the desire to avoid

failure (fear of failure). In his formulation of the need achievement theory, Atkinson (1957) postulated that the desire to attain success and the desire to avoid failure are important determinants of achievement behaviour. Thus, classic achievement motivation theorists emphasized that activity in achievement settings may be oriented toward the attainment of success or the avoidance of failure.

Murray (1938) conceptualized achievement motivation as a unidimensional motive to strive for high standards that encompasses the desire to seek challenge and outperform others across situations. This motivational orientation is often considered an adaptive motivational pattern as it promotes the establishment, maintenance and attainment of achievement goals. Accordingly, achievement motivation reflects the willingness to work hard and the tendency to aspire to accomplish difficult tasks (Wong & Csikszentmihalyi, 1991).

Atkinson (1957) conceptualized the motive to avoid failure as a capacity to respond negatively when the outcome of performance is failure. More specifically, this tendency is aroused when it is obvious to the person that his or her performance will be evaluated, and that failure is a real possibility. Consequently, the person will react with anxiety, and withdraw from the situation. Fear of failure is therefore considered a negative maladaptive motivational pattern as it is associated with a failure to maintain an effective striving toward valued goals, and to obtain these goals (Dweck, 1986). In the achievement motivation literature, fear of failure has generally been equated with trait test anxiety and, accordingly, fear of failure has often been measured using a score on a self-report measure of test anxiety. Like fear of failure, trait test anxiety involves a tendency to experience evaluation anxiety in achievement situations, and both

dimensions are affective-motivational constructs that orient individuals toward negative possibilities (Elliott & McGregor, 1999). A study conducted by Herman (1990) found that fear of failure was a latent trait component of test anxiety, which manifests itself as a situational state of test anxiety under performance conditions. A more recent study attempted to replicate these findings. Consistent with their hypotheses, Elliot and McGregor (1999) found a conceptual and functional convergence of trait test anxiety and fear of failure. Furthermore, Elliot and Sheldon (1997) used a direct measure of fear of failure (see Herman, 1990) as well as an indirect assessment of this construct (Test Anxiety Scale; Sarason, 1978). They discovered that analyses with these measures produced the same results. The findings of these studies provide support for the use of test anxiety scales to assess the motive to avoid failure.

Several studies have examined the relationships between motivational orientations and academic performance (Blankstein, Flett, Watson, & Koledin, 1990; Crawford, 1978; Elliot & McGregor, 1999). Researchers have reported a negative relationship between trait test anxiety and academic outcomes (Blankstein, et al., 1990; Elliot & McGregor, 1999; Herman, 1990). Similarly, Cock and Halvari (1999) found that the motive to avoid failure was negatively correlated with performance on a math test. An investigation that examined motivational orientation and performance on tasks varying in difficulty level revealed that students with high achievement motivation performed increasingly better as the task increased in difficulty, while the opposite was found for those high in fear of failure (Crawford, 1978).

Achievement Goals

Previous studies, which have documented two strikingly different reactions to failure in children, have led researchers to examine the reasons behind such discrepant reactions. Children who attributed their failures to low ability showed deterioration in performance, while those who exhibited a solution-oriented focus tended to show improved performance (Diener & Dweck, 1978). These findings suggested that the two groups of children were endorsing different goals in achievement settings. The performance-oriented individuals sought to maintain positive judgements of their ability, while the mastery-focused students sought to increase their ability (Elliott & Dweck, 1988). Achievement goal concerns the purpose of achievement behaviour, and the specific type of goal adopted is posited to create a framework for how people interpret, experience, and act in their achievement endeavours (Dweck, 1986).

Two distinct goal constructs have been extensively studied. Mastery and performance goals represent different conceptions of success and reasons for engaging in achievement activities. Individuals who pursue mastery goals endeavour to develop new skills and improve their level of competence, and to achieve a sense of mastery based on self-referenced standards. Essential to a performance goal, on the other hand, is a focus on one's ability relative to others. A sense of self-worth is dependent on exceeding normative-based standards. Therefore, public recognition that one has done better than others is especially important for those with performance goals (Ames, 1992). More recently, however, the performance goal has been partitioned into independent approach and avoidance components (Elliot & Harackiewicz, 1996). The former has been labelled performance-approach goal, which is directed toward the attainment of favourable

judgements of competence, while the latter, performance-avoidance goal, is aimed at avoiding unfavourable judgements of competence. Individuals with either a mastery or performance-approach goal generally perceive achievement contexts as challenging, and this perception is likely to facilitate task absorption, and orient the individual toward the presence of success-relevant or mastery-relevant information. In contrast, those who endorse performance-avoidance goals tend to construe achievement settings as a threat, and the prospect of failure is likely to elicit anxiety, disrupt concentration, and orient the individual toward the presence of failure-relevant information (Elliot & Harackiewicz, 1996).

There are multiple determinants of achievement goals including contextual factors such as classroom structure or experimental manipulations (see Midgley & Urdan, 2001; Elliot & Harackiewicz, 1996), as well as personality differences in motivational orientation (see Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997). Motivational orientations are posited to prompt the adoption of goals, and these goals are presumed to function as the direct regulators of achievement outcomes. In other words, motivational orientations exert indirect or distal effects on achievement behaviour by means of their influence on achievement goal adoption. Thus, goals can be construed as cognitive-dynamic manifestations of their corresponding motives, and are proximal determinants of achievement outcomes (Elliot & Sheldon, 1997). Goals give expression to human needs or motivations, and they are posited to be more concrete representations of abstract motivational dispositions. Mastery and performance-avoidance goals are considered "pure" goals in that they serve a single motivational function: achievement motivation and fear of failure, respectively. As an example, fear of failure orients individuals toward

the possibility of failure and, therefore, is likely to evoke performance-avoidance goals that emphasize avoidance of negative outcomes. Performance-approach goal, on the other hand, is conceived as a more complex form of orientation as it can serve both approach and avoidance motivational functions in which individuals work in order to avoid unfavourable judgements of competence (Elliot & Church, 1997).

These propositions have achieved considerable empirical support, with results indicating that the primary effect of achievement motivation and fear of failure on achievement behaviours is indirect, with achievement goals as the direct regulators of achievement outcome. Elliot and Church (1997) found a positive association between achievement motivation and mastery and performance goals in a sample of university students. In the context of the university classroom, Elliot and Church (1997) measured, rather than manipulated, the three goal orientations. Similar to the results obtained in the laboratory, they found that mastery goals facilitated intrinsic motivation, but had no effect on graded performance. Performance-avoidance goals had a negative influence on both intrinsic motivation and grades, while approach goals evidenced a positive association with grades, but had no influence on intrinsic motivation.

Harackiewicz and her colleagues (1997) investigated the consequences of goal adoptions for academic performance in university students. Using a prospective longitudinal design, they found that performance-approach goals had positive effects on course grades, while avoidance goals had a negative effect on performance. In addition, these investigators found that mastery goals had a positive influence on intrinsic motivation, and no effect on graded performance. When tested in conjunction with achievement goals, there were no direct effects of achievement motivation on

performance or intrinsic motivation. Instead, goals were found to be the proximal predictors of these positive educational outcomes.

Perfectionism and Motivation

While perfectionism has been viewed as a cognitively based construct, there is evidence that it has a motivational component as well. It has been suggested that the personality style of perfectionism is comprised of distinct affective, behavioural, interpersonal, and motivational components (Hewitt & Flett, 1990). Personality traits determine which situations people will approach and which they will avoid. For these reasons, it is important to relate traits to characteristic motivational structures (Lorr, Youniss, & Stefic, 1984). Hamachek (1978) for example, describes the normal perfectionist as an individual who allows for latitude in goal attainment, while the neurotic perfectionist is overly critical of failure. As a result, the latter individual is motivated by fear of failure rather than a need for achievement. Therefore, any evaluated performance is viewed as an opportunity to fail rather than succeed. In addition to the anecdotal reports, some empirical studies have found that perfectionism has a salient motivational component. Frost and Marten (1990) found that students scoring high in perfectionism assigned greater importance to an upcoming evaluated task and reported higher levels of negative affect when the evaluative component of the writing task was made salient. However, when the evaluative threat was low, there was no difference in affect between high and low perfectionists. Furthermore, the performances of highly perfectionistic individuals were judged to be lower in quality by professors.

Hewitt and Flett (1991) found that socially prescribed perfectionism was related to fear of negative evaluation, and another investigation revealed that these individuals

were more likely to have a fear of failure, and of making mistakes (Blankstein, Flett, Hewitt, & Eng, 1993). On a similar note, Frost and Henderson (1991) found that the doubts about actions subscale of the FMPS was positively correlated with failure orientation, as well as anxiety regarding athletic competition. In explaining these relationships, they inferred that individuals scoring high on the doubts about actions subscale tend to view evaluated performance as an opportunity for failure and thus feel threatened in these settings. Frost and Henderson further proposed that individuals who score high in concern over mistakes will show decreased motivation at times when their mistakes are more apparent.

Perfectionism has also been found to underpin motivational problems, such as procrastination. For example, Flett and his colleagues (1992) discovered that socially prescribed perfectionism was positively correlated with general procrastination, as well as the frequency of academic procrastination. In addition, they found that perfectionism was correlated with increased fear of failure, while another investigation discovered that only socially prescribed perfectionism was related to test anxiety (Mills & Blankstein, 2000).

Hill, McIntire, and Bacharach (1997) found that self-oriented perfectionism was associated with the achievement striving and dutifulness subscales of the Big Five factor model of personality. Thus, self-oriented perfectionists aspire to high levels of performance, and are intent on realizing their goals. Similarly, Hewitt and Flett (1991) described self-oriented perfectionists as high in intrinsic motivation and goal-directedness, rather than having avoidance tendencies.

A salient motivational component is further suggested by results that link perfectionism with various dimensions of Type A behaviour, which has a motivational element (Flett, Hewitt, Blankstein, & Dynin, 1994). Hewitt and Flett (1993) construe perfectionism as an achievement-based construct that involves the tenacious pursuit of personal goals. Thus, in addition to negative motivational patterns (e.g., fear of failure) associated with some aspects of perfectionism, there are positive achievement oriented motivations related to other components.

Perfectionism and Achievement

Arthur and Hayward (1997) examined the relationships between perfectionism, standards for academic achievement, and emotional distress. Perfectionistic tendencies were associated with students' actual performance in a postsecondary program. In particular, higher levels of depression and socially prescribed perfectionism were associated with lower grade point average (GPA). Thus, only socially prescribed perfectionism appeared to manifest in symptoms of depression and, ultimately, lower academic performance. Similarly, Brown and her colleagues (1999) investigated the influence of perfectionism on academic performance. They found that individuals with high personal standards engaged in more frequent study behaviour, and had high standards and expectations for academic performance. Furthermore, these individuals attained better grades across the semester. Maladaptive concern over mistakes was also related to more frequent study behaviour; however, it was also associated with perceptions of greater course difficulty, higher anxiety, and more negative mood prior to examinations. The latter dimension was not related with better grades.

Present Study

While it has been established that perfectionism is related to academic performance, and that different motivational orientations exert their influence on graded performance via achievement goals, no investigations have examined whether these predictors combined may enhance prediction of academic achievement. Based on this apparent gap in the literature, the purpose of the current investigation was to examine the relationships between perfectionism, motivational orientation, goals, and academic performance. A secondary aim was to replicate previous reports that motivational orientation (fear of failure and achievement motivation) exerts only indirect effects on marks that are mediated by their respective achievement goals.

Method

Participants

Two hundred and eight (40 males and 168 females) participants were recruited from an introductory level psychology course at Lakehead University. In return for their participation, students received one mark towards their grade in the course. The mean age of participants was 20.3 years old with a range of 18 to 63.

Instrumentation and Measures

Achievement Motivation. The Achievement Motivation subscale of Jackson's (1974) Personality Research Form was used as a measure of the achievement motive. Underlying the development of this subscale was Murray's (1938) conceptualization of the need for achievement as a unitary construct. This measure consists of 16 true-false items, such as "I enjoy difficult work" and "I often set goals that are difficult to reach." Several studies have confirmed the reliability, and construct and predictive validity of the

measure (e.g., Fineman, 1977; Harper, 1975). Responses were summed to form the achievement motivation index.

Test Anxiety. The 20-item Test Anxiety Inventory (Spielberger, 1980) was used to assess fear of failure in an academic context. The premise behind this questionnaire is that people who are high in test anxiety tend to perceive evaluative situations as personally threatening, and thus, experience debilitating evaluative stress. Studies have attested to the validity and reliability of this instrument (e.g., Spielberger, 1980). The trait test anxiety and fear of failure constructs possess a high degree of conceptual convergence. However, trait test anxiety measures are focussed exclusively on examination settings, while fear of failure measures focus more broadly on achievement-relevant contexts in general. Thus, trait test anxiety is viewed as a domain-specific analogue of fear of failure, a situation-specific disposition representing fear of failure involving exam performance (Elliott & McGregor, 1999). Responses on the 4-point items (1 = almost never, 4 = almost always) were summed to form the test anxiety index.

Achievement Goals. An achievement goal questionnaire developed by Elliot and Church (1997) was used to measure participants' adoption of mastery, performance-approach, and performance-avoidance achievement goals for the course. This questionnaire includes six items that are used to assess each of the goals, and participants were asked to indicate their responses by using a 7-point scale (1 = not at all true of me, 7 = very true of me). Since this instrument has been recently developed, there is only preliminary evidence for its reliability and validity (Elliot & Church, 1997). Responses for each goal orientation were averaged to form the performance-approach, performance-avoidance, and mastery goal indexes.

Frost Multidimensional Perfectionism Scale (FMPS). This instrument (Frost et al., 1990) was used as a measure of perfectionism. It contains 35 items that provide a global assessment of perfectionism, as well as six subscales: concern over mistakes (9 items), personal standards (7 items), parental expectations (5 items), parental criticism (4 items), doubts about actions (4 items), and organization (6 items). Responses were on a five-point scale (1 = strongly disagree, 5 = strongly agree). Frost and his colleagues (1990) have reported an internal reliability for the FMPS using Cronbach's alpha of .90 with coefficients for the six subscales ranging from .78 to .92. The findings of Parker and Adkins' (1995) investigation suggested that the FMPS is a psychometrically sound measure of potential value in the assessment of perfectionism. The concurrent validity of this measure has also been documented (Frost et al., 1993).

Hewitt and Flett Multidimensional Perfectionism Scale (HMPS). This 45-item scale was developed by Hewitt and Flett (1991) to assess perfectionism. It contains three subscales of 15 questions each, with one subscale reflecting the intra-personal (self-oriented) aspects of perfectionism, while the remaining two reflect the interpersonal (socially prescribed and other-oriented) components. Participants were required to respond to each item using a 7-point scale (1 = disagree, 7 = agree). This measure had adequate reliability (coefficient alpha = .89 for the self-oriented subscale, .79 for other-oriented, and .86 for socially prescribed). In terms of validity, the results of a factor analysis confirmed the presence of three factors that corresponded to the three dimensions (Hewitt & Flett, 1991). The other-oriented perfectionism subscale was not included in the present study as this measure has not been found to be a predictor of achievement outcomes.

Academic Performance. Marks on the Introduction to Psychology December exam were used as a measure of academic performance.

Procedure

Early in the fall semester, participants were asked to complete a questionnaire package that included measures of achievement motivation, test anxiety, achievement goals, and perfectionism. The scales were presented in random order, and the questionnaires were completed in small-group sessions that lasted approximately one hour. Before completing the battery of questionnaires, participants were asked to provide informed consent for the release of their grades for the course. They were assured that their responses will remain confidential and would in no way influence their course grade. Furthermore, participants were informed that they would receive one mark for their participation in the study, and that they have the opportunity to receive a summary of the results of the investigation. At the end of the first semester, participants' grades on the exam were obtained from the class instructor.

Results

The exam marks ranged from 30% to 97%, with an average of 71% and a standard deviation of 14.0. Table 1 contains the means and standard deviations of all other variables, along with the correlations with marks on the exam.

Perfectionism and Academic Performance

Eight measures of perfectionism were used in the present study. Significant

Table 1.

Means and Standard Deviations of All Measures and Their Correlations with Exam Marks.

Variables	Mean	SD	Correlations with Marks (n = 195)
Perfectionism Measures			
Self-oriented	67.1	15.7	.04
Socially-prescribed	49.8	13.2	-.04
Parental expectations	13.8	4.8	-.13
Parental criticisms	8.7	3.7	-.07
Concern over mistakes	18.9	6.4	.05
Doubts about actions	11.2	3.7	-.01
Personal standards	22.1	5.0	.18*
Organization	22.9	5.5	-.07
Achievement Goals			.01
Mastery	34.2	4.9	
Avoidance	27.0	6.8	-.19**
Approach	23.4	7.5	.00
Motivational Orientation			
Achievement motivation	9.8	3.3	.13
Fear of failure	43.7	13.8	-.32**

*correlation is significant at .05 level (2 tailed)
** correlation is significant at .01 level (2 tailed)

correlations with marks were only found for the personal standards subscale, $r(193) = .18$, $p < .05$ (see Table 1). One goal of the present study was to determine whether the perfectionism subscales combined could predict academic performance. A standard multiple regression analysis revealed that these perfectionism measures significantly contributed to the variance in academic marks, R square = .12, adjusted R square = .08, $F(8, 186) = 3.09$, $p < .01$. The regression coefficients for parental expectations, organization and personal standards were significantly different from zero, $t(186) = -2.40$, $p < .05$, $t(186) = -2.29$, $p < .05$, and $t(186) = 3.72$, $p < .001$, respectively. The direction of the beta coefficients indicates that high marks are uniquely predicted by high personal standards, low parental expectations, and low organization.

The findings from the multiple regression analyses contradict those from the simple correlations (Table 1). Why should measures of organization and parental expectations make significant unique contributions to the prediction of marks, when neither had significant simple correlations? Further analyses were conducted to explore the reasons for this finding. Two general explanations are available for why variables would make a significant unique contribution when their bivariate correlations were not significant. One explanation is that other variables entered into the multiple regression equation accounted for large sources of extraneous variance, enabling a smaller effect to be detected. The second explanation is more complex: that the relationship was suppressed by another relationship (Cohen & Cohen, 1983). Table 2 contains the zero-order correlations between organization, parental expectations, personal standards, and exam marks, as well as the partial correlations between organization and parental expectations with exam marks, controlling for personal standards. The findings from this

Table 2.

Correlations and Partial Correlations to Clarify the Inconsistent Effects of Organization and Parental Expectations on Marks

	Bivariate Correlations				Partial Correlations
Variables	1	2	3	4	4 (controlling for Personal Standards)
1. Parental Expectations	-	.01	.30**	-.13	-.18**
2. Organization		-	.39**	-.07	-.17*
3. Personal Standards			-	.18*	-
4. Exam Marks				-	-

*correlation is significant at .05 level (2 tailed)
** correlation is significant at .01 level (2 tailed)

table are consistent with the suppression explanation. Both parental expectations and organization are positively correlated with personal standards. Furthermore, the latter variable has a positive correlation with exam marks. However, when this positive component is removed using partial correlations, then negative contributions of both parental expectations and organization are revealed. Thus, there appear to be two components of perfectionism that predict exam marks: (1) a positive dimension measured by the personal standards subscale, which is also partially represented in the organization and parental expectations subscales, and (2) a negative component, which is independent of this positive dimension, and which is measured by both organization and parental expectations.

Motivational Orientation and Achievement Goals

Achievement motivation and test anxiety were used as measures of motivational orientation. Fear of failure as measured by the test anxiety scale was significantly related to marks, $r(193) = -.32$, $p < .01$. Lower grades were associated with higher levels of fear of failure. Achievement motivation, on the other hand, was not significantly correlated with academic performance, $r(193) = .13$, n.s. Three achievement goals, mastery, performance-approach, and performance-avoidance were included. Only performance-avoidance goals were significantly related to grades, $r(193) = -.19$, $p < .01$, indicating that individuals who pursue avoidance goals tend to obtain lower marks.

Another purpose of the present study was to replicate previous results that different motivational orientations only influence grades through achievement goals. Thus, a path analysis was used to examine whether the relationship between achievement motivation or fear of failure and academic grades was mediated by the three achievement

goals. A stepwise multiple regression analysis indicated that the three different achievement goals did not significantly predict marks, but the addition of both achievement motivation and fear of failure produced a significant increase in R square, (R square change = .09, $F(2, 189) = 9.70$, $p < .001$). The regression coefficients for achievement motivation, $t(189) = 2.15$, $p < .05$, and test anxiety, $t(189) = -3.91$, $p < .001$, were significantly different from zero, indicating that achievement motivation and fear of failure had direct relationships with grades that were not shared with the three achievement of goals (see Figures 1 and 2). Thus, contrary to previous reports, the present results do not support the notion that different motivational orientations only exert their influence on academic grades via achievement goals.

Since the expected mediating effect of achievement goals was not found, exploratory analyses were performed to determine whether these goals instead play a moderating role between motivational orientation and grades. Regression analyses were conducted to examine whether the two motivational orientations interacted with each of the achievement goals. Only the interaction between achievement motivation and mastery goals was significant, R square change = .03, F change$(1, 191) = 6.12$, $p < .05$. Examining this interaction, a median split of the mastery goals revealed a significant positive correlation between achievement motivation and academic grades only in those who endorse low levels of mastery goals, $r(90) = .31$, $p < .01$, but no correlation for those with high mastery goals, $r(101) = .003$, $p = .97$. These findings show that individuals with high levels of achievement motivation tend to have high marks but only if they also endorse low levels of mastery goals.

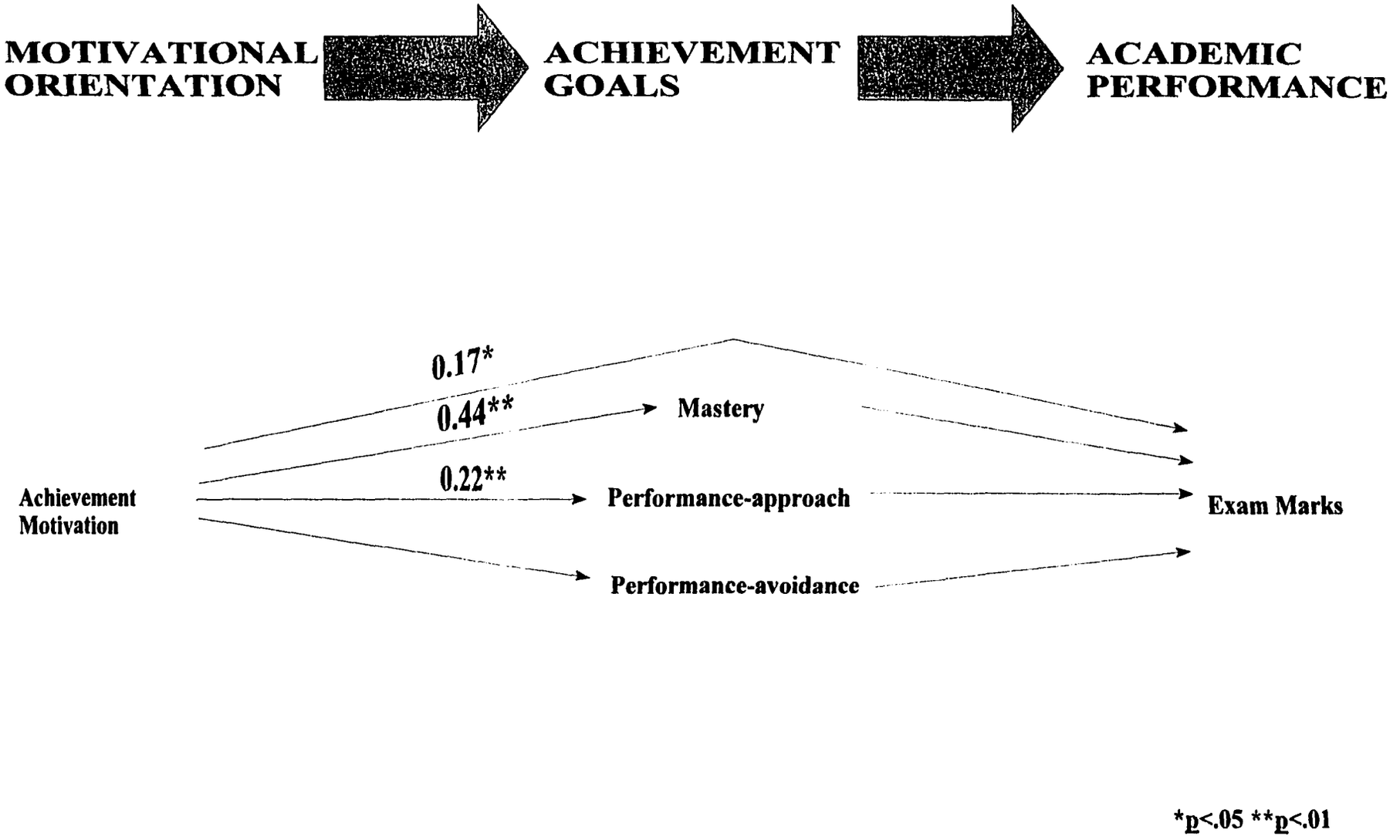

Figure 1. Path analysis examining the mediating role of achievement goals between achievement motivation and marks. Only significant standardized multiple regression coefficients are included.

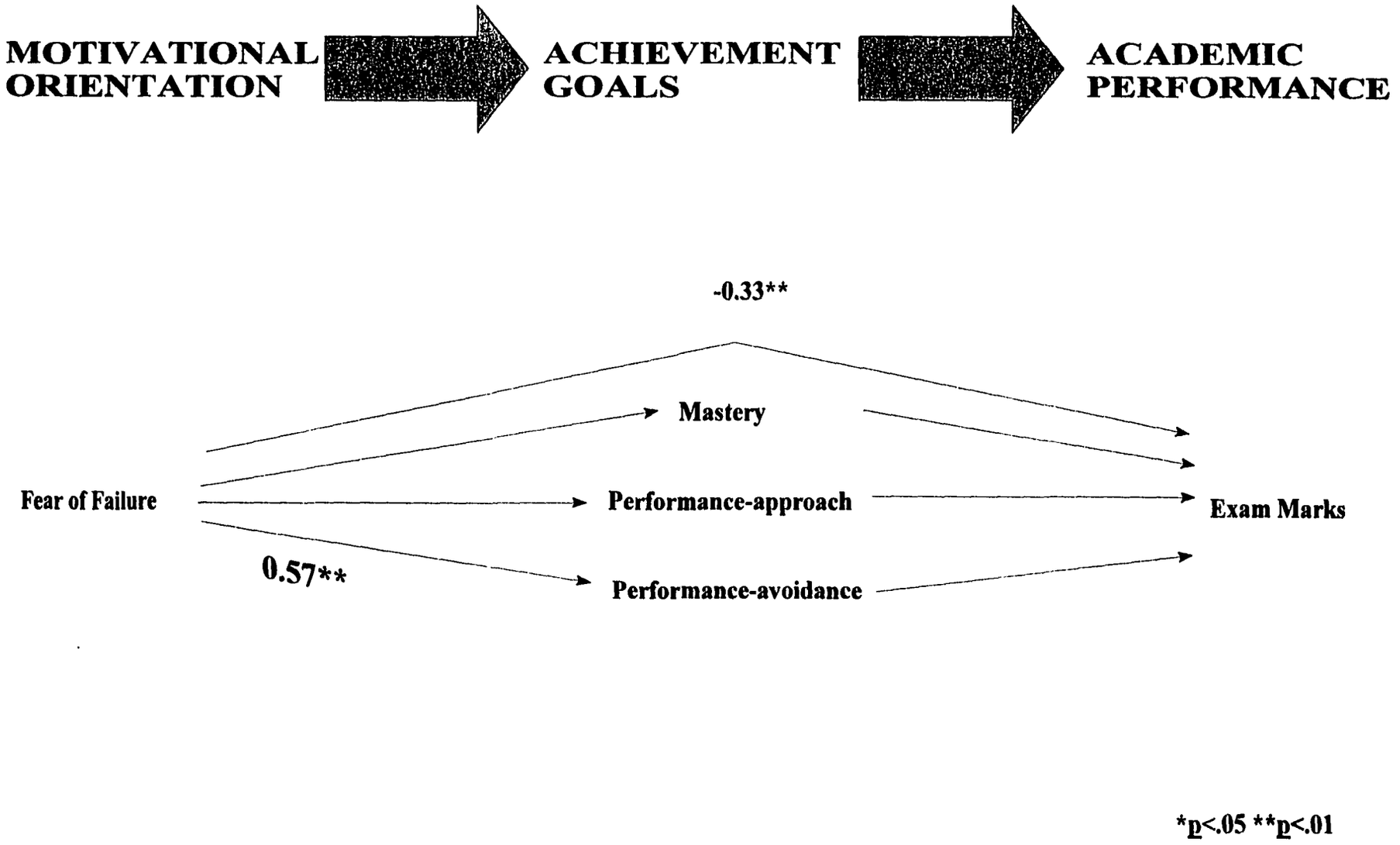

Figure 1. Path analysis examining the mediating role of achievement goals between fear of failure and marks. Only significant standardized multiple regression coefficients are included.

Additional analyses were conducted to examine whether achievement goals could be predicted from achievement motivation and fear of failure. Three multiple regression analyses were conducted to determine whether achievement motivation and fear of failure accounted for a significant portion of the variance in mastery, performance approach, or performance avoidance goals, respectively. Using mastery goals as the dependent variable, the regression equation with achievement motivation and fear of failure were significant, R square = .21, adjusted R square = .20, F (2, 205) = 27.7, $p <$ .001. Achievement motivation had a significant unique effect on mastery goals, t(205) = 7.1, $p < .001$, but fear of failure did not. The next multiple regression analysis indicated that achievement motivation and fear of failure together were significantly related to performance approach goals, R square = .06, adjusted R square = .05, F(2,205) = 6.42, p < .01. Again, only achievement motivation had a unique effect, t(205) = 3.24, $p < .01$. The third regression analysis showed that both types of achievement orientation significantly predicted performance avoidance goals, R square = .32, adjusted R square = .31, F(2, 205) = 48.06, $p < .001$. However, this time only fear of failure had a significant unique effect, t(205) = 9.80, $p < .001$. These findings indicate that achievement motivation made independent contributions to the prediction of mastery goals, not accounted for by fear of failure, while fear of failure primarily contributed to performance avoidance goals. These conclusions are consistent with previous reports. However, contrary to previous findings, the present results indicated that only achievement motivation independently explained a significant amount of variance in performance approach goals.

Motivational Orientation and Perfectionism as Predictors of Grades

One aim of the present investigation was to examine whether motivational orientation (achievement motivation and fear of failure) and perfectionism made independent contributions to the prediction of academic performance. Sequential multiple regression analysis indicated that the perfectionism measures together predicted academic performance over and above that afforded by the two motivational dimensions, R square change = .10, F change (8, 184) = 3.06, $p < .05$. Parental expectations, organization, and personal standards each made significant unique contributions, $t(184) = -2.70$, $p < .05$, $t(184) = -2.00$, $p < .05$, $t(184) = 3.36$, $p < .01$, respectively after fear of failure and achievement motivation had been removed (see Table 3). The next sequential analysis revealed that fear of failure and achievement motivation significantly contributed to the variance in grades beyond that accounted for by the perfectionism measures, R square change =.12, F change(2, 184) = 12.45, $p < .001$. A significant unique contribution was made by fear of failure, $t(184) = -4.68$, $p < .001$, but not by achievement motivation (see Table 4). These findings indicate that the two sets of predictors have independent and additive effects on academic grades. An additional multiple regression analysis was conducted entering fear of failure, achievement motivation, and the three achievement goals at the first step of the equation and the eight perfectionism measures at the second step. Perfectionism still made a significant independent contribution to the prediction of grades, R squared change = .11, F change (8, 181) = 3.19, $p < .01$.

Table 3.

Perfectionism as a Predictor of Grades, After Controlling for Motivational Orientation.

	R square	R square change	F	Beta	t
Step 1	.12	.12	13.0**		
(Motivational Orientation Measures)					
Achievement motivation				.16	2.38*
Fear of failure				.32	-4.73**
Step 2	.22	.10	3.06**		
(Perfectionism Measures)					
Self-oriented				-.17	-1.62
Socially prescribed				.09	.88
Parental expectations				-.25	-2.69**
Organization				-.15	-1.99**
Parental criticism				.00	.02
Personal standards				.32	3.36**
Doubts about actions				.05	.63
Concern over mistakes				.13	1.39

* significant at .05 level
**significant at .01 level

Table 4.

Motivational Orientations as Predictors of Marks, After Controlling for Perfectionism

	R square	R square change	F	Beta	t
Step 1 (Perfectionism Measures)	.12	.12	3.09**		
Self-oriented				-.10	-.98
Socially prescribed				.05	.47
Parental expectations				-.23	-2.40*
Organization				-.18	-2.29*
Parental criticism				-.03	-.29
Personal standards				.37	3.72**
Doubts about actions				-.08	-.99
Concern over mistakes				.10	1.02
Step 2 (Motivational Orientation Measures)	.22	.11	12.5**		
Achievement motivation				.15	1.78
Fear of failure				-.36	-4.68**

* significant at .05 level
**significant at .01 level

Discussion

The purpose of the current study was to examine the relationship between perfectionism and academic performance, and how other predictors of academic performance, such as achievement motivation, fear of failure, and achievement goals interrelate in predicting grades. The findings indicated relationships of both positive and negative aspects of perfectionism to academic performance. Perfectionism contributed significantly to the prediction of academic performance over and above the influence of other determinants of performance, such as achievement motivation, fear of failure, and achievement goals.

Perfectionism and Academic Performance

A significant relationship was found between perfectionism and exam grades, with three perfectionism subscales making significant unique contributions to academic performance. The personal standards subscale had a significant positive correlation with academic performance, indicating that university students who set extremely high standards for themselves generally obtained higher marks on their exams in Introductory Psychology classes. In contrast, the organization and parental expectations subscales were negatively related to academic performance, indicating that students who placed great emphasis on organization and orderliness in their everyday lives, and those who felt that their parents set extremely high goals for them generally performed more poorly.

It should be noted that a somewhat puzzling finding emerged. The findings from the multiple regression and from the bivariate correlations were contradictory. Significant zero-order correlations with academic grades were not found for organization and parental expectations, even though these measures made significant unique predictions in

the multiple regression analysis. Further analyses were performed to clarify these findings. Zero-order correlations revealed that both parental expectations and organization were positively related to personal standards. While all three of these perfectionism subscales were positively correlated, reflecting a common component, they showed diverse unique relationships to marks. This common, positive component suppressed the negative component in the zero-order correlations. When the common aspect was removed in the multiple regression analysis, the negative contributions of the organization and parental expectations subscales were revealed.

On the basis of these findings, it appears that the parental expectations and organization subscales contain both positive and negative components. The positive component is evidenced by its positive correlation with the personal standards subscale, while the negative component is manifested in its detrimental relationship with grades. Furthermore, this negative component was suppressed by the positive component unless partialling methods are used.

Other studies have documented the positive and negative features of perfectionism (Brown et al., 1999; Hall, Kerr, & Matthews, 1998; Rice et al., 1998; Rice & Mirzadeh, 2000). In general, the personal standards, organization, and self-oriented perfectionism subscales have been reported to be positive aspects of perfectionism, while the parental expectations, parental criticism, doubts about action, concern over mistakes, and socially prescribed perfectionism subscale measured the negative components. However, there are inconsistencies reported in the literature with respect to the categorization of scales as either positive or negative. As an example, while Rice and Mirzadeh (2000) reported that the parental expectations subscale was negatively related

to academic integration at university, Rice et al. (1998) found that greater parental expectations positively influenced self-esteem. Although Parker (1997) found that greater organization was characteristic of maladaptive perfectionists, Frost and his colleagues (1993) found that organization was a component of positive perfectionism.

While some of the inconsistent findings with respect to the differentiation between positive and negative perfectionism reflect differences in methodology, the equivocal results in the literature may have been partly due to treating each subscale as solely positive or negative, rather than viewing them as having two components. Future research should take into consideration the impurities of certain perfectionism subscales; accordingly, any possible influences of positive components should be removed during the analyses of the negative measures and vice versa. Thus, it may be worthwhile for future studies to explore the use of partialling methods to separate the positive and negative features of each subscale.

In the present investigation, some scales were not significantly related to academic performance (e.g., self-oriented and socially prescribed perfectionism), even though they have been found by other studies to be significantly related to academic performance (Arthur & Hayward, 1997; Rice & Mirzadeh, 2000). Arthur and Hayward, for example, found that socially prescribed perfectionism was related to lower GPA. The reason such correlations were not found in the present study is unclear, but may reflect the use of only a single mark as an indicator of academic performance.

Motivational Orientation and Achievement Goals

The current results provided support for the association of negative motivational orientation with academic performance. Individuals with a fear of failure orientation

generally obtained lower grades. Previous studies in the achievement motivation literature support the present findings; for example, Elliot and Church (1997) found that fear of failure was associated with lower course grades. Similarly, other investigators have reported a negative relationship between trait test anxiety and academic outcomes (Blankstein, et al., 1990; Cock & Halvari 1999; Elliot & McGregor, 1999). Thus, fear of failure appears to be a detrimental motivational orientation for students to adopt.

Mastery and approach goals were not significantly associated with exam marks; however, avoidance goals were negatively correlated with grades. Some of these findings were not consistent with previous reports. For instance, Elliot and Church (1997) found that performance-avoidance and performance-approach goals were predictive of high grades, while mastery goals had no relationship with marks. Furthermore, the present study found that achievement motivation was not significantly related to marks in the zero-order correlations, but this construct did emerge as significant in the multiple regression when fear of failure was entered into the analysis. Fear of failure, on the other hand, was a strong predictor of academic performance as it emerged as significant in both the bivariate and regression analyses. Thus, weak support was found for the role of achievement motivation, but not for positive achievement goals, as a predictor of marks. Reasons for the discrepant finding in the present study with respect to approach goals are unclear.

Exploration of Mediating and Moderating Role of Achievement Goals

An additional purpose of the present study was to replicate the finding that motivational orientations influence grades only through their relationship with achievement goals. The results indicated that fear of failure exerted direct influences on

academic performance, and this association was not mediated by achievement goals. Both fear of failure and achievement motivation made significant contributions to the prediction in marks that were not shared with achievement goals. Thus, the motivational orientations that students adopted directly influenced their academic performance, irrespective of which goals they endorsed. These findings are inconsistent with those of Elliot and Church (1997) who reported an indirect influence of motivational orientation on academic performance, more specifically, that fear of failure and achievement motivation exerted their influences on grades only via their respective achievement goals. The reason for these different findings is unclear.

Since the mediating influences of achievement goals on grades were not found, exploratory analyses were conducted to determine whether or not these goals could have a moderating effect instead. Results indicated a positive relationship between achievement motivation and academic performance only in those who endorsed low levels of mastery goals. That is, university students with low levels of mastery goals obtained higher marks if they also endorsed high levels of achievement motivation. For students with high mastery goals, achievement motivation does not affect grades. This finding could reflect a ceiling effect whereby mastery goals alone are sufficient to maximize academic performance. However, for those with low mastery goals, a high level of achievement motivation will result in improved performance. This finding is similar to the report by Harackiewicz and Elliot (1993) that intrinsic interest in a task was enhanced if students with low achievement motives also pursued mastery goals. However, due to the exploratory nature of the current analyses, the moderating role of achievement goals should be replicated in future studies.

Implications

The results of the present investigation may have implications for individuals who work in academic settings. Engineering the motivational climate in educational contexts may be an effective way of minimizing maladaptive patterns of achievement behaviour. For instance, reducing evaluation anxiety and avoidance behaviours in the academic domain may lead to successful outcomes. The use of test anxiety interventions may be particularly beneficial for perfectionists who often experience negative affect during evaluative tasks and, thus, are more inclined to avoid situations in which the threat of failure is perceived to be high (Frost & Marten, 1990). Since the present study found that perfectionism and motivational orientation reflected separate sets of predictor variables, it may be worthwhile for educators to assess personality characteristics as well as the motivational orientations that students adopt to understand the variations in academic performance.

The current findings may have implications for clinical practice. Psychologists who work with perfectionists should not assume that perfectionism is a unidimensional construct and entirely maladaptive. Instead, the clinician should consider the possibility that the client possess some adaptive features of perfectionism that should not be changed (e.g., the presence of high personal standards should not be discouraged). Furthermore, the personal and social dimensions of perfectionism should be assessed, and the maladaptive components should be challenged (e.g., excessive levels of organization and perceptions of parental expectations should be reduced).

The findings replicated previous reports of both positive and negative components of perfectionism. However, this study also identified a potential strategy for data analysis

to determine whether or not the positive components of the subscales are being masked by the negative ones, and vice versa. The finding that the personal standards subscale reflects the positive dimension of perfectionism is consistent with past studies. Individuals who set extremely high standards for themselves are typically motivated by a success orientation, and they also engage in more study behaviours, and obtain higher grades (Brown et al., 1999; Frost & Henderson, 1991). Another study found that personal standards was negatively correlated with depression when the variance it had in common with the concern over mistakes subscale was removed (Frost et al., 1990). Thus, it may be worthwhile for researchers to use the personal standards subscale to partial out the positive aspects from the other perfectionism subscales. Adopting this statistical method may allow future researchers to explore the possibility that some perfectionism subscales have both positive and negative dimensions.

Summary

The present investigation found that perfectionism made independent contributions to the prediction of academic performance above and beyond that accounted for by the two motivational orientations (achievement motivation and fear of failure). More specifically, the parental expectations, organization, and personal standards subscales of perfectionism were unique predictors of marks. While perfectionism was independent from motivational orientation in the prediction of academic performance, both fear of failure and achievement motives also made unique contributions to marks. Analyses revealed that fear of failure was a significant independent predictor of marks, but achievement motivation was not.

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Appendix A: HMPS (Hewitt & 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 any one of the numbers between 1 and 7. If you feel neutral or undecided the midpoint is 4.

	Strongly Disagree						**Strongly Agree**
• When I am working on something, I can not relax until it is perfect.	1	2	3	4	5	6	7
• I find it difficult to meet others' expectations of me.	1	2	3	4	5	6	7
• One of my goals is to be perfect in everything I do.	1	2	3	4	5	6	7
• I never aim for perfection in my work.	1	2	3	4	5	6	7
• Those around me readily accept that I can make mistakes too.	1	2	3	4	5	6	7
• The better I do, the better I am expected to do.	1	2	3	4	5	6	7
• I seldom feel the need to be perfect.	1	2	3	4	5	6	7
• Anything I do that is less than excellent will be seen as poor work by those around me.	1	2	3	4	5	6	7
• I strive to be as perfect as I can be.	1	2	3	4	5	6	7
• It is very important that I am perfect in everything that I attempt.	1	2	3	4	5	6	7
• I strive to be the best at everything I do.	1	2	3	4	5	6	7
• The people around me expect me to succeed at everything I do.	1	2	3	4	5	6	7
• I demand nothing less than perfection of myself.	1	2	3	4	5	6	7

• Others will like me even if I don't excel at everything.	1	2	3	4	5	6	7
• It makes me uneasy to see an error in my work.	1	2	3	4	5	6	7
• Success means that I must work even harder to please others.	1	2	3	4	5	6	7
• I am perfectionistic in setting my goals.	1	2	3	4	5	6	7
• Others think I am okay, even when I do not succeed.	1	2	3	4	5	6	7
• I feel that people are too demanding of me.	1	2	3	4	5	6	7
• I must work up to my full potential at all times	1	2	3	4	5	6	7
• Although they may not show it, other people get very upset with me when I slip up.	1	2	3	4	5	6	7
• I do not have to be the best at whatever I am doing	1	2	3	4	5	6	7
• My family expects me to be perfect.	1	2	3	4	5	6	7
• I do not have very high goals for myself.	1	2	3	4	5	6	7
• My parents rarely expected me to excel in all aspects of my life.	1	2	3	4	5	6	7
• People expect nothing less than perfection from me.	1	2	3	4	5	6	7
• I set very high standards for myself.	1	2	3	4	5	6	7
• People expect more from me than I am capable of giving.	1	2	3	4	5	6	7
• I must always be successful at school or at work.	1	2	3	4	5	6	7
• People around me think I am still competent even if I make a mistake.	1	2	3	4	5	6	7

Appendix B: FMPS (Frost et al., 1990).

Read each of the following statements and decide how much you agree with each of the following according to the following scale: 5 = **strongly agree**, 4 = agree, 3 = neutral, 2 = disagree, 1 = **strongly disagree**. Please read each item carefully and respond to it as honestly as you can. Note that the response scale for these items is different than the one you used for the last set of items.

	Strongly Disagree				**Strongly Agree**
• My parents set very high standards for me.	1	2	3	4	5
• Organization is very important to me.	1	2	3	4	5
• As a child I was punished for doing things less than perfect.	1	2	3	4	5
• If I do not set the highest standards for myself, I am likely to end up a second-rate person.	1	2	3	4	5
• My parents never tried to understand my mistakes.	1	2	3	4	5
• It is important to me that I be thoroughly competent in everything I do.	1	2	3	4	5
• I am a neat person.	1	2	3	4	5
• I try to be an organized person.	1	2	3	4	5
• If I fail at work / school, I am a failure as a person.	1	2	3	4	5
• I should be upset if I make a mistake.	1	2	3	4	5
• My parents wanted me to be the best at everything.	1	2	3	4	5
• I set higher goals than most people.	1	2	3	4	5
• If someone does a task at work / school better than I, then I feel like I failed at the whole task.	1	2	3	4	5
• If I fail partly, it's as bad as being a complete failure.	1	2	3	4	5
• Only outstanding performance is good enough in my family.	1	2	3	4	5

• I am very good at focusing my efforts on obtaining a goal.	1	2	3	4	5
• Even when I do something very carefully, I often feel that it is not quite right.	1	2	3	4	5
• I hate being less than the best at things.	1	2	3	4	5
• I have extremely high goals.	1	2	3	4	5
• My parents have expected excellence from me.	1	2	3	4	5
• People will probably think less of me if I make a mistake	1	2	3	4	5
• I never felt like I could meet my parents' expectations.	1	2	3	4	5
• If I do not do as well as other people, it means I am an inferior human being.	1	2	3	4	5
• Other people seem to accept lower standards from themselves than I do.	1	2	3	4	5
• If I do not do well all the time, people will not respect me.	1	2	3	4	5
• My parents have always had higher expectations for my future than I have.	1	2	3	4	5
• I try to be a neat person.	1	2	3	4	5
• I usually have doubts about the simple everyday things I do.	1	2	3	4	5
• Neatness is very important to me.	1	2	3	4	5
• I expect higher performance in my daily tasks than most people.	1	2	3	4	5
• I am an organized person.	1	2	3	4	5
• I tend to get behind in my work because I repeat things over and over.	1	2	3	4	5

- It takes me a long time to do something "right." 1 2 3 4 5
- The fewer mistakes I make the more people will like me. 1 2 3 4 5
- I never felt like I could meet my parent's standards. 1 2 3 4 5

Appendix C: Achievement goals questionnaire (Elliot & Church, 1997).

Please read each item, and decide to what extent you believe each item to be true of yourself. Circle 1 if you believe it to be ***not at all true*** of yourself, or circle 7 if you feel that it is ***very true*** of yourself. If you feel somewhere in between, circle any one of the numbers between 1 and 7. If you feel neutral or undecided, the midpoint is 4. Note that the response scale for these items is different than the one you used previously.

	Not at all true						**Very true**
• It is important to me to do better than the other students.	1	2	3	4	5	6	7
• I want to learn as much as possible from this class.	1	2	3	4	5	6	7
• I often think to myself, "What if I do badly in this class?"	1	2	3	4	5	6	7
• My goal in this class is to get a better grade than most of the students.	1	2	3	4	5	6	7
• It is important for me to understand the content of this course as thoroughly as possible.	1	2	3	4	5	6	7
• I worry about the possibility of getting a bad grade in this class.	1	2	3	4	5	6	7
• I am striving to demonstrate my ability relative to others in this class.	1	2	3	4	5	6	7
• I hope to have gained a broader and deeper knowledge of psychology when I am done with this class.	1	2	3	4	5	6	7
• My fear of performing poorly in this class is often what motivates me.	1	2	3	4	5	6	7
• I am motivated by the thought of outperforming my peers in this class.	1	2	3	4	5	6	7
• I desire to completely master the material presented in class.	1	2	3	4	5	6	7

- I just want to avoid doing poorly in this class. 1 2 3 4 5 6 7

- It is important to me to do well compared to others in this class. 1 2 3 4 5 6 7

- In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn. 1 2 3 4 5 6 7

- I'm afraid that if I ask my TA or instructor a "dumb" question, they might not think that I am very smart. 1 2 3 4 5 6 7

- I want to do well in this class to show my ability to my family, friends, advisors, and others. 1 2 3 4 5 6 7

- In a class like this, I prefer course material that really challenges me so I can learn new things. 1 2 3 4 5 6 7

- I wish this class was not graded. 1 2 3 4 5 6 7

Appendix D: Test Anxiety Inventory (Spielberger, 1980)

A number of statements which people have used to describe themselves are given below. Read each statement carefully and then circle the letter(s) to indicate how you *generally* feel. Select AN for **almost never**, S for **sometimes,** O for **often**, AA for **almost always.** Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel. Please note that the response scale for these items is different than the one you used for the last set of items.

AN=**almost never** S=**sometimes** O=**often** AA=**almost always**

• I feel confident and relaxed while taking tests.	AN	S	O	AA
• While taking examinations I have an uneasy, upset feeling	AN	S	O	AA
• Thinking about my grades in a course interferes with my work on tests.	AN	S	O	AA
• I freeze up on important exams.	AN	S	O	AA
• During exams I find myself thinking about whether I'll ever get through school.	AN	S	O	AA
• The harder I work at taking a test, the more confused I get.	AN	S	O	AA
• Thoughts of doing poorly interfere with my concentration on tests.	AN	S	O	AA
• I feel very jittery when taking an important test.	AN	S	O	AA
• Even when I'm well prepared for a test, I feel very nervous about it.	AN	S	O	AA
• I start feeling very uneasy just before getting a test paper back.	AN	S	O	AA
• During tests I feel very tense.	AN	S	O	AA
• I wish examinations did not bother me so much	AN	S	O	AA
• During important tests I am so tense that my stomach gets upset.	AN	S	O	AA

• I seem to defeat myself while working on important tests.	AN	S	O	AA
• I feel very panicky when I take an important test.	AN	S	O	AA
• I worry a great deal before taking an important examination	AN	S	O	AA
• During tests I find myself thinking about the consequences of failing.	AN	S	O	AA
• I feel my heart beating very fast during important tests.	AN	S	O	AA
• After an exam is over I try to stop worrying about it , but I just can't.	AN	S	O	AA
• During examinations I get so nervous that I forget facts I really know.	AN	S	O	AA

Appendix E: Achievement Motivation scale (from the PRF; Jackson, 1974).

Please read each statement and decide whether or not it describes you. If you agree with a statement or decide it describes you, answer **TRUE**. If you disagree with a statement or feel that it is not descriptive of you, answer **FALSE**. Answer every statement either true or false, even if you are not completely sure of your answer. Note that the response scale for these items is different than the one you used for the last set of items.

• People should be more involved with their work.	True	False
• I enjoy difficult work.	True	False
• I will not be satisfied until I am the best in my field of work.	True	False
• I would work just as hard whether or not I had to earn a living.	True	False
• My goal is to do at least a little a bit more than anyone else has done before.	True	False
• I often set goals that are very difficult to reach.	True	False
• As a child I worked a long time for some of the things I earned.	True	False
• I don't mind working while other people are having fun.	True	False
• I seldom set standards which are difficult for me to reach.	True	False
• I have rarely done extra studying in connection with my work.	True	False
• I try to work just hard enough to get by.	True	False
• I do not let my work get in the way of what I really want to do.	True	False
• In my work I seldom do more than is necessary.	True	False

- People seldom think of me as a hard worker. True False
- It doesn't really matter to me whether or not I become one of the best in my field. True False
- I am not really very certain what I want to do or how to go about doing it. True False

Appendix F: **CONSENT FORM**

My signature on this form indicates I agree to participate in a study on PESONALITY AND ACADEMIC PERFORMANCE. It also indicates that I understand the following:

1. My participation in this research is voluntary. If for some reason I wish to discontinue participation in the study once I start filling out the questionnaires, I am free to do so without explanation or penalty even after I have signed this form.

2. There is no apparent risk of psychological or physical harm.

3. The data that I provide will be confidential (only the researchers will have access to the data), and in no way will influence my course grade.

4. I will receive one mark towards my Introductory Psychology course grade for participation in the study.

5. I understand that the data obtained in this research will be kept in secure storage for seven years.

6. If I so wish, I may request for a summary of the results from this research project upon its completion.

I have received an explanation about the nature of the study, its purpose, and the procedure.

Participant's name (Print) Date

Signature

My signature below indicates that I consent to the release of my Introductory Psychology mark (December exam) and my final marks in all courses that I am taking this year to the researcher.

Signature Date

Appendix G: **DEBRIEFING/PURPOSE OF THIS STUDY**

Have you ever wondered why some students get better grades than others, even though they have the same level of intelligence and ability? This query has prompted researchers, including myself, to try to find some plausible explanation for this interesting question.

While common sense says that people with high IQ's tend to get higher grades, researchers have found that there are other, equally important, factors that can contribute to academic success. These variables include motivational and personality factors, such as perfectionism, achievement orientation, and achievement goals.

The present study is designed to identify which type of motivational pattern is optimal for success at the university level, and which type of individuals are more likely to adopt such an orientation. Through the use of various scales that I have included in your questionnaire, I hope to answer the questions outlined above.

Identifying a motivational pattern that will facilitate academic success is important so that we can develop programs to help students improve their academic performance.

Please note that if you would like to obtain the findings of this study, you can contact me by email at muntran@hotmail.com or by leaving a message with your mailing address for Mun Tran in the Psychology Office (SN 1042). Again, thank you for your participation.

BEFORE YOU LEAVE, PLEASE ANSWER THE FOLLOWING QUESTIONS:

1. Name two factors that are generally associated with academic success.

2. Why is it important to understand which motivational pattern will facilitate academic success?

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THE RUBY MINE

A conceptualized view of events related to the Butte deposits and the Ruby

"The famed Butte district, hardly more than eight square miles in area and nearly a mile deep, and with over 1000 miles of underground workings, has produced from 1880 to 1964, some 327 million tons of zinc, lead, copper, gold, silver and manganese ore. Butte was called the richest hill on earth and was exceeded only by the South African Witwatersrand gold deposits in metallic wealth extracted. After the cessation of underground mining an additional billion and a half tons of material were extracted from the Berkeley open pit, which was the largest truck-operated open pit mine in the United States".

Attached is a perceived model of possible geological events related to the genesis of the Ruby and the Berkeley deposits and as well a view of what a section through the Ruby might look like in terms of what we could anticipate encountering in the Boulder Batholith. If we have a replicate of the Berkeley situation, there should be a zone of secondary enrichment, brought about by copper minerals in solution, percolating downwards from the top. Upon reaching the water table, the copper from these solutions would precipitate as sooty chalcocite (high grade copper sulfide) onto any other sulfides present. In this manner, the grade of the ore at that horizon would be upgraded by the sooty chalcocite. In other words, if the average grade at this horizon was initially around 1% copper, it could now be 3% or more. This secondary or supergene, zone in places extended downwards to a depth of 1000 feet and probably constituted the bulk of the disseminated ore that was mined from the Berkeley open pit. By itself this ore was probably too low a grade to be profitable for the type of underground mining that constituted the early operations. If vein structures similar to those mined at Butte are encountered, the Ruby could become a major underground operation, supporting a production in the tens of thousands of tons per day. Such productive capacity can only be possible when the land tenure is sufficiently large so as to encompass the reserves required to justify the investment for development of a world class deposit . In many cases the cutting edge of present day mining technology has proven to be sufficiently cost effective so as to permit the profitable mining of even lower grade ores than those mined at Butte.

The famed Butte mining district occurred in the exposed margin of the granodiorite Boulder Batholith within an alteration halo having an area of 2 by 4 miles, within which ore grade mineralization went to depths in excess of 5000 feet. In all probability the ore did not physically terminate at the deepest levels mined. The mine's infrastructures, such as hoists,

compressor capacities etc., reached their designed physical limitations. The cost of increasing the physical capacities of the existing equipment to handle deeper mining was not economically justified in light of the ore reserves existing within the confines of a limited sized property. Within this 2 by 4 mile altered area there was an intensely fractured and metallized area, about 2000 feet long and 300 to 500 feet wide, within which most of the richest veins as well as the score or more mines were located. There was no common impoverishment of the ore at depth, a phenomena usually associated with epithermal deposits. There probably were several periods of deposition, resulting in a telescoping of values in the vertical dimension. It is possible that the base metal vein encountered in the 600 foot level adit at the Ruby may be due to a late surge of mineralization from the granodiorite.

The airborne magnetic low, which manifests itself over the Butte alteration halo, is due to the effects of hydrothermal fluids altering prior existing magnetic minerals in the granodiorite to non-magnetic varieties. For instance the magnetic iron mineral magnetite is reduced to the non-magnetic iron mineral hematite. Therefore, with the magnetism reduced below what would be the normal background intensity of granodiorite, the signature of this alteration results in a low magnetic response in an airborne magnetometer survey. Unfortunately, such magnetic lows do not indicate the presence or absence of economic minerals such as copper, lead or zinc. The alteration halo over Butte would have given the same magnetic low, whether there was ore there or not. However, what is important, is the fact that nearly all of the known &quotporphyry copper" types of deposits are associated with alteration halos and as well, with magnetic lows. Therefore, no magnetic low should be ignored, especially when it is associated with an obvious alteration halo. Once having identified such an association, it becomes the explorationists challenge to locate the possible ore center with further geophysics and drilling.

The intensity of the magnetic low, over the Ruby area, is about the same as that over Butte, despite being blanketed by possibly a couple of thousand feet of volcanics. This would lead one to surmise, that if the volcanics were not there, which is the case at Butte, this magnetic low would probably have been much more pronounced, reflecting a more intense alteration which could have greater manifestation of associated ore. At Butte there may not have been any overlying volcanics, or they may have been eroded away, together with a good portion of the mineralized granodiorite itself. Erosion of the granodiorite at the Ruby was stopped, when the overlying volcanic formations covered it. This could mean that a greater vertical extent of the ore zone would be intact within the granodiorite, as no further erosion took place once volcanic emplacement commenced. There is nothing within the indicated low magnetic anomaly at the Ruby which would preclude the existence of a replicate Berkeley type deposit within the underlying granodiorite. The airborne magnetic anomaly is a signature only of the large alteration halo within the batholith, it is doubtful whether any of the ore itself would have affected it.

Disseminated mineralization as in most porphyry copper deposits, the Butte deposits are steeply dipping fissure veins. The deposits range in widths from a few feet to a few tens of feet and are as much as 7000 feet long. The older Anaconda system of veins are long, southerly dipping tension fissures up to 100 feet wide, over 4000 feet deep and have been the great producers of the district. Blind veins are common, some of them do

not extend above a depth of 2000 feet. The mineralization may have been a long drawn-out, continuous event, within which different periods of fissuring and faulting occurred.

At the Ruby, it can be conjectured, that the underlying granodiorites, within the hydrothermal alteration zone as defined by the magnetic low, may harbor mineralization similar to that at Butte, and be amenable to bulk underground mining methods.

The overlying volcanics, we know, are host to the Bonanza type gold ore shoots. We do not know to what depth these may go. If they are the results of repeated waves of mineralization, deposited under differing conditions of temperatures and pressures, then they could have a considerable vertical dimension. The base metal vein encountered in the 600 foot level adit probably is related to some late phase post volcanic activity within the granodiorite. If this is true, then that mineralization should be apparent throughout the total thickness of the volcanic sequence, and depending on its physical characteristics, could be a substantial source of ore within the volcanic sequence.

The Ruby presents realistic exploration targets from the surface to within the underlying granodiorite with its possible Butte type ores.

The airborne magnetic low fingerprints the Butte mineralized area. Why can't the same thing exist at the Ruby? We have to generate a peep hole through the overlying volcanics first, and then send something down that hole which will tell us what lies peripheral to it.

Postscript

Further thoughts on the deep ore potential at the Ruby. Superimposing the situation at the Berkeley Pit onto a cross-section of the Ruby, it becomes strikingly apparent that the pit itself did not run out of ore, but it reached a cut-off due to the limitations of geometry as it relates to being able to sustain side slopes at a safe angle and still be in ore. If the pit had gone any deeper, the amount of waste that would have to be removed would have made the grade uneconomic.

It is interesting that minable ore at the Mountain Con Mine continued nearly 3,500 feet below the pit bottom. At that level it still probably was in ore but with depth the costs escalated to the point that the existing reserves did not justify additional costly expenditures necessary to continue mining. Probably needed a larger hoist, enlarged shaft, costly ventilation equipment etc. The mine was in all probability located on a postage stamp sized claim which did not permit the development of the additional needed reserves. If the entire area covered by the pit would have constituted the property, the mine could have continued operation. The same story applies to all the other mines at Butte. They were strangled by the land tenure laws.

If the same situation does exist at the Ruby, and the veins go down thousands of feet from the batholith-volcanics interface, and we control the ownership of the land, then, in all probability we could entertain the thought of the Ruby being a major underground operation. This is why it is important to have sufficient property area.