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Exporing the Influence of Parenting Styles on Development of Perfectionism in a Reward and Punishment Computer-Based Learning Task Among College Students

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EXPORING THE INFLUENCE OF PARENTING STYLES ON DEVELOPMENT OF PERFECTIONISM IN A REWARD AND PUNISHMENT COMPUTER-BASED LEARNING TASK AMONG COLLEGE STUDENTS

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ABSTRACT

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This study examined the relationship between perfectionism, anxiety (i.e., emotional state anxiety, personality trait anxiety, inhibitory anxiety, prospective anxiety, sensitivity to reward, sensitivity to punishment), parenting styles (i.e., authoritative, authoritarian, permissive), GPA (measured by self-report responses), and SES (measured as parents' income) as well as a difference in the effect of high or low perfectionism, parenting styles, and levels of GPA and SES on a reward and punishment computer-based learning task among college students. One hundred forty undergraduates completed measures of Multidimensional Perfectionism Scale (MPS), Parental Authority Questionnaire (PAQ), Intolerance of Uncertainty Scale (IUS), Sensitivity to Punishment Sensitivity to Reward Questionnaire (SPSRQ), the State-Trait Anxiety Inventory (STAI), and a computer-based learning task involving reward-based and punishment-based trials. Results indicated positive relationships between maladaptive perfectionism dimensions, anxiety factors, and authoritarian parenting style. Furthermore, a direct effect was seen in between anxiety and learning performance on a computer-based task. Indirect effects were seen in between perfectionism, parenting style, and learning performance on a computer-based task. Higher GPA for undergraduates was positively related to adaptive perfectionism dimensions, and lower GPA was negatively linked to adaptive

perfectionism dimensions. Perfectionistic students had higher anxiety, such as sensitivity to punishment, sensitivity to reward, inhibitory anxiety, prospective anxiety, and personality trait anxiety, than non-perfectionistic students. Furthermore, perfectionistic students had more authoritarian parents than non-perfectionistic students. Learning performance for both students with higher GPA and students with lower GPA showed an increase in reward trial across four training blocks as training progressed. Learning performance for both students with higher SES and students with lower SES indicated an increase in reward and punishment trials across four training blocks as training progressed. Parents, teachers, counselors, and other higher education professionals should consider how parents foster children to be healthy perfectionists, as well as what factors help students to acquire perfectionism involving adaptive dimensions that assist students in attaining academic success in educational settings.

Keywords*:* perfectionism, anxiety, parenting style, GPA, SES, computer-based learning task

DEDICATION

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CHAPTER I

INTRODUCTION

Recent work explored the associations between dimensions of perfectionism (i.e., concern over mistakes, doubts about actions, parental criticism, and parental expectations in maladaptive dimensions, as well as personal standards and organization in adaptive dimensions) and anxiety factors for state trait anxiety, intolerance of uncertainty, and sensitivity anxiety (Watabe & Allen, 2017). Specifically, maladaptive perfectionism dimensions of parental criticism, doubts about actions, and concern over mistakes had a positive relationship with sensitivity to punishment. The dimensions of parental criticism and concern over mistakes also had a negative relationship with emotional state anxiety. Additionally, the dimensions of doubts about actions and concern over mistakes had a positive relationship with personal trait anxiety. The finding is consistent with previous research, which demonstrated that there is a relationship between anxiety and parental components, including parenting styles: authoritarian, authoritative, and permissive (Silva, Dorso, Azhar, & Renk, 2007). Specifically, the study results exhibited that authoritarian parenting was linked to increases in college students' anxiety, and authoritative parenting was associated with decreases in college students' anxiety. Furthermore, Silva et al. (2007) reported that authoritative parenting, authoritarian

parenting, and college students' anxiety were linked to college students' grade point averages (GPA). Kawamura, Frost, and Harmatz (2002) found associations between parenting styles, college students' GPAs, and perfectionism; specifically, concern over mistakes and doubts about actions of maladaptive dimensions of perfectionism were associated with authoritarian parenting style, and personal standards of adaptive dimensions of perfectionism were associated with higher GPA for college students. In addition, a positive relationship between multiple dimensions of perfectionism and feelings of personally mastery or competence among female students with higher levels of SES measured by parents' income was found in the previous study (Lyman & Luthar, 2014). Given these previous research results, it would be possible that there was a specific relationship between perfectionism, anxiety, parenting style, GPA, and SES. The current study focused this point.

Perfectionism refers to the tendency to set inordinately high standards and engage in excessively critical self-evaluations (Frost, Marten, Lahart, & Rosenblate, 1990). However, theorists have disagreed about the developmental roots of perfectionism (Barrow & Moore, 1983; Flett, Hewitt, Oliver, & MacDonald, 2002; Pacht, 1984). There is reason to believe that a perfectionistic orientation advances across time, and the contexts of the individual's experiences within the family may contribute to the development of perfectionism as a product of children's interactions with their parents (Hibbard & Walton, 2014; Kawamura et al., 2002). Kawamura et al. (2002) examined how parenting styles involving components of parent-child interactions influence the development of perfectionism and what relationships are seen between perfectionism and grade point average (GPA) among college students. The findings revealed that concern

over mistakes and doubts about actions of maladaptive dimensions of perfectionism were linked to authoritarian parenting style. The study results also indicated that personal standards of adaptive dimensions of perfectionism were linked to higher GPA among college students. Although the researchers found an association between perfectionism, parenting styles, and GPA, the association between perfectionism, anxiety, and socioeconomic status (SES) is unclear. The study results suggest necessities for expanding the research on the relationship between perfectionism, parenting styles, GPA, anxiety, and SES.

Perfectionism is one of the unique personality elements in human beings. Several studies reported that perfectionism is associated with anxiety factors such as state-trait anxiety, intolerance of uncertainty, and anxiety sensitivity (Bardone-Cone, Lin, & Butler, 2017; Erozkan, 2016; Flett, Greene, & Hewitt, 2004; Shikatani, Antony, Cassin, & Kuo, 2016). State-trait anxiety involves emotional state anxiety that reflects the intensity of anxiety, as well as personality trait anxiety that refers to individual differences in anxiety proneness (Affrunti & Woodruff-borden, 2015; Klibert, Lamis, Naufel, Yancey, & Lohr, 2015). For example, there were significant positive relationships between dimensions of maladaptive perfectionism and personality trait anxiety (Brown & Kocovski, 2014; Flett et al., 2004; Klibert et al., 2015). On the other hand, the anxiety for intolerance of uncertainty encompasses inhibitory anxiety that represents beliefs about the negative nature of uncertainty, as well as prospective anxiety that reflects beliefs about the negative impact of uncertainty related to future events (Reuther et al., 2013). A positive relationship between overall perfectionism and anxiety for intolerance of uncertainty was seen in clinical samples with social anxiety disorder (Shikatani et al., 2016).

Additionally, the link between perfectionism and anxiety sensitivity was investigated by previous research (Ellis, 2002; Erozkan, 2016; Flett et al., 2004). Anxiety sensitivity consists of two sensitivity components: sensitivity to punishment and sensitivity to reward (Torrubia, Avila, Moltó, & Caseras, 2001). Sensitivity to punishment refers to the behavioral inhibition system (BIS) that breeds behavior regulation in response to signals of punishment that are frustrating to individuals due to non-reward (Gray & McNaughton, 2003). In contrast, sensitivity to reward reflects the behavioral activation system (BAS) associated with a conceptual system, which is behavior in response to signals of reward or non-punishment (Gray & McNaughton, 2003). Overall, perfectionists tended to be characterized by high levels of anxiety sensitivity (Flett et al., 2004).

Although perfectionism exists among individuals of all ages (Flett & Hewitt, 2002), perfectionism and its influence on specific human personality elements (i.e., state trait anxiety, intolerance of uncertainty, sensitivity to reward, sensitivity to punishment), parenting styles (i.e., authoritative, authoritarian, permissive), GPA, and parents' SES on learning tasks among college students has not been thoroughly researched. At both the undergraduate and graduate levels, students are under increasing pressure to perform at the highest levels (Pekrun, Goetz, Titz, & Perry, 2002; Song, Bong, Lee, & Kim, 2015), which may lead those students to feel anxiety, intolerance, and sensitivity on learning tasks. Furthermore, due to perfectly accomplishing tasks under pressure, those students' GPAs may be higher than students who do not feel anxiety on the tasks. Parents' income levels may also generate pressure that leads students to perfectly complete academic tasks. For instance, students whose parents' income levels are high may have higher

perfectionism under pressure associated with socioeconomic status. Additionally, students whose parents are authoritarian or permissive may have lower perfectionism compared with students whose parents are authoritative (Walton, Hibbard, & Watabe, 2017). Therefore, it is possible that the nature and effects of perfectionism may vary for the individual anxiety levels, GPA, SES, and perceived parenting styles. The high-pressure context of school settings may also produce perfectionism where students feel like they must achieve perfection just to meet high standards, which may cause aversive outcomes for their emotional components.

Conceptualizations of Perfectionism

Perfectionism concepts have long been a focus of psychological and educational research. Perfectionism is generally seen as "striving for flawlessness" (Flett & Hewitt, 2002, p. 5). Various conceptualizations of perfectionism have been discussed based on biological aspects and psychological contexts from the past to the present. Researchers have conceptualized perfectionism from two main perspectives: perfectionism dimensions and adaptive and maladaptive perfectionism (Frost et al., 1990; Hewitt & Flett, 1990, 1991; Slade & Owens, 1998).

Perfectionism Dimensions

Although, early research examined perfectionism as unidimensional (Ellis, 1962), later research differentiated between *normal* perfectionists who have high personal standards but allow themselves some flexibility in self-evaluation, and *neurotic* perfectionists who avoid positive self-evaluations unless their performance is always *perfect* (Hamachek, 1978). After a decade, several researchers found concepts of perfectionism as multidimensional (Frost et al., 1990; Hewitt & Flett, 1990, 1991). Frost

et al. (1990) pointed out perfectionism consists of six dimensions, including *concern over mistakes* (i.e., a propensity to have a negative reaction to mistakes, to anticipate disapproval, and to interpret mistakes as equivalent to failure), *personal standards* (i.e., setting high standards of great importance that are imposed on the self), *parental expectations* (i.e., belief that parents set very high standards for the self), *parental criticism* (i.e., belief that parents are overly harsh), *doubts about actions* (i.e., extent to which an individual doubts his/her ability to accomplish a task), and *organization* (i.e., belief in the importance of neatness and order). The finding of the multidimensional paradigm acquired an insight into how each perfectionism dimension is linked to specific human personalities such as features of state trait anxiety (Christensen, Danko, & Johnson, 1993; Hankin, Roberts, & Gotlib, 1997). Therefore, the current study focuses on multidimensional concepts of perfectionism.

Adaptive and Maladaptive Perfectionism

Early research reported that research in perfectionism tends to view the characteristics of perfectionism as negative aspects (Hamachek, 1978). The authors suggested that features of perfectionism are classified into two categories: adaptive perfectionism and maladaptive perfectionism (Slade & Owens, 1998). Adaptive perfectionism reflects perfectionistic behavior that is a function of positive reinforcement, which encompasses a willingness to approach stimuli. In contrast, maladaptive perfectionism refers to a function of negative reinforcement and includes a desire to avoid aversive outcomes (Hamachek, 1978; Slade & Owens, 1998). These two classifications were used to categorize six dimensions of perfectionism into adaptive perfectionism and maladaptive perfectionism; *personal standards* and *organization* were

categorized as adaptive perfectionism; *concern over mistakes, parental expectations, parental criticism,* and *doubts about actions* were categorized as maladaptive perfectionism.

Perfectionism and Anxiety in Educational Context

A study reported that graduate students with relatively high levels of other-oriented perfectionism (i.e., extremely high standards for other people; Flett & Hewitt, 2002) and socially prescribed perfectionism (i.e., perception of unrealistically high standards being placed on the self; Flett & Hewitt, 2002) are likely to have greater levels of statistics anxiety such as interpretation anxiety, computational self-concept, and fear of asking for help (Onwuegbuzie & Daley, 1999). Furthermore, undergraduate students with high levels of self-oriented perfectionism (i.e., high personal standards and motivation to achieve perfection; Flett & Hewitt, 2002) were positively associated with statistics anxiety and greater predictions of statistics anxiety (Walsh & Ugumba-Agwunobi, 2002). However, there has not been much research on the relationship between distinct dimensions of perfectionism and factors of anxiety in learning tasks among college students, especially in a computer-based learning task. It would be useful to know how students' perfectionism are influenced with anxiety factors, which are induced when students are trying to learn tasks perfectly. The results of the current study could help school counselors and practitioners to provide effective intervention strategies for perfectionistic students.

Characteristics of Parenting Styles

Although it has been suggested in theories of socialization that parenting styles are vital to children's educational and social outcomes (Baumrind, 1966, 1967), it is

unclear whether or not parenting styles are directly related to the development of adaptive or maladaptive perfectionistic propensities. A past study refined Baumrind's (1966) conceptualization of parenting styles as representing two dimensions: *demandingness* and *responsiveness* (Maccoby & Martin, 1983). *Demandingness* refers to the standards and demands set by parents (e.g., control, supervision), whereas *responsiveness* reflects parents' responses to, and communication with, their children (e.g., warmth, acceptance). *Authoritative* parenting involves high demandingness and high responsiveness. Authoritative parents try to direct their children's activities by applying warmth and positivity during communication, as well as proper autonomy granting and feelings-oriented reasoning (Baumrind, 1989; Mize & Pettit, 1997). Authoritative parenting has been linked to a high degree of task persistence among their children, high self-esteem and self-efficacy, and favorable academic performance (Amato & Fowler, 2002; Aunola, Stattin, & Nurmi, 2000; Chen, 2015; Masud, Ahmad, Jan, & Jamil, 2016). *Authoritarian* parenting involves high demandingness and low responsiveness. Authoritarian parents try to shape, control, and evaluate their children's behaviors and attitudes (Baumrind, 1989; Mize & Pettit, 1997). Children and adolescents whose parents are authoritarian report low self-esteem, low self-reliance, and are likely to be overwhelmed by challenging tasks (Hart, Newell, & Olsen, 2003; Thompson, Hollis, & Richards, 2003; Uji, Sakamoto, Adachi, & Kitamura, 2014). *Permissive* parenting involves low demandingness and high responsiveness. Permissive parents are highly accepting, making few demands, and allowing their children essential self-regulation (Baumrind, 1989; Mize & Pettit, 1997). Children with permissive parents tend to be dependent, display less persistence than other children with tasks, and have lower self-efficacy and

academic achievement (Bacus, 2014; Barber & Olsen, 1997; Lamborn, Mounts, Steinberg, & Dornbusch, 1991; Tam, Chong, Kadirvelu, & Khoo, 2013). There is an extensive amount of research on parenting styles and their relationship with numerous outcomes for children; however, there has been a paucity of research in which the focus has been exclusively on the influence of parenting styles on the development of distinct aspects of perfectionism.

Perfectionism in Academic Contexts

Academic contexts have been found to be associated with various factors and variables in the literature, including teacher-student relationship, classroom environment, achievement motivation, and GPA (Komarraju, Karau, & Schmeck, 2009; Sebanc, Guimond, & Lutgen, 2016; Summers, Davis, & Hoy, 2017). Robbins et al., (2004) conducted a meta-analysis, and found that students' self-efficacy and achievement motivation are the best predictors of their GPA. With the idea of measuring achievement motivation as a potential predictor of students' GPAs, several researchers attempted to analyze how perfectionism is associated with students' achievement motivation by asking current GPAs (Brown et al., 1999; Castro & Rice, 2003; Elion, Wang, Slaney, & French, 2012; Frost et al., 1990; Kawamura et al., 2002). However, perfectionistic students tended to strive to achieve difficult goals that often induces negative outcomes and counterproductive behavior (Bong, Hwang, Noh, & Kim, 2014; Einstein, Lovibond, & Gaston, 2000). For instance, anxiety under academic pressure, which impacts academic outcomes among students, has been closely explored in the association with perfectionism (Inglés, García-Fernández, Vicent, Gonzálvez, & Sanmartín, 2016; Onwuegbuzie & Daley, 1999; Walsh & Ugumba-Agwunobi, 2002). Wingate and Tomes

(2017) demonstrated that students' academic anxiety and achievement motivation highly predicted GPAs. Anxiety in educational settings that comes from perfectionism is a potential obstacle to acquiring successful academic outcomes, especially in regards to levels of GPA. Therefore, it is important to examine whether perfectionism affects students' GPAs on psychological and behavioral responses in educational contexts.

Perfectionism as a Factor of Parents' Socioeconomic Status

Parents' SES may influence perfectionism and anxiety, particularly in learning tasks. SES is a complex factor and is a multidimensional paradigm, combining objective elements such as an individual's (or parent's) education, occupation, and income (Adler et al., 1994; Dubow, Huesmann, Boxer, Pulkkinen, & Kokko, 2006; Yang et al., 2016). Families with higher SES are able to provide high quality opportunities for their children such as good education, parental involvement in educational events, and social connections that are beneficial to children (Strand, 2014; Yang et al., 2016). Conversely, children having parents with low SES are less likely to acquire greater educational opportunities and sufficient community services, and experience the aversive outcomes linked to increased symptoms of depression and anxiety (Adler et al., 1994; Galindo & Sonnenschein, 2015; Marmot, Kogevinas, & Elston, 1987; Strand, 2014). However, vast reviews of the literature have produced no results for studies testing the relationship between perfectionism and SES in a computer-based learning task among college students. Examining perfectionism among college students from different economic backgrounds could reveal whether parents' income levels relate to the pressures or anxiety that students experience in educational settings.

Rationale for the Current Study

If, indeed, there are distinct dimensions of perfectionism, it is important to examine how each of these dimensions is linked to factors of anxiety (state trait anxiety, intolerance of uncertainty, and sensitivity to reward and punishment), parenting styles (authoritative, authoritarian, and permissive), GPA (measured by self-report responses), and SES (measured as parents' income) among college students. Additionally, a majority of the empirical research in the area of the association between perfectionism, anxiety, parenting styles, GPA, and SES exhibited measuring elements of perfectionism, anxiety, parenting styles, GPA, and SES use pencil-paper personality inventories (Bardone-Cone et al., 2017; Elion et al., 2012; Onwuegbuzie & Daley, 1999; Shikatani et al., 2016). There are inherent limitations to the use of the form of self-report questionnaire. The most obvious limitation is the potential for response bias and demand characteristics (McCambridge, de Bruin, & Witton, 2012). A behavioral task that does seem to specifically target perfectionist behavior would avoid these biases. However, extensive reviews of the literature have yielded no results for studies that examined the relationship between perfectionism, anxiety, parenting styles, GPA, and SES by utilizing a computer-based learning task involving reward and punishment trials. The current study seeks to utilize a computer-based objective behavioral task to investigate perfectionism. The computer-based learning task is used due to the difficulty and frustrating nature of its being probabilistic. The task is probabilistic in that an item is only in a particular category 80% of the time. Therefore, 20% of the time a correct categorization is scored as an incorrect response, and a stimulus does not belong to the same category on each trial (Myers et al., 2013; Sheynin et al., 2013). For example, stimulus S1 belonged to

category A on 80% of trials, so response “A” was always optimal (i.e., if participants chose the category that was most often associated with its stimulus) for its stimulus; however, it was only correct (i.e., resulted in point gain) on 80% of trials, because on the remaining 20% of trials S1 belonged to category B (see Table 1). Specifically, for being probabilistic, a participant saw a stimulus on each trial and was asked to categorize that stimulus as “A” or “B” (see Figure 1). The selected category was circled, and corrective feedback might appear. For some stimuli (punishment trials), incorrect classification was punished with point loss (B) while correct classification received no feedback (C) (see Figure 1). The screen (C) also made participants ambiguous because of probabilistic tasks that led participants to frustration (see Figure 1). For other stimuli (reward trials), correct classification was rewarded with point gain (D) while incorrect classification received no feedback (see Figure 1). These conditions enabled the study to thoroughly measure the influence of levels of perfectionism on factors of anxiety (e.g., state trait anxiety, intolerance of uncertainty, sensitivity to reward, sensitivity to punishment), parenting styles involved in parental pressure that bred anxiety to students (Quach, Epstein, Riley, Falconier, & Fang, 2015), GPA associated with academic anxiety (Thomas, Cassady, & Heller, 2017), and SES involved in socioeconomic anxiety (Matthews, 2000) across different training points. In addition to exploring the relationship of perfectionism with these factors, it was important to examine how perfectionism affected learning in a task known to be affected by anxiety vulnerability. The current study attempted to explore these issues.

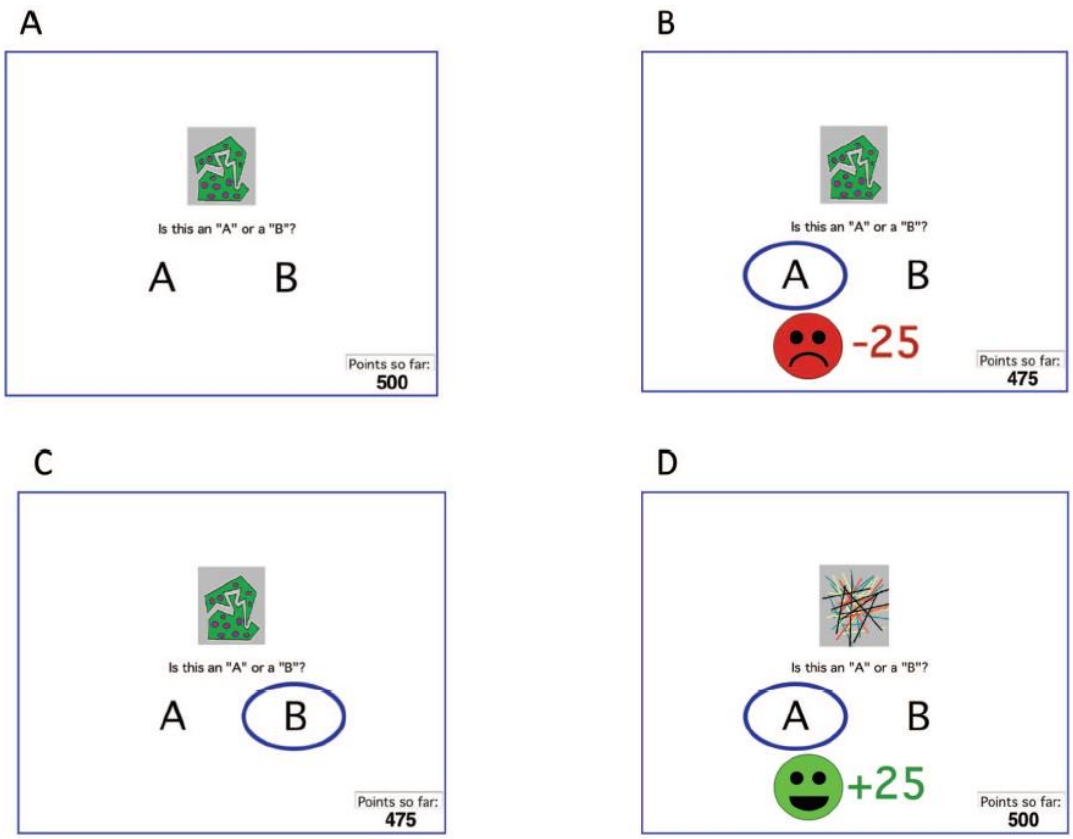

Figure 1. Example screen events of computer-based learning and memory tests (reward-based and punishment-based trials; Myers et al., 2013).

Table 1

Category and Feedback Structure of the Probabilistic Reward and Punishment Learning Task

Stimulus	Category Membership	Feedback if correct	Feedback if incorrect
S1	80% category A 20% category B	+ 25 points	No feedback
S2	20% category A 80% category B	+ 25 points	No feedback
S3	80% category A 20% category B	No feedback	– 25 points
S4	20% category A 80% category B	No feedback	– 25 points

Purpose of the Current Study

The purpose of the current study was to examine the relationship between perfectionism, anxiety factors, parenting styles, GPA, and SES (measured as parents' income) in a computer-based learning task among college students using the theoretical model and framework by Kawamura et al. (2002). This theoretical model indicated that maladaptive dimensions of perfectionism (e.g., concern over mistakes, doubts about actions) were associated with authoritarian parenting style for both male and female undergraduates. Furthermore, an adaptive dimension of perfectionism (e.g., personal standards) was linked to higher GPA for female undergraduates only (Kawamura et al., 2002). Although this past research identified the associations of perfectionism, parenting styles, and GPA among undergraduates, the influence of anxiety factors (i.e., state trait anxiety, intolerance of uncertainty, sensitivity to reward, sensitivity to punishment) and SES on college students' perfectionism was unclear. In addition, the researchers only used paper-pencil survey questionnaires to measure the associations between perfectionism, parenting styles, and GPA, so the associations between perfectionism, anxiety, parenting style, GPA, and SES on a computer-based learning task were not identified. Thus, a major purpose in the current study was to examine how each of the perfectionism dimensions (i.e., *concern over mistakes, personal standards, parental expectations, parental criticism, doubts about actions,* and *organization*) was associated with anxiety factors (i.e., emotional state anxiety, personality trait anxiety, inhibitory anxiety, prospective anxiety, sensitivity to reward, sensitivity to punishment), parenting styles (authoritative, authoritarian, and permissive), GPA (measured by self-report responses), and SES (measured as parents' income) among college students. A

secondary purpose was to explore the cause-effect relationship between predictor variables (i.e., perfectionism, anxiety, parenting style, GPA, and SES) and outcome variable (i.e., learning performance on computer-based task). A tertiary purpose was to investigate a difference in the effect of high or low perfectionism on a reward and punishment computer-based learning task among college students. A quaternary purpose was to explore a difference in the effect of parenting styles on a reward and punishment computer-based learning task among college students. A quinary purpose was to examine a difference in the effect of levels of GPA on a reward and punishment computer-based learning task among college students. A final purpose was to explore a difference in the effect of levels of SES on a reward and punishment computer-based learning task among college students.

Hypotheses and Research Questions

The following hypotheses replicated the previous study that showed significant results (Watabe & Allen, 2017). The following research questions came from the previous study (Watabe & Allen, 2017), which did not explore a relationship between predictor variables (parenting styles, levels of GPA, and levels of SES) and outcome variable (learning performance on a computer-based task) involving a cause-effect relationship. The research questions in the current study also came from the experimenter's interest. Especially, the experimenter was interested in whether a cause-effect relationship was seen between predictor variables (perfectionism, anxiety, parenting styles, levels of GPA, and levels of SES) and outcome variable (learning performance on a computer-based task), which was not found in previous research. Based on previous research results (Kawamura et al., 2002; Watabe & Allen, 2017), the

experimenter predicted there might be a direct effect between perfectionism, anxiety, and GPA and learning performance on a computer-based task. Furthermore, an indirect effect between predictor variables (perfectionism, parenting style, GPA, and SES) and outcome variable (learning performance on a computer-based task) was predicted (see Figure 2).

To measure participants perfectionism, the *Multidimensional Perfectionism Scale* (MPS; Frost et al., 1990) was used. This scale measured six dimensions of perfectionism (i.e., concern over mistakes, doubts about actions, parental criticism, parental expectations, personal standards, and organization). To measure participants' anxiety for intolerance of uncertainty, *Intolerance of Uncertainty Scale* (IUS; Carleton, Norton, & Asmundson, 2007) was used. This scale included a subscale of inhibitory anxiety and a subscale of prospective anxiety. To measure participants' anxiety sensitivity, *Sensitivity to Punishment and Sensitivity to Reward Questionnaire* (SPSRQ; Torrubia et al., 2001) was used. This scale included a subscale of sensitivity to punishment and a subscale of sensitivity to reward. To measure participants' state trait anxiety, the *State-Trait Anxiety Inventory* (STAI; Spielberger, 1983) was used. This scale included a subscale of an emotional state (i.e., S-anxiety) and a subscale of a personality trait (i.e., T-anxiety). To measure participants' perceived parenting styles, *Parental Authority Questionnaire* (PAQ; Buri, 1991**)** was used. This scale included three parenting subscales: authoritarian, authoritative, and permissive. The following hypotheses and research questions guided the current study:

H1 There would be a positive relationship between maladaptive dimensions of perfectionism (concern over mistakes, doubts about actions, parental criticism, and parental expectations measured by Multidimensional Perfectionism Scale; Frost et al., 1990) and anxiety factors (emotional state anxiety and personality trait anxiety measured by STAI; Spielberger, 1983, inhibitory anxiety and prospective anxiety measured by IUS; Carleton et al., 2007, sensitivity to punishment and sensitivity to reward measured by SPSRQ; Torrubia et al., 2001).

Q1 Is there a relationship between maladaptive perfectionism dimensions (i.e., concern over mistakes, doubts about actions, parental criticism, parental expectations measured by Multidimensional Perfectionism Scale; Frost et al., 1990), adaptive perfectionism dimensions (i.e., personal standards, organization measured by Multidimensional Perfectionism Scale; Frost et al., 1990), parenting styles (authoritarian, authoritative, and permissive measured by Parental Authority Questionnaires; Buri, 1991), levels of GPA measured by self-report responses (students with higher GPA and students with lower GPA), and levels of SES measured as parents' income (students with higher SES and students with lower SES)?

H2 Perfectionistic students (high maladaptive and adaptive perfectionism dimensions) would have higher learning performance in a reward and punishment computer-based learning task than non-perfectionistic students (low maladaptive and adaptive perfectionism dimensions).

H3 Perfectionistic students (high maladaptive and adaptive perfectionism dimensions) would have greater change in mean scores on learning for punishment-based trials in a computer-based learning task across four training blocks than non-perfectionistic students (low maladaptive and adaptive perfectionism dimensions).

Q2 How do perfectionism, parenting style, GPA, and SES affect learning performance in a computer-based task?

Q3 Do parenting style, GPA, SES, or anxiety mediate the relationship between perfectionism and learning performance?

H4 Perfectionistic students (high maladaptive and adaptive perfectionism dimensions) would have higher anxiety factors (emotional state anxiety and personality trait anxiety measured by STAI; Spielberger, 1983, inhibitory anxiety and prospective anxiety measured by IUS; Carleton et al., 2007, sensitivity to punishment and sensitivity to reward measured by SPSRQ; Torrubia et al., 2001) than non-perfectionistic students (low maladaptive and adaptive perfectionism dimensions).

Q4 How do perfectionistic students (high maladaptive and adaptive perfectionism dimensions) and non-perfectionistic students (low maladaptive and adaptive perfectionism dimensions) differ on parenting styles, GPA, and SES?

Q5 How do the following variables (parenting style, anxiety, GPA, and SES) predict maladaptive and adaptive perfectionism?

Q6 How do the following variables (maladaptive perfectionism, adaptive perfectionism, parenting style, anxiety, and SES) predict GPA?

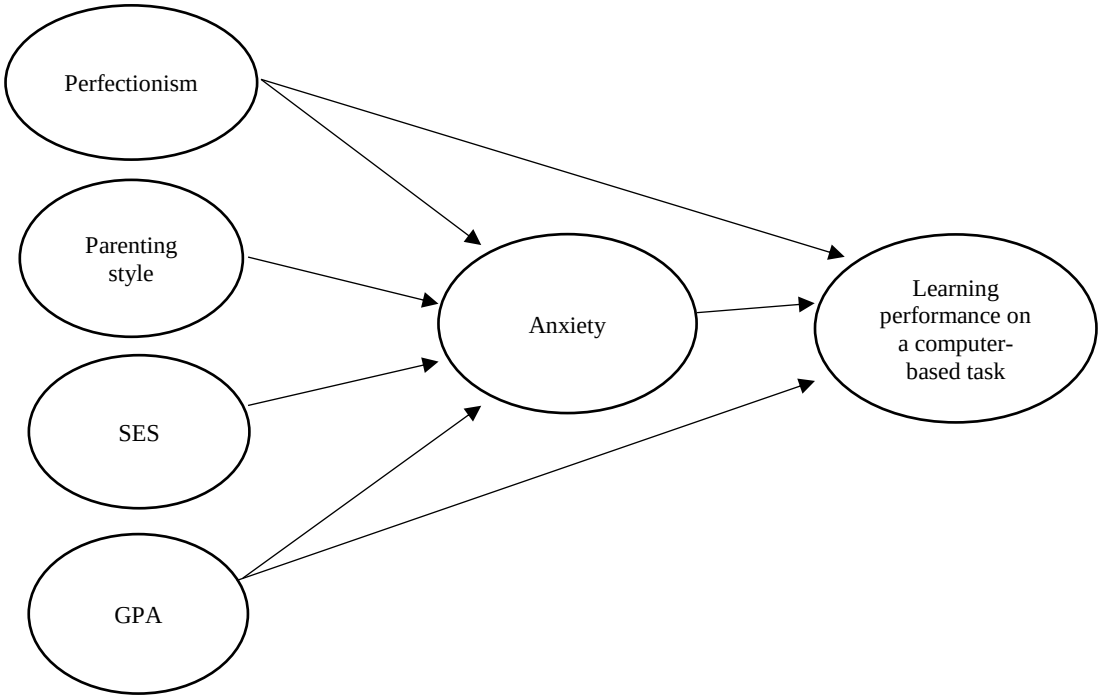

Figure 2. The hypothesized causal ordering for how perfectionism, parenting style, SES, GPA, and anxiety cause learning performance on a computer-based task.

Definition of Terms

Adaptive Dimensions of Perfectionism--Perfectionistic behavior that is a function of positive reinforcement, including a willingness to approach stimuli (Hamachek, 1978; Slade & Owens, 1998).

Anxiety Sensitivity--Consisting of two sensitivity components: sensitivity to punishment and sensitivity to reward (Torrubia et al., 2001).

Sensitivity to punishment refers to the behavioral inhibition system (BIS) that breeds behavior regulation in response to signals of punishment that are frustrating to individuals due to non-reward (Gray & McNaughton, 2003). Sensitivity to reward reflects the behavioral activation system (BAS) associated with a conceptual system, which is behavior in response to signals of reward or non-punishment (Gray & McNaughton, 2003).

Authoritarian Parenting--Attempting to sharpen, control, and evaluate the behavior and attitude of their children, which is typically expressed in a higher authority (Baumrind, 1989). The parents with authoritarian parenting are high on demandingness and low on responsiveness (Maccoby & Martin, 1983).

Authoritative Parenting--Attempting to reasonably direct their children's activities and utilize more warm control, positivity during communication, feelings-oriented reasoning as well as induction, and more responsiveness to children's questions (Baumrind, 1989; Mize & Pettit, 1997). The parents with authoritative parenting possess high demandingness and high or medium responsiveness (Maccoby & Martin, 1983).

Grade Point Average (GPA)--The average obtained by dividing the total number of grade points earned by the total number of credits attempted, which also called quality point average (Warne, Nagaishi, Slade, Hermesmeyer, & Peck, 2014).

Intolerance of Uncertainty--Consisting of two anxiety components: inhibitory anxiety and prospective anxiety (Reuther et al., 2013). Inhibitory anxiety represents

beliefs about the negative nature of uncertainty, and prospective anxiety reflects beliefs about the negative impact of uncertainty related to future events (Reuther et al., 2013).

Maladaptive Dimensions of Perfectionism--Perfectionistic behavior that is a function of negative reinforcement, including a desire to avoid aversive outcomes (Hamachek, 1978; Slade & Owens, 1998).

Parenting Style--The manner in which parents raise children involving the parents' levels of expectations, performance demands, attentiveness to rules, and discipline style that are utilized to enforce their expectations toward children (Baumrind, 1967).

Perfectionism--Flett and Hewitt (2002) defined perfectionism as “striving for flawlessness” (p. 5).

Permissive Parenting--Highly accepting children, making some demands for the children’s behavior, and allowing children fundamental self-regulation (Baumrind, 1989). Permissive parents possess low demandingness and high responsiveness (Maccoby & Martin, 1983).

Socioeconomic Status (SES)--Socioeconomic status (SES) is defined as the social standing or the class of an individual or group (Baker, 2014; Galobardes, Shaw, Lawlor, Lynch, & Smith, 2006; House 2002).

State Trait Anxiety--State trait anxiety involves emotional state anxiety that reflects the intensity of anxiety, as well as personality trait anxiety that refers to individual differences in anxiety proneness (Affrunti & Woodruff-borden, 2015; Klibert et al., 2015).

Summary

The current study expanded on the existing literature by examining the links with perfectionism among college students. The current study was an exploratory investigation that intended to identify general associations of perfectionism and anxiety factors, perceived parenting styles, levels of GPA, and levels of SES in a reward and punishment computer-based learning task. Utilizing a computer-based learning task further produced possibilities for specific results that induced potential insights into how perfectionism influences learning in a task that was affected by anxiety vulnerability. It was beneficial for understanding whether perfectionistic students may be more vulnerable than other students.

In addition, the current study had the potential to establish whether a change in learning performance on a computer-based task is seen in between perfectionistic/non-perfectionistic students, students with authoritative parenting/authoritarian parenting/permissive parenting, students with a high GPA/a low GPA, and students with a high SES/a low SES. It was also useful to know how perfectionism levels, parenting styles, levels of GPA, and levels of SES influence students' learning outcomes in educational contexts.

Studying perfectionism for college students provides fundamental understandings of the role of the various aspects in educational environments. Information about the relationship between factors of perfectionism, anxiety, parenting style, GPA, and SES in learning tasks for college students could assist family members, counselors, teachers, and other higher education professionals who help perfectionistic students. Data from this

study also could be used to inform strategies in the development of educational programs to benefit college students and their families.

CHAPTER II

REVIEW OF LITERATURE

Chapter II provides several information in regard to the relationship between perfectionism, anxiety, parenting style, GPA, and SES: (1) the link between perfectionism and factors of anxiety (i.e., state trait anxiety, intolerance of uncertainty, anxiety sensitivity), (2) the development of perfectionism on authoritative, authoritarian, and permissive parenting styles, (3) the influence of perfectionism on students' GPAs, (4) the effect of SES on educational outcomes, and (5) the association between perfectionism and SES.

The major topics of interest in the current study involve how perfectionism interact with each of factors, such as anxiety, parenting style, GPA, and SES. The current study also aims to explore how perfectionistic students, non-perfectionistic students, students with authoritative parenting style, students with authoritarian parenting style, students with permissive parenting style, students with a high GPA, students with a low GPA, students with a high SES, and students with a low SES differ in learning tasks, including educational components of receiving reward and punishment events.

Previous studies examined the relationship between perfectionism and anxiety factors, the association between perfectionism, parenting style, and GPA, and the link

between perfectionism and SES. The current study expands on the existing literature by examining the correlates of perfectionism, anxiety, parenting style, GPA, and SES in a computer-based learning task among college students.

Perfectionism and State Trait Anxiety

The association between perfectionism and general anxiety typically measures how components of state-trait anxiety (i.e., emotional state anxiety, personality trait anxiety) and maladaptive perfectionism dimensions are associated (Flett, Endler, Tassone, & Hewitt, 1994). The findings showed that socially prescribed perfectionism is the dimension that is most closely associated with components of state trait anxiety, especially in conditions of ego threat (Flett et al., 1994). Brown and Kocovski (2014) also investigated the relationship between perfectionism and state trait anxiety among college students and whether the relationship could predict a post-event rumination. The results indicated that higher perfectionism was predictive of increased negative post-event rumination that involved in the state trait anxiety component (Brown & Kocovski, 2014). Additionally, Bardone-Cone et al. (2017) found maladaptive perfectionism interacted with trait anxiety, and the interaction predicted eating disorder among undergraduate females.

Byrne, Eichen, Fitzsimmons-Craft, Taylor, and Wilfley (2016) examined the influence of elements of perfectionism, emotion dysregulation, and aspects of trait anxiety and depression, as well as the interactions of these elements on clinical impairment in college-aged female individuals who suffered from eating disorders. The study results showed that the three-way interaction of perfectionism, emotion dysregulation, and affective trait anxiety and depression (i.e., trait anxiety and

depression) was not significant. However, there was a significant result of the two-way interaction between perfectionism and emotion dysregulation indicating participants who had higher levels of both perfectionism and emotion dysregulation. The researchers concluded that the combination of perfectionism and emotion dysregulation might cause aversive health outcomes for clinical patients at high risk for eating disorders (Byrne et al., 2016).

Perfectionism and Intolerance of Uncertainty

Numerous studies have demonstrated the relationship between perfectionism and intolerance of uncertainty for general anxiety, including components of inhibitory anxiety and prospective anxiety, on psychological disorders (Reuther et al., 2013; Shikatani et al., 2016; Whiting et al., 2014). Reuther et al. (2013) revealed that intolerance of uncertainty moderates the relationship between perfectionism and severity of obsessive–compulsive disorder (OCD) symptoms. Shikatani et al. (2016) exhibited the independent roles of two transdiagnostic variables (i.e., perfectionism and intolerance of uncertainty) as unique predictors of postevent processing (PEP) in social anxiety disorder (SAD) above and beyond social anxiety and depressive symptoms. The findings showed perfectionism and intolerance of uncertainty were positively correlated with positive PEP distress, and significantly predicted increased distress associated with positive PEP above and beyond social anxiety and depressive symptoms (Shikatani et al., 2016).

Whiting et al. (2014) examined the role of intolerance of uncertainty in the two types of social phobia–interaction and performance–among a nonclinical sample. The findings indicated intolerance of uncertainty accounted for a significant proportion of the variance in both Social Interaction Anxiety Scale (SIAS) and Social Phobia Scale (SPS)

scores beyond that of other known anxiety correlates such as perfectionism (Whiting et al., 2014). Thus, the elements of intolerance of uncertainty are more likely to impact psychological disorders than perfectionism dimensions, and the association between perfectionism and intolerance of uncertainty is worth analyzing.

Kawamoto and Furutani, (2018) tested that the link between effects of intolerance of uncertainty (IU) and personal standards (PS) and concern over mistakes (CM) in perfectionism dimensions, potential mediating effects of IU, and the specific and common effects of perfectionism dimensions, PS and CM, on psychological adjustment/maladjustment. Five hundred mothers participated an online survey involving measures of perfectionism (PS and CM), IU, and psychological adjustment/maladjustment (life satisfaction, depression, and rearing stress). The findings indicated that PS and CM in perfectionism dimensions were positively related to IU. Specifically, IU mediated the relationship between CM and psychological adjustment/maladjustment. On the other hand, IU involved a suppression effect on the link between PS and psychological adjustment/maladjustment when CM was not partialled out. The researchers pointed out the importance of understanding of the link between PS, CM, and IU, as well as the common and unique effects of dimensions of perfectionism on IU (Kawamoto & Furutani, 2018).

Perfectionism and Anxiety Sensitivity

Although there is a paucity of research on perfectionism and anxiety sensitivity, the relationship between perfectionism and high levels of anxiety sensitivity was pointed out in an early study of panic disorder. The study revealed that perfectionists were likely to be characterized with high levels of anxiety sensitivity. Perfectionists tended to

believe that they were free from panic, and the belief was activated as the uneasiness of panic sensitivity that became more apparent (Ellis, 1962, 2002).

The association between panic disorder and the dimension of socially prescribed perfectionism was clarified by a study (Antony, Purdon, Huta, & Swinson, 1998). Antony et al. (1998) reported social phobia and obsessive compulsive cognitions were linked to perfectionistic thinking, that is the belief that making mistakes might cause a loss of control across specific outcomes. The study reported that anxiety sensitivity was a cognitive risk factor for panic disorder, and anxiety sensitivity was associated with overall perfectionism in clinical samples (Antony et al., 1998).

Flett et al. (2002) found there was a positive correlation between the multidimensional perfectionism and behavioral inhibition system (BIS) sensitivity. The BIS sensitivity refers to avoidance motivation associated with sensitivity to punishment (Flett et al., 2002). Perfectionists were likely to gain a fearful sensitivity to signals of punishment and nonreward, which was interpreted with the concepts of perfectionists' fear of incapability to tolerate failure (Flett, Blankstein, Hewitt, & Koledin, 1992). Additionally, self-oriented perfectionism was positively correlated with behavioral activation system (BAS) sensitivity that reflects approach motivation related to reward concepts (Flett et al., 2002). Furthermore, both the BIS and the BAS sensitivities were positively correlated with self-oriented and other-oriented perfectionism (O'Connor & Forgan, 2007).

Flett et al. (2004) demonstrated that automatic interpersonal aspects of the perfectionism construct and thoughts involving perfectionism were related to anxiety sensitivity. Perfectionism cognitions were also linked to anxiety sensitivity including a

dimension of *fears of cognitive dyscontrol*. Perfectionistic self-presentation and socially prescribed perfectionism were linked to a dimension of *fears of publicly observable anxiety reactions* suggesting that dimensions of the interpersonal perfectionism were primarily associated with anxiety sensitivity to negative social evaluation that might yield panic attacks (Flett et al., 2004).

The relationship between dimensions of perfectionism and anxiety sensitivity was explored (Erozkan, 2016). The data suggested that all dimensions of perfectionism (i.e., *concern over mistakes, personal standards, parental expectations, parental criticism, doubts about actions,* and *organization*) were positively related to anxiety sensitivity among young adults. This study also showed that all dimensions of perfectionism significantly accounted for anxiety sensitivity, and especially, maladaptive perfectionism is an important risk factor to identify among young adults with anxiety sensitivity (Erozkan, 2016).

Watabe and Allen (2017) investigated that the relationship between perfectionism and anxiety. One hundred-five undergraduates completed measures of Multidimensional Perfectionism Scale (MPS), Intolerance of Uncertainty Scale (IUS), Sensitivity to Punishment Sensitivity to Reward Questionnaire (SPSRQ), the State-Trait Anxiety Inventory (STAI). The findings revealed maladaptive perfectionism dimensions of parental criticism, doubts about actions, and concern over mistakes had a positive relationship with sensitivity to punishment. The dimensions of parental criticism and concern over mistakes had a negative relationship with emotional state anxiety. The dimensions of doubts about actions and concern over mistakes had a positive relationship with personal trait anxiety. Perfectionistic students had higher anxiety, such as sensitivity

to punishment, sensitivity to reward, prospective anxiety, and personality trait anxiety, than non-perfectionistic students (Watabe & Allen, 2017).

Parenting Typology, Pattern, and Dimension

Over five decades ago, studies of socialization of competence determined that different sorts of parenting would yield different children's behaviors (Baumrind, 1966, 1967). The findings revealed that there are nine types of parenting styles: (1) authoritative, (2) demanding, (3) traditional, (4) authoritarian, (5) undifferentiated, (6) democratic, (7) permissive, (8) nondirective, and (9) rejecting-neglecting. Authoritative, traditional, authoritarian, permissive, and rejecting-neglecting involve the most distinctive influence on children's development, and have been considered parenting prototypes (Baumrind, 1966, 1967). The original parenting style prototypes were classified into three representative categories: authoritative, authoritarian, and permissive (Baumrind, 1967, 1989). The typology of parenting styles is important in understanding children's developmental outcomes that are structurally relative (Pong, Johnston, & Chen, 2010).

Baumrind (1989) reported four vital patterns for the classifications of parenting. First, authoritative, demanding, and traditional parenting styles are classified as parents in an engaged pattern. Second, authoritarian parenting style is considered as a restrictive pattern. Third, democratic, undifferentiated, and permissive parenting styles are described as a lenient pattern. Lastly, nondirective and rejecting-neglecting parenting styles are categorized as an unengaged pattern (Baumrind, 1989).

Maccoby and Martin (1983) pointed that Baumrind's parenting styles (1966, 1967) represent two dimensions: demandingness and responsiveness. Demandingness is

conceptualized by the standards and demands set by parents, such as control and supervision. In contrast, responsiveness reflects parent's response and communication with their children, such as warmth, acceptance, and involvement (Maccoby & Martin, 1983).

Authoritative parents possess high demandingness and high or medium responsiveness (Baumrind, 1989; Maccoby & Martin, 1983). Authoritative parents reasonably attempt to direct their children's activities and utilize more warm control, positivity during communication, feelings-oriented reasoning as well as induction, and more responsiveness to children's questions (Mize & Pettit, 1997). Adolescents with authoritative parents were seen in higher grades in academic performance than adolescents with neglectful parents. Furthermore, those adolescents displayed stronger academic orientation, school engagement, and bonding with teachers than adolescents with neglectful parents (Steinberg, Blatt-Eisengart, & Cauffman, 2006).

Parents who are authoritarian attempt to sharpen, control, and evaluate the behavior and attitude of their children, which is typically expressed in a higher authority (Baumrind, 1989). The parents are high on demandingness and low on responsiveness (Maccoby & Martin, 1983). Children and adolescents whose parents are authoritarian had low self-esteem and spontaneity, withdrawal, antisocial, and delinquent behaviors (Coie & Dodge, 1998). Parents in this pattern value obedience as a virtue, and are punitive and forceful (Baumrind, 1989).

Permissive parents have low demanding and high responsive (Baumrind, 1989). Parents in this type highly accept their children, and make some demands for the children's behavior. These parents allow their children fundamental self-regulation

(Baumrind, 1989). Fite, Stoppelbein, and Greening (2009) reported that permissive parenting style is associated with readmission for both Black and White children who are hospitalized in child psychiatric inpatient facilities.

Stewart and Bond (2002) described that parenting dimensions are universal, and they provide better measures for parenting behaviors, especially in ethnic cultural groups in which the culture-specific meaning of the behavior may be dissimilar. Baumrind (1966, 1967) investigated whether components of family interaction are linked to cognitive competence. The study result indicated that three parenting styles (authoritative, authoritarian, and permissive) include values of the development of cognitive and social competence. These three parenting types are different from the standards, behaviors, and principles that children are expected to adopt in parental expectations about the behavior of children (Baumrind & Black, 1967; Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987). The current study examines scores obtained from the authoritarian, the authoritative and the permissive subscales of the Parental Authority Questionnaire (PAQ; Buri, 1991).

The Associations among Parenting Styles, Anxiety, and Academic Contexts

Silva et al. (2007) explored the associations among parenting styles experienced in childhood, anxiety, motivation, and academic success in college students. The findings revealed that fathers' authoritative parenting was linked to decreases in college students' anxiety. However, the link between mothers' authoritarian parenting and increases in those students' anxiety was seen in the study results. Furthermore, mothers' and fathers' authoritative parenting, mothers' authoritarian parenting, and college

students' anxiety were positively linked to college students' grade point averages. Additionally, college students' motivation played a mediational role in the link between their anxiety and GPAs. The findings indicated that college students are more likely to experience enhancements in their school performance with interventions that emphasize college students' perceived parenting styles that received during their childhood, which generate anxiety and motivation to perform well in educational tasks.

Wolfradt, Hempel, and Miles (2003) investigated the link between perceived parenting styles, depersonalization, anxiety, and coping behavior in 276 high school student participants. The study results showed that perceived parental psychological pressure was positively linked to depersonalization and trait anxiety among those participants. Specifically, there was a positive relationship between perceived parental warmth and active coping, as well as a negative relationship between perceived parental warmth and trait anxiety in the adolescent participants. The researchers also conducted a cluster analysis to identify the effect of four sorts of parenting styles, such as authoritarian, authoritative, permissive, and indifferent, on the factors of depersonalization, anxiety, and coping behavior. The higher scores on depersonalization and anxiety were seen in the group of the authoritarian parenting style. The highest score on active problem coping exhibited in the groups of the authoritative and permissive style for both parents (Wolfradt et al., 2003).

Developmental Perfectionism on Parenting Style

A comprehensive view of perfectionism on the developmental perspective is seen in a particular emphasis on the role of family factors, such as parenting styles (Flett et al., 2002). Numerous studies provided empirical evidence that the individual perfectionism

is more likely to develop in the families with overly critical parents (Flett, Hewitt, & Singer, 1995; Frost, Lahart, & Rosenblate, 1991; Kawamura et al., 2002; Rice, Ashby, & Preusser, 1996). Frost et al. (1991) revealed that perfectionism in a sample of female college students was linked to harsh parenting styles. Similarly, according to Rice et al. (1996), individuals with maladaptive dimensions of perfectionism reported that their parents are more demanding and more critical than parents for individuals with adaptive dimensions of perfectionism.

Baumrind (1971) identified three parenting styles, authoritative, authoritarian, and permissive, which stress qualitatively different forms of parental attitudes toward their children. Several studies reported that both the authoritarian and the permissive parenting styles related to poor child outcomes (Flett et al., 1995; Jungert et al., 2015; Tavassolie, Dudding, Madigan, Thorvardarson, & Winsler, 2016). The relationship between various indices of perfectionism and parenting styles has been examined by previous studies (Basirion, Majid, & Jelas, 2014; Hibbard & Walton, 2014; Miller, Lambert, & Speirs Neumeister, 2012). The recent study reported that authoritarian parenting style is positively linked to socially prescribed perfectionism among college students (Miller & Speirs Neumeister, 2017). Primarily, the past and present literature has focused on authoritarian and authoritative parenting styles that might play a role in contributing to the development of perfectionism. For instance, the researchers revealed that college students who have higher scores on socially prescribed perfectionism tended to perceive one or both of their parents as authoritarian (Miller et al., 2012; Speirs Neumeister, 2004). Furthermore, Speirs Neumeister (2004) demonstrated that participants whose scores are high on self-oriented perfectionism have

parents with authoritative style. Additionally, Basirion et al. (2014) investigated whether adaptive and maladaptive dimensions of perfectionism relate to authoritarian, authoritative, and permissive parenting styles. The findings indicated that although there is a relationship between maladaptive perfectionism dimensions and authoritarian parenting style, as well as adaptive perfectionism dimensions and authoritative parenting style, permissive parenting style did not relate to both adaptive and maladaptive perfectionism dimensions (Basirion et al., 2014).

However, the association between authoritarian parenting and perfectionism often varied in the literature (Basirion et al., 2014; Speirs Neumeister, 2004). Some researchers proposed that it might be an artifact of the parenting style measure (Craddock, Church, & Sands, 2009; Gong, Fletcher, & Bolin, 2015; Soenens et al., 2005). On the other hand, a study did not identify a link between authoritative parenting and dimensions of adaptive perfectionism as measured by the *personal standards* and *organization* subscales of the Multidimensional Perfectionism Scale (MPS; Hibbard & Walton, 2014). Instead, the researchers provided an insight that although authoritative parenting did not predict adaptive dimensions of perfectionism, authoritative parenting may play a role as a buffer against the development of maladaptive dimensions of perfectionism. These previous study results suggest necessities of expanding the research on the association between perfectionism, authoritative, and authoritarian parenting styles and exploring the potential relationship between perfectionism and permissive parenting style.

The Influence of Perfectionism on Grade Point Average

In early study, Frost and Henderson (1991) found that one of the adaptive perfectionism dimensions (i.e., *personal standards*) was associated with higher achievement motivation for participants from 40 female college athletes. Studies also demonstrated that an adaptive dimension of perfectionism, *personal standards*, was linked to more positive academic achievement striving associated with higher GPAs (Brown et al., 1999; Frost et al., 1990). However, these researchers carried out the experiment with participants from private college students for women only. Thus, the study results involved an insufficient element for participants from various ethnicities.

Kawamura et al. (2002) examined how perfectionism in participants from Caucasian-American college students and Asian-American college students relates to academic achievement measured by their GPAs. The researchers conducted the study of both genders. The findings indicated that there was a significant relationship between *personal standards* of the adaptive perfectionism dimension and GPA. However, the relationship was only seen in the women for both Caucasian-American students and Asian-American students.

Castro and Rice (2003) investigated how perfectionism is connected to college students' academic achievement. The researchers measured students' academic achievement, operationalized by student self-reported GPA. Although the study results indicated that lower scores for maladaptive dimensions of perfectionism and higher scores for adaptive dimensions of perfectionism were linked to higher cumulative GPA, the study only consisted of a small number of male participants.

Elion et al. (2012) demonstrated the association between perfectionism and GPA among college students. The findings revealed that perfectionistic students who have adaptive dimensions of perfectionism had higher GPA than nonperfectionistic students. However, the researchers used African American undergraduate participants only, so the results for other ethnicities were limited.

Socioeconomic Factor

SES is defined as the social standing or the class of an individual or group (Baker, 2014; Galobardes et al., 2006; House, 2002). Numerous researchers have measured SES as a combination of factors of education, income, and occupation (Purcell-Gates, McIntyre, & Freppon, 1995; Reardon, Valentino, & Shores, 2013; Sheridan & McLaughlin, 2016; Shonkoff & Garner, 2012). SES includes not only income but also academic achievement, occupational prestige, and individual insights of social status and social class. SES potentially involves qualities of life features and the opportunities and advantages afforded to people within society. SES is also a contingent factor upon an enormous array of outcomes over the human life span involving physical and psychological health (Baker, 2014; Mirowsky, 2017; Winkleby, Jatulis, Frank, & Fortmann, 1992).

The Influence of Levels of Socioeconomic Status in Emotional Component

Majority of studies found a relationship between SES and anxiety (Azizoddin et al., 2017; Newacheck, Hung, Jane Park, Brindis, & Irwin, 2003; Ochi, Fujiwara, Mizuki, & Kawakami, 2014; Shen et al., 2013). For example, lower levels of SES are associated with higher levels of aggression, hostility, perceived threat, and emotional and behavioral

difficulties, including social problems, delinquent behavior symptoms, attention deficit/hyperactivity disorder among adolescents (Chen & Paterson, 2006; DeCarlo Santiago, Wadsworth, & Stump, 2011; Molnar, Cerda, Roberts, & Buka, 2008; Russell, Ford, Williams, & Russell, 2016; Spencer, Kohn, & Woods, 2002). There is also the association between lower levels of SES and higher rates of depression, anxiety, attempted suicide, cigarette dependence, illicit drug use, and episodic heavy drinking among adolescents (Newacheck et al., 2003).

A recent study investigated whether the relationship between SES and symptoms of depression/anxiety in 128 clinical patients with systemic lupus erythematosus (SLE) is influenced with factors of reserve capacity/resilience predictors (Azizoddin et al., 2017). These findings revealed that intrapersonal and interpersonal psychosocial features of reserve capacity mediated the link between SES and anxiety/depression. Lower SES was indirectly linked to higher symptoms of depression and anxiety through the effects of psychosocial resilience (Azizoddin et al., 2017).

A relationship between lower levels of SES and negative psychological and educational outcomes, such as anxiety, depression, and poor academic performance, has also been found (DeCarlo Santiago et al., 2011; Russell et al., 2016; Spencer et al., 2002). Additionally, positive psychological and educational outcomes, optimism, self-esteem and perceived control, have been seen in youths whose parents' income levels are higher (Crosnoe, 2002; Morgan, Farkas, Hillemeier, & Maczuga, 2009; Strand, 2014; Yang et al., 2016).

The Link between Socioeconomic Status and Educational Outcomes

Numerous studies demonstrated that lower levels of SES and exposure to adversity are linked to diminished academic success (Sheridan & McLaughlin, 2016; Steinmayr, Dinger, & Spinath, 2012). Hochschild (2003) reported that children from low-SES homes showed at least 10 percent lower scores than average on national achievement scores in reading and mathematics. As one of the consequences, children in impoverished environments are more likely to be absent from school throughout their academic experiences (Zhang, 2003). Furthermore, its contexts of frequent absence in school lead to increase in the learning gap between those children and their wealthier peers (Zhang, 2003).

Early experiences in the deprived environment have a long-term impact on linguistic, cognitive, and socioemotional skills, behavior, and health for children (Shonkoff & Garner, 2012). Specifically, children from low-SES families often start preschool with notably less linguistic knowledge (Purcell-Gates et al., 1995). Accordingly, when such children from low-income families enter high school, their average literacy skills are five years behind as compared with those from high-income families (Reardon et al., 2013).

Socioeconomic Status and Perfectionism

Although there is little research on SES and perfectionism, the association between SES and perfectionism was found by measuring child participants' perfectionism and parents' income levels. Lyman and Luthar (2014) investigated the relationship between perceived parental pressures to be perfect, personal perfectionistic

self-presentation, and envy of peers by measuring multiple dimensions of perfectionism. The study included two academically-gifted participants of 11th and 12th grade students who have different SES backgrounds: some students from an exclusive private school and students from a magnet school. Positive and negative adjustment outcomes for feelings of personally mastery or competence and feelings of interpersonal relatedness were examined in the association of multiple dimensions of perfectionism involving perceived parental pressures to be perfect, personal perfectionistic self-presentation, and envy of peers. The study results indicated students with lower levels of SES had vulnerability toward feelings of interpersonal relatedness. However, students with higher levels of SES largely showed higher envy of peers. Female students with higher levels of SES tended to be vulnerable with noticeable elevations in perfectionistic propensities, peer envy, and body dissatisfaction. There was a positive relationship between multiple dimensions of perfectionism and feelings of personally mastery or competence among female students who have higher levels of SES.

Krstic and Kevereski (2015) demonstrated how SES impacts the families on the appearance of perfectionism in 102 gifted children from upper classes from the central primary schools located in the Municipality of Bitola. The study results indicated that gifted children whose parents have higher SES have lower levels of adaptive dimensions of perfectionism. The researchers concluded that the individual pressures from perfectionism related to setting unrealistic goals, strict rules, and requirements on the tasks generate a life filled with worry. The SES of gifted students' families must play a role toward the occurrence of higher levels of adaptive perfectionism dimensions in the gifted children (Krstic & Kevereski, 2015).

Computer-Based Learning Task Involving Reward and Punishment Trials

As described earlier, the computer-based learning task allows the current study to see the effect of levels of perfectionism on learning involving reward trials and punishment trials associated with factors of anxiety across training blocks. Each block involves a mixture of 20 reward trials and 20 punishment trials, and later, the computer automatically records participants' scores, which are classified into 80 reward trials of four blocks and 80 punishment trials of four blocks (see Table 2; Myers et al., 2013; Sheynin et al., 2013). This section shows several experiments involved use of the computer-based learning task to examine how human personality, especially in anxiety, affects learning in a task in terms of behavioral inhibition (BI) and behavioral activation (BA,) which is known to be affected by anxiety vulnerability (Myers et al., 2013).

Table 2

Each Block Involving Mixed 20 Reward Trials and 20 Punishment Trials of the Probabilistic Reward and Punishment Learning Task

Stimulus	Block 1	Block 2	Block 3	Block 4
Reward	20 trials	20 trials	20 trials	20 trials
Punishment	20 trials	20 trials	20 trials	20 trials

Although there are a few research studies on use of a computer-based learning task, the computer-based learning task involves reward and punishment trials that are used in order to see learning differences on subjects (stimuli) in terms of behavioral inhibition (BI) and behavioral activation (BA). The influence of Parkinson's

disease on outcomes of a reward and punishment computer-based learning task was investigated in clinical settings to study the effect of medications. The findings indicated that early signs of Parkinson's disease were seen in decreased reward processing for never-medicated, young, and non-depressed patients (Bo´di et al., 2009). Additionally, dopaminergic medications enhanced reward processing in the feedback-based computer learning task; however, punishment learning was less effective in medicated than in non-medicated conditions (Bo´di et al., 2009). Accordingly, dopamine agonists increased the link between reward processing and novelty seeking; however, these drugs reduced the link between punishment processing in the computer-based learning task and harm avoidance (Bo´di et al., 2009).

Participants with severe PTSD symptoms (i.e., PTSS group) or with few or no PTSD symptoms (i.e., control group) completed a probabilistic classification computer-based learning task that encompassed both reward-based and punishment-based trials (see Figure 1) in which feedback could take the form of reward, punishment, or an ambiguous *no-feedback* outcome. That could indicate either successful avoidance of punishment or failure to obtain reward (Myers et al., 2013). The findings revealed that the PTSS group outperformed the control group in total points gained. Although the PTSS group performed better than the control group on reward-based trials, there was no the difference on punishment-based trials between these two groups (Myers et al., 2013).

Two experiments were carried out to examine the effect of behavioral inhibition (BI) on a reward and punishment computer-based learning task. Sheynin et al. (2013) refer to BI as a temperament that relates to the tendency to experience distress and to withdraw from unfamiliar situations, people, or environments. In the first experiment,

the researchers tested whether individuals with high self-reported BI display faster learning on a computer-based learning task. In the second experiment, the researchers explored whether those inhibited individuals are more likely to avoid aversive outcomes (Sheynin et al., 2013). Two types of avoidance were focused on those two experiments: (1) *learning optimal classification responses* that reduced risk of punishment and (2) *opt-out responding* that allowed the participant to eliminate any risk of punishment. The results of the first experiment showed that participants displayed better associative learning. The results of the second experiment demonstrated that in order to attain the task, similar performance might be seen in both inhibited and uninhibited individuals. At this point, however, different strategies might be utilized by the individuals. Although uninhibited individuals learned to make classification responses in the task to diminish probability of punishment, inhibited individuals tended to skip punishment trials altogether (Sheynin et al., 2013).

Watabe and Allen (2017) examined whether there is a change in mean scores for punishment-based trials in a computer-based learning task across four training blocks between perfectionistic students and non-perfectionistic students. The findings showed both perfectionistic and non-perfectionistic students demonstrated improvements in scores for punishment-based trials across four training blocks. Furthermore, perfectionistic students outperformed non-perfectionistic students on punishment trials. Further research also demonstrated anxiety sensitivity factors were consistently associated with perfectionism dimensions, especially in sensitivity to punishment (Erozkan, 2016; Flett et al., 2004). These findings suggested that perfectionism may be more related to sensitivity to punishment than sensitivity to reward, and perfectionistic

students learned better on punishment trials than non-perfectionistic students (Watabe & Allen, 2017).

Application to the Current Study

The importance of developmental perfectionism has been pointed out in the literature exploring anxiety components, parenting roles, educational contexts, and social status. There are common features of the association between perfectionism and each of the anxiety factors, such as state trait anxiety, intolerance of uncertainty, and anxiety sensitivity, which indicate positive relationships. Considering the features, individuals with perfectionism, especially in maladaptive dimensions of perfectionism, are more likely to be influenced with anxiety factors than individuals with non-perfectionism. Thus, it is possible that there may be a relationship between each of maladaptive perfectionism dimensions, state trait anxiety, intolerance of uncertainty, and anxiety sensitivity.

The literature for the relationship of perfectionism and parenting style has emphasized that the development of maladaptive perfectionism dimensions is influenced by authoritarian parenting style. Authoritative parenting style helps foster adaptive dimensions of perfectionism, especially in the *personal standard* dimension. Both adaptive and maladaptive perfectionism dimensions are not linked to permissive parenting style. The current study focuses on the association between perfectionism and these three parenting styles, as well as how every student's parenting context influences learning performance on a computer-based task.

Although the association between perfectionism and GPA as reflected in self-reported grades among college students has been reported in the literature, all of the study

results are derived from a limited group of ethnicities. Unlike the previous studies, the current study sought participants from various ethnicities (e.g., African-American, Asian-American, Caucasian, Hispanic, East Asian, South Asian) and both genders.

Lower SES is associated with higher anxiety symptoms and poor academic outcomes. Primary school-aged participants whose parents have higher SES manifest lower levels of adaptive perfectionism dimensions and higher levels of maladaptive perfectionism dimensions. Although the past studies demonstrated these associations by measuring primary school-aged participants, the current study intended to see whether there is a relationship between perfectionism and SES among college student samples.

The use of a reward and punishment computer-based learning task enables numerous studies to measure various factors (i.e., variables) across training blocks. Specifically, researchers are able to see how the progression of Parkinson's symptoms, PTSD symptoms, and BI on individuals' learning would be influenced by factors across several training blocks. The use of the computer-based learning task must be beneficial for understanding how participants make improvements in learning on a task known to be affected by anxiety vulnerability. The current study aimed to identify different scores on the computer-based learning tasks for perfectionistic/non-perfectionistic students, students with authoritative parenting style/authoritarian parenting style/permissive parenting style, students with higher GPA/lower GPA, and students with higher SES/lower SES under specific types of anxiety (parental pressure, academic anxiety, socioeconomic anxiety).

CHAPTER III

METHODOLOGY

The current study utilized quantitative methods to determine the relationship between each of perfectionism dimensions, factors of anxiety (state trait anxiety, intolerance of uncertainty, and sensitivity to reward and punishment), parenting styles (authoritative, authoritarian, and permissive), GPA (measured by self-report responses), and SES (measured as parents' income) among college students. Furthermore, how perfectionism, parenting style, SES, GPA, and anxiety cause learning performance on a computer-based task was explored. Additionally, how perfectionistic students (high maladaptive and adaptive perfectionism) and non-perfectionistic students (low maladaptive and adaptive perfectionism) differ in terms of anxiety factors, parenting styles, levels of GPA, and SES levels was investigated. Specifically, whether there was a change in learning performance on a reward and punishment computer-based task for perfectionistic/non-perfectionistic students, students with authoritative, authoritarian, and permissive parenting styles, students with higher and lower GPA, and students with higher and lower SES across four training blocks was explored. A mixed within and between subject quasi experimental design was utilized to analyze how perfectionistic students (high maladaptive and adaptive perfectionism) and non-perfectionistic students

(low maladaptive and adaptive perfectionism) differ with scores on a reward and punishment computer-based learning task across four training blocks. Each of these students' characteristics was seen as comparison groups on the analysis, which establishes causality.

Participants

ANOVA-Repeated measures, within-between interaction for a section of the statistical test in G-Power (i.e., power analysis software) was used to determine sample size in the current study. The minimum sample size needed for the current study was 70. Herringer, Raph, and Cook (2011) reported the minimum sample size is 78 if variable scores are split participants into three groups such as participants with high level variable/middle level variable/low level variable, and participants with high level variable and participants with low level variable are used to compare between these two variable levels. Participants included 140 undergraduate college students enrolled in a public university in the United States (47 males, 93 females, age range: 18-38 years) with a mean age of 19.32 years (*SD* = 2.33) whom identified as 92 Caucasian, 15 Hispanic, 12 African-American, 5 East Asian, 3 South Asian, and 13 Mixed Race or Other. The participants were recruited from the Psychology Research Participant Pool as a part of the research credit requirement for the introductory psychology course (i.e., volunteer sampling). The students from the course signed up to participate in the study through an online system. Participants from other psychology courses were also recruited for extra credit points on coursework. Instructors announced the availability of the study for extra credit and provided a sign-up sheet for available times to complete the study. Participants were recruited without regard for race or ethnicity.

Research Design

As a mixed between-within subject quasi experimental design, the current study involved repeated measures of the dependent variable (outcome variable) that were scored (in reward trials and in punishment trials) by participants' learning. The mixed between-within subject design allows for testing change of the dependent variable (participants' learning performance on a computer-based task) due to the independent variable (predictor variables for perfectionism, parenting style, GPA, and SES) across four training blocks. The characteristics of a quasi experimental design include at least one manipulated variable. Participants' levels of perfectionism (independent variable) were experimentally manipulated by providing types of reinforcement (e.g., reward, punishment) in a computer-based learning task within both perfectionists and non-perfectionists.

Measures

Quantitative data were collected in terms of students' perfectionism, intolerance of uncertainty, anxiety sensitivity, state trait anxiety, perceived parenting styles, levels of GPA, levels of SES, and behavioral task during the laboratory experiment in order to respond to each of research questions proposed in the current study. Specifically, participants were asked to complete a demographic questionnaire involving the information about levels of GPA and levels of SES, pencil-paper personality inventories (i.e., Multidimensional Perfectionism Scale, Intolerance of Uncertainty, Sensitivity to Punishment Sensitivity to Reward Questionnaire, State-Trait Anxiety Inventory, Parental Authority Questionnaire), and a computer-based learning task involved in reward trials and punishment trials.

Demographic Information

Standard demographic information, such as gender, age, ethnicity, education, GPA, and SES, was collected. For GPA, participants were asked to log in the course management system to show their GPA. If participants decline to show their GPA, the experimenter asked participants about the range of their GPA (e.g., 4.00-3.50, 3.49-3.00, 2.99-2.50, 2.49-2.00, below 1.99). Regarding socioeconomic status, initially, SES in a participant questionnaire included five levels (i.e., above $100,000, $99,999-75,000, $74,999-$50,000, $49,999-$25,000, less than $24,999), and 80 undergraduates responded their parents' income level to the questionnaire. After five more SES levels were added to the questionnaire that included total nine levels of SES (i.e., above $200,000, $199,999-$175,000, $174,999-$150,000, $149,999-$125,000, $124,999-$100,000, $99,999-75,000, $74,999-$50,000, $49,999-$25,000, less than $24,999), 60 further participants answered their parents' income level in the revised questionnaire. According to U.S. Census Bureau (2017), current year's median household income is $55,322. Previous study also revealed that parents' income level that is above $75,000 is classified as higher income level, parents' income level that is between $74,999 and $50,000 is classified as middle level of income, and parents' income level that is less than $49,999 is classified as lower income level (Travis & Samuel, 2014). Based on these information, students whose parents' income level was above $75,000 were classified as students with higher SES. Students whose parents' income level was between $74,999 and $50,000 as students with middle level of SES. Students whose parents' income level was less than $49,999 were classified as students with lower SES.

Perfectionism

To measure participants' perfectionism, the *Multidimensional Perfectionism Scale* (MPS; Frost et al., 1990) was used. This scale includes 35 items and measures the following six dimensions of perfectionism: (a) concern over mistakes (e.g., "*If I fail at school/work, I am a failure as a person*"), (b) personal standards (e.g., "*I set higher goals than most people*"), (c) parental expectations (e.g., "*My parents wanted me to be the best at everything*"), (d) parental criticism (e.g., "*As a child, I was punished for doing things less than perfect*"), (e) doubts about actions (e.g., "*Even when I do something carefully, I often feel it is not quite right*"), and (f) organization (e.g., "*Organization is very important to me*"). Participants described their perfectionism by responding to the statements on a 5-point Likert-type scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. An elevated score indicates higher in that dimension. Internal consistencies with alpha for scale and subscale scores of the MPS in the current study are shown in Table 4 and 5 in results section.

Intolerance of Uncertainty

To measure participants' anxiety for intolerance of uncertainty, *Intolerance of Uncertainty Scale* (IUS; Carleton et al., 2007) was utilized. This is a 12-item inventory that tests two factors (i.e., *prospective anxiety, inhibitory anxiety*) on uncertainty. The first factor *prospective anxiety* comprises seven items reflecting beliefs about the negative impact of uncertainty related to future events (e.g., *"Unforeseen events upset me greatly"*). The second factor *inhibitory anxiety* consists of five items and reflects beliefs about the negative nature of uncertainty and the manner in which it impairs a person's functioning (e.g., *"When I am uncertain I can't function very well"*). Participants rated

each item on a 5-point Likert scale ranging from 1 (not at all characteristic of me) to 5 (entirely characteristic of me). Internal consistencies with alpha for scale and subscale scores of the IUS in the current study are shown in Table 4 and 5 in results section.

Anxiety Sensitivity

Sensitivity to Punishment and Sensitivity to Reward Questionnaire (SPSRQ; Torrubia et al., 2001) was used to measure anxiety sensitivity for participants. This scale consists of 48 items (i.e., a subscale of sensitivity to punishment with 24 items, a subscale of sensitivity to reward with 24 items) to which participants answer yes or no that separately measures a factor of sensitivity to punishment and a factor of sensitivity to reward. The sensitivity to punishment scale measures individual differences in functions dependent on the behavioral inhibition system (e.g., *"Do you generally avoid speaking in public?"*). Items of this scale reflect passive avoidance in general situations involving the possibility of aversive consequences, as well as worry or cognitive processes produced by the threat of punishment or failure (Torrubia et al., 2001). In contrast, the sensitivity to reward scale assesses individual differences in Gray's behavioral activation system dimension (Gray & McNaughton, 2003). Items of this scale represent gaining potential rewarding stimuli such as money, sex partners, social events, power, and sensation (e.g., *"Do you often do things to be praised?"*). Internal consistencies with alpha for scale and subscale scores of the SPSRQ in the current study are shown in Table 4 and 5 in results section.

State Trait Anxiety

Participants' state trait anxiety was assessed using the *State-Trait Anxiety Inventory* (STAI; Spielberger, 1983). The STAI includes two 20-item scales to measure

the intensity of anxiety as an emotional state (i.e., S-anxiety) and individual differences in anxiety proneness as a personality trait (i.e., T-anxiety). The S-anxiety assesses current levels of anxiety using 20 items asking participants how they feel *right now*, and rates each item on a 4-point intensity scale between two anchor points of *not at all* to *very much so*. Scores range from 20–80 with higher scores referring to higher emotional state anxiety. The T-anxiety assesses a relatively stable behavioral nature of responding with high state anxiety to various daily situations and stressors (Mundy et al., 2015; Spielberger, 1983). The scale includes 20 items asking participants to rate how often they experience certain feelings and sensations (i.e., how they *generally* feel), using a 4-point frequency scale between two anchor points of *almost never* to *almost always* (Mundy et al., 2015; Spielberger, 1983). Scores range from 20–80, with higher scores reflecting higher trait anxiety. Internal consistencies with alpha for scale and subscale scores of the STAI in the current study are shown in Table 4 and 5 in results section.

Parental Authority Questionnaire

To measure participants' perceived parenting styles, *Parental Authority Questionnaire* (PAQ; Buri, 1991**)** was used. The PAQ includes a 30-item questionnaire with three parenting scales designed to measure Baumrind's authoritarian parenting style (e.g., As I was growing up, my mother would get very upset if I tried to disagree with her), authoritative parenting style (e.g., My mother gave me direction for my behavior and activities as I was growing up and she expected me to follow her direction, but she was always willing to listen to my concerns and to discuss clear direction with me), and permissive parenting style (e.g., My mother did not view herself as responsible for directing and guiding my behavior as I was growing up). Each item was responded using

a 5-point Likert rating scale ranging from 1 (strongly disagree) to 5 (strongly agree). No items were reverse scored; items related to each parenting style were totaled to obtain a score for each parenting style. A higher score indicated a higher perception of that parenting style. Internal consistencies with alpha for scale and subscale scores of the PAQ in the current study are shown in Table 4 and 5 in results section.

Behavioral Task

A computer-based learning task involved in reward trials and punishment trials (Myers et al., 2013; Sheynin et al., 2013) was utilized to see learning differences between perfectionistic students and non-perfectionistic students. The learning task is comparable to the kinds of simple learning paradigms which have been extensively studied in animals and humans (Bo´di et al., 2009). The task took approximately 20 minutes to complete. A Macintosh desktop computer was used to deliver stimuli and to record subject responses. At the beginning of the experiment, participants received instructions about the task and two practice trials (i.e., one practice includes reward feedback, another practice includes punishment feedback). Stimuli were visual events on the computer screen. Participants entered responses by pressing one of two labeled computer keys, with the rest of the keyboard covered by a paper mask. Participants were asked to watch stimulus events on a computer screen and responded using computer keys. For example, on each trial, a participant saw a stimulus and was asked to categorize that stimulus as “A” or “B” (see Figure 1). The selected category was circled, and corrective feedback might appear (see Figure 1). For some stimuli (e.g., punishment trials), incorrect classification was punished with point loss while correct classification received no feedback. For other stimuli (e.g., reward trials), correct classification was rewarded with point gain while

incorrect classification received no feedback. The task is probabilistic, so a stimulus does not belong to the same category on each trial (see Table 1; Myers et al., 2013; Sheynin et al., 2013). In short, on each of 160 trials, participants viewed one of the four images (see Table 1; stimuli S1, S2, S3, and S4) and learned whether it belonged to category A or category B (see Table 1 and Figure 1).

On any given trial, stimuli S1 and S3 belonged to category A with 80% probability and to category B with 20% probability; stimuli S2 and S4 belonged to category B with 80% probability and to category A with 20% probability (see Table 1). Stimuli S1 and S2 were used on reward learning trials; if the participant made a correct classification response, a reward of 25 points was received but if the participant made an incorrect classification response, no feedback message appeared (see Table 1). Stimuli S3 and S4 were used in punishment learning trials; if the participant made an incorrect classification response on a trial with either of these stimuli, a punishment of 25 points was received; however, correct classification received no feedback message (see Table 1). The no-feedback outcome, when presented, was ambiguous, as it could signal lack of reward for an incorrect response (if received during a trial with S1 or S2) or lack of punishment for a correct response (if received during a trial with S3 or S4). Participants did not receive any monetary reward related to point accumulation during the experiment.

Trials were divided into four blocks of 40 intermixed trials with each stimulus appearing 10 times per block (for a total of 20 reward and 20 punishment trials intermixed per block). Data from the probabilistic learning task were scored in terms of percent *optimal* responding across the 80 punishment trials and the 80 reward trials. Regarding *optimal* responding, the participant's response was *optimal* if the participant

chose the category that is most often associated with that stimulus. Thus, only correct responses on 80% of trials were *optimal*. In each training point (four training points for four blocks of reward trials and four training points for four blocks of punishment trials), learning scores in each block involving 20 reward and 20 punishment trials were automatically recorded by the computer.

Procedure

Participants were tested individually while the participant and the experimenter sat in a quiet laboratory room during the experiment. Participants did not receive any monetary reward related to point accumulation during the experiment. After participants completed a computer-based learning task involving reward trials and punishment trials, measures of MPS, IUS, SPSRQ, STAI, and PAQ were completed by the participants. Participants were debriefed after data collection. On the informed consent, which the participants sign before participating in the study, they were provided information about the study, such as the purpose of the study, the study duration, description of the study including procedures to be used, and confidentiality and the voluntary nature of participation. Participants completed the MPS (Frost et al., 1990), IUS (Carleton et al., 2007), SPSRQ (Torrubia et al., 2001), STAI (Spielberger, 1983), PAQ (Buri, 1991), and a computer-based learning task involving reward trials and punishment trials (Bo´di et al., 2009; Myers et al., 2013; Sheynin et al., 2013). Participants were administrated the computer-based learning task (probabilistic classification task). Participants took approximately 30 minutes to complete all measures. All measures and procedures were approved by an Institutional Review Board, and all participants were treated according to American Psychological Association ethical standards.

Data Analysis

The statistical analyses were conducted using SPSS version 22.0 (SPSS, Inc., Chicago, IL, USA). For multiple comparisons, alpha was set to 0.05 (two tailed) with Bonferroni correction used as appropriate to protect against inflated risk of family-wise error. Scores on the paper and pencil inventories were calculated based on standard procedures. The perfectionism scores were used to divide the participants as perfectionists and non-perfectionists. Herringer et al., (2011) reported that splitting participants into three groups (participants with high level variable/ participants with middle level variable/ participants with low level variable) and picking participants with high level variable and participants with low level variable up are statistically better to analyze data than dividing participants into only two groups (participants with high level variable/participants with low level variable) if researchers need participants to compare high level variable with low level variable. Thus, the scores in the current study were split the participants into three groups: higher perfectionism participants, participants with middle perfectionism level, and lower perfectionism participants. The higher perfectionism participants and the lower perfectionism participants were used as perfectionists (high maladaptive and adaptive perfectionism) and non-perfectionists (low maladaptive and adaptive perfectionism) respectively. These variables were analyzed by a one-way MANOVA, a paired-samples t-test, and a mixed between-within subjects repeated measures ANOVA.

As described earlier, an individual's perceived parenting style was designated based on which of the three subscales had the highest score. The parenting style scores were used to categorize the participants as students with authoritative parenting style,

students with authoritarian parenting style, and students with permissive parenting style. These three groups were analyzed by bivariate correlations, a one-way MANOVA, and a mixed between-within subjects repeated measures ANOVA. A previous research showed classification of higher GPA as ranging from 4.00 to 3.00 and lower GPA as below 2.99 (Tietjen & Scoville, 2014). The levels of GPA were used to classify the participants as students with higher GPA ranging from 4.00 to 3.00 and students with lower GPA indicating below 2.99. These groups were analyzed by bivariate correlations, a one-way MANOVA, and a mixed between-within subjects repeated measures ANOVA. As described earlier, according to U.S. Census Bureau (2017), current year's median household income is $55,322. Previous study also revealed that parents' income level that is above $75,000 is classified as higher income level, parents' income level that is between $74,999 and $50,000 is classified as middle level of income, and parents' income level that is less than $49,999 is classified as lower income level (Travis & Samuel, 2014). Based on these information, students whose parents' income level was above $75,000 were classified as students with higher SES. Students whose parents' income level was between $74,999 and $50,000 as students with middle level of SES. Students whose parents' income level was less than $49,999 were classified as students with lower SES. In the current study, students with higher SES and students with lower SES were examined and analyzed by bivariate correlations, a one-way MANOVA, and a mixed between-within subjects repeated measures ANOVA. For a computer-based learning task involving reward and punishment trials, the computer recorded scores for each participant's trial. Internal consistencies of the questionnaires for MPI, IUS, SPSRQ, STAI, and PAQ were analyzed using Cronbach's alpha (see Table 4 and 5).

Answering Hypotheses

Bivariate correlations were performed to analyze the associations between perfectionism dimensions and anxiety factors. A one-way multiple analysis of variance (MANOVA) was also utilized to analyze the differences between perfectionistic students and non-perfectionistic students in anxiety factors. The third hypothesis focused on the difference between perfectionistic students and non-perfectionistic students in terms of learning performance in a reward and punishment computer-based learning task, and a paired-samples t-test was utilized to compare computer-based learning performance scores for perfectionistic students and non-perfectionistic students.

For the final hypothesis that aimed the effect of high or low perfectionism (perfectionist/non-perfectionist) on participants' scores in the punishment computer-based task across four training blocks, a mixed between-within subjects repeated measures ANOVA was utilized to analyze the effect. Specifically, a mixed between-within subjects repeated measures ANOVA was used to assess responding, with between-subject factor of perfectionism levels (perfectionistic students vs. non-perfectionistic students) and within-subject factors of feedback type (reward trial training vs. punishment trial training) and, in some cases, trial block (four blocks of 20 trials with each feedback type).

Answering Research Questions

Bivariate correlations were performed to analyze the relationship between perfectionism, parenting styles, levels of GPA, and levels of SES. Path analysis was also utilized to analyze the cause-effect relationship between perfectionism, anxiety, parenting style, GPA, SES, and learning performance on a computer-based task. A one-way

multiple analysis of variance (MANOVA) was utilized to analyze the differences in parenting styles between perfectionistic students and non-perfectionistic students, the differences in levels of GPA between perfectionistic students and non-perfectionistic students, and the differences in levels of SES between perfectionistic students and non-perfectionistic students. Multiple regression was performed to determine whether parenting style, anxiety, GPA, and SES predict maladaptive and adaptive perfectionism, as well as whether maladaptive perfectionism, adaptive perfectionism parenting style, anxiety, and SES predict GPA.

A mixed between-within subjects repeated measures ANOVA was utilized to analyze: (1) the effect of high or low perfectionism (perfectionist/non-perfectionist) on participants' scores on a reward computer-based task across four training blocks, (2) the effect of three types of parenting styles and four training blocks on participants' learning performance on a reward and punishment computer-based learning task across four training blocks, (3) the effect of high and low levels of GPA and four training blocks on participants' learning performance, and (4) the effect of high and low levels of SES and four training blocks on participants' learning performance. Lastly, post hoc ANOVA was used to analyze the second hypothesis and the eleventh research question.

Summary

The current study attempted to explore the correlates of perfectionism, anxiety factors, parenting styles, levels of GPA, and levels of SES among college students. Whether there is a cause-effect relationship between predictor variables (perfectionism, anxiety, parenting style, GPA, and SES) and outcome variable (learning performance on a computer-based task) was also explored. Furthermore, how perfectionistic students and

non-perfectionistic students differ in terms of anxiety factors, parenting styles, levels of GPA, and SES levels was examined. Whether parenting style, anxiety, GPA, and SES predict maladaptive and adaptive perfectionism was explored. Whether maladaptive perfectionism, adaptive perfectionism parenting style, anxiety, and SES predict GPA was also explored. Additionally, whether perfectionistic students and non-perfectionistic students differ in terms of learning performance on a reward and punishment computer-based task was also explored. Lastly, whether there is a change in learning performance on a reward and punishment computer-based task across four training blocks among perfectionistic students, non-perfectionistic students, students with authoritative parenting style, students with authoritarian parenting style, students with permissive parenting style, students with higher GPA, students with lower GPA, students with higher SES, and students with lower SES was investigated.

The research design for the current study was quantitative analysis, especially in a mixed between-within subject quasi experimental design. A volunteer sampling method was utilized in the current study. The sample for the current study consisted undergraduates at a western U.S. university. Data for the current study were collected from a demographic questionnaire, five personality inventories, and a reward and punishment computer-based learning task. Participants' responses to the demographic questionnaire and five inventories were analyzed using a descriptive analysis, bivariate correlations, path analysis, and a one-way MANOVA. Total learning performance in the computer-based learning task for participants was analyzed using a paired-samples t-test. Participants' scores on the computer-based learning task across four training blocks were analyzed by performing a mixed between-within subjects repeated measures ANOVA.

As further analyses, post hoc ANOVA was also performed to analyze the second hypothesis and the eleventh research question.

CHAPTER IV

RESULTS

This chapter provides the results of four hypotheses and six research questions answered about the associations between perfectionism, anxiety, parenting style, GPA, SES, and learning performance in a computer-based task, as well as differences in anxiety, parenting styles, levels of GPA, and levels of SES between perfectionists and non-perfectionist, and how they were analyzed. Specifically, the findings on the effect of perfectionism, parenting styles, levels of GPA, levels of SES, and four training blocks for reward and punishment trials on learning performance in a computer-based task are provided as answered for one of the four hypotheses and a research question. In addition, tables and figures with regard to the data collected are provided.

Preliminary Analyses: Descriptive Statistics

First of all, descriptive statistics were generated for the sample in the current study. The sample sizes for each variable are presented in Table 3. Values of mean, standard deviation, skewness, kurtosis, and Cronbach's alpha of scales and subscales for perfectionism, anxiety, and parenting style were calculated to ensure measures in the current study (see Table 4 and 5). As described in the methodology section, 140 undergraduates (47 males, 93 females, age range: 18-38 years) with a mean age of 19.32

years (*SD* = 2.33) and mean years of education of 13.19 years (*SD* = 1.39, range of years of education: 12-19 years) participated in this study. The participants reported their actual GPA (*M* = 3.26, *SD* = .56, GPA range: 1.15-4.00) and SES: 16 classified as less than $24999, 23 classified as $49999-$25000, 36 classified as $74999-$50000, 24 classified as $99999-75000, 28 classified as $124,999-$100,000, 4 classified as $149,999-$125,000, 1 classified as $174,999-$150,000, 4 classified as $199,999-$175,000, and 4 classified as above $200,000. In terms of the participants' scores of PAQ showing participants' perception of their parents' parenting style, 41 participants were classified as authoritarian parenting style, 87 participants were classified as authoritative parenting style, and 12 participants were classified as permissive parenting style (see Table 3).

Table 3

Sample Sizes for Each Variable

	n
High maladaptive perfectionism	37
Low maladaptive perfectionism	42
High adaptive perfectionism	53
Low adaptive perfectionism	40
High GPA	48
Low GPA	48
High SES	65
Low SES	39
Authoritarian	41
Authoritative	87
Permissive	12

Table 4

Descriptive Statistics and Values of Coefficient Alpha for Scale Scores

Scale	*M*	*SD*	*α*	Skewness	Kurtosis
Perfectionism	3.15	.48	.89	.39	-.03
State trait anxiety	2.32	.20	.84	.08	-.43
Intolerance of uncertainty	2.82	.57	.85	.17	-.19
Anxiety sensitivity	.52	.14	.81	-.29	.07
Parenting style	3.07	.31	.88	-.44	2.07

Note. Perfectionism is from Frost et al. (1990); State Trait Anxiety is from Spielberger, (1983); Intolerance of Uncertainty is from Carleton et al. (2007); Anxiety Sensitivity is from Torrubia et al. (2001); Parenting style is from Buri (1991).

Table 5

Descriptive Statistics and Values of Coefficient Alpha for Subscale Scores

Subscale	*M*	*SD*	*α*	Skewness	Kurtosis
Perfectionism:					
Parental expectations	3.27	.83	.88	-.10	-.23
Parental criticism	2.43	.97	.81	.69	.04
Doubts about actions	2.95	.79	.73	.15	-.30
Concern over mistakes	2.69	.78	.87	.50	.14
Personal standards	3.72	.57	.78	-.43	-.10
Organization	3.81	.67	.86	.21	-.45
Anxiety:					
Emotional state anxiety	2.27	.25	.89	.11	-.14
Personality trait anxiety	2.36	.24	.91	.04	-.28
Inhibitory anxiety	2.37	.81	.85	.38	-.20
Prospective anxiety	3.14	.57	.85	.23	-.03
Sensitivity to punishment	.53	.23	.83	-.12	-.17
Sensitivity to reward	.51	.17	.75	-.17	-.38
Parenting style:					
Authoritarian parenting	3.11	.77	.87	-.03	-.19
Authoritative parenting	3.47	.71	.85	-.96	.96
Permissive parenting	2.64	.56	.84	.08	-.52

Note. Perfectionism is from Frost et al. (1990); Emotional sate anxiety and personality trait anxiety are from Spielberger, (1983); Inhibitory anxiety and prospective anxiety are from Carleton et al. (2007); Sensitivity to punishment and sensitivity to reward are from Torrubia et al. (2001); Parenting style is from Buri (1991).

Preliminary Analyses: Correlations among Anxiety Factors

Bivariate correlations were performed to examine the association between emotional state anxiety, personality trait anxiety, inhibitory anxiety, prospective anxiety,

sensitivity to punishment, sensitivity to reward, and overall anxiety, which is presented in Table 6.

Table 6

Bivariate Correlations among Anxiety Factors

	1	2	3	4	5	6	7
1. Emotional state anxiety	_____						
2. Personality trait anxiety	.74**	_____					
3. Inhibitory anxiety	.70**	.63**	_____				
4. Prospective anxiety	-.63**	.72*	.69**	_____			
5. Sensitivity to punishment	.79**	.64**	.72*	.78**	_____		
6. Sensitivity to reward	.77**	.70**	.61**	.62**	-.61**	_____	
7. Overall anxiety	.86**	.64**	.72*	.74**	.74**	.62**	_____

Note. $*p < 0.05$. $**p < 0.01$.

Hypothesis One

H1 There would be a positive relationship between maladaptive dimensions of perfectionism (concern over mistakes, doubts about actions, parental criticism, and parental expectations measured by Multidimensional Perfectionism Scale; Frost et al., 1990) and anxiety factors (emotional state anxiety and personality trait anxiety measured by STAI; Spielberger, 1983, inhibitory anxiety and prospective anxiety measured by IUS; Carleton et al., 2007, sensitivity to punishment and sensitivity to reward measured by SPSRQ; Torrubia et al., 2001).

Table 7

Bivariate Correlations between Maladaptive Dimensions of Perfectionism and Anxiety Factors

	Emotional state anxiety	Personality trait anxiety	Inhibitory anxiety	Prospective anxiety	Sensitivity to punishment	Sensitivity to reward
Parental expectations	.07	.18*	.22**	.02	.22**	.30**
Parental criticism	.10	.24**	.27**	.12	.37**	.12
Doubts about actions	.03	.36**	.22**	.33**	.55**	.17*
Concern over mistakes	.08	.38**	.44**	.36**	.52**	.24**

Note. *$p < 0.05$. **$p < 0.01$.

Table 7 shows the results of the correlations between maladaptive dimensions of perfectionism (i.e., parental expectations, parental criticism, doubts about actions, concern over mistakes) and anxiety factors (i.e., emotional state anxiety, personality trait anxiety, inhibitory anxiety, prospective anxiety, sensitivity to punishment, sensitivity to reward). Cohen (1988) suggested the value of the correlation coefficient for determining the strength of the relationship to be: .00 to .39 for weak, .40 to .59 for moderate, and .60 to 1.00 for strong. As expected, most anxiety factors were related to maladaptive perfectionism dimensions (see Table 7). Specifically, there were weak and moderate positive relationships between the maladaptive dimensions of perfectionism and anxiety factors (personality trait anxiety, inhibitory anxiety, prospective anxiety, sensitivity to punishment, and sensitivity to reward) among college students; personality trait anxiety, inhibitory anxiety, and sensitivity to punishment were linked to all maladaptive

dimensions of perfectionism. Unexpectedly, however, emotional state anxiety did not have a relationship with the maladaptive dimensions of perfectionism. Thus, undergraduate participants in the current study who have the maladaptive perfectionism dimensions did seem to feel anxiety about elements of personality trait, inhibitory, uncertainty associated with prospective events, sensitivity to punishment, and sensitivity to reward.

Research Question One

Q1 Is there a relationship between maladaptive perfectionism dimensions (i.e., concern over mistakes, doubts about actions, parental criticism, parental expectations measured by Multidimensional Perfectionism Scale; Frost et al., 1990), adaptive perfectionism dimensions (i.e., personal standards, organization measured by Multidimensional Perfectionism Scale; Frost et al., 1990), parenting styles (authoritarian, authoritative, and permissive measured by Parental Authority Questionnaires; Buri, 1991), levels of GPA measured by self-report responses (students with higher GPA and students with lower GPA), and levels of SES measured as parents' income (students with higher SES and students with lower SES)?

Table 8

Bivariate Correlations between Dimensions of Perfectionism and Parenting Styles

	Authoritarian (n = 41)	Authoritative (n = 87)	Permissive (n = 12)
Parental expectations	.47**	-.01	-.16
Parental criticism	.52**	-.36**	-.32**
Doubts about actions	.30**	-.10	.02
Concern over mistakes	.30**	-.18*	-.01
Personal standards	.09	.15	-.03
Personal standards	-.15	.09	.11

Note. *$p < 0.05$. **$p < 0.01$.

As Table 8 indicates, significant weak and moderate positive relationships were seen in between parental expectations, parental criticism, doubts about actions, concern over mistakes (i.e., maladaptive dimensions of perfectionism) and authoritarian parenting style for college students. Significant weak negative relationships were evident in between parental criticism, concern over mistakes, and authoritative parenting style, as well as parental criticism and permissive parenting style among college students. Especially, authoritarian parenting style among college students was associated with all maladaptive dimensions of perfectionism.

Table 9

Bivariate Correlations between Dimensions of Perfectionism and Levels of GPA

	Students with higher GPA	Students with lower GPA
Parental expectations	-.02	.05
Parental criticism	-.09	.13
Doubts about actions	-.07	-.02
Concern over mistakes	.05	-.03
Personal standards	.25**	-.17*
Personal standards	.19*	-.17*

Note. *$p < 0.05$. **$p < 0.01$.

As seen in Table 9, there were weak positive relationships between students with higher GPA, personal standards, and organization. The weak negative relationships were seen in students with lower GPA, personal standards, and organization. Thus, among

college students, high level of GPA was positively linked to adaptive dimensions of perfectionism (personal standards and organization), while low GPA was negatively related to adaptive dimensions of perfectionism.

Table 10

Bivariate Correlations between Dimensions of Perfectionism and Levels of SES

	Students with higher SES	Students with lower SES
Parental expectations	.03	.01
Parental criticism	-.11	.04
Doubts about actions	-.18*	-.03
Concern over mistakes	-.12	-.06
Personal standards	-.14	.08
Personal standards	-.03	-.03

Note. $*p < 0.05$.

As Table 10 shows, only a significant weak negative relationship was seen in students with higher SES and doubts about actions. Thus, college age participants whose parents have higher income did seem to feel less doubtful about their abilities.

Hypothesis Two

H2 Perfectionistic students (high maladaptive and adaptive perfectionism dimensions) would have higher learning performance in a reward and punishment computer-based learning task than non-perfectionistic students (low maladaptive and adaptive perfectionism dimensions).

Counter to prediction, the results indicated that computer-based learning performance scores did not differ significantly for high maladaptive perfectionistic

students and low maladaptive perfectionistic students, t = -.27, p = .788 (see Figure 3), as well as for high adaptive perfectionistic students and low adaptive perfectionistic students, t = -.80, p = .425 (see Figure 4).

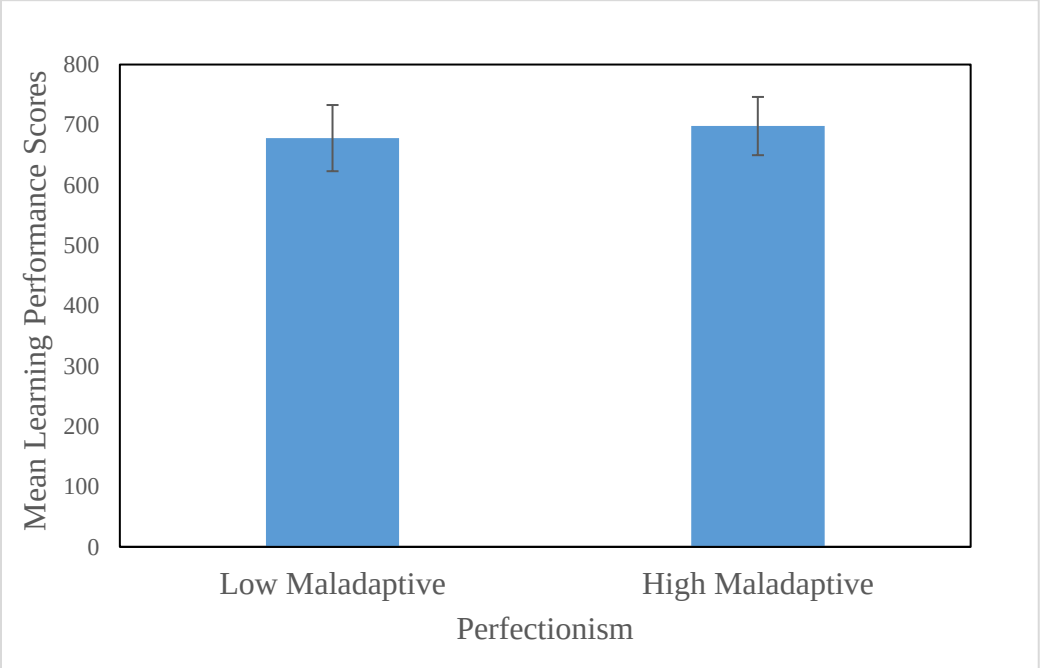

Figure 3. Comparing computer-based learning performance scores for low maladaptive perfectionistic students and high maladaptive perfectionistic students.

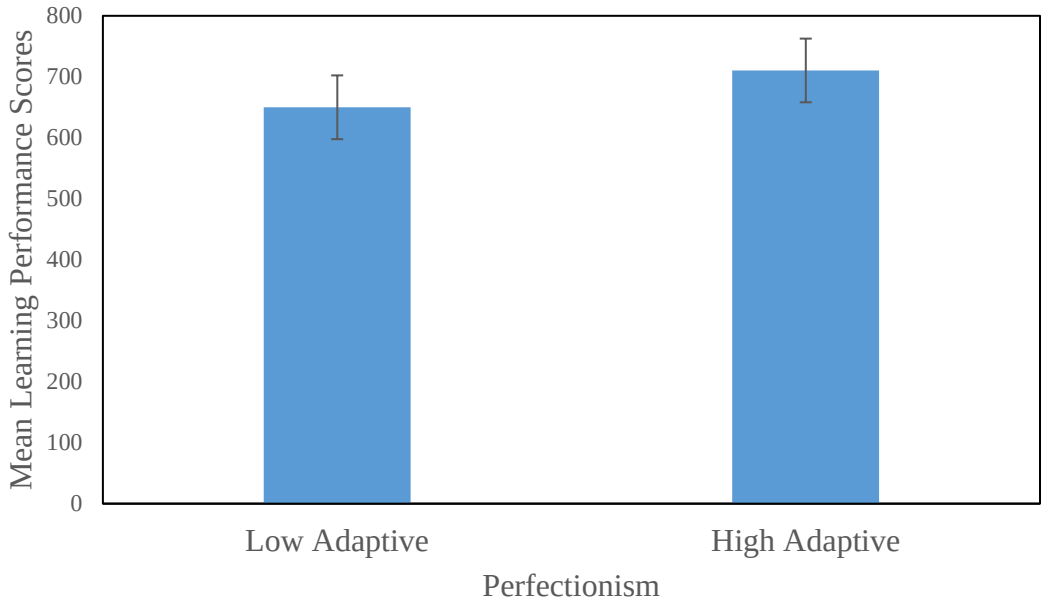

Figure 4. Comparing computer-based learning performance scores for low adaptive perfectionistic students and high adaptive perfectionistic students.

Hypothesis Three

H3 Perfectionistic students (high maladaptive and adaptive perfectionism dimensions) would have greater change in mean scores on learning for punishment-based trials in a computer-based learning task across four training blocks than non-perfectionistic students (low maladaptive and adaptive perfectionism dimensions).

A mixed between-within subjects repeated measures ANOVA was performed to determine the effect of high or low perfectionism (perfectionists as students with high maladaptive perfectionism dimensions/non-perfectionists as students with low maladaptive perfectionism dimensions) on participants' scores on the punishment computer-based tasks across four training blocks. Unexpectedly, the main effect for punishment trial was not significant, Wilks' Lambda = .95, F (3, 75) = 1.41, p = .246. The main effect comparing perfectionists and non-perfectionists on punishment trials was

also not significant, F (1, 77) = .23, p = .634. The interaction between high or low maladaptive perfectionism and punishment trial was not significant, F (3, 75) = 1.16, p = .333 (see Figure 5).

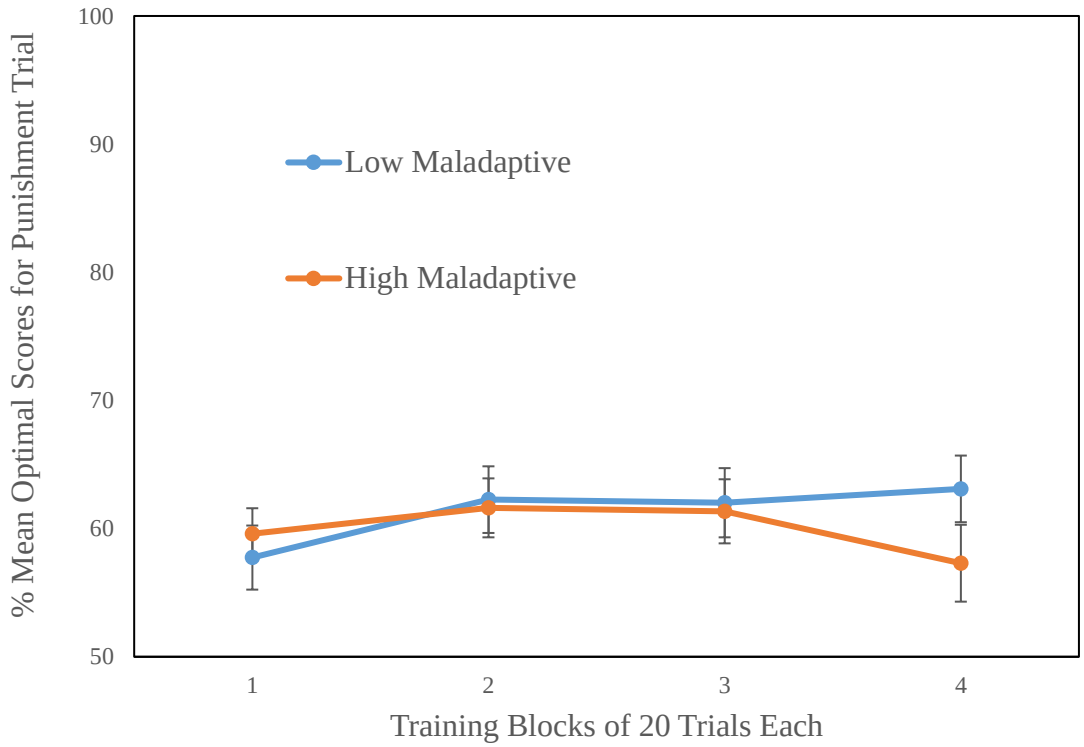

Figure 5. The effect of high or low maladaptive dimensions of perfectionism on scores on the punishment computer-based tasks across four training blocks.

A mixed between-within subjects repeated measures ANOVA was performed to determine the effect of high or low perfectionism (perfectionists as students with high adaptive perfectionism dimensions/non-perfectionists as students with low adaptive perfectionism dimensions) on participants' scores on the punishment computer-based tasks across four training blocks. Unexpectedly, the main effect for punishment trial was

not significant, Wilks' Lambda = .89, F (3, 89) = 4.01, p = .091. The main effect comparing perfectionists and non-perfectionists on punishment trials was not significant, F (1, 91) = 1.04, p = .311. The interaction between high or low adaptive perfectionism and punishment trial was not significant, F (3, 89) = .30, p = .827 (see Figure 6).

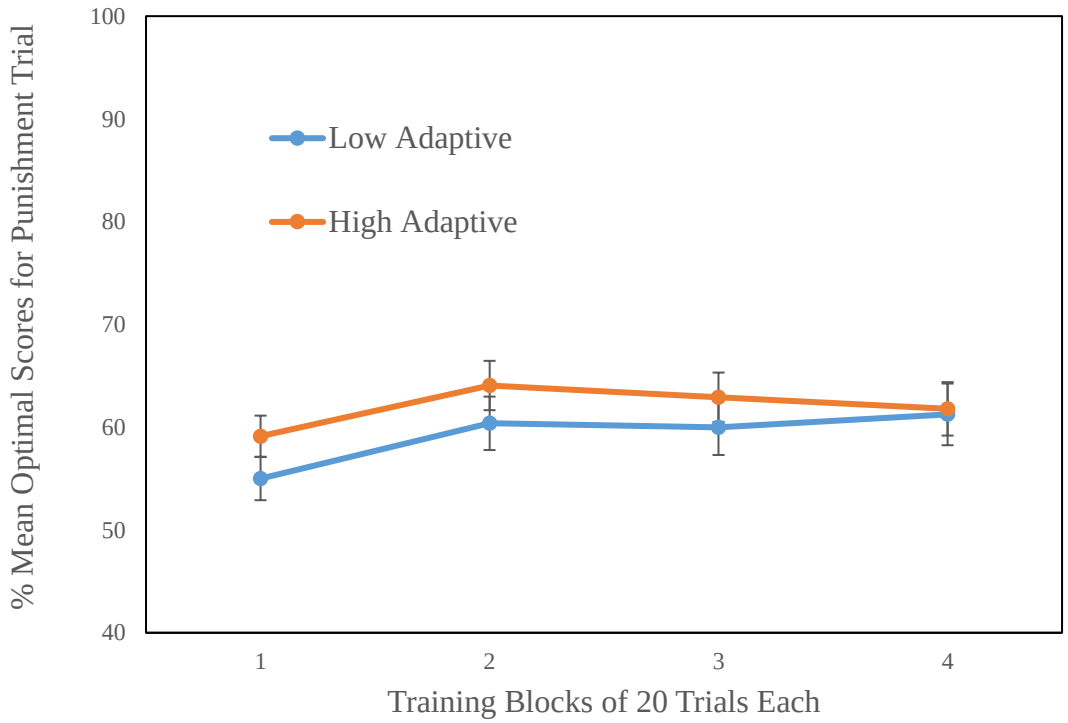

Figure 6. The effect of high or low adaptive dimensions of perfectionism on scores on the punishment computer-based tasks across four training blocks.

Research Question Two

Q2 How do perfectionism, parenting style, GPA, and SES affect learning performance in a computer-based task?

A mixed between-within subjects repeated measures ANOVA was performed to assess the effect of high or low perfectionism (perfectionists as students with high

maladaptive perfectionism dimensions/non-perfectionists as students with low maladaptive perfectionism dimensions) on participants' scores on the reward computer-based tasks across four training blocks. The main effect for reward trial was not significant, Wilks' Lambda = .94, F (3, 75) = 1.57, p = .203. The main effect comparing perfectionists and non-perfectionists on reward trials was not significant, F (1, 77) = 1.06, p = .307. The interaction between high or low maladaptive perfectionism and reward trial was not significant, F (3, 75) = 1.62, p = .191 (see Figure 7).

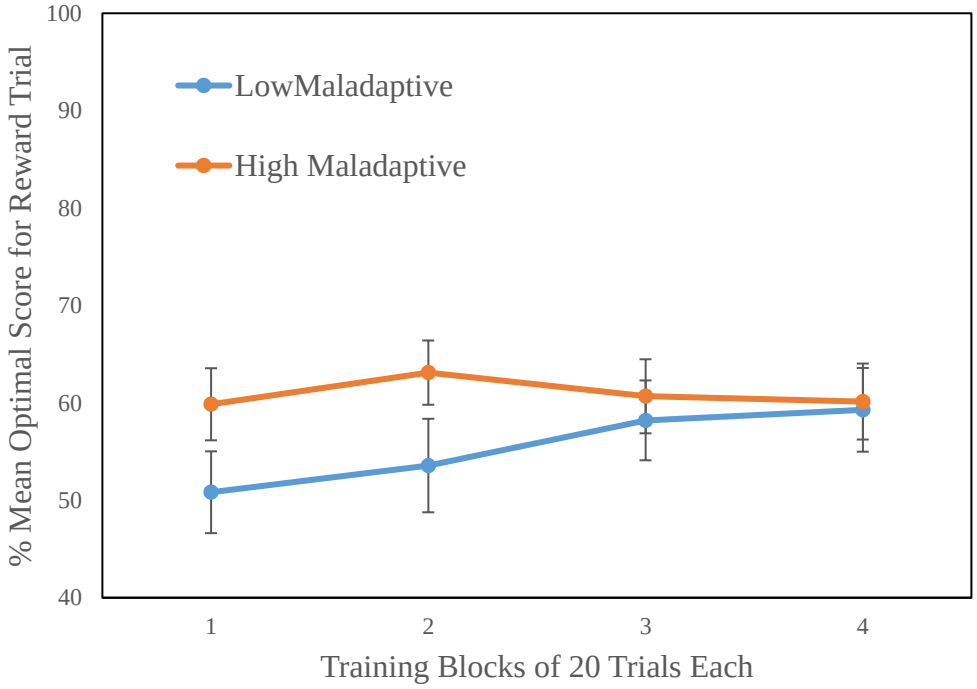

Figure 7. The effect of high or low maladaptive dimensions of perfectionism on scores on the reward computer-based tasks across four training blocks.

A mixed between-within subjects repeated measures ANOVA was performed to assess the effect of high or low perfectionism (perfectionists as students with high

adaptive perfectionism dimensions/non-perfectionists as students with low adaptive perfectionism dimensions) on participants' scores on the reward computer-based tasks across four training blocks. The main effect for reward trial was not significant, Wilks' Lambda = .93, F (3, 89) = 2.23, p = .091. The main effect comparing perfectionists and non-perfectionists on reward trials was not significant, F (1, 91) = 1.26, p = .266. The interaction between high or low adaptive perfectionism and reward trial was not significant, F (3, 89) = .28, p = .841 (see Figure 8).

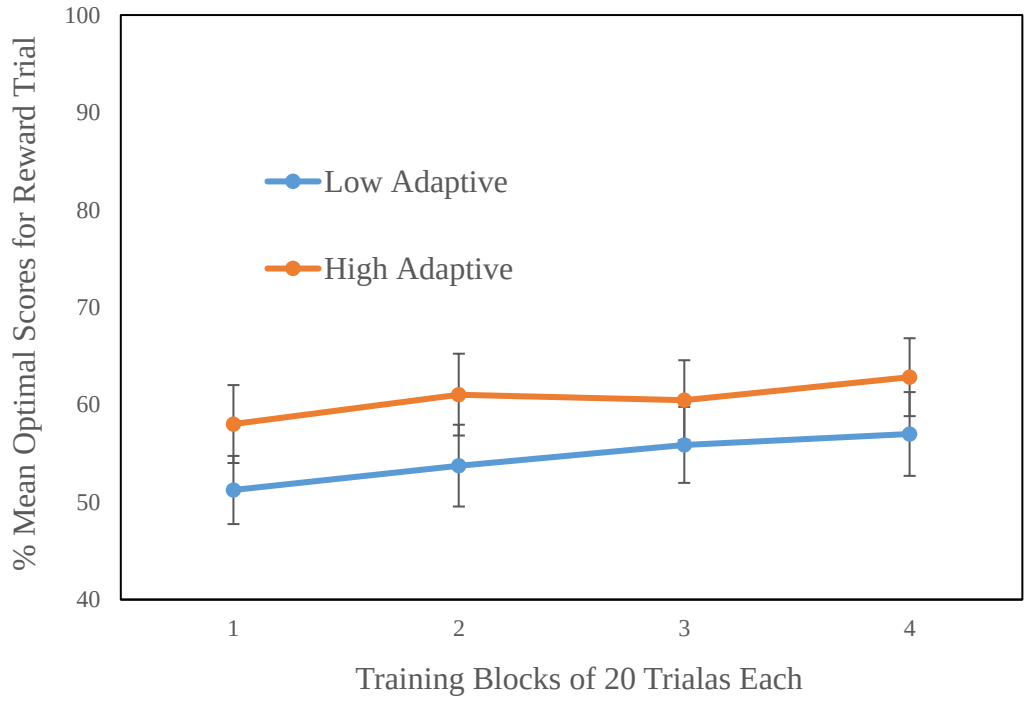

Figure 8. The effect of high or low adaptive dimensions of perfectionism on scores on the reward computer-based tasks across four training blocks.

A mixed between-within subjects repeated measures ANOVA was performed to assess the effect of parenting style (i.e., authoritarian, authoritative, permissive) on participants' scores on the reward computer-based tasks across four training blocks. The

main effect for reward trial was not significant, Wilks' Lambda = .96, F (3, 135) = 2.10, p = .103. The main effect comparing students with authoritarian parenting, students with authoritative parenting, and students with permissive parenting on reward trials was not significant, F (2, 137) = .68, p = .511. The interaction between parenting styles and reward trial was not significant, F (6, 270) = .60, p = .734 (see Figure 9).

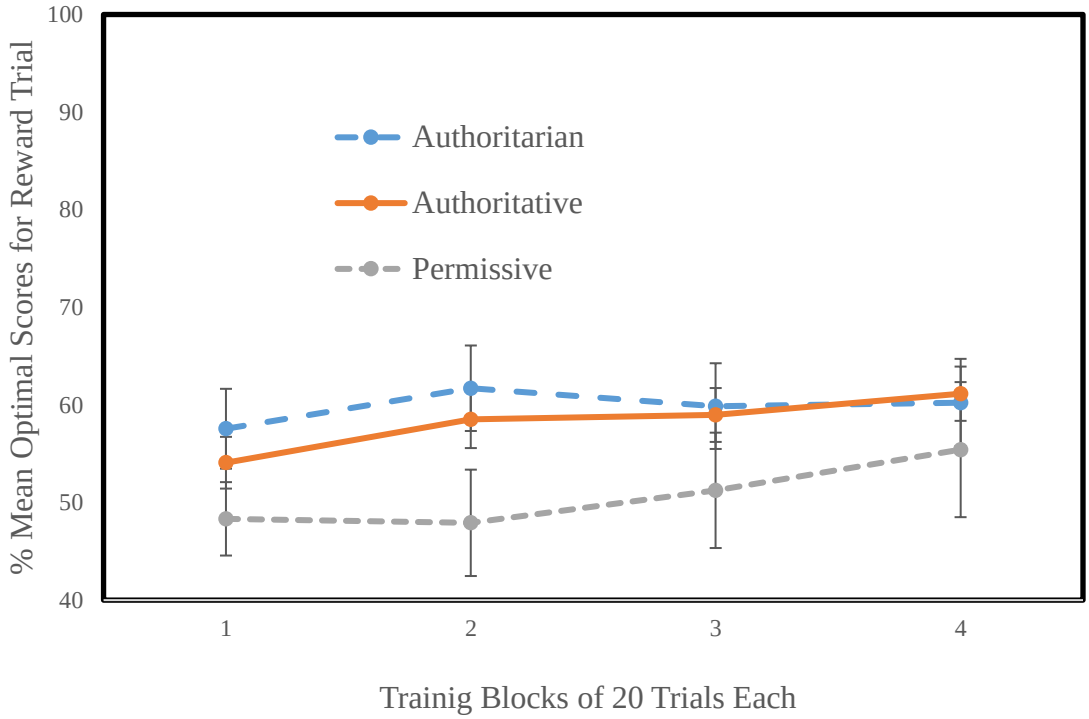

Figure 9. The effect of parenting style on scores on the reward computer-based tasks across four training blocks.

A mixed between-within subjects repeated measures ANOVA was performed to determine the effect of parenting style (i.e., authoritarian, authoritative, permissive) on participants' scores on the punishment computer-based tasks across four training blocks. There was a significant main effect for punishment trial, Wilks' Lambda = .94, F (3, 135)

= 2.74, p = .046. The main effect comparing students with authoritarian parenting, students with authoritative parenting, and students with permissive parenting on punishment trials was not significant, F (2, 137) = .61, p = .544. The interaction between parenting styles and punishment trial was not significant, F (6, 270) = .78, p = .588. There was a change in learning scores for punishment trial across four training blocks showing an increase in scores as training progressed (see Figure 10).

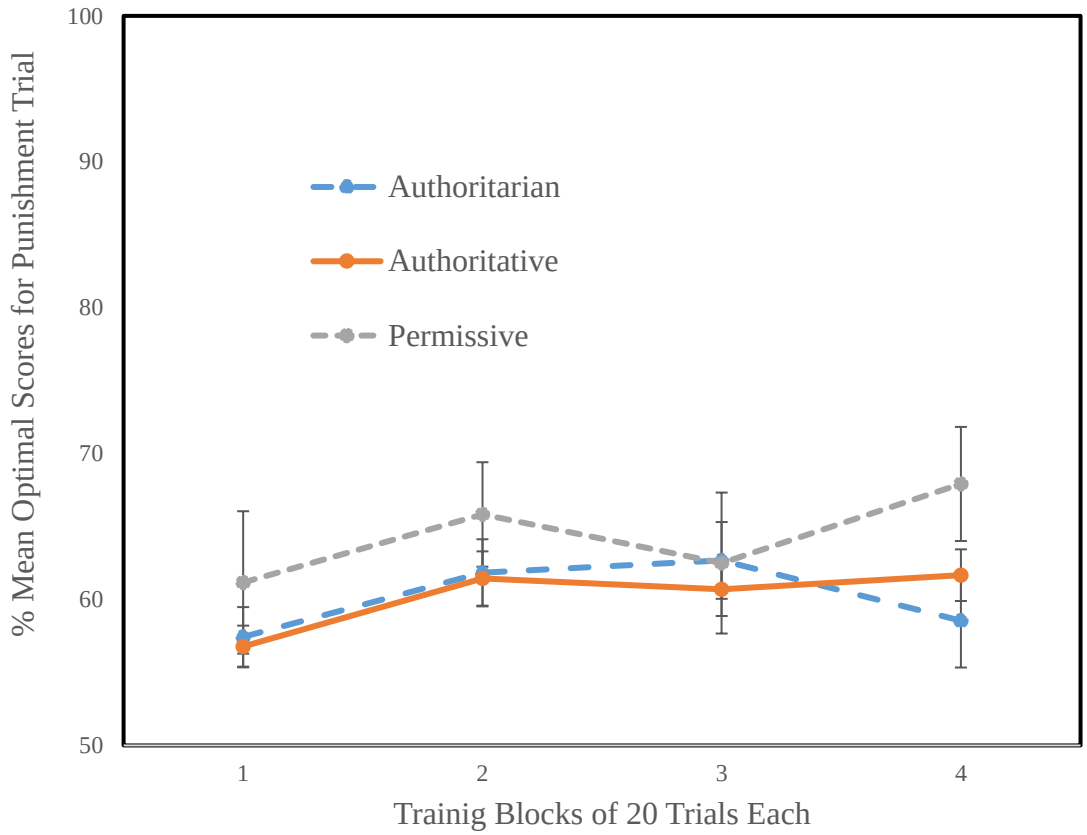

Figure 10. The effect of parenting style on scores on the punishment computer-based tasks across four training blocks.

A mixed between-within subjects repeated measures ANOVA was performed to assess the effect of high or low GPA (high level of GPA/low level of GPA) on

participants' scores on the reward computer-based tasks across four training blocks. There was a significant main effect for reward trial, Wilks' Lambda = .87, F (3, 92) = 4.52, p = .005. The main effect comparing students with higher GPA and students with lower GPA on reward trials was not significant, F (1, 94) = .56, p = .458. The interaction between GPA and reward trial was not significant, F (3, 92) = 1.21, p = .309. The results suggest there was a change in learning scores for reward trial across four training blocks showing an increase in scores as training progressed (see Figure 11).

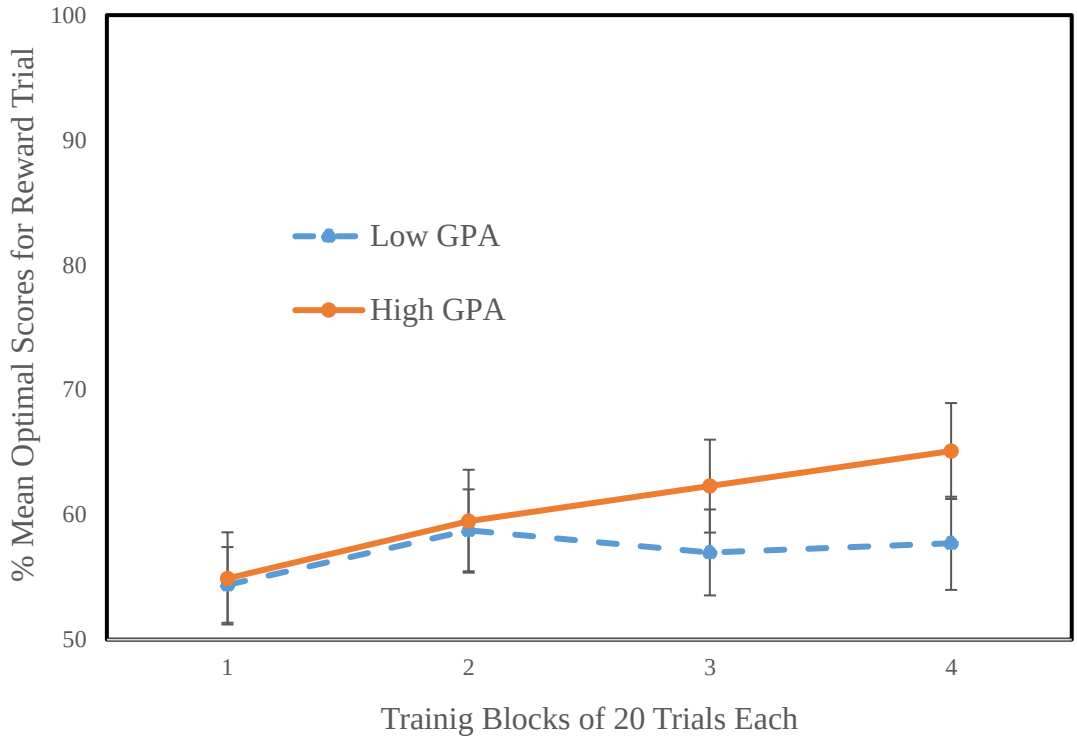

Figure 11. The effect of GPA on scores on the reward computer-based tasks across four training blocks.

A mixed between-within subjects repeated measures ANOVA was performed to determine the effect of high or low GPA (high level of GPA/low level of GPA) on

participants' scores on the punishment computer-based tasks across four training blocks. The main effect for punishment trial was not significant, Wilks' Lambda = .92, F (3, 92) = 2.60, p = .057. The main effect comparing students with higher GPA and students with lower GPA on punishment trials was not significant, F (1, 94) = .17, p = .683. The interaction between GPA and punishment trial was not significant, F (3, 92) = .02, p = .996 (see Figure 12).

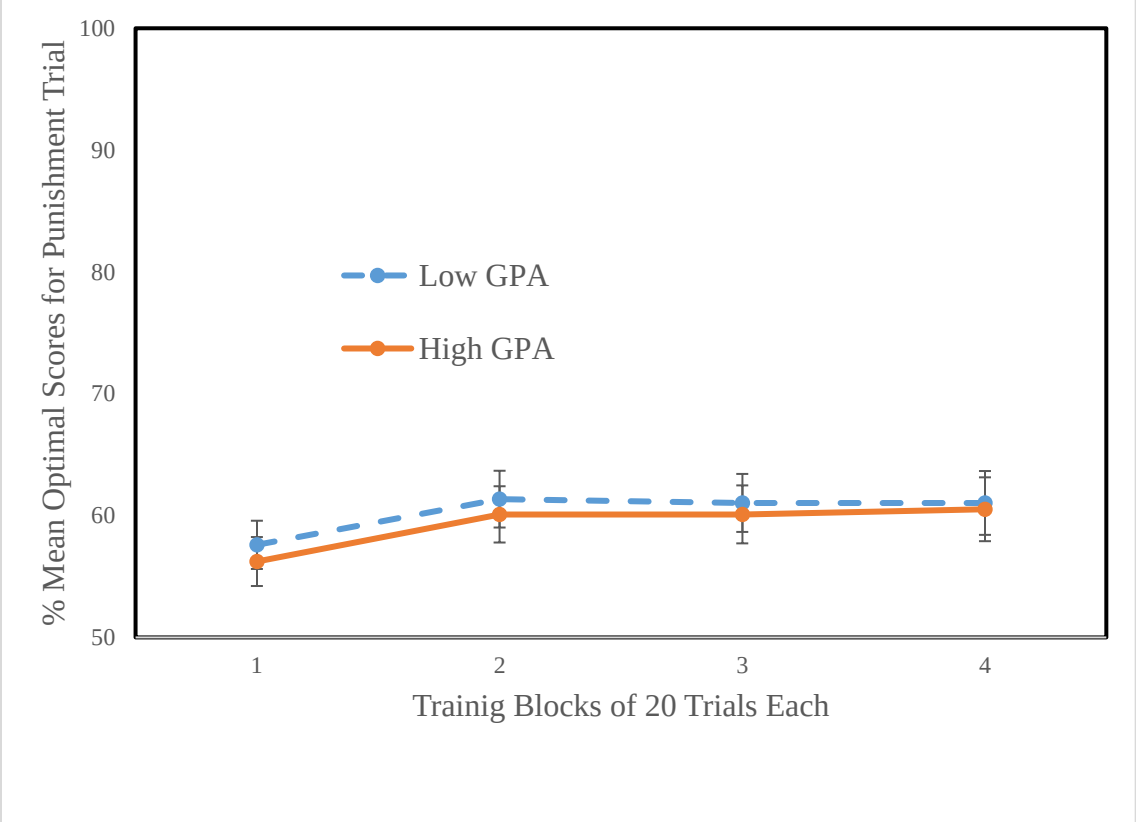

Figure 12. The effect of GPA on scores on the punishment computer-based tasks across four training blocks.

A mixed between-within subjects repeated measures ANOVA was performed to determine the effect of high or low SES (high level of SES/low level of SES) on

participants' scores on the reward computer-based tasks across four training blocks. There was a significant main effect for reward trial, Wilks' Lambda = .87, F (3, 100) = 4.96, p = .003. The main effect comparing students with higher SES and students with lower SES on reward trials was not significant, F (1, 102) = .49, p = .485. The interaction between SES and reward trial was not significant, F (3, 100) = .98, p = .403. Thus, there was a change in learning scores for reward trial across four training blocks showing an increase in scores as training progressed (see Figure 13).

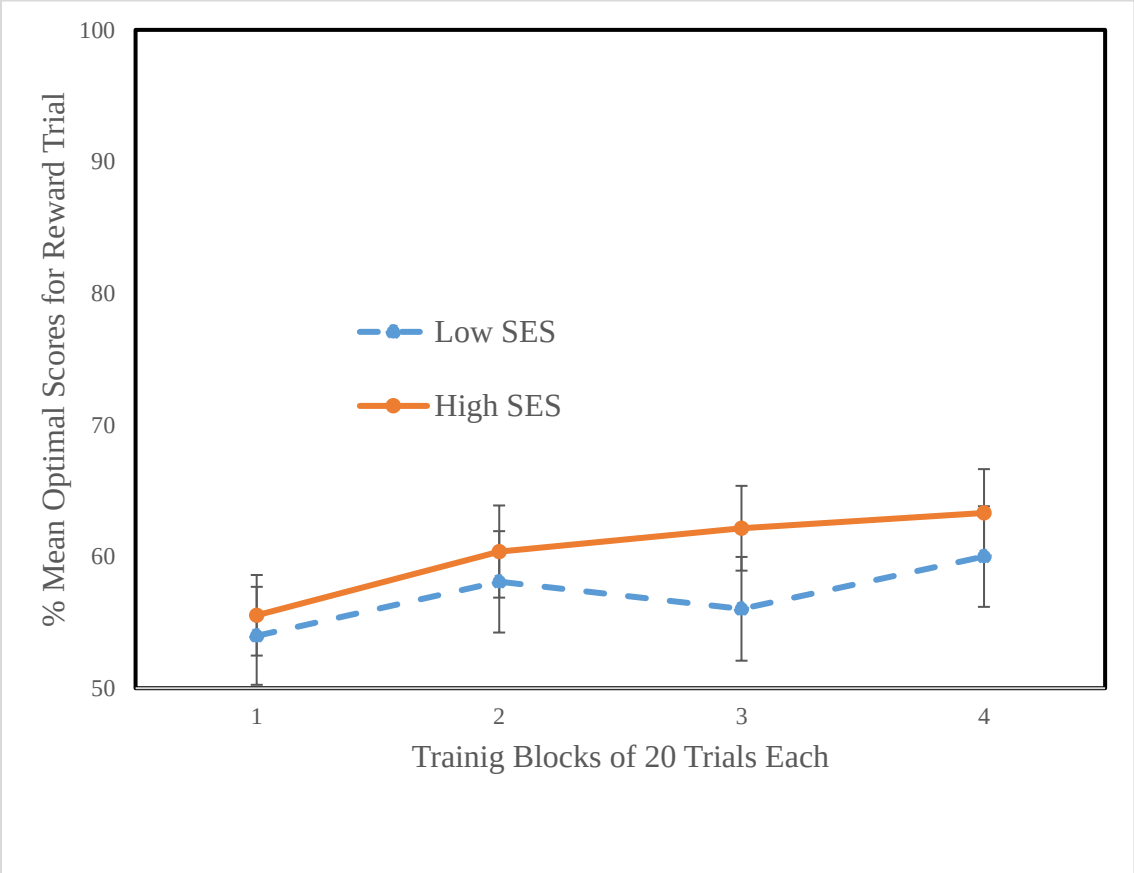

Figure 13. The effect of SES on scores on the reward computer-based tasks across four training blocks.

A mixed between-within subjects repeated measures ANOVA was performed to assess the effect of high or low SES (high level of SES/low level of SES) on participants' scores on the punishment computer-based tasks across four training blocks. There was a significant main effect for punishment trial, Wilks' Lambda = .90, F (3, 100) = 3.56, p = .017. The main effect comparing students with higher SES and students with lower SES on punishment trials was not significant, F (1, 102) = .09, p = .761. The interaction between SES and punishment trial was not significant, F (3, 100) = 1.24, p = .300. The results suggest there was a change in learning scores for punishment trial across four training blocks showing an increase in scores as training progressed (see Figure 14).

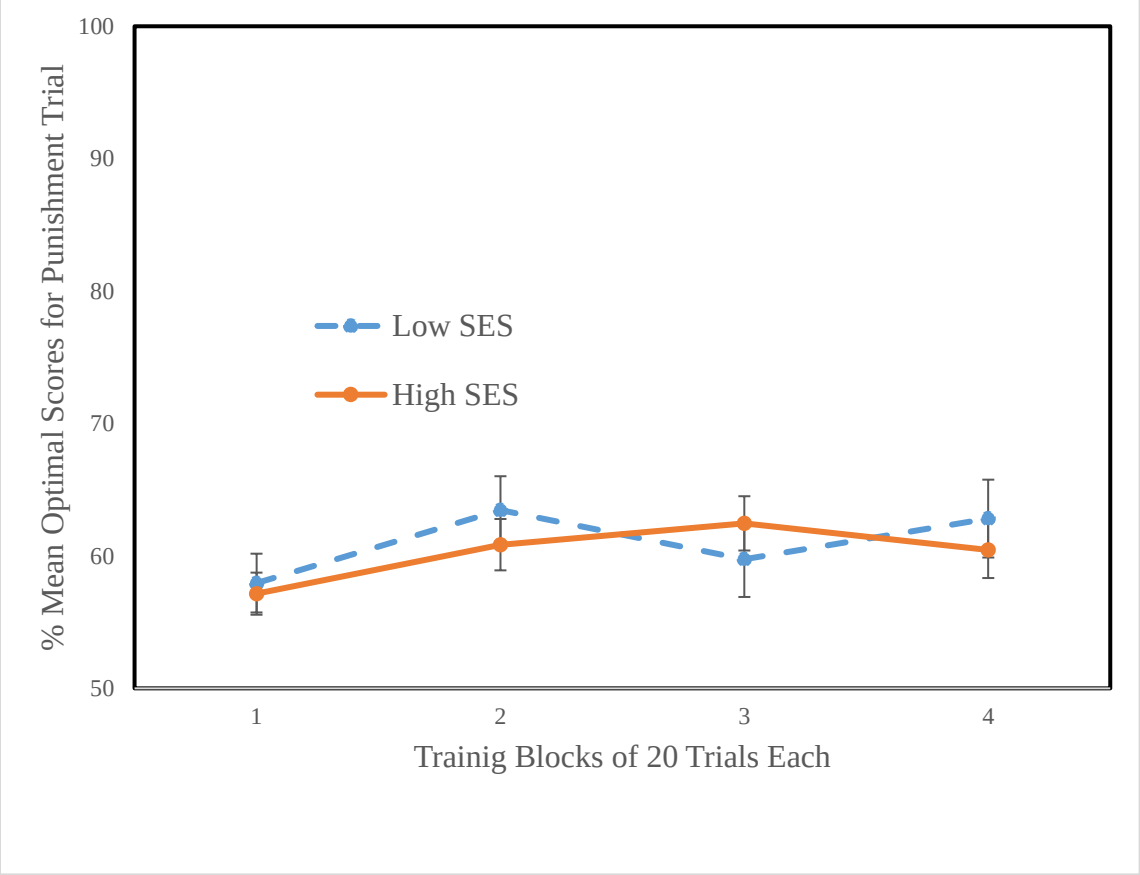

Figure 14. The effect of SES on scores on the punishment computer-based tasks across four training blocks.

Research Question Three

Q3 Do parenting style, GPA, SES, or anxiety mediate the relationship between perfectionism and learning performance?

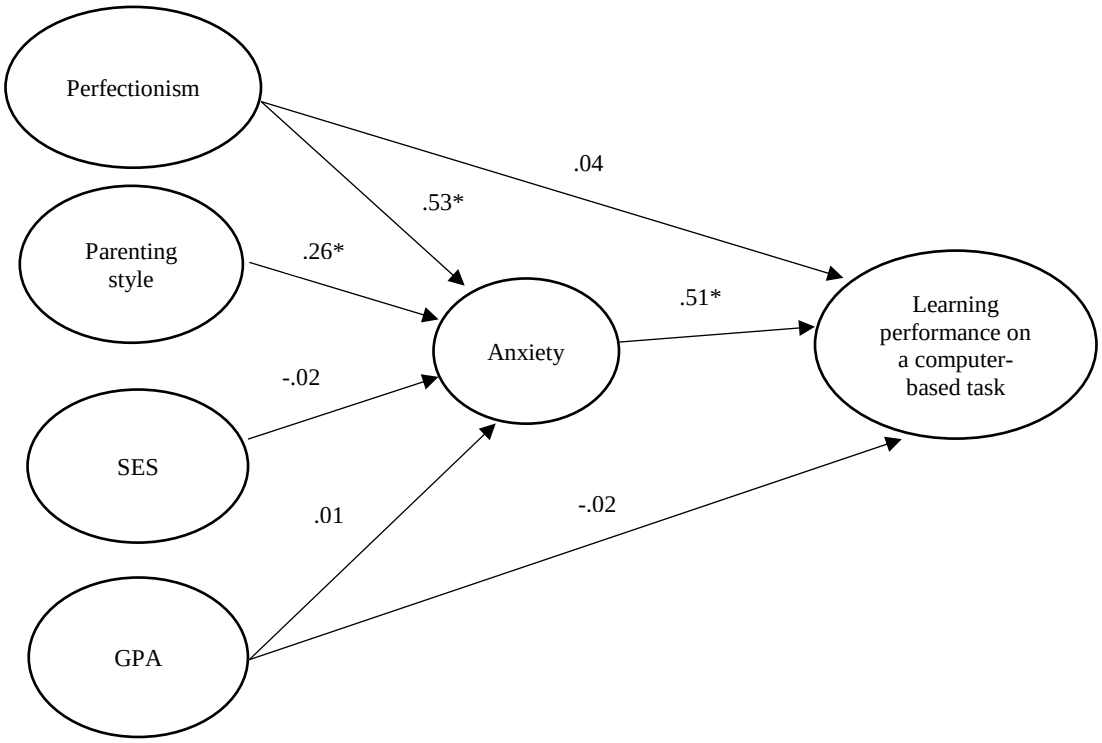

Figure 15. Results of the path analysis for perfectionism, parenting style, SES, GPA, anxiety, and learning performance on a computer-based task. Standardized coefficients are presented in each path. *$p < 0.05$.

Figure 16 displays the results of the cause-effect relationship between perfectionism, anxiety, parenting style, GPA, SES, and learning performance on a computer-based task. The findings indicated that anxiety has a significant direct effect on learning performance on a computer-based task, $\beta_{ANL} = .51$, $p < .001$. Perfectionism had a significant indirect effect on learning performance on a computer-based task, β_{PEAN}* $\beta_{ANL} = .53*.51 = .27$, $p < .001$. Parenting style also had a significant indirect effect on

learning performance on a computer-based task, β_{PTAN}* β_{ANL} = .26*.51 = .13, $p < .001$. Significant direct effects were not seen in perfectionism and learning performance on a computer-based task or between GPA and learning performance on a computer-based task. SES and GPA did not have significant indirect effects on learning performance on a computer-based task.

Hypothesis Four

H4 Perfectionistic students (high maladaptive and adaptive perfectionism dimensions) would have higher anxiety factors (emotional state anxiety and personality trait anxiety measured by STAI; Spielberger, 1983, inhibitory anxiety and prospective anxiety measured by IUS; Carleton et al., 2007, sensitivity to punishment and sensitivity to reward measured by SPSRQ; Torrubia et al., 2001) than non-perfectionistic students (low maladaptive and adaptive perfectionism dimensions).

The results showed a significant multivariate main effect of maladaptive perfectionism level, which was supported by a one-way MANOVA, Wilks' Lambda = .60, F (6, 72) = 7.96, $p < .001$, that was followed up with pair-wise comparisons. The findings of the pair-wise comparisons indicated perfectionistic students (higher maladaptive perfectionism) had significantly higher prospective anxiety, inhibitory anxiety, personality trait anxiety, sensitivity to punishment, and sensitivity to reward than those of non-perfectionistic students (lower maladaptive perfectionism). As expected, perfectionists seemed to be more anxious than non-perfectionists. Unexpectedly, however, there were no differences between perfectionistic students and non-perfectionistic students on emotional state anxiety. The analysis is presented in Table 11.

Table 11

MANOVA Comparing Anxiety between Perfectionist with High Maladaptive Perfectionism and Non-Perfectionist with Low Maladaptive Perfectionism

	M (SD)	*M (SD)*	*F*	*p*	*Partial η²*
Variable	Perfectionists with high maladaptive perfectionism	Non-perfectionists with low maladaptive perfectionism			
Anxiety:					
Prospective anxiety	3.34 (.62)	2.93 (.59)	8.86	8.86	.103
Inhibitory anxiety	2.69 (.91)	1.87 (.63)	21.92	.000*	.222
Emotional state anxiety	2.37 (.26)	2.27 (.22)	3.13	.081	.039
Personality trait anxiety	2.49 (.24)	2.29 (.22)	15.13	.000*	.164
Sensitivity to punishment	.67 (.22)	.38 (.21)	36.98	.000*	.324
Sensitivity to reward	.56 (.17)	.45 (.15)	9.44	.003*	.109

Note. Variables for prospective anxiety and inhibitory anxiety scores range from 1-5. Variables for emotional state anxiety and personality trait anxiety scores range from 1-4. Variables for sensitivity to punishment and sensitivity to reward scores range from 0-1. *$p < 0.05$.

A multivariate main effect of adaptive perfectionism level was not significant. This was supported by a one-way MANOVA, Wilks' Lambda = .89, F (6, 86) = 1.70, p = .131. There were not significant univariate effects for perfectionistic students (higher adaptive perfectionism) and non-perfectionistic students (lower adaptive perfectionism). The analysis is presented in Table 12.

Table 12

MANOVA Comparing Anxiety between Perfectionist with High Adaptive Perfectionism and Non-Perfectionist with Low Adaptive Perfectionism

	M (SD)	*M (SD)*	*F*	*p*	*Partial η²*
Variable	Perfectionists with high adaptive perfectionism	Non-perfectionists with low adaptive perfectionism			
Anxiety:					
Prospective anxiety	3.37 (.59)	3.23 (.56)	7.87	.060	.080
Inhibitory anxiety	2.49 (.88)	2.37 (.87)	.41	.525	.004
Emotional state anxiety	2.28 (.28)	2.21 (.22)	1.77	.187	.019
Personality trait anxiety	2.39 (.22)	2.34 (.26)	1.04	.310	.011
Sensitivity to punishment	.56 (.24)	.54 (.22)	.18	.672	.002
Sensitivity to reward	.52 (.17)	.49 (.16)	.55	.460	.006

Note. Variables for prospective anxiety and inhibitory anxiety scores range from 1-5. Variables for emotional state anxiety and personality trait anxiety scores range from 1-4. Variables for sensitivity to punishment and sensitivity to reward scores range from 0-1. *$p < 0.05$.

Research Question Four

Q4 How do perfectionistic students (high maladaptive and adaptive perfectionism) and non-perfectionistic students (low maladaptive and adaptive perfectionism) differ on parenting styles, GPA, and SES?

The findings showed a significant multivariate main effect of maladaptive perfectionism level, which was supported by a one-way MANOVA, Wilks' Lambda

= .64, F (3, 75) = 14.20, $p < .001$, that was followed up with pair-wise comparisons. The results of the pair-wise comparisons indicated perfectionistic students (high maladaptive perfectionism) had significantly higher authoritarian parenting than that of non-perfectionistic students (low adaptive perfectionism). The analysis is presented in Table 13.

Table 13

MANOVA Comparing Parenting Style between Perfectionist with High Maladaptive Perfectionism and Non-Perfectionist with Low Maladaptive Perfectionism

	M (SD)	*M (SD)*	*F*	*p*	*Partial η²*
Variable	Perfectionists with high maladaptive perfectionism	Non-perfectionists with low maladaptive perfectionism			
Parenting:					
Authoritarian	3.67 (.74)	2.65 (.68)	40.90	.000*	.347
Authoritative	3.13 (.81)	3.24 (.69)	9.44	.083	.109
Permissive	2.40 (.54)	2.57 (.54)	5.19	.076	.063

Note. Variables for parenting style scores range from 1-5. *$p < 0.05$.

A multivariate main effect of adaptive perfectionism level was not significant. This was supported by a one-way MANOVA, Wilks' Lambda = .98, F (3, 89) = .63, p = .598. There were no significant univariate effects for parenting styles (see Table 14).

Table 14

MANOVA Comparing Parenting Style between Perfectionist with High Adaptive Perfectionism and Non-Perfectionist with Low Adaptive Perfectionism

	M (SD)	*M (SD)*	*F*	*p*	*Partial η²*
Variable	Perfectionists with high adaptive perfectionism	Non-perfectionists with low adaptive perfectionism			
Parenting:					
Authoritarian	3.45 (.77)	2.68 (.68)	.04	.845	.000
Authoritative	3.34 (.74)	3.50 (.74)	1.64	.204	.018
Permissive	2.52 (.56)	2.69 (.57)	.17	.682	.002

Note. Variables for parenting style scores range from 1-5. *$p < 0.05$.

A multivariate main effect of maladaptive perfectionism level was not significant. This was supported by a one-way MANOVA, Wilks' Lambda = 1.00, F (2, 94) = .14, p = .770. There were no significant univariate effects for high level of GPA and low level of GPA (see Table 15).

Table 15

MANOVA Comparing GPA Level between Perfectionist with High Maladaptive Perfectionism and Non-Perfectionist with Low Maladaptive Perfectionism

	M (SD)	*M (SD)*	*F*	*p*	*Partial η²*
Variable	Perfectionists with high maladaptive perfectionism	Non-perfectionists with low maladaptive perfectionism			
GPA level:					
High GPA	1.44 (1.87)	1.27(1.81)	.178	.674	.002
Low GPA	.89 (1.25)	.95 (1.36)	.034	.853	.010

Note. Variables for high GPA and low GPA indicate self-reported grade point average.

A multivariate main effect of adaptive perfectionism level was not significant. This was supported by a one-way MANOVA, Wilks' Lambda = .94, F (2, 90) = 4.26, p = .067. There were no significant univariate effects for high level of GPA and low level of GPA (see Table 16).

Table 16

MANOVA Comparing GPA Level between Perfectionist with High Adaptive Perfectionism and Non-Perfectionist with Low Adaptive Perfectionism

	M (SD)	*M (SD)*	*F*	*p*	*Partial η²*
Variable	Perfectionists with high adaptive perfectionism	Non-perfectionists with low adaptive perfectionism			
GPA level:					
High GPA	1.70 (1.89)	1.08 (1.62)	5.12	.056	.053
Low GPA	.89 (1.00)	1.15 (1.36)	7.15	.089	.073

Note. Variables for high GPA and low GPA indicate self-reported grade point average.

A multivariate main effect of maladaptive perfectionism level was not significant. This was supported by a one-way MANOVA, Wilks' Lambda = .99, F (2, 76) = .43, p = .650. There were no significant univariate effects for high level of SES and low level of SES (see Table 17).

Table 17

MANOVA Comparing SES Level between Perfectionist with High Maladaptive Perfectionism and Non-Perfectionist with Low Maladaptive Perfectionism

	M (SD)	*M (SD)*	*F*	*p*	*Partial η²*
Variable	Perfectionists with high maladaptive perfectionism	Non-perfectionists with low maladaptive perfectionism			
SES level:					
High SES	2.16 (3.10)	2.43 (2.72)	.170	.681	.002
Low SES	.43 (.77)	.52 (.80)	.266	.608	.003

Note. Variables for low SES scores range from 1-2. Variables for high SES scores range from 4-9. Low SES ≤ $49,999; High SES ≥ $75,000.

A multivariate main effect of adaptive perfectionism level was not significant. This was supported by a one-way MANOVA, Wilks' Lambda = .99, F (2, 90) = .69, p = .502. There were no significant univariate effects for high level of SES and low level of SES (see Table 18).

Table 18

MANOVA Comparing SES Level between Perfectionist with High Adaptive Perfectionism and Non-Perfectionist with Low Adaptive Perfectionism

	M (SD)	*M (SD)*	*F*	*p*	*Partial η²*
Variable	Perfectionists with high adaptive perfectionism	Non-perfectionists with low adaptive perfectionism			
SES level:					
High SES	1.87 (2.67)	2.45 (2.50)	1.14	.288	.012
Low SES	.57 (.87)	.40 (.74)	.94	.334	.010

Note. Variables for low SES scores range from 1-2. Variables for high SES scores range from 4-9. Low SES ≤ $49,999; High SES ≥ $75,000.

Research Question Five

Q5 How do the following variables (parenting style, anxiety, GPA, and SES) predict maladaptive and adaptive perfectionism?

Parenting style, anxiety, GPA, and SES were not significant predicters for maladaptive perfectionism (see Table 19).

Table 19

Regression Predicting Maladaptive Perfectionism from Parenting Style, Anxiety, GPA, and SES

	B	*SE B*	β	*p*
Parenting style	.062	.155	.029	.692
Anxiety	1.406	.192	.540	.063
GPA	-1.40	.087	-.119	.109
SES	.008	.026	.023	.759

Parenting style, anxiety, GPA, and SES were not significant predicters for adaptive perfectionism (see Table 20).

Table 20

Regression Predicting Adaptive Perfectionism from Parenting Style, Anxiety, GPA, and SES

	B	*SE B*	β	*p*
Parenting style	.080	.145	.048	.583
Anxiety	.255	.180	.123	.158
GPA	.152	.081	.163	.064
SES	-.016	.025	-.056	.520

Research Question Six

Q6 How do the following variables (maladaptive perfectionism, adaptive perfectionism, parenting style, anxiety, and SES) predict GPA?

Maladaptive perfectionism, adaptive perfectionism, parenting style, anxiety, and SES were not significant predicters for GPA (see Table 21).

Table 21

Regression Predicting GPA from Maladaptive Perfectionism, Adaptive Perfectionism Parenting Style, Anxiety, and SES,

	B	*SE B*	β	*p*
Maladaptive perfectionism	-.130	.083	-.153	.119
Adaptive perfectionism	.162	.088	.151	.070
Parenting style	.041	.151	.023	.789
Anxiety	.157	.222	.071	.480
SES	.080	.025	.263	.082

Summary

The results of the current study showed significant relationships between maladaptive dimensions of perfectionism (parental expectations, parental criticism, doubts about actions, and concern over mistakes), anxiety factors (personality trait anxiety, inhibitory anxiety, prospective anxiety, sensitivity to punishment, and sensitivity to reward), and authoritarian parenting style. Furthermore, significant positive and negative relationships between adaptive dimensions of perfectionism (personal standards and organization) and students with higher/lower GPA, as well as a negative relationship between one of the maladaptive perfectionism dimensions (doubts about actions) and

students with higher SES were found. There was a direct effect between anxiety and learning performance on a computer-based task and two indirect effects between perfectionism and learning performance on a computer-based task, as well as between parenting style and learning performance on a computer-based task. Parenting style, anxiety, GPA, and SES did not predict maladaptive and adaptive perfectionism. Maladaptive perfectionism, adaptive perfectionism, parenting style, anxiety, and SES did not predict GPA. Perfectionists with higher maladaptive perfectionism and non-perfectionists with lower maladaptive perfectionism differed in terms of anxiety factors (personality trait anxiety, inhibitory anxiety, prospective anxiety, sensitivity to punishment, and sensitivity to reward) and authoritarian parenting style. Additionally, for students with each of three parenting styles (authoritarian, authoritative, and permissive), there was a change in learning performance on punishment trials across four training blocks. For students with levels of GPA (high/low), there was a change in learning performance on reward trials across four training blocks. For students with levels of SES (high/low), there was a change in learning performance on both reward and punishment trials across four training blocks. These results suggested that learning scores among college students increased as training progressed.

Overall, the findings suggested that perfectionists with higher maladaptive perfectionism whose parents are authoritarian are more likely to have anxiety than non-perfectionists with lower maladaptive perfectionism whose parents are authoritarian, authoritative, or permissive. In addition, perfectionism, anxiety, and parenting style could influence learning performance on a computer-based task. Four training blocks for punishment trials influenced learning performance in a computer-based task for college

students with parenting styles, and four training blocks for reward trials influenced learning performance in a computer-based task for college students with GPA levels. Furthermore, four training blocks for both reward and punishment trials influenced learning performance in a computer-based task for college students with SES levels.

CHAPTER V

DISCUSSION

The final chapter provides a discussion for each hypothesis and research question analyzed in the current study. The overarching purpose of the current study was to examine the relationships between perfectionism, anxiety factors, parenting styles, GPA, and SES (measured as parents' income) in a computer-based learning task among college students. Specifically, the study explored the cause-effect relationship between perfectionism, anxiety, parenting style, GPA, SES, and learning performance on a computer-based task, as well as the influence of perfectionism, parenting style, GPA, and SES on a computer-based learning task across four training blocks. This chapter discusses the results of the current study, implications of the findings, limitations to the current study, recommendations for future research, and conclusion.

Relationship for Maladaptive Perfectionism and Anxiety

One major goal of this study was to examine whether maladaptive perfectionism dimensions (i.e., parental expectations, parental criticism, doubts about actions, and concern over mistakes) would be related to anxiety factors (i.e., emotional state anxiety, personality trait anxiety, inhibitory anxiety, prospective anxiety, sensitivity to punishment, sensitivity to reward) among college students. Findings revealed support for

the prediction. For example, personality trait anxiety, inhibitory anxiety, and sensitivity to punishment were associated with all maladaptive dimensions of perfectionism. Prospective anxiety was also linked to doubts about actions and concern over mistakes, and sensitivity to reward was related to parental expectations and concern over mistakes. These five anxiety factors were positively associated with maladaptive dimensions of perfectionism. Specifically, inhibitory anxiety and sensitivity to punishment were associated with doubts about actions and concern over mistakes as compared with other anxiety factors. These results suggest students who are anxious about the negative nature of uncertainty and the negative impact of unpredictability associated with future events tend to be more doubtful about their abilities, to be more worried about making mistakes, and to be likely to inhibit their behavior toward the unknown events or to activate their behavior toward the unknown events in order to avoid having negative outcomes under feeling anxiety. In educational settings, students are likely to be concerned about making mistakes through taking exams and trying to finish up homework assignments due to accomplishing all tasks perfectly, and the situation may yield various types of anxiety to students. Particularly, prospective anxiety was significantly associated with social phobia (McEvoy & Mahoney, 2012). For college students, perhaps incomplete academic tasks might lead to having academic phobia associated with anxiety factors.

Unexpectedly, however, there was no relationship between emotional state anxiety and maladaptive dimensions of perfectionism. Emotional state anxiety reflects the intensity of anxiety that involves characteristics of how individuals feel anxiety *right now*. Although previous research (Watabe & Allen, 2017) exhibited the associations between emotional state anxiety and two maladaptive perfectionism dimensions (i.e.,

parental criticism, concern over mistakes), the current study showed that maladaptive perfectionism dimensions did not relate to emotional state anxiety. The emotional state anxiety encompasses components of feelings of anxiety *right now*. Maladaptive aspects in perfectionism involve anxiety that is likely to feel after a while (Hibbard, Walton, & Watabe, 2016). The current finding suggests that feelings of anxiety *right now* among college students would not involve maladaptive aspects of perfectionism, such as worries about parental criticism and parental expectations, doubting their abilities, and concerns about making mistakes.

Association for Perfectionism and Parenting Style

A second major goal of this study was to test how perfectionism dimensions (i.e., parental expectations, parental criticism, doubts about actions, concern over mistakes, personal standards, organization) are associated with parenting styles (i.e., authoritarian, authoritative, permissive) among college students. Results revealed that the patterns of association between perfectionism and parenting styles are positively or negatively moderate or weak for college students. For instance, moderate and weak positive relationships were seen in between authoritarian parenting style and all maladaptive perfectionism dimensions (i.e., parental expectations, parental criticism, doubts about actions, concern over mistakes). These findings seem consistent with other studies in which being fearful of failure in academic tasks as well as criticism and excessive expectations from parents have been linked with authoritarian parenting style (Thompson et al., 2003; Walton et al., 2017). An authoritarian parenting style is often seen as a being harsh in Western cultures, with high demands being placed on the child without much warmth or support being provided (Hart et al., 2003). Perhaps this parenting style might

foster more maladaptive aspects of perfectionism. The current findings provide some support for this insight. For example, the authoritarian parenting style was linked to parental expectations to be perfect, feelings of being criticized, doubts about abilities, and being more concerned about making mistakes, but was unrelated to fostering high standards or organization in adaptive perfectionism dimensions. The relationship was even more pronounced for parental expectations and parental criticism when college students perceive their mothers and fathers as parenting with the characteristics of an authoritarian style. These findings suggest that this combination of parenting characteristics is not advantageous if the goal is to foster adaptive perfectionism in children and adolescents. Individuals growing up in a family environment with an authoritarian parenting style might never take on difficult tasks in academic contexts due to being afraid of failure and criticism from parents.

An authoritative parenting style was negatively related to parental criticism and concern over mistakes. This parenting style involves two dimensions of high demands and high warmth, and authoritative parents use more warm control, positivity during communication, and feelings-oriented reasoning (Mize & Pettit, 1997). Children with authoritative parents were seen in higher grades in academic performance and school engagement as compared with children whose parents had the other parenting style (Steinberg et al., 2006). The findings in the current study are consistent with previous studies in which positive communication with parents and support from parents have been related to task persistence and self-efficacy among college students (Day & Padilla-Walker, 2009; Padilla-Walker, Day, Dyer, & Black, 2013). Given these points, for the

current study, authoritative parenting style should be negatively related to criticism from parents and being concerned about making mistakes on academic challenges.

A permissive parenting style involving dimensions of low demands and high warmth was also negatively linked to parental criticism. There has been a paucity of research that examined the permissive parenting style and the relationship with perfectionism. Some theories of perfectionism describe the possibility that the permissive parenting style may not foster the desire to attain high standards in children because the demands placed on the child are low, although the parenting style involves high warmth (Flett et al., 2002). The finding in the current study provides some clarification on this suggestion. For instance, the current finding suggests that a permissive parenting style seemed to buffer college participants from feeling criticized by parents. Similarly, a recent study found there was no association between permissive parenting style and child perfectionism (Walton et al., 2017). Results of past studies showed that parental permissiveness is associated with low self-control and poor academic performance (Jungert et al., 2015; Lamborn et al., 1991; Tavassolie et al., 2016). However, the current finding suggests that the concept is more complex. Because the high degree of warmth feature of the permissive style might contribute to a supportive family environment. It is possible that permissive parenting style could encourage children to attempt challenging activities or tasks without feelings of being criticized by parents.

Relationship for Perfectionism and Grade Point Average

A third major goal of this study was to explore whether there was a relationship between dimensions of perfectionism (i.e., parental expectations, parental criticism,

doubts about actions, concern over mistakes, personal standards, organization) and GPA (higher GPA/lower GPA) among college students. Results confirmed that students with higher GPA were positively related to the adaptive dimensions of perfectionism (i.e., personal standards, organization). In contrast, students with lower GPA were negatively related to the adaptive dimensions of perfectionism. This lends further support to the past study that an adaptive dimension of perfectionism, *personal standards*, was related to more positive educational success striving associated with higher GPAs (Brown et al., 1999). Furthermore, an adaptive perfectionism dimension (personal standards) was associated with higher GPA among undergraduates (Kawamura et al., 2002). More specifically, a positive relationship between adaptive perfectionism and students' higher GPAs, as well as a negative relationship between maladaptive perfectionism and students' higher GPAs was also found (Rice & Ashby, 2007; Rice & Slaney, 2002). In the current study, however, maladaptive dimensions of perfectionism were unrelated to lower GPA. Considering the previous research results and the current findings, GPA for college students is more likely to be linked to adaptive dimensions of perfectionism than maladaptive dimensions of perfectionism. To the extent that college student GPA is the best predictor of the student's self-efficacy and achievement motivation (Robbins et al., 2004), students with adaptive dimensions of perfectionism should try to achieve their goals with high standards and to better organize study plans that lead them to acquire higher GPA.

Link for Perfectionism and Socioeconomic Status

A fourth major goal of this study was to examine whether there was a link between dimensions of perfectionism (i.e., parental expectations, parental criticism,

doubts about actions, concern over mistakes, personal standards, organization) and SES (higher SES/lower SES) among college students. The current finding revealed there was only a negative relationship between college students with higher SES and doubts about actions, which is one of the maladaptive perfectionism dimensions. The finding is consistent with previous educational research showing that families with higher SES are able to provide high quality opportunities for their children (e.g., good education, parental involvement in educational events, social connections) that are productive to academic outcomes (Strand, 2014; Yang et al., 2016). That is, college students whose parents have higher income may be less likely to doubt their abilities when they take exams or try to complete difficult assignments, and the contexts could cultivate higher self-efficacy on challenging tasks because of being less doubtful about their academic abilities.

Cause-Effect Relationship for Perfectionism, Anxiety, Parenting Style, Grade Point Average, and Socioeconomic Status

A fifth major goal of this study was to explore whether there was a cause-effect relationship between perfectionism, anxiety, parenting style, GPA, SES, and learning performance on a computer-based task. Results from the path analysis suggested anxiety directly influences learning performance on a computer-based task. This concurs with Chen, Hsiao, Chern, and Chen (2014) who examined the associations between anxiety and learning performance. Specifically, the researchers tested whether internet anxiety influences learning performance in a computer-based task among Taiwanese high school students. The findings showed that the internet anxiety positively influenced with enhanced learning performance in a computer-based task. In the current study, anxiety summing together the six factors, including emotional state anxiety, personality trait

anxiety, inhibitory anxiety, prospective anxiety, sensitivity to punishment, and sensitivity to reward, positively influenced college students' learning performance. The study results (Chen et al., 2014) along with the current findings emphasize the importance of understanding the cause-effect relationship between anxiety and learning performance. Students may have a high level of anxiety if they acquire outstanding school performance or excellent academic engagement. In other words, these students may not only exhibit higher learning performance, but also obtain greater academic achievement under aversive pressure from anxiety. These results may provide information to the design of effective intervention programs for students who have higher learning performance along with higher anxiety levels when accomplishing tasks.

The current findings revealed that perfectionism indirectly influenced learning performance on a computer-based task. This lends limited support to a previous research showing language learning performance and anxiety as a joint function of perfectionism (Flett, Hewitt, Su, & Flett, 2016). The research reported three elements of perfectionism (e.g., trait perfectionism, perfectionistic cognitions, and perfectionistic self-presentation) directly influence language learning performance and anxiety. Although the previous research demonstrated elements of perfectionism were directly associated with learning performance and anxiety, the current findings suggest that perfectionism was determined to have an indirect effect on learning performance on a computer-based task. However, the indirect effect involves anxiety as a mediator variable, and how the cause-effect relationship between perfectionism and learning performance is mediated by anxiety was examined. In light of these combined results, a direct effect might be seen between perfectionism and anxiety if explored in the future.

In addition, the results of the current study suggested that parenting style indirectly influenced learning performance on a computer-based task. The finding generally mirrors past research (Duchesne & Ratelle, 2010; Luo, Aye, Hogan, Kaur, & Chan, 2013). That is, parenting styles, including authoritarian, authoritative, and permissive are vital factors for students' learning in educational contexts. Students with authoritative or permissive parents tend to try activities under high parental warmth, and students with authoritarian parents are likely to accomplish tasks under high parental demands. Specifically, Luo et al. (2013) reported that parental involvement in learning positively influenced children's learning performance and low anxiety. Those children tended to make effort in the face of challenges and difficulties, to exhibit greater learning performance at school, and to have low anxiety. In the current study, anxiety as a mediator variable was involved in an indirect causal relationship between parenting style and learning performance on a computer-based task. The anxiety component, such as high anxiety or low anxiety, may depend on a sort of parenting styles or parental behaviors among college students that influence learning performance on a computer-based task. Thus, parenting styles associated with levels of anxiety may be a key factor in the outcome of learning performance.

Predicting Maladaptive and Adaptive Perfectionism

A sixth major goal of this study was to examine whether parenting style, anxiety, GPA, and SES are predictors for maladaptive and adaptive perfectionism. The result showed that parenting style, anxiety, GPA, and SES were not predictors for maladaptive and adaptive perfectionism. This is inconsistent with past research that indicated parenting style predicts both maladaptive and adaptive perfectionism (Walton et al.,

2017). Specifically, in the study, parenting style predicted parental criticism, doubts about actions, and concern over mistakes in maladaptive perfectionism dimensions and organization in adaptive perfectionism dimension. Furthermore, Bardone-Cone et al. (2017) found anxiety and depression predicted maladaptive perfectionism among undergraduate students. The current study did not find significant predictors for maladaptive and adaptive perfectionism; however, considering the literature's suggestions, parenting style and anxiety might be predictors for maladaptive perfectionism, and parenting style might also be a predictor for adaptive perfectionism.

Predicting Grade Point Average

A seventh major goal of this study was to test whether maladaptive perfectionism, adaptive perfectionism, parenting style, anxiety, and SES are predictors for GPA. The result revealed that maladaptive perfectionism, adaptive perfectionism, parenting style, anxiety, and SES were not predictors for GPA. This is inconsistent with past research that indicated anxiety and maladaptive perfectionism were significant predictors for GPA among East Asian international students (Hamamura & Laird, 2014). GhorbanDordinejad and Nasab (2013) also reported that anxiety and maladaptive perfectionism significantly predicted Iranian college students' GPAs. Although the current study did not find significant predictors for GPA, in light of the literature's points, anxiety and maladaptive perfectionism might predict GPA for college students.

Anxiety for Perfectionists and Non-Perfectionists

An eighth major goal of this study was to determine whether perfectionistic students (higher maladaptive perfectionism dimensions/ higher adaptive perfectionism dimensions) would have higher anxiety factors than non-perfectionistic students (lower

maladaptive perfectionism dimensions/ lower adaptive perfectionism dimensions). Findings confirmed that perfectionistic students who have higher maladaptive perfectionism dimensions had higher levels of prospective anxiety, inhibitory anxiety, personality trait anxiety, sensitivity to punishment, and sensitivity to reward than non-perfectionistic students who have lower maladaptive perfectionism dimensions. The findings suggest that perfectionistic students may be more likely to be influenced with factors of anxiety than non-perfectionistic students. Through school work, students experience some types of behavioral inhibition system for sensitivity, such as studying for exams. Those students are inhibited to do anything (e.g., being patient with any fun events) until exams are over. Some of the students may feel uncertainty about the results of their exams whether they gain higher scores, average scores, or lower scores, which cause being anxious on uncertain events. Furthermore, for the students, the outcomes of exams are like reward (i.e., excellent outcomes) or punishment (i.e., poor outcomes). McEvoy and Mahoney (2012) reported prospective anxiety is associated with social phobia. Previous research demonstrated personality trait anxiety is characterized by a stable perception of environmental stimuli (e.g., events or others' statements) as threatening (Gidron, 2013). Considering these concepts, taking midterms and finals might be specific environmental stimuli (i.e., reward and punishment) that are regularly given to students, and yield anxiety in educational settings, which might gradually progress social phobia that impacts future academic trials.

Counter to expectations, however, perfectionistic students with higher maladaptive perfectionism dimensions and non-perfectionistic students with lower maladaptive perfectionism dimensions did not differ in terms of emotional state anxiety.

Indeed, this is consistent with recent research showing differences in emotional state anxiety between perfectionistic students and non-perfectionistic students (Watabe & Allen, 2017). As described earlier, emotional state anxiety refers to the intensity of anxiety; that is, how individuals feel anxiety *right now*. Given the results of the recent research and the current findings, both college age perfectionists and non-perfectionists may have almost same degree of the intensity of anxiety when being anxious that is perceived as *right now*.

Parenting Style for Perfectionists and Non-Perfectionists

A ninth major goal of this study was to examine whether perfectionistic students (higher maladaptive perfectionism dimensions/ higher adaptive perfectionism dimensions) and non-perfectionistic students (lower maladaptive perfectionism dimensions/lower adaptive perfectionism dimensions) differ in terms of parenting styles (i.e., authoritarian, authoritative, permissive). Results revealed that although there were no differences of perceived authoritative parenting style and permissive parenting style between perfectionistic students with higher maladaptive and adaptive perfectionism dimensions and non-perfectionistic students with lower maladaptive and adaptive perfectionism dimensions, more perfectionistic students with higher maladaptive perfectionism dimensions perceived their parents as authoritarian as compared with non-perfectionistic students with lower maladaptive perfectionism dimensions. The finding lends support to past empirical evidence that the individual perfectionism tends to be fostered in the families with overly critical parents (Flett et al., 1995; Frost et al., 1991; Kawamura et al., 2002; Rice et al., 1996). For instance, perfectionism among female undergraduates was associated with harsh parenting styles (Frost et al., 1991). Their

parents were more demanding and more critical than parents for the undergraduate students who did not have perfectionistic trends. A recent research also found that a positive association was seen in between authoritarian parenting style and perfectionism among college students (Miller & Speirs Neumeister, 2017). Authoritarian parenting style is more likely to produce maladaptive dimensions of perfectionism to children than authoritative and permissive parenting styles (Walton et al., 2017). This is consistent with the current findings that college age perfectionists who have higher maladaptive perfectionism dimensions were more likely to have authoritarian parents than non-perfectionists who have lower maladaptive perfectionism. Thus, parenting styles play an important role in fostering perfectionism whether children acquire adaptive aspects or maladaptive aspects of perfectionism.

Levels of Grade Point Average for Perfectionists and Non-Perfectionists

A tenth major goal of this study was to determine whether perfectionistic students with higher maladaptive and adaptive perfectionism dimensions and non-perfectionistic students with lower maladaptive and adaptive perfectionism dimensions differ in terms of levels of GPA (i.e., students with higher GPA, students with lower GPA). The result showed that perfectionistic students with higher maladaptive and adaptive perfectionism dimensions and non-perfectionistic students with lower maladaptive and adaptive perfectionism dimensions did not differ in terms of levels of GPA. This is inconsistent with past research that indicated perfectionists have higher cumulative GPAs than non-perfectionists (Brumbaugh, Lepsik, & Olinger, 2007; Grzegorek, Slaney, Franze, & Rice, 2004; Rice & Ashby, 2007; Rice & Slaney, 2002). Previous research also revealed that perfectionistic college students who gained higher cumulative GPA had lower scores for

maladaptive dimensions of perfectionism and higher scores for adaptive dimensions of perfectionism (Castro & Rice, 2003). Additionally, African American undergraduate students who have adaptive dimensions of perfectionism acquired higher GPA than non-perfectionistic African American undergraduate students (Elion et al., 2012). Although the current study did not find significant differences of levels of GPA between perfectionistic students with higher maladaptive and adaptive perfectionism dimensions and non-perfectionistic students with lower maladaptive and adaptive perfectionism dimensions, considering these literature's suggestions, perfectionism, especially in adaptive dimensions, should be a key to obtaining higher GPA among college students.

Levels of Socioeconomic Status for Perfectionists and Non-Perfectionists

An eleventh major goal of this study was to explore whether perfectionistic students with higher maladaptive and adaptive perfectionism dimensions and non-perfectionistic students with lower maladaptive and adaptive perfectionism dimensions differ in terms of levels of SES (i.e., students with higher SES, students with lower SES). Results indicated that perfectionistic students with higher maladaptive and adaptive perfectionism dimensions and non-perfectionistic students with lower maladaptive and adaptive perfectionism dimensions did not differ in terms of levels of SES. However, the past several researchers reported the associations between perfectionism and SES levels. For example, a positive relationship was seen between maladaptive dimensions of perfectionism and higher levels of SES among female high school students (Lyman & Luthar, 2014). Furthermore, gifted children whose parents have a high income had lower levels of adaptive dimensions of perfectionism (Krstic & Kevereski, 2015). The term SES reflects the social standing or the class of an individual or group

(Baker, 2014; Galobardes et al., 2006; House, 2002). SES is also a combination element involving academic success, occupational prestige, and individual insights of social status and social class (Mirowsky, 2017; Winkleby et al., 1992). In addition, children whose parents have higher income tended to display higher school performance and excellent academic outcomes (Sheridan & McLaughlin, 2016). Because parents with higher SES are more likely to provide high quality opportunities for their children, such as good education or parental involvement in school events, than parents with lower SES (Strand, 2014; Yang et al., 2016). Given these points, students who have parents with higher SES could exhibit higher academic performance and achieve higher academic goal by striving to be perfect. However, previous research (Krstic & Kevereski, 2015; Lyman & Luthar, 2014) revealed that students whose parents with higher SES had lower adaptive dimensions of perfectionism, as well as higher maladaptive dimensions of perfectionism. Although the current study did not find significant differences of levels of SES between perfectionistic students with higher maladaptive and adaptive perfectionism dimensions and non-perfectionistic students with lower maladaptive and adaptive perfectionism dimensions, considering these literature's suggestions, students whose parents have higher income might have higher maladaptive perfectionism dimensions and lower adaptive perfectionism dimensions.

In addition to investigating perfectionism for college students and exploring the influence of college students' parenting style, GPA, and SES on learning performance, a computer-based objective behavioral task, including the difficulty and frustrating nature due to being probabilistic was performed. The following discussion sections provide

insights into the results of the current study that came from the use of a computer-based objective behavioral task.

Learning Performance for Perfectionists and Non-Perfectionists

A twelveth major goal of this study was to examine whether perfectionistic students (higher maladaptive perfectionism dimensions/ higher adaptive perfectionism dimensions) would have higher learning performance in a computer-based task than non-perfectionistic students (lower maladaptive perfectionism dimensions/ lower adaptive perfectionism dimensions). Counter to the prediction, perfectionistic students' scores on learning performance did not differ from learning performance scores for non-perfectionistic students. Gregersen and Horwitz (2002) reported higher learning performance for learners is constructed from high levels of perfectionism and academic anxiety. Considering this point, perfectionistic students in the current study might be less likely to feel academic anxiety when accomplishing tasks, which might affect outcomes of learning performance. Although the current study revealed perfectionistic students did not have higher learning performance in a computer-based task than non-perfectionistic students, a way of learning (e.g., providing an appropriate amount of reward or a small amount of punishment) may influence learning performance outcomes for both perfectionistic students and non-perfectionistic students in order to engage and to complete tasks.

Influence of Perfectionism on a Computer-Based Learning Task cross Four Training Blocks

A thirteenth major goal of this study was to test whether there is a difference in learning performance between perfectionistic students (higher maladaptive perfectionism

dimensions/ higher adaptive perfectionism dimensions) and non-perfectionistic students (lower maladaptive perfectionism dimensions/ lower adaptive perfectionism dimensions) on a punishment and reward computer-based learning task across four training blocks. Findings revealed, unexpectedly, there was no difference in learning performance between perfectionistic students and non-perfectionistic students on both punishment and reward trials in a computer-based learning task across four training blocks. This is inconsistent with a recent research showing both perfectionistic students and non-perfectionistic students had improvements in scores for punishment-based trials across four training blocks, and perfectionistic students outperformed non-perfectionistic students on the punishment trials (Watabe & Allen, 2017). Why did the current study show the inconsistent results? It is possible that sample size affected the study results. In the current study, splitting participants into three groups (participants with high level variable, participants with middle level variable, and participants with low level variable) and choosing participants with high level variable and participants with low level variable helped to analyze data, rather than dividing participants into only two groups (participants with high level variable and participants with low level variable). Both perfectionists and non-perfectionists variables in the current study were constructed by these ways, that is, the higher perfectionism participants and the lower perfectionism participants were used as perfectionists and non-perfectionists respectively because according to Herringer et al (2011), it is statistically better to analyze data in this manner. However, each sample size for perfectionists (n = 49) and non-perfectionists (n = 48) was small. This may affect the current study results showing no learning performance differences between perfectionistic students and non-perfectionistic students on both

punishment and reward trials in a computer-based learning task across four training blocks.

Influence of Parenting Style on a Computer-Based Learning Task cross Four Training Blocks

A fourteenth major goal of this study was to determine whether there is a difference in learning performance between students with authoritarian parenting style, students with authoritative parenting style, and students with permissive parenting style on a reward and punishment computer-based task across four training blocks. Results suggest that students with authoritarian parenting style, students with authoritative parenting style, and students with permissive parenting style did not differ for learning performance on a reward computer-based learning task across four training blocks. However, current findings showed a main effect for punishment trials across four training blocks regardless of parenting style. This suggests punishment stimuli across four training blocks influenced learning performance in a computer-based task showing an increase in scores for students with authoritarian parenting style, students with authoritative parenting style, and students with permissive parenting style as training progressed. A recent research indicated that children with authoritative and permissive parents inclined to challenge activities and to accomplish difficult tasks under parental warmth (Walton, Hibbard, Coughlin, & Coyl-Shepherd, 2018). However, children with authoritarian parents were more likely to increase anxiety on assigned tasks than children with authoritative and permissive parents, and children with authoritarian parents exhibited lower academic performance than children with authoritative and permissive parents due to higher anxiety from excessive parental pressures (Silva et al., 2007). In western cultures, authoritative parenting is thought to be the best balance between

demands placed on children and warm, supportive parenting environment that assists children in enhancing learning abilities (Steinberg, Lamborn, Dornbush, & Darling, 1992). Although the current study did not find significant differences of learning for parenting styles, given prior literature, college students who were fostered by authoritative parenting style and permissive parenting style may be more likely to strive to accomplish tasks on the pursuit of enhanced learning than students with authoritarian parents.

Influence of Grade Point Average on a Computer-Based Learning Task cross Four Training Blocks

A fifteenth major goal of this study was to examine whether there is a difference in learning performance between students with higher GPA and students with lower GPA on a reward and punishment computer-based task across four training blocks. Findings revealed that although there were no differences in learning performance on a punishment computer-based task across four training blocks between students with higher GPA and students with lower GPA (see Figure 10), there was a main effect for reward trials across four training blocks (see Figure 9). That is, reward stimuli across four training blocks influenced learning performance showing an increase in scores in a computer-based task for both students with higher GPA and students with lower GPA as training progressed. The findings are inconsistent with previous research that the context of higher GPA plays in assisting students in completing difficult tasks and contributing to higher academic performance rather than the context of lower GPA (Steinmayr, Bipp, & Spinath, 2011; Tuckman, 2003). However, the circumstance of providing reward stimuli might generate the pursuit to increase competencies for both students with higher GPA and students with lower GPA in order to accomplish the computer-based task. The findings of the current

study suggest that giving reward could lead to the beneficial effect of achieving academic success on both students with higher GPA and students with lower GPA. However, giving learners a reinforcer (reward or punishment) using the traditional behaviorism approach is less effective in enhancing learners' academic abilities (Driscoll, 2005). Given these ideas, a way of increasing academic motivation from constructivism approach may promote improvement on learning performance for students, which leads those students to achieve their goals. For both students with higher GPA and students with lower GPA, providing punishment would not be effective in enhancing learning and may produce an adverse effect on educational and social outcomes.

Influence of Socioeconomic Status on a Computer-Based Learning Task cross Four Training Blocks

A final goal of this study was to examine whether there is a difference in learning performance between students with higher SES and students with lower SES on a reward and punishment computer-based task across four training blocks. Results showed there was no difference in learning performance between students with higher SES and students with lower SES on a reward and punishment computer-based task, but there was a main effect for both reward and punishment trials across four training blocks. Thus, reward and punishment across four training blocks influenced learning performance showing an increase in scores in a computer-based task for both students with higher SES and students with lower SES as training progressed. Previous research revealed that excellent school performance and positive psychological and educational outcomes were seen in youth whose parents' income levels are higher (Crosnoe, 2002; Morgan et al., 2009; Strand, 2014; Yang et al., 2016). In contrast, lower levels of SES for college

students were associated with diminished academic success (Sheridan & McLaughlin, 2016; Steinmayr et al., 2012).

Although the current study did not find significant differences of learning for SES levels among students, in light of prior literature, students with lower SES may exhibit lower learning performance under high anxiety causing less pursuits on the accomplishment of the task as compared to students with higher SES.

Implications

There are several implications that can be derived from the findings in the current study. The first implication involves the ideas that maladaptive dimensions of perfectionism (i.e., parental expectations, parental criticism, doubts about actions, concern over mistakes) are linked to most anxiety factors (i.e., personality trait anxiety, inhibitory anxiety, prospective anxiety, sensitivity to punishment, sensitivity to reward) but not emotional state anxiety. The emotional state anxiety reflects whether individuals feel anxiety right now. The maladaptive dimensions for parental expectations, parental criticism, doubts about actions, and concern over mistakes may appear in individuals' emotions after a while, such as through experiences of interactions with one's parents in his/her childhood. It is possible that anxiety in the individuals that comes from their childhood may take time to appear emotionally. Thus, students may not feel anxiety right now. In general, maladaptive dimensions of perfectionism are associated with various anxiety components; however, in the current study, maladaptive perfectionism dimensions for college students were unrelated to emotional state anxiety. These students may have unique experiences in the past that contribute to anxiety factors that are unrelated to feeling anxiety right now.

For college students, authoritarian parenting style is positively linked to maladaptive dimensions of perfectionism, and authoritative and permissive styles are negatively associated with maladaptive dimensions of perfectionism. Authoritarian parenting involving high demands and low warmth tends to induce negative emotional and social outcomes for children in western cultures. In contrast, authoritative parenting style and permissive style involve high parental warmth. Thus, parental warmth should be an important key for assisting human development in minimizing components of maladaptive perfectionism dimensions, and parental warmth might be able to foster adaptive dimensions of perfectionism for children.

In the current study, college students who had higher GPA were positively linked to adaptive dimensions of perfectionism (i.e., personal standards, organization), and those who have lower GPA were negatively linked to adaptive dimensions of perfectionism. Robbins et al. (2004) reported GPA for college students as the best predictor of the student's self-efficacy and academic achievement motivation. Therefore, college students with higher GPA should organize future plans with high standards and accomplish their goals on academic success. College students whose parents have higher income were negatively linked to one of the maladaptive dimensions of perfectionism, doubts about actions. Thus, college students having higher SES parents might have to reduce doubts about their academic abilities when completing tasks.

Although anxiety directly influences learning performance on a computer-based task, perfectionism and parenting style indirectly influence learning performance on a computer-based task. These indirect effects involve a factor of anxiety. Given these points, for college students' learning performance on a computer-based task, the anxiety

factor should be included in the contexts of individual student perfectionism and his/her experience of types of parenting styles.

Perfectionistic students are more likely to be anxious and have authoritarian parents than non-perfectionistic students. These perfectionistic students should have more maladaptive dimensions of perfectionism than adaptive dimensions of perfectionism, to the extent that authoritarian parenting style is fully associated with maladaptive dimensions of perfectionism. Considering these ideas, authoritarian parenting may negatively impact students' emotional components, and students who have authoritarian parents are more likely to have maladaptive perfectionism dimensions than students whose parents are authoritative or permissive.

Reward affects learning performance showing an increase in a computer-based task for both college students with higher GPA and for those with lower GPA as training progressed. Thus, providing some rewards may help students to further improve learning outcomes. Although the current study did not find a significant result of influence of punishment stimuli on learning performance for GPA levels, giving punishment stimuli may produce learners negative learning outcomes.

For the influence of SES on students' learning performance, reward and punishment stimuli affect learning performance showing an increase in a computer-based task for both college students with higher SES and those with lower SES as training progressed. Furthermore, punishment affects learning performance showing an increase in a computer-based task for students with authoritarian parenting style, students with authoritative parenting style, and students with permissive parenting style as training progressed. However, gaining higher academic performance by giving punishment is not

the ideal pedagogy in educational settings. Teachers should help draw out learners' motivation to complete tasks and achieve their goals without providing punishments in terms of constructivism approach.

In the current study, a computer-based learning task involving reward and punishment stimuli was utilized to examine perfectionism among college students and to investigate the influence of college students' parenting style, GPA, and SES on learning performance. The computer-based learning task is useful to see how learning performance for participants changes across four training blocks by unique stimuli: reward and punishment. As the current findings of path analysis show, specifically, anxiety directly influences learning performance on a computer-based task. Therefore, participants' learning performance on the task may involve various types of anxiety, such as anxiety from authoritarian parenting, academic contexts, and socioeconomic backgrounds, and the computer-based learning task could help develop effective intervention and support strategies for perfectionists with maladaptive perfectionism dimensions who tend to be anxious.

Limitations

The current study involves several limitations that could be addressed in future work. First, the ability to generalize results from the sample to a more diverse population is limited. Indeed, the undergraduate participants in the current study were mostly Caucasian. The lack of overall diversity makes it difficult to generalize about perfectionism to a wider range of participants. Second, a related issue concerns the representativeness of only one university involved in this study. It is possible that students from one university were not a typical representation of studying the relationship

between perfectionism, anxiety factors, parenting style, GPA, SES, and learning performance in a computer-based task. Replication of the current study in students from various college contexts and regions of the country would help to address this concern. Third, participants responded to the personality inventories and levels of GPA and SES as self-report responses. Thus, social desirability may have factored into the response. For example, some participants may have predicted what the study was examining and responded to the inventories accordingly. Furthermore, some participants may have responded to their GPA and SES as higher rather than lower due to being ashamed. This means participants may have responded in a way that they think that the researcher wanted. Fourth, treatment by attributes interaction in potential external validity threats may be involved in the current study. Some participants might have many experiences of a computer-based learning task (e.g., computer games related to educational components) and might have higher skills and strategies for a computer-based learning task. In addition, pre-knowledge of concepts of anxiety, especially in students who have taken the related subjects such as personality psychology or stress management, might interact with the effect of the treatment in the current study.

Fifth, there may be another potential external validity threat (e.g., Hawthorne effect). In the current study, the undergraduate participants know they are being studied because a laboratory room was used, and the participants are from the research participant pool. Therefore, some participants may modify or improve an aspect of their behavior in response to their awareness of being studied. Specifically, some participants might try to obtain excellent scores for a computer-based learning task and provide positive responses to personality inventories (e.g., their parents are authoritative rather

than authoritarian), which should affect the results of the current study. Lastly, rather than summing up one component of perfectionism as was done for the current study, each perfectionism dimension should be analyzed. Previous research found that personal standards in adaptive perfectionism dimensions and concern over mistakes in maladaptive perfectionism dimensions consistently show different relationships with reward versus punishment sensitivity, as well as task performance (Stoeber, 2012). For instance, path analysis in the current study involved one component of perfectionism; however, each perfectionism dimension should be used to analyze the cause-effect relationships of parenting style, GPA, SES, and learning performance. Furthermore, each perfectionism dimension should also be used to analyze participants' learning performance in a computer-based task, such as participants with personal standards versus participants with concern over mistakes. This analysis would be helpful in clarifying the learning performance differences on each perfectionism dimension.

Recommendations for Future Research

All participants in the current study were college age students, which means a specific population may not be generalizable to other populations. Future research should collect data from a range of ages to better understand the developmental progression of perfectionism. Future research should also examine the issue of how cultural context plays a role in the association between perfectionism, anxiety, parenting style, GPA, SES, and learning performance on a computer-based task. Past research reported cultural differences in dimensions of perfectionism between African American and White college students (Nilsson, Paul, Lupini, & Tatem, 1999), as well as the relationship between perfectionism and anxiety symptoms among adolescents in

Germany and in Hong Kong (Essau, Leung, Conradt, Cheng, & Wong, 2008). However, no studies have tested the relationship between perfectionism, anxiety, parenting style, GPA, SES, and learning performance on a computer-based task in diverse cultures. The results may differ for other cultural contexts in which norms concerning perfectionism, anxiety, parenting style, GPA, SES, and learning performance on a computer-based task are different. Cross cultural research exploring the intersection of cultural perfectionism norms and the association between perfectionism, anxiety, parenting style, GPA, SES, and learning performance on a computer-based task is needed. Additionally, as described in the previous section, all measures were self-reported surveys, which may be influenced by both social desirability and response biases. For instance, some participants were required to recall the parenting style they experienced while living at home. Future research should supplement self-report survey data with multiple source reporting, such as surveying parents themselves as well as qualitative methods, including interviews or observational techniques. Lastly, future research consider what other educational, personal, environmental, and social variables might help to clarify why an individual becomes a perfectionist.

Conclusion

The strength of the current study encompasses the examination of the associations between perfectionism, anxiety, parenting style, GPA, SES, and learning performance on a computer-based task, which has not been examined in previous research. The findings suggest that perfectionistic college students who have authoritarian parents are more likely to be anxious than non-perfectionists whose parents are authoritarian, authoritative, or permissive. Furthermore, maladaptive dimensions of perfectionism are related to

anxiety and authoritarian parenting; in contrast, adaptive dimensions of perfectionism are linked to levels of GPA. Learning performance for students with higher GPA or lower GPA showed an increase in reward trial across four training blocks as training progressed. Learning performance for both students with higher SES and students with lower SES displayed an increase in reward and punishment trials across four training blocks as training progressed. Anxiety factors directly influence learning performance on a computer-based task, and perfectionism and parenting style also influence learning performance through anxiety factors. However, the current study did not find significant predictors for GPA and maladaptive and adaptive perfectionism.

Given these ideas, learning performance for both college students with higher GPA and those with lower GPA could improve by receiving reward stimuli, and learning performance for both college students with higher SES and those with lower SES could enhance by receiving reward and punishment. However, as described earlier, the ideal instruction approach for improving students' learning should be the constructivism paradigm focused on learners' motivation rather than the behaviorism approach involving reward and punishment (Driscoll, 2005). In addition, college students whose backgrounds involve the experience of authoritarian parenting should show higher academic performance at school by having maladaptive dimensions of perfectionism due to feeling anxiety to accomplish assigned tasks. However, college students who have authoritative or permissive parents, higher GPA, and higher SES could achieve their goals without having maladaptive dimensions of perfectionism because this context does not lead students to be overly anxious.

Parents, teachers, counselors, and other higher education professionals should consider how parents foster children to be healthy perfectionists, as well as what factors help students to acquire perfectionism involving adaptive dimensions attaining academic success without being anxious. Knowledge of the nature of perfectionism, as well as the situations and conditions under which perfectionism has the most influence, can lead those who work with college students to developing effective intervention and support strategies that encourage adaptive perfectionism in individuals and discourage (or at least help perfectionists manage) more maladaptive aspects of perfectionism.

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APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

UNIVERSITY OF
NORTHERN COLORADO

Institutional Review Board

DATE:	September 15, 2017
TO:	Akiko Watabe
FROM:	University of Northern Colorado (UNCO) IRB
PROJECT TITLE:	[1116898-2] Parenting Styles, Computer Games, and Academic Attitudes
SUBMISSION TYPE:	Amendment/Modification
ACTION:	APPROVED
APPROVAL DATE:	September 15, 2017
EXPIRATION DATE:	September 15, 2018
REVIEW TYPE:	Expedited Review

Thank you for your submission of Amendment/Modification materials for this project. The University of Northern Colorado (UNCO) IRB has APPROVED your submission. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on applicable federal regulations.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this committee prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of September 15, 2018.

Please note that all research records must be retained for a minimum of three years after the completion of the project.

If you have any questions, please contact Sherry May at 970-351-1910 or Sherry.May@unco.edu. Please include your project title and reference number in all correspondence with this committee.

APPENDIX B

PARTICIPANT CONSENT FORM

UNIVERSITY of NORTHERN COLORADO

Informed Consent for Participation in Research
University of Northern Colorado
Project Title: Parenting Styles, Computer Games, and Academic Attitudes

Researchers: Akiko Watabe, M. Todd Allen, Ph.D., School of Psychological Sciences
Phone Number: (970) 351 2532
E-mail: akiko.watabe@unco.edu michael.allen@unco.edu

I. THE PURPOSE OF THE STUDY AND HOW LONG IT WILL LAST
The purpose of this study is to understand how personality and perfectionism might influence responding. It is important that you read and understand the information on this form. The results from this study will help us to better understand the differences in responding, as well as how personality and perfectionism responses can influence learning and memory. This study will take about 30 minutes from start to finish.

II. DESCRIPTION OF THE STUDY INCLUDING PROCEDURES TO BE USED
If you agree to volunteer for this study, the following things will happen:

You will first be asked to fill out some questionnaires (STAI, IUS, SPSRQ Multidimensional Perfectionism Scale, and Parental Authority Questionnaire) about how you are feeling (ex. "Are you relaxed", "Are you an organized person", etc.) If you have any concerns or problems with any part of this study, you are encouraged to let the investigator know.

You will participate in one or more short computer "games," in which you will watch what happens on the screen and press a key or click the mouse at appropriate times. These computer tests do not require any special knowledge about using computers.

After that, you will be asked to fill out a final questionnaire to collect information (i.e., age, gender, education level, your parents' income level, GPA), all of which will remain anonymous. These questions will also give you a chance to give feedback about the study. If you have any concerns or problems with any part of this study, you are encouraged to let the investigator know.

III. CONFIDENTIALITY AND VOLUNTARY NATURE OF PARTICIPATION
Your participation in this study is voluntary. At any time, you can stop participating without any penalty. All of the questionnaire data will be stored under an anonymous participant number. Your name and identity will also not be discernable in any written or presented document in this study results.

All learning data will be coded by number and saved on a USB key which will be stored in a locked file cabinet when not being used for analysis. We will **not** store any personal information (i.e. name, etc) with the data collected or with the surveys from this study. All personal information will be kept completely separate from the subject numbers, and kept completely confidential. Only myself and my research assistants/colleagues will have access to the data, which will be kept for three years and any personal information will be destroyed after three years.

IV. EXPECTED RISKS, DISCOMFORTS, OR INCONVENIENCES OF PARTICIPATION IN STUDY

The risk of connecting the coded results with any personal data is minimal because no personal information is being stored with the data. Some discomfort on negative reactions may occur from the items in the questionnaires with person's who have a history of anxiety issues. If you feel uncomfortable with the topics of the questions, you may stop the experiment at any time. You can also contact the UNC Psychological Services Clinic located Mckee Hall Room 248, phone # 970-351-1645. They offer assistance in addressing an array of concerns such as depression, trauma, grief and loss, relational conflict, stress management, anxiety, low self-esteem, eating disorders, drug or alcohol use, couple distress, employment stress, relocation struggles, parenting issues, family conflict, and life transitions.

V. EXPECTED BENEFITS OF THE STUDY

Although you will not directly benefit from being in this study, the knowledge to be gained is helpful for understanding differences in learning between people with different perfectionism characteristics.

I understand that:

1. Results from my participation will be held in strict confidence and that my name will not be used in conjunction with any data derived from this experiment.
2. I may discontinue my participation in this experiment AT ANY TIME I SO DESIRE.
3. The experimenter(s) has/have taken reasonable precautions to protect my safety in this experiment.
4. My signature on this form verifies my consent to participate in this study but does not waive legal or human rights.
5. Participation in this study is only one way to satisfy the research experience requirement for my PSY 120 class and I may, if I choose, select an alternative assignment to being a research participant.
6. Participation for extra credit in other psychology classes is only one way to gain extra credit and I may, if I choose select an alternative assignment to being a research participant.

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions, please sign below if you would like to participate in this research. A copy of this form will be given to you to retain for future reference. If you have any concerns about your selection or treatment as a research participant, please contact the Office of Sponsored Programs, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-2161.

_____

Signature Date

_____

Researcher as Witness Date

APPENDIX C

DEMOGRAHIC QUESTIONNAIRE

Computer Games

Participant Questionnaire

Participant number:_____ Date_____

1) Participant age: _____

2) Ethnicity:

_____Hispanic _____Caucasian
_____African American _____East Asian
_____South Asian _____Other - please specify: _____

3) Gender: _____

4) Years of Education: _____
(For example, High school graduate = 12 years;
2 years of college = 14 years;
4 years of college = 16 years; etc.)

5) GPA: _____
(If you do not have GPA at UNC, please write your high school GPA)

6) Your parents' income level: _____
(For example, above $200,000 = 9;
$199,999-$175,000 = 8;
$174,999-$150,000 = 7;
$149,999-$125,000 = 6;
$124,999-$100,000 = 5;
$99,999-$75,000 = 4;
$74,999-$50,000 = 3;
$49,999-$25,000 = 2;
less than $24,999 =1; etc.)

APPENDIX D

PERFECTIONISM QUESTIONNAIRE

The Frost Scale

***Instructions*: Please circle the option that best reflects your opinion, using the rating system below.**

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

1. My parents set very high standards for me.	1	2	3	4	5
2. Organization is very important to me.	1	2	3	4	5
3. As a child, I was punished for doing things less than perfectly.	1	2	3	4	5
4. 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
5. My parents never tried to understand my mistakes.	1	2	3	4	5
6. It is important to me that I be thoroughly competent in everything I do.	1	2	3	4	5
7. I am a neat person.	1	2	3	4	5
8. I try to be an organized person.	1	2	3	4	5
9. If I fail at work/school, I am a failure as a person.	1	2	3	4	5
10. I should be upset if I make a mistake.	1	2	3	4	5
11. My parents wanted me to be the best at everything.	1	2	3	4	5
12. I set higher goals for myself than most people.	1	2	3	4	5
13. If someone does a task at work/school better than me, then I feel like I failed the whole task.	1	2	3	4	5
14. If I fail partly, it is as bad as being a complete failure.	1	2	3	4	5

15. Only outstanding performance is good enough in my family.	1	2	3	4	5
16. I am very good at focusing my efforts on attaining a goal.	1	2	3	4	5
17. Even when I do something very carefully, I often feel that it is not quite done right.	1	2	3	4	5
18. I hate being less than the best at things.	1	2	3	4	5
19. I have extremely high goals.	1	2	3	4	5
20. My parents have expected excellence from me.	1	2	3	4	5
21. People will probably think less of me if I make a mistake.	1	2	3	4	5
22. I never felt like I could meet my parents' expectations.	1	2	3	4	5
23. If I do not do as well as other people, it means I am an inferior human being.	1	2	3	4	5
24. Other people seem to accept lower standards from themselves than I do.	1	2	3	4	5
25. If I do not do well all the time, people will not respect me.	1	2	3	4	5
26. My parents have always had higher expectations for my future than I have.	1	2	3	4	5
27. I try to be a neat person.	1	2	3	4	5
28. I usually have doubts about the simple everyday things I do.	1	2	3	4	5
29. Neatness is very important to me.	1	2	3	4	5
30. I expect higher performance in my daily tasks than most people.	1	2	3	4	5
31. I am an organized person.	1	2	3	4	5

32. I tend to get behind in my work because I repeat things over and over.	1	2	3	4	5
33. It takes me a long time to do something "right."	1	2	3	4	5
34. The fewer mistakes I make, the more people will like me.	1	2	3	4	5
35. I never felt like I could meet my parents' standards.	1	2	3	4	5

APPENDIX E

PARENTAL AUTHORITY QUESTIONNAIRE

Instructions: Please choose the appropriate response for each item:	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. While I was growing up my mother felt that in a well-run home the children should have their way in the family as often as the parents do.	1	2	3	4	5
2. Even if her children didn't agree with her, my mother felt that it was for our own good if we were forced to conform to what she thought was right.	1	2	3	4	5
3. Whenever my mother told me to do something as I was growing up, she expected me to do it immediately without asking any questions.	1	2	3	4	5
4. As I was growing up, once family policy had been established, my mother discussed the reasoning behind the policy with the children in the family.	1	2	3	4	5
5. My mother has always encouraged verbal give-and-take whenever I have felt that family rules and restrictions were unreasonable.	1	2	3	4	5
6. My mother has always felt that what her children need is to be free to make up their own minds and to do what they want to do, even if this does not agree with what their parents might want.	1	2	3	4	5
7. As I was growing up my mother did not allow me to question any decision she had made.	1	2	3	4	5
8. As I was growing up my mother directed the activities and decisions of the children in the family through reasoning and discipline.	1	2	3	4	5
9. My mother has always felt that more force should be used by parents in order to get their children to behave the way they are supposed to.	1	2	3	4	5
10. As I was growing up my mother did not feel that I needed to obey rules and regulations of behavior simply because someone in authority had established them.	1	2	3	4	5
11. As I was growing up I knew what my mother expected of me in my family, but I also felt free to discuss those expectations with my mother when I felt that they were unreasonable.	1	2	3	4	5
12. My mother felt that wise parents should teach their children early just who is boss in the family.	1	2	3	4	5
13. As I was growing up, my mother seldom gave me expectations and guidelines for my behavior.	1	2	3	4	5

14. Most of the time as I was growing up my mother did what the children in the family wanted when making family decisions.	1	2	3	4	5
15. As the children in my family were growing up, my mother consistently gave us direction and guidance in rational and objective ways.	1	2	3	4	5
16. As I was growing up my mother would get very upset if I tried to disagree with her.	1	2	3	4	5
17. My mother feels that most problems in society would be solved if parents would not restrict their children's activities, decisions, and desires as they are growing up.	1	2	3	4	5
18. As I was growing up my mother let me know what behavior she expected of me, and if I didn't meet those expectations, she punished me.	1	2	3	4	5
19. As I was growing up my mother allowed me to decide most things for myself without a lot of direction from her.	1	2	3	4	5
20. As I was growing up my mother took the children's opinions into consideration when making family decisions, but she would not decide for something simply because the children wanted it.	1	2	3	4	5
21. My mother did not view herself as responsible for directing and guiding my behavior as I was growing up.	1	2	3	4	5
22. My mother had clear standards of behavior for the children in our home as I was growing up, but she was willing to adjust those standards to the needs of each of the individual children in the family.	1	2	3	4	5
23. My mother gave me direction for my behavior and activities as I was growing up and she expected me to follow her direction, but she was always willing to listen to my concerns and to discuss that direction with me.	1	2	3	4	5
24. As I was growing up my mother allowed me to form my own point of view on family matters and she generally allowed me to decide for myself what I was going to do.	1	2	3	4	5
25. My mother has always felt that most problems in society would be solved if we could get parents to strictly and forcibly deal with their children when they don't do what they are supposed to as they are growing up.	1	2	3	4	5
26. As I was growing up my mother often told me exactly what she wanted me to do and how she expected me to do it.	1	2	3	4	5

27. As I was growing up my mother gave me clear direction for my behaviors and activities, but she was also understanding when I disagreed with her.	1	2	3	4	5
28. As I was growing up my mother did not direct the behaviors, activities, and desires of the children in the family.	1	2	3	4	5
29. As I was growing up I knew what my mother expected of me in the family and she insisted that I conform to those expectations simply out of respect for her authority.	1	2	3	4	5
30. As I was growing up, if my mother made a decision in the family that hurt me, she was willing to discuss that decision with me and to admit it if she had made a mistake.	1	2	3	4	5

APPENDIX F

ANXIETY SENSITIVITY QUESTIONNAIRE

SPSRQ

1.	Do you often refrain from doing something because you are afraid of it being illegal?	No	Yes
2.	Does the good prospect of obtaining money motivate you strongly to do some things?	No	Yes
3.	Do you prefer not to ask for something you are not sure you will obtain it?	No	Yes
4.	Are you frequently encouraged to act by the possibility of being valued in your work, in your studies, with your friends or with your family?	No	Yes
5.	Are you often afraid of new or unexpected situations?	No	Yes
6.	Do you often meet people that you find physically attractive?	No	Yes
7.	Is it difficult for you to telephone someone you do not know?	No	Yes
8.	Do you like taking some drugs because of the pleasure you get from them?	No	Yes
9.	Do you often renounce your rights when you know you can avoid a quarrel with a person or an organization?	No	Yes
10.	Do you often do things to be praised?	No	Yes
11.	As a child, were you troubled by punishments at home or in school?	No	Yes
12.	Do you like being the center of attention at a party or a social meeting?	No	Yes
13.	In tasks that you are not prepared for, do you attach great importance to the possibility of failure?	No	Yes
14.	Do you spend a lot of your time on obtaining a good image?	No	Yes
15.	Are you easily discouraged in difficult situations?	No	Yes
16.	Do you need people to show their affection for you all the time?	No	Yes
17.	Are you a shy person?	No	Yes

SRPQ 1

18. When you are with a group, do you try to make your opinions the most intelligent or the funniest?	No	Yes
19. Whenever possible, do you avoid demonstrating your skills for fear of being embarrassed?	No	Yes
20. Do you often take the opportunity to pick up people you find attractive?	No	Yes
21. When you are with a group, do you have difficulties selecting a good topic to talk about?	No	Yes
22. As a child, did you do a lot of things to get people's approval?	No	Yes
23. Is it often difficult for you to fall asleep when you think about things you have done or must do?	No	Yes
24. Does the possibility of social advancement, move you to action, even if this involves not playing fair?	No	Yes
25. Do you think a lot before complaining in a restaurant if your meal is not well prepared?	No	Yes
26. Do you generally give preference to those activities that imply an immediate gain?	No	Yes
27. Would you be bothered if you had to return to a store when you noticed you were given the wrong change?	No	Yes
28. Do you often have trouble resisting the temptation of doing forbidden things?	No	Yes
29. Whenever you can, do you avoid going to unknown places?	No	Yes
30. Do you like to compete and do everything you can do to win?	No	Yes
31. Are you often worried by things you said or did?	No	Yes
32. Is it easy for you to associate tastes and smells to very pleasant events?	No	Yes
33. Would it be difficult for you to ask your boss for a raise (salary increase)?	No	Yes
34. Are there a large number of objects or sensations that remind you of pleasant events?	No	Yes

35. Do you generally avoid speaking in public?	No	Yes
36. When you start to play with a slot machine, is it often difficult for you to stop?	No	Yes
37. Do you, on a regular basis, think that you could do more things if it was not for your insecurity or fear?	No	Yes
38. Do you sometimes do things for quick gains?	No	Yes
39. Comparing yourself to people you know, are you afraid of many things?	No	Yes
40. Does your attention easily stray from your work in the presence of an attractive stranger?	No	Yes
41. Do you often find yourself worrying about things to the extent that performance in intellectual abilities is impaired?	No	Yes
42. Are you interested in money to the point of being able to do risky jobs?	No	Yes
43. Do you often refrain from doing something you like in order not to be rejected or disapproved by others?	No	Yes
44. Do you like to put competitive ingredients in all of your activities?	No	Yes
45. Generally, do you pay more attention to threats than to pleasant events?	No	Yes
46. Would you like to be a socially powerful person?	No	Yes
47. Do you often refrain from doing something because of your fear of being embarrassed?	No	Yes
48. Do you like displaying your physical abilities even though this may involve danger?	No	Yes

APPENDIX G

INTOLERANCE OF UNCERTAINTY SCALE QUESTIONNAIRE

IUS-12

PARTICIPANT #_____Please check the blank for each item that fits how the item describes you.

	Not at all characteristic of me	Not very characteristic of me	Somewhat characteristic of me	Mostly characteristic of me	Entirely characteristic of me
1. Unforeseen events upset me greatly.					
2. It frustrates me not having all the information I need.					
3. One should always look ahead so as to avoid surprises.					
4. A small, unforeseen event can spoil everything, even with the best of planning.					
5. I always want to know what the future has in store for me.					
6. I can't stand being taken by surprise.					
7. I should be able to organize everything in advance.					
8. Uncertainty keeps me from living a full life.					
9. When it's time to act, uncertainty paralyzes me.					
10. When I am uncertain I can't function very well.					
11. The smallest doubt can stop me from acting.					
12. I must get away from all uncertain situations.					

APPENDIX H

STATE TRAIT ANXIETY QUESTIONNAIRE

SELF-EVALUATION QUESTIONNAIRE

Developed by Charles D. Spielberger
in collaboration with
R. L. Gorsuch, R. Lushene, P. R. Vagg, and G. A. Jacobs

STAI Form Y-1

_____ Date _____ S ____

Age _____ Sex: M ____ F ____ T ____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	①	②	③	④
2. I feel secure	①	②	③	④
3. I am tense	①	②	③	④
4. I feel strained	①	②	③	④
5. I feel at ease	①	②	③	④
6. I feel upset	①	②	③	④
7. I am presently worrying over possible misfortunes	①	②	③	④
8. I feel satisfied	①	②	③	④
9. I feel frightened	①	②	③	④
10. I feel comfortable	①	②	③	④
11. I feel self-confident	①	②	③	④
12. I feel nervous	①	②	③	④
13. I am jittery	①	②	③	④
14. I feel indecisive	①	②	③	④
15. I am relaxed	①	②	③	④
16. I feel content	①	②	③	④
17. I am worried	①	②	③	④
18. I feel confused	①	②	③	④
19. I feel steady	①	②	③	④
20. I feel pleasant	①	②	③	④

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SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-2

_____ Date _____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21. I feel pleasant	①	②	③	④
22. I feel nervous and restless	①	②	③	④
23. I feel satisfied with myself	①	②	③	④
24. I wish I could be as happy as others seem to be	①	②	③	④
25. I feel like a failure	①	②	③	④
26. I feel rested	①	②	③	④
27. I am "calm, cool, and collected"	①	②	③	④
28. I feel that difficulties are piling up so that I cannot overcome them	①	②	③	④
29. I worry too much over something that really doesn't matter	①	②	③	④
30. I am happy	①	②	③	④
31. I have disturbing thoughts	①	②	③	④
32. I lack self-confidence	①	②	③	④
33. I feel secure	①	②	③	④
34. I make decisions easily	①	②	③	④
35. I feel inadequate	①	②	③	④
36. I am content	①	②	③	④
37. Some unimportant thought runs through my mind and bothers me	①	②	③	④
38. I take disappointments so keenly that I can't put them out of my mind	①	②	③	④
39. I am a steady person	①	②	③	④
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	①	②	③	④