

Toward A Multilevel Extension and Cross-Cultural Assessment of The 2 × 2 Model of
Perfectionism

Véronique Franche

Thesis submitted to the Faculty of Graduate and Postdoctoral Studies
in partial fulfillment of the requirements
for the Doctorate of Philosophy degree in Clinical Psychology

School of Psychology
Faculty of Social Sciences
University of Ottawa

© Véronique Franche, Ottawa, Canada, 2017

General Abstract

Perfectionistic standards are ubiquitous features conveyed in several aspects of life. Although some aspects of perfectionism may be beneficial to promote achievement, continuously targeting perfection and flawlessness has been shown to impede on one's psychological adjustment, motivation, and self-regulation (Hewitt & Flett, 1991). Essentially, there still exists no consensus among researchers to identify whether perfectionism—or at least, some facets of perfectionism—is likely to promote or undermine positive outcomes (e.g., Gotwals, Stoeber, Dunn, & Stoll, 2012). The 2×2 model of perfectionism (Gaudreau, 2012; Gaudreau & Thompson, 2010) is a welcome addition for researchers studying perfectionism because it proposes an open-ended theoretical system in which novel hypotheses are amenable to empirical scrutiny, thus offering leeway for researchers to theorize and reinterpret those past mixed findings. The overarching goal of this dissertation was to address some of the gaps of the perfectionism literature in order to better understand under which circumstances perfectionistic standards are useful to foster achievement without thwarting psychological adjustment. Accordingly, the current dissertation used the 2×2 model of perfectionism as theoretical framework to propose four original studies regrouped under three articles. In *Article 1*, we aimed at providing a multilevel extension of the 2×2 model in order to better understand how the relationships between subtypes of perfectionism and indicators of positive and negative psychological adjustment may vary according to the level of analysis that is being studied. In other words, in this study, we examined the within-person relationships between subtypes of perfectionism and psychological adjustment (i.e., accounting for the fact that these relationships may vary within each person from one life domain to another) in complement to the between-person relationships (i.e., accounting for individual differences across people). A sample of 338 undergraduate students completed measures of perfectionism,

vitality, goal progress, affect, and stress for each life domain in which they reported being invested. Preliminary analyses of multilevel confirmatory factor analysis supported the multilevel factorial structure of our measure. Furthermore, results of multilevel regressions with random coefficient supported most hypotheses of the model with positively-, but not negatively-worded outcomes, deserving further discussion. In an attempt to better understand these unexpected yet interesting findings, *Article 2* aimed at extending the findings of *Article 1* by examining the multilevel associations between subtypes of perfectionism and coping strategies of undergraduate students. Two studies were conducted to examine the between- and within-person relationships respectively. Accordingly, 332 undergraduate students completed measures to assess their dispositional perfectionism and coping tendencies in Study 1 (i.e., between-person). In Study 2, 203 undergraduate students completed repeated measures of perfectionism and coping for each life domain in which they reported being invested (i.e., within-person). Results of multiple regressions from Study 1 (i.e., between-person) showed similar findings than those obtained in past research with task- and disengagement-oriented coping, and support of all four hypotheses was obtained with relative coping (i.e., proportion of task-oriented compared to one's overall coping). Results of multilevel regressions with random coefficient from Study 2 (i.e., within-person) provided support for all hypotheses with disengagement-oriented coping, two hypotheses with task-oriented coping, and three hypotheses with relative coping. Finally, in *Article 3*, we aimed at identifying the potential role of moderators in the 2×2 model of perfectionism, particularly the role of sociocultural identity. A sample of 697 undergraduate students (538 Euro Canadians and 159 Asian Canadians) completed measures aimed at assessing perfectionism and indicators of school achievement (i.e., satisfaction and grade-point average). Preliminary multi-group confirmatory factor analyses with invariance testing supported the

factorial structure of our measure across both samples, thus rendering the measure equivalent across both sociocultural groups. Furthermore, results provided support for our *socially prescribed perfectionism as a cultural makeup hypothesis*, suggesting that Asian Canadians with a subtype of mixed perfectionism (i.e., high self-oriented and high socially prescribed perfectionism)—in contrast to their Euro Canadians counterparts—were able to reach both the achievement and satisfaction targets known to play an important part in the positive academic experience of students. Overall, the current dissertation bears significant theoretical implications by providing further validation of the 2×2 model of perfectionism, as well as supporting a multilevel and cross-cultural extension. It also holds methodological contributions by supporting the factorial invariance of the short-*Multidimensional Perfectionism Scale* across levels of analysis and sociocultural groups. Furthermore, this dissertation involves practical implications for clinical psychologists by underlining the need to compare clients to their own average across significant domains of their life (e.g., to monitor their progress or areas of concern) along to the normative standards designed to compare them with individuals (e.g., to monitor their levels in comparison to the population).

Acknowledgments

Tout d'abord, j'aimerais remercier mon superviseur de thèse, Patrick, pour le précieux temps que tu as mis à me fournir de la rétroaction constructive afin de me former comme jeune chercheure. Mon travail de recherche ne serait pas d'une qualité aussi exemplaire si ce n'était de tes efforts à soutenir notre autonomie et nous offrir des opportunités de développer notre plein potentiel. Merci de la confiance que tu m'as accordée, de ton écoute et de tes encouragements tant dans le cadre de mes accomplissements professionnels que personnels.

Merci à tous mes collègues de laboratoire pour votre feedback sur mes travaux de recherche, temps à échanger et discuter et votre compagnie lors des congrès. À mes collègues de cohorte clinique, merci de votre soutien et amitié. Votre présence a clairement enrichi mon expérience générale du doctorat.

Merci aux membres de mon comité de thèse, Silvia, Marie-France, Tracy et Frédéric. Votre rétroaction a grandement contribué à l'enrichissement et approfondissement de ma thèse doctorale. Merci du temps que vous avez dédié à me formuler de la rétroaction spécifique pour alimenter la discussion lors de la soutenance de ma thèse.

Enfin, un énorme merci à mon conjoint, René, de m'avoir accompagné tout au long de ce chapitre de ma vie. Merci de ton écoute passionnée, de ton soutien et encouragement inconditionnel. Et tout spécialement, le plus gros des mercis à mes petits boys, Tomas et Theo, pour la drive que vous m'avez donnée, votre patience et surtout, pour m'avoir montré à quel point la conciliation travail-famille est la plus belle chose qui soit.

Statement of Co-Authorship

All of the articles included in this dissertation were prepared in collaboration with my thesis advisor, Dr. Patrick Gaudreau, who contributed as second author in all of them. The first article « Integrating Dispositional Perfectionism and Within-Person Variations of Perfectionism across Life Domains into a Multilevel Extension of the 2×2 Model of Perfectionism » was published in *Personality and Individual Differences* in January 2016. The second article « A Multilevel Investigation of the 2×2 Model of Perfectionism: Relation Between Subtypes of Perfectionism and Coping at the Between-Person and Within-Person Levels of Analysis » was prepared in collaboration with Kristina Kljajic, current doctoral student in experimental psychology at the University of Ottawa. Her role in this article was to conduct the analyses of Study 1 and contribute to the revisions of the manuscript. The third article « The 2×2 Model of Perfectionism : A Comparison Across Asian Canadians and European Canadians » was published in *Journal of Counseling Psychology* in October 2012. This article was prepared in collaboration with Dr. Dave Miranda, associate professor at the University of Ottawa, who assisted us in the elaboration of the cross-cultural rationale and revision of the manuscript.

As first author in all three articles, my role consisted of developing the studies and conceptualizing the research questions, reviewing the literature, preparing and submitting the ethical applications, setting up the studies online and collecting data, managing and preparing the databases for analyses, conducting most of the analyses, writing the articles, and revising them as they underwent the publication process. As second author in all three articles, my thesis advisor Dr. Gaudreau provided me with guidance in developing the studies and considering the potential ethical issues, elaborating the research questions and theoretical rationales, teaching me some of the analyses, and revising and providing me with feedback on earlier versions of the manuscripts.

Table of Contents

General Abstract	ii
Acknowledgments	v
Statement of Co-Authorship	vi
List of Tables	x
List of Figures	xi
List of Appendices	xii
<u>CHAPTER 1 : Statement of the Problem</u>	<u>1</u>
<u>CHAPTER 2: Overview of Key Issues in the Perfectionism Literature</u>	<u>6</u>
What is perfectionism?	6
Higher-Order Dimensions of Perfectionism	8
Evaluative Concerns Perfectionism	8
Personal Standards Perfectionism	9
Addressing Controversy: The 2 × 2 Model of Dispositional Perfectionism	11
Assumptions of the 2 × 2 Model	13
Four Subtypes of Perfectionism and Four Hypotheses	16
Reviewing Findings from Past Research	19
Toward A Multilevel Extension and Cross-Cultural Assessment of the 2 × 2 Model of Perfectionism	27
Perfectionism as a Multilevel Construct	30
Multilevel Perfectionism and Coping	35
Exploring Moderators: The Socio-Cultural Heritage	36
The Present Dissertation	39
<u>CHAPTER 3 : Integrating Dispositional Perfectionism and Within-Person Variations of Perfectionism across Life Domains into a Multilevel Extension of the 2 × 2 Model of Perfectionism</u>	<u>51</u>
Abstract	52
Toward a Multilevel Extension of the 2 × 2 Model of Perfectionism	54
The Present Study	56
Method	56
Participants and Design	57
Measures	57
Results	58
Preliminary Analyses	58
Plan of Analyses	59
Main Analyses	60
Discussion	62
A Multilevel Extension of the 2 × 2 Model of Perfectionism	62
Limitations and Future Directions	64
Conclusion	64
Footnote	65
References	66

CHAPTER 4 : A Multilevel Investigation of the 2 × 2 Model of Perfectionism: Relation Between Subtypes of Perfectionism and Coping at the Between-Person and Within-Person Levels of Analysis	73
Abstract	74
The 2 × 2 Model of Perfectionism and a Multilevel Extension	75
Perfectionism and Coping	77
The Present Studies	80
Study 1	80
Method	82
<i>Participants and Design</i>	82
<i>Measures</i>	82
Results	83
<i>Task-oriented coping</i>	83
<i>Disengagement-oriented coping</i>	83
<i>Relative coping</i>	84
Brief Discussion	84
Study 2	85
Method	86
<i>Participants and Design</i>	86
<i>Measures</i>	87
Results	87
<i>Task-oriented coping</i>	88
<i>Disengagement-oriented coping</i>	88
<i>Relative coping</i>	89
Brief Discussion	90
General Discussion	91
Moving Beyond the Dimensions Themselves: The Implications of Relative Coping	92
Limitations and Future Directions	94
Conclusion	96
References	97
CHAPTER 5 : The 2 × 2 Model of Perfectionism: A Comparison Across Asian Canadians and European Canadians	105
Abstract	106
Four Subtypes of Perfectionism	107
Perfectionism among Asian Americans	109
The Present Study	110
Method	112
Participants and Design	112
Measures	113
Results	114
Measurement Invariance of Perfectionism	114
Main Analyses	115
Discussion	119
Measuring Perfectionism in a Cross-Cultural Context	119
The 2 × 2 Model in a Cross-Cultural Context	120

Limitations and Conclusion	122
References	124
Supplemental Material	131
Measurement Invariance of Perfectionism	131
Measurement Model of Academic Satisfaction	132
Multiple Group Latent Moderation Structural Models	133
Complementary Analyses of Reversed Academic Dissatisfaction	134
CHAPTER 6: General Discussion of Dissertation	139
Key Findings and Contributions from <i>Article 1: A Multilevel Extension of the 2 × 2 Model of Perfectionism</i>	141
Key Findings from <i>Article 2: Multilevel Perfectionism and Coping</i>	145
Key Findings and Contributions from <i>Article 3: A Cross-Cultural Assessment of the 2 × 2 Model</i>	147
Limitations and Future Research Directions	150
Population	150
Measures	153
Design	156
Retrospective Coping Bias	157
Consistency Motif Bias	158
Negative Affectivity Bias	160
Implications of Dissertation for Research	161
Theoretical Implications: Supporting an Open-Ended Theoretical Formulation of the 2 × 2 Model of Perfectionism	161
Methodological Implications	163
Practical Implications	167
Conclusion	170
References (Chapters 1, 2, and 6)	172
Appendices	188

List of Tables

CHAPTER 2: General Introduction to Dissertation

Table 1 : Literature Review on the 2×2 Model of Dispositional Perfectionism	41
--	----

CHAPTER 3, ARTICLE 1: Integrating Dispositional Perfectionism and Within-Person Variations of Perfectionism across Life Domains into a Multilevel Extension of the 2×2 Model of Perfectionism

Table 1 : Results of Multilevel Modeling	70
Table 2 : Predicted Values and Cohen's <i>d</i> Effect Sizes of Hypotheses	71
Table 3 (Supplemental Material) : Descriptive Statistics and Correlations	72

CHAPTER 4, ARTICLE 2: A Multilevel Investigation of the 2×2 Model of Perfectionism: Relation Between Subtypes of Perfectionism and Coping at the Between-Person and Within-Person Levels of Analysis

Table 1 : Results of Multiple Regressions (Study 1) and Multilevel Analyses (Study 2)	101
Table 2 : Predicted Values and Cohen's <i>d</i> Effect Sizes of the Four Hypotheses of the 2×2 Model of Perfectionism	102

CHAPTER 5, ARTICLE 3: The 2×2 Model of Perfectionism: A Comparison Across Asian Canadians and European Canadians

Table 1 : Inter-Correlations and Descriptive Statistics	128
Table A1 (Supplemental Material) : MPlus Input Codes for the Multiple Group LMS Model with the SOP, SPP, and SOPXSPP Effects Freely Estimated in Each Group	135
Table A2 (Supplemental Material) : MPlus Input Codes for the Multiple Group LMS Model with the SOP, SPP, and SOPXSPP Effects Constrained to Equality Across Groups	137
Table A3 (Supplemental Material) : Predicted Values of Reversed Academic Dissatisfaction for the Four Subtypes of Perfectionism in Asian Canadian and European Canadian Samples	138

CHAPTER 6: General Discussion of Dissertation

Table 1: Summary of Findings Across the Three Articles of the Dissertation	140
--	-----

List of Figures

CHAPTER 2: General Introduction to Dissertation

- Figure 1 : An integrated measurement model of perfectionism (reproduced from DiBartolo & Rendon, 2012) 47
- Figure 2 : The Tripartite Model of Perfectionism (reproduced from Stoeber & Otto, 2006) 48
- Figure 3 : The 2×2 Model of Dispositional Perfectionism (reproduced from Gaudreau & Thompson, 2010) 49
- Figure 4 : Relationship between X and Y at the within-person (i.e., fine lines) and between-person (i.e., bold line) levels of analysis. At the within-person level of analysis, relationships between X and Y are positive 50

CHAPTER 4, ARTICLE 2: A Multilevel Investigation of the 2×2 Model of Perfectionism: Relation Between Subtypes of Perfectionism and Coping at the Between-Person and Within-Person Levels of Analysis

- Figure 1 : Predicted Values of Task-Oriented (panel A), Disengagement-Oriented (panel B), and Relative (panel C) Coping Across the Four Subtypes of Perfectionism at the Between-Person Level of Analysis (Study 1) 103
- Figure 2 : Predicted Values of Task-Oriented (panel A), Disengagement-Oriented (panel B), and Relative (panel C) Coping Across the Four Subtypes of Perfectionism at the Within-Person Level of Analysis (Study 2) 104

CHAPTER 5, ARTICLE 3: The 2×2 Model of Perfectionism: A Comparison Across Asian Canadians and European Canadians

- Figure 1: Results of Simple Slope Analyses Between Subtypes of Perfectionism Among Asian and European Canadians 129
- Figure 2 : Predicted Values of Academic Satisfaction Among Asian Canadians Across the Four Subtypes of Perfectionism 129
- Figure 3 : Predicted Values of Academic Satisfaction Among European Candians Across the Four Subtypes of Perfectionism 130

List of Appendices

CHAPTER 3, ARTICLE 1: Integrating Dispositional Perfectionism and Within-Person Variations of Perfectionism across Life Domains into a Multilevel Extension of the 2 × 2 Model of Perfectionism

Appendix A: Results of Multilevel Confirmatory Factor Analysis	188
Appendix B: Figures of the Predicted Values of Multilevel Modeling across the four subtypes of perfectionism	191
Figure 1: Predicted values of within- (panel A) and between-person (panel B) vitality across the four subtypes of perfectionism	191
Figure 2: Predicted values of within- (panel A) and between-person (panel B) goal progress across the four subtypes of perfectionism	191
Figure 3: Predicted values of within- (panel A) and between-person (panel B) positive affect across the four subtypes of perfectionism	192
Figure 4: Predicted values of within- (panel A) and between-person (panel B) negative affect across the four subtypes of perfectionism	192
Figure 5 : Predicted values of within- (panel A) and between-person (panel B) stress across the four subtypes of perfectionism	193
Appendix C: Questionnaire From Article 1	194
Appendix D: Questionnaire From Article 2	202
Appendix E: Questionnaire From Article 3	207
Appendix F: Research Ethics Board Approval	209
Article 1 & Article 2, Study 2	209
Article 2, Study 1	213
Article 3	217

CHAPTER 1: Statement of the Problem

The quest for perfection is an increasingly challenging issue that is reinforced in the modern society. In fact, perfectionism—a multidimensional personality disposition represented by a tendency to strive for perfection and to evaluate, judge, and define oneself according to these exceedingly high standards of excellence and flawlessness (Hewitt & Flett, 1991)—seems to be a key feature to successful careers in achievement-related settings. Perfectionism has come to be admired as a gauge of excellence sought by policy makers of various settings (i.e., competitive sports, post-secondary education, governmental funding agencies) in order to identify and recruit the best athletes, graduate students, and/or beneficiaries of grants and scholarships. The 2008 Summer Olympic Games in Beijing, China substantiated how consequential perfectionism might be on achievement, with Chinese excelling in every aspect and winning a total of 100 Olympic medals, of which more than half were of gold (i.e., 51 Gold, 21 Silver, 28 Bronze). Perfectionism appears to be a very promising quality to reach victory and notoriety among one's peers.

Nonetheless, continuously targeting outstandingly high standards and flawlessness has been considered by many researchers as a vulnerability factor likely to hinder optimal functioning. In fact, striving toward being perfect and flourishing in all areas has been shown to engender considerable stress and increased risks of psychopathology, including depression, anxiety, eating disorders, and suicidal ideations (Flett & Hewitt, 2002). Given the equivocal implications of perfectionism, or what some researchers might refer to as a “double-edge sword” (Stoeber, 2014), it is important to depict under which circumstances perfectionism might be useful and under which it might be damaging, which will enable researchers, practitioners, and counselors to better understand perfectionism in order to tailor effective interventions.

Perfectionism entails two central features/facets: to pursue perfectionistic standards

according to the *perceived pressure exerted by significant others* (i.e., socially prescribed perfectionism) on the one hand, and to pursue perfectionistic standards for the *personal importance* (i.e., self-oriented perfectionism) on the other hand. Although researchers have consistently outlined socially prescribed perfectionism as a vulnerability factor likely to hinder psychological adjustment, results are still equivocal regarding the influence of self-oriented perfectionism (see Gotwals et al., 2012 for a review). There seems to be a gap in the literature to better understand how self-oriented perfectionism may lead to positive consequences in certain circumstances, but also to negative consequences in other occurrences. Recently, the 2×2 model of perfectionism (Gaudreau, 2012; Gaudreau & Thompson, 2010) has been formulated to propose novel hypotheses to better understand these seemingly contradicting findings by proposing to distinguish four subtypes of perfectionism, derived from the within-person combinations of self-oriented and socially prescribed perfectionism. Hence, the model proposes that pure self-oriented perfectionism (i.e., high self-oriented and low socially prescribed), pure socially prescribed perfectionism (i.e., low self-oriented and high socially prescribed), mixed (i.e., high self-oriented and high socially prescribed), and non-perfectionism (i.e., low self-oriented and low socially prescribed) should each relate differentially to outcomes. The model has received mounting empirical support across 14 studies in various contexts. However, more research is needed to understand why results are varying across studies. Hence, one of the purpose of this dissertation was to review the studies conducted thus far using the 2×2 model of perfectionism in order to identify potential gaps to be filled for the development of the model, but also for the study of perfectionism in general. *Chapter 2* will thus present an overview of the 2×2 model of perfectionism, along with a review and analysis of the studies conducted so far using this theoretical framework.

One of the current limitations in the perfectionism literature is that perfectionism is generally conceptualized as a *dispositional* personality trait, thus assuming that one's perfectionism remains relatively stable over time, contexts, and situations of their life. However, some research has recently shown that personality is likely to fluctuate and be expressed differently across life contexts. Hence, it is possible for individuals to be perfectionistic in certain areas of their life, without being perfectionistic in general. For example, university students may pursue high standards of perfection in their schoolwork while showing very low levels of perfectionism across the remaining domains in which they are involved (e.g., relationships, job). Nonetheless, research has yet to integrate these *domain-specific/contextualized fluctuations* (i.e., intra-individual variations) of perfectionism with the study of dispositional perfectionism (i.e., individual differences). Examining these complementary approaches is important to examine the specificities and generalities of findings obtained so far across several life domains. Furthermore, this line of research is clinically significant in order to target specific domains in which to intervene. Hence, a first goal of this dissertation was to propose a *multilevel* extension of the 2×2 model of perfectionism by proposing to complement the study of dispositional perfectionism (i.e., examining individual differences) with the study of contextualized perfectionism (i.e., examining intra-individual differences across life domains).

Likewise, university students are faced with numerous stressors and challenges with which they are required to cope; one of them being to learn to conciliate the various life domains in which they are actively engaged (Hurst, Baranik, & Daniel, 2013). Whereas their personal goals are likely to vary from one life domain to another, university students may favor different coping strategies to cope with the specific demands of their life domains. In fact, research has demonstrated that perfectionism may influence the coping strategies being used by students (e.g.,

Dunkley, Mandel, & Ma, 2014). Nonetheless, research conducted so far has mainly focused on examining the individual differences in these relationships although university students' coping skills are even more likely than perfectionism to fluctuate according to contexts. Examining the contextualized and dispositional relationships between perfectionism and coping is another area of research that is likely to offer valuable answers to better understand the mixed findings obtained so far. A second goal of this dissertation was to support a multilevel extension of the 2×2 model of perfectionism, this time using an outcome of coping rather than psychological adjustment.

Another limitation in the perfectionism research is the lack of studies examining socio-cultural differences in perfectionism. Most research has been conducted among samples of White/Caucasian Americans. Nonetheless, one's sociocultural background is very likely to influence their perfectionism, as cultural background is a pivotal factor involved in the development of one's personality and identity (Heine, Lehman, Markus, & Kitayama, 1999). Sociocultural background may thus influence the strength and direction of the relationships between perfectionism and important academic outcomes such as psychological adjustment and achievement (DiBartolo & Rendon, 2012). Future research is needed to examine the role of sociocultural background in order to identify potential specificities and generalities associated with individuals' cultural identity. A third goal of this dissertation was to propose a cross-cultural assessment of the 2×2 model of perfectionism by examining the moderating role of sociocultural background of Asian Canadians and Euro Canadians in the relationship between perfectionism subtypes and academic adjustment.

Overall, the present dissertation proposed four original studies regrouped into three articles in order to fill these aforementioned gaps and further our understanding of perfectionism.

In *Article 1*, we proposed a *multilevel extension* of the 2×2 model in order to reconcile the study of perfectionism as a within-person personality trait likely to fluctuate across contexts, along with the long-standing tradition of conceptualizing perfectionism as a dispositional/trait-like personality trait. In *Article 2*, we aimed at further supporting this multilevel extension by examining the multilevel associations between subtypes of perfectionism and coping strategies of university students. Finally, in *Article 3*, we targeted the identification of potential moderators in the 2×2 model by proposing the role of sociocultural background as a moderator of the relationships between subtypes of perfectionism and school adjustment. A general discussion will follow in *Chapter 6* in which the theoretical, methodological, and practical implications of these studies will be discussed, along with their limitations and ideas for future research directions.

CHAPTER 2: Overview of Key Issues in the Perfectionism Literature

What is perfectionism?

Perfectionism is a multidimensional personality disposition (e.g., Hewitt et al., 2002) that represents a tendency to strive for perfection and to evaluate, judge, and define oneself according to outstandingly high standards of excellence and flawlessness. Research in perfectionism has remained sparse and limited until the early 1990s. In fact, the dissemination of two seminal articles published around the same time in the early 1990s propelled the research in perfectionism. These articles proposed to integrate past research on perfectionism in order to propose two competing models for conceptualizing perfectionism. On the one hand, Frost, Marten, Lahart, and Rosenblate (1990) proposed six distinct facets of perfectionism to portray both the positive influence that perfectionism may have on achievement strivings and performance, along to the negative associations having been reported between perfectionism and several indicators of psychological adjustment: (1) high personal standards; (2) preference for order and organization; (3) excessive concern over mistakes; (4) perception of high parental expectations; (5) perception of high parental criticisms; and (6) doubts about the quality of one's actions. High personal standards and a preference for order and organization represent the positive facets of perfectionism. High *personal standards* involves the importance of setting very high goals and standards for oneself and critically evaluating oneself according to the attainment of these goals and standards. The *order and organization* dimension includes the emphasis placed on order, organization, and neatness (i.e., the perception that things need to be placed at the right place). Both of these facets have been linked with positive outcomes for one's achievement strivings (Frost et al., 1990). The remaining four facets of perfectionism constitute the negative facets of perfectionism. Excessive *concern over mistakes* involves the fear of

committing mistakes, as they equate failure. It represents the perception that mistakes are harmful to oneself and may result in the loss of respect or acceptance from significant others. High *parental expectations* include the belief that one's parents hold very high standards toward them and that their love and approval is contingent upon the realization of these standards. Similarly, high *parental criticisms* are the perception that parents will overly criticize oneself for not achieving their high standards of excellence. It also involves the feeling that one can never reach the standards and goals that one's parents have set for them. Finally, *doubts about actions* consist of continuously doubting and being uncertain about one's actions or quality of their work. It is also characterized about the feeling of not being entirely satisfied with completed tasks. These four facets have been shown to foster negative psychological outcomes (Frost et al., 1990). The main contribution of Frost et al. (1990) has been to demonstrate that perfectionism is a multidimensional construct that can be organized into several facets. Furthermore, their findings also supported the idea that perfectionism may encompass positive as well as negative characteristics for promoting psychological adjustment.

On the other hand, the findings of Hewitt and Flett (1991) proposed a conceptualization of perfectionism originating from both the *personal* (i.e., intra-individual) and *social* (i.e., interpersonal) components. Hence, they proposed that perfectionism could be organized into the self-oriented and socially prescribed facets. *Self-oriented perfectionism* is defined by the self-directed setting of outstandingly high standards of perfection and self-improvement. It is also characterized by the desire to avoid mistakes and the evaluation of oneself according to these standards (Hewitt & Flett, 1991). Furthermore, *socially prescribed perfectionism* entails the perception that significant others hold unrealistic standards for oneself, put pressure on them to achieve these standards, and evaluate them according to these standards (Hewitt & Flett, 1991).

While the main contribution of their findings has been the demonstration that perfectionism may stem from both *personal* and *social* motivation (i.e., pursuing high standards for oneself vs. significant others), their dimensions also tap the perception of controllability (i.e., self-settled vs. prescribed pressure).

Higher-Order Dimensions of Perfectionism

Frost et al. (1990) and Hewitt and Flett (1991) proposed two distinct models of perfectionism, but their findings should be seen as providing complementary rather than competing information to guide future research in perfectionism. Their findings highlighted the characteristics/facets of perfectionistic behaviour as well as their motivational source.

Researchers have aimed at integrating the findings from these seminal streams of research in order to propose two higher-order dimensions of perfectionism, encompassing the various facets of perfectionism proposed by Frost et al. (1990) and Hewitt and Flett (1991) (see Figure 1): (1) evaluative concerns perfectionism and (2) personal standards perfectionism. Such dimensions have taken various synonymous labels over the years such as neurotic vs. normal (Hamachek, 1978; Pearson & Gleaves, 2006), negative vs. positive (Slade & Owens, 1998; Terry-Short, Owens, Slade, & Dewey, 1995), unhealthy vs. healthy (Stoeber & Otto, 2006), or maladaptive vs. adaptive (Rice & Ashby, 2007; Rice, Kubal, & Preusser, 2004).

Evaluative concerns perfectionism. The first higher-order dimension of perfectionism is labeled *evaluative concerns perfectionism*. It represents a tendency to critically *evaluate* oneself and anticipate social criticisms and expectations according to these standards (Dunkley, Blankstein, Masheb, & Grilo, 2006). Evaluative concerns perfectionism is described by constant concerns over perfection (i.e., concerns over mistakes, doubts about actions) and over apprehensions of perfectionism that significant others might hold for oneself (i.e., parental

criticisms, parental expectations). It thus entails socially prescribed perfectionism (SPP), a perfectionism facet represented by the desire to reach perfection because of the actual and/or perceived pressure exerted by significant others and to believe that one's acceptance is contingent upon the attainment of desirable outcomes (Hewitt & Flett, 1991). Accordingly, socially prescribed perfectionism entails the social (i.e., interpersonal) component of perfectionism and can be taken as a cardinal feature of evaluative concerns perfectionism. Being overly concerned about striving for perfectionistic standards that significant others may hold toward oneself has been shown to foster psychological maladjustment, as evidenced with outcomes such as anxiety (e.g., Stoeber, Feast, & Hayward, 2009), depression (e.g., Flett, Madorsky, Hewitt, & Heisel, 2002; R. C. O'Connor, Rasmussen, & Hawton, 2010), low self-esteem (e.g., Besser, Flett, Hewitt, & Guez, 2008), suicidal tendencies and hopelessness (see D. B. O'Connor, 2007 for a review), eating disorders (see Franco-Paredes, Mancilla-Diaz, Vazquez-Arévalo, Lopez-Aguilar, & Alvarez-Rayon, 2005 for a review), and obsessive-compulsive symptomatology (e.g., Yorulmaz, Karanci, & Tekok-Kilic, 2006).

Personal standards perfectionism. The second higher-order dimension of perfectionism is labeled *personal standards perfectionism*. It encompasses the *importance* of holding high personal goals and standards of perfection. Personal standards perfectionism is characterized by the pursuit of perfectionism in order to attain goals and standards that have personal valuation (personal standards), while doing so with extreme organization. It thus entails the self directed facet of perfectionism (i.e., self-oriented perfectionism), which is defined by the striving toward exceedingly high standards of achievement and the evaluation of oneself according to the attainment of these personal self-settled endeavors of excellence (Hewitt & Flett, 1991). Self-oriented perfectionism (SOP) encompasses the self (i.e., intrapersonal) component of

perfectionism and is a cardinal feature of personal strivings perfectionism. Striving to achieve high self-oriented standards of perfectionism has been the object of debate among numerous researchers across the past decades (see Stoeber & Otto, 2006 for a review), which remains controversial even to date. Accordingly, researchers have reported seemingly mixed findings proposing positive, neutral, or negative associations between self-oriented perfectionism and psychological adjustment (see Gotwals et al., 2012 for a review). This limitation is important because it entails that under some conditions, self-oriented perfectionism may be beneficial or detrimental to one's psychological functioning. Further understanding the mechanisms or circumstances leading self-oriented perfectionism to positive or negative outcomes would hold significant implications for the research on perfectionism. Some researchers (e.g., Stoeber & Otto, 2006) posit that self-oriented perfectionism should be associated positively with indicators of psychological adjustment and achievement, as evidenced by the growing number of studies supporting the associations between SOP and performance (e.g., Mills & Blankstein, 2000; Witcher, Alexander, Onwuebuze, Collins, & Witcher, 2007), well-being (e.g., Molnar, Reker, Culp, Sadava, & DeCourville, 2006; Verner-Filion & Gaudreau, 2010), and school motivation (e.g., Miquelon, Vallerand, Grouzet, & Cardinal, 2005). Conversely, a few researchers (e.g., Bieling, Israeli, & Antony, 2004) have also conveyed the idea that self-oriented perfectionism holds a neutral, or somewhat null effect, on psychological adjustment. Other researchers (e.g., Hewitt & Flett, 1991) have strongly argued that self-oriented perfectionism should lead to psychological maladjustment and lower levels of achievement. Many researchers who advocate for this viewpoint have lent strong support, as evidenced by the numerous studies demonstrating that self-oriented perfectionism was positively related to indicators of depression and anxiety (e.g., Dunkley, Zuroff, & Blankstein, 2003; Hewitt et al., 2002), anorexia (e.g., Brannan &

Petrie, 2008), and obsessive-compulsive symptomatology (e.g., Yorulmaz et al., 2006). Although this debate represents an ongoing limitation for the study of perfectionism, very few researchers have proposed valuable hypotheses, ideas, or research directions to fulfill this gap.

Understanding the conditions (i.e., moderators) and mechanisms (i.e., mediators) under which self-oriented perfectionism may lead to positive rather than negative outcomes is important for research on perfectionism to better tailor preventive programs.

Addressing Controversy: The 2 × 2 Model of Dispositional Perfectionism

In an attempt to reorient this debate and better understand these equivocal results, some researchers have sought to explore new ways of conceptualizing perfectionism. One such way was to propose the existence of “subtypes of perfectionism” based on the core dimensions of perfectionism. Subtypes of perfectionism thus underline the assumption that dimensions of perfectionism may coexist and be differentially organized within individuals. They represent within-person combinations of perfectionism facets or dimensions, which remains consistent with the multidimensional nature of perfectionism (Frost et al., 1990; Hewitt & Flett, 1991). Introducing subtypes of perfectionism offers a promising solution by moving beyond the dimensions or facets themselves and proposing a model that would attempt to offer an integrative platform that could help explain the mixed findings reported thus far. Accordingly, revising the concept of perfectionism in terms of subtypes is pivotal in attempting to explain *why* SOP may be associated with such contradictory findings.

Two models have been proposed to organize dimensions of perfectionism into subtypes of perfectionism. The tripartite model (Rice & Slaney, 2002; Stoeber & Otto, 2006) proposed three subtypes of perfectionism portraying the healthy, unhealthy, and neutral (non-perfectionism) subtypes of perfectionism (see Figure 2 for an illustration of the model). In this

model, *healthy perfectionism* was defined as holding high perfectionistic strivings (i.e., high personal standards perfectionism) and low perfectionistic concerns (i.e., low evaluative concerns perfectionism) whereas *unhealthy perfectionism* was described as a tendency to embrace high levels of both strivings (i.e., high personal standards perfectionism) and concerns (i.e., high evaluative concerns perfectionism). In this model, the combined effect of both dimensions of perfectionism was thus considered maladaptive. Furthermore, *non-perfectionism* represented a subtype in which individuals displayed low levels of perfectionistic strivings (i.e., low personal strivings perfectionism). Whereas the main contribution of the tripartite model was to propose that both dimensions of perfectionism might coexist to a different degree within individuals, the model comprises several limitations. As such, the tripartite model proposes subtypes of perfectionism based upon their levels on each dimension, but does not account for a subtype of perfectionism in which individuals would hold high perfectionistic concerns (i.e., high evaluative concerns perfectionism) while pursuing low strivings of perfectionism (i.e., low personal standards perfectionism). In fact, regrouping such a subtype under the umbrella of non-perfectionism is conceptually flawed (Stoeber, 2014). Differentiating such a profile of perfectionism from non-perfectionism would enable researchers to fully capture the specificities that may be accountable with it. Furthermore, uses of labels proposed by these researchers circumvent future researchers to examine hypotheses that may not be aligned with the labeled subtypes. For example, healthy perfectionism (high personal standards/low evaluative concerns) should presumably lead to positive consequences, whereas unhealthy perfectionism (high personal standards/high evaluative concerns) should automatically be associated with negative ones. This limitation prevents researchers to revisit the mixed findings observed so far in the literature.

More recently, *the 2 × 2 model of dispositional perfectionism* (Gaudreau, 2012; Gaudreau & Thompson, 2010) proposed an open-ended theoretical system comprised of four novel and testable hypotheses to better integrate and interpret past findings. Offering such a model seemed like a more promising way to reinterpret past findings, as it allowed researchers more flexibility to explore the mechanisms or processes (i.e., mediators) and conditions (i.e., moderators) associated with perfectionism subtypes to further enrich the understanding of multidimensional perfectionism. The main difference between the two models is that the 2 × 2 model proposes four subtypes derived upon the within-person combinations of personal standards and evaluative concerns perfectionism. Furthermore, the 2 × 2 model of perfectionism used neutral labels of perfectionism subtypes to encourage researchers to revisit and formulate hypotheses. These distinctions are important to further understand and explore the antecedents, processes, and consequences associated with each subtype, which might contribute to further our understanding of the mixed findings.

Assumptions of the 2 × 2 Model

The 2 × 2 model is built upon seven main assumptions (Gaudreau, 2013; Gaudreau & Verner-Filion, 2012). First, research on perfectionism has consistently reported moderate inter-correlation between both dimensions (i.e., evaluative concerns/personal standards perfectionism) and/or facets (i.e., socially prescribed/self-oriented perfectionism) of perfectionism (Hewitt & Flett, 1991; Stoeber & Otto, 2006). These results thus suggest that the social and self constituents of perfectionism could both be present within a person, albeit to a varying degree for different persons. Therefore, the model posits that within-person combinations of these two components should be taken into account in the prediction of psychological outcomes (*assumption #1*).

Furthermore, people may display distinct within-person combinations of these two

components (*assumption #2*). In the 2×2 model, the expression “subtype” is used as a proxy for referring to “within-person combinations of self-oriented and socially prescribed perfectionism”. It is nonetheless important to note that the 2×2 model is an interactional model, which respects the quantitative rather than dichotomous/categorical distribution of perfectionism. The 2×2 model further asserts that the combination of the two dimensions or facets can be used to distinguish and differentiate four subtypes of perfectionism (*assumption #3*). These subtypes can further be tested through traditional variable-centered analyses (i.e., multiple regressions, structural equation modeling) or sophisticated person-centered analyses (i.e., latent class modeling, cluster analyses). The model encourages researchers to use statistical analyses such as regressions, structural equation modeling, and cluster analyses, rather than median-split procedures (Gaudreau, 2012) in order to ensure the respect of the quantitative rather than dichotomous/categorical distribution of perfectionism (Broman-Fulks, Hill, & Green, 2008). For example, research conducted within the confines of person-centered approaches (i.e., cluster analyses) has provided complementary evidence for the existence of four prototypical perfectionism subtypes that closely mirrored the four subtypes proposed in the 2×2 model of perfectionism, albeit using different conceptualizations of perfectionism (Cumming & Duda, 2012; Sironic & Reeve, 2012). Recently, Gaudreau (2015) also proposed a novel measure—the *Self-Assessment of Perfectionism Subtypes (SAPS)*—to capture the “accessible mental representation” (Gaudreau, 2015, p. 53) characterizing each of the four subtypes. In this study, it was demonstrated that a measure in which participants were asked to self-assess their own subtype of perfectionism was strongly associated with scores that were obtained from traditional measures, thus supporting the differentiation of four subtypes of perfectionism.

A fourth assumption of the 2×2 model stipulates that the within-person combination of

perfectionism dimensions or facets should possess greater predictive validity than the dimensions or facets themselves (*assumption #4*), a line of reasoning that has been adopted in other streams of personality research (e.g., Judge & Erez, 2007). As such, research in personality has highlighted the importance of considering the interactive effects of personality traits in order to conceptualize the synergistic relationship between traits. These results demonstrated that the interaction between two personality traits such as between agreeableness and conscientiousness (Witt, Burke, Barrick, & Mount, 2002), as well as between emotional stability and extraversion (Judge & Erez, 2007) was a significant predictor of performance, over and above their independent main effects. Although the first step to test the hypotheses of the 2×2 model consists of probing for an interaction between perfectionism dimensions/facets and conducting simple slopes to compare the predicted values of the four subtypes and hypotheses of the model, an interaction is not a required condition to support the 2×2 model's hypotheses. Main effects can alternatively be used to calculate predicted values of each subtype across high (+1SD) and low (-1SD) values of each dimension/facet of perfectionism by deleting the non-significant interaction so that the effect of the independent variable does not remain conditioned at the mean value of the other predictor and interactive term. This method (i.e., known as a compensatory model) can be used to statistically infer the hypotheses of the 2×2 model (Gaudreau, 2012; also, see the method delineated in Chapter 3, pp. 59-60, as well as results of Chapter 4, Studies 1 and 2, and Chapter 5).

Notwithstanding these different approaches, the four subtypes of perfectionism should be considered distinct from one another, hence associated with different antecedents (i.e., acquisition and development of perfectionism, cultural background), processes (i.e., self-regulation, goal striving), and consequences (i.e., psychological adjustment, achievement;

assumption #5). A sixth assumption of the 2×2 model resides in the absence of labels referring to the adaptiveness/healthiness of each perfectionism subtype. The effects of personality dispositions are subject to vary according to a myriad of psycho-socio-cultural factors. For instance, what may predict achievement for oneself does not necessarily imply that it will be useful at no cost for someone else, just like it does not entail that it will automatically be useful under all circumstances. Therefore, the 2×2 model adopted and recommended the use of neutral labels in order to facilitate exploring the effects of numerous moderators that shape the way people think, feel, and interact with their surroundings.

Finally, residing under the assumption of *functional homogeneity*, the 2×2 model posits that both dimensions (personal standards, evaluative concerns perfectionism) and facets (self-oriented, socially prescribed perfectionism) can be used to test the model, in particular self-oriented and socially prescribed perfectionism because they are cardinal features of personal standards and evaluative concerns perfectionism respectively (*assumption #7*). Researchers (e.g., Skinner, Edge, Altman, & Sherwood, 2003) have posited that facets regrouped under the broader dimensions relate in a similar fashion to consequences associated with these dimensions. The model does not encourage researchers to use facets and dimensions interchangeably as a same concept but rather agrees that both can be used to test the model's hypotheses, as they should both relate to similar consequences of adjustment.

Four Subtypes of Perfectionism and Four Hypotheses

The 2×2 model proposes that the intersections between high and low levels of dimensions (i.e., evaluative concerns and personal standards) or facets (i.e., socially prescribed and self-oriented perfectionism) of perfectionism can be used to define and distinguish four

prototypical subtypes of perfectionism¹ (see Figure 3 for an illustration of the model): pure self-oriented perfectionism, mixed perfectionism, pure socially prescribed perfectionism, and non-perfectionism². A first subtype, *non-perfectionism*, personifies individuals who do not hold high perfectionistic strivings and are thus characterized by a combination of low levels of both SOP and SPP. These individuals deliberately choose not to pursue perfection and do not feel pressured by significant others from their social entourage.

Pure self-oriented perfectionism (pure SOP) is a second subtype of perfectionism characterized by high levels of SOP and low levels of SPP. This subtype represents individuals who hold self-imposed perfectionistic standards. They pursue those standards because of their personal importance and value. The comparison of pure SOP and non-perfectionism offers a way of recasting the debate on the adaptive vs. maladaptive outcomes of SOP. Considering the unsettled nature of this debate, the 2×2 model proposes three alternative hypotheses. Proponents of the healthiness, unhealthiness, and neutral nature of SOP (see Stoeber & Otto, 2006 for a review) would respectively expect that pure SOP should lead to better (*Hypothesis 1a*), poorer (*Hypothesis 1b*), and equivalent (*Hypothesis 1c*) psychological outcomes than non-perfectionism.

A third subtype, *pure socially prescribed perfectionism* (pure SPP), typifies individuals who strive toward perfection because of the perceived pressure that significant others exert on them as well as to reach socially driven standards of excellence but not for personal goals and purposes. This subtype is characterized by a combination of high levels of SPP and low levels of

¹ Facets of perfectionism (i.e., SOP and SPP) will be retained for the remaining of the dissertation to alleviate the text instead of referring to both the dimensions and facets given that facets are used in the studies presented in the upcoming chapters.

² Using perfectionism dimensions instead of facets would yield the following four subtypes of perfectionism: non-perfectionism, pure personal standards perfectionism, pure evaluative concerns perfectionism, and mixed perfectionism.

SOP. As such, this subtype is what constitutes a pivotal difference between the tripartite and the 2×2 models because in the tripartite model, a subtype of pure SPP (high SPP/low SOP) does not exist. Pure SPP might be seen as a type of “externally regulated perfectionism” (Gaudreau & Thompson, 2010, p. 533). As such, it represents a subtype in which the goals, values, standards, and ideals of perfection are pursued mainly out of external pressure prescribed from one’s social environment. Past research has shown that SPP was associated with non-self-determined motivation (i.e., extrinsic forms of motivation; e.g., Miquelon et al., 2005). More recently, studies on the 2×2 model of perfectionism have also supported this association between a subtype of pure SPP and non-self-determined motivation (Gaudreau, 2015; Gaudreau, Franche, & Gareau, 2016; Gaudreau & Thompson, 2010). Hence, according to the 2×2 model, pure SPP should foster the lowest levels of internalization and psychological adjustment compared to non-perfectionism (Hypothesis 2).

The fourth subtype, *mixed perfectionism*, is depicted by a combination of high levels of both SOP and SPP. Individuals portrayed by a mixed perfectionism subtype strive toward perfection in order to reach self- and socially driven criteria of excellence. Mixed perfectionism thus represents a subtype in which the goals, values, and standards of perfectionism are partially internalized (high SOP) although individuals also pursue perfectionistic standards because of the social pressure (high SPP). In fact, Gaudreau (2016) stated that “the combinatory presence of high levels of ECP and PSP denotes a partial internalization in which the perceived external contingencies are cohabiting in relative harmony with personal standards, values, and priorities” (p. 178). It is thus possible that SOP might act as a natural shield against the negative impact of SPP on psychological health and performance. Hence, contrarily to the tripartite model, the 2×2 model does not conceptualize mixed perfectionism as yielding the worst consequences of

adjustment. In fact, the 2×2 model posits that mixed perfectionism should be associated with greater psychological adjustment compared to pure SPP (Hypothesis 3), but poorer psychological adjustment compared to pure SOP (Hypothesis 4).

Overall, the 2×2 model of perfectionism builds on the tripartite model in order to propose four distinct subtypes of perfectionism, which can be differentiated on the basis of their antecedents, processes, and/or outcomes. This model adds to the literature by proposing a subtype of perfectionism in which individuals would pursue perfectionistic standards out of very high levels of SPP but little SOP. As a result, a subtype of pure SPP is expected to be more detrimental to psychological functioning than a subtype of mixed perfectionism in which high levels of SOP might act as a shield and compensate over high levels of SPP that are expressed alongside. Hence, the 2×2 model of perfectionism contributes to research by proposing a set of formalized hypotheses amenable to empirical scrutiny.

Reviewing Findings from Past Research

Growing attention and empirical support has been allocated to the 2×2 model of perfectionism since its development. In fact, 14 studies have been conducted to examine the relationships between subtypes of perfectionism and outcomes in several contexts such as work, sport, and academic. To facilitate the discussion and interpretation of their findings, studies on the 2×2 model of perfectionism are regrouped below by context. Results are summarized in Table 1.

Work. Only one study examined the 2×2 model of perfectionism in the workplace. Li, Hou, Chi, Liu, and Hager (2014) examined the hypotheses of the model with burnout and by conceptualizing perfectionism as a dispositional personality trait. Although research has thus far examined hypotheses of the 2×2 model exclusively with samples of European descent, this

study used a sample of 345 Chinese IT employees. Their results revealed that non-perfectionism was associated with lower levels of burnout compared to pure SOP (*Hypothesis 1a*) although it was associated with higher levels of burnout compared to pure SPP (*Hypothesis 2*). They also demonstrated that mixed perfectionism was related to greater levels of burnout compared to pure SOP (*Hypothesis 4*), but similar levels of burnout compared to pure SPP, thus failing to support *Hypothesis 3*.

Sports. In the sports domain, eight studies examined several sports outcomes using the 2 × 2 model of perfectionism. Some of these studies conceptualized perfectionism as a dispositional personality trait (Gaudreau & Verner-Filion, 2012; Hill & Davis, 2014), and some contextualized it to assess perfectionism specifically in the domain of sport (Crocker, Gaudreau, Mosewich, & Kljajic, 2014; Cumming & Duda, 2012; Hill, 2013; Mallinson, Hill, Hall, & Gotwals, 2014; Méndez-Giménez, Cecchini-Estrada, & Fernandez-Rio, 2014; Queded, Cumming, & Duda, 2014). A first set of studies examined sports outcomes related to *athletes' psychological adjustment*. The first study conducted in the sports domain is the study of Gaudreau and Verner-Filion (2012), which examined subjective well-being of 208 athletes from various sports. Specifically, this study assessed life satisfaction, as well as contextualized vitality and positive affect of athletes. The study of Cumming and Duda (2012) measured positive and negative affect of 194 vocational dance students, as well as their burnout symptoms in dance (i.e., physical symptoms, social physique anxiety, physical and emotional exhaustion). Hill (2013) also examined sport burnout (i.e., global score of burnout, reduced sense of accomplishment, emotional exhaustion, sport devaluation) in a sample of 171 soccer players.

Psychological adjustment of athletes is important to monitor in order to promote optimal levels of sports achievement. Nonetheless, elite athletes have to undergo numerous competitions

in their athletic journey/training. Learning to manage one's levels of stress during these competitions hence becomes an integral part of their training. Hence, two studies have examined *athletes' self-regulation behaviour*. The study of Crocker et al. (2014) examined several situational sports outcomes related to the stress process of a competition with a sample of 179 athletes in varsity sports. Specifically, this study assessed athletes' affect (i.e., positive and negative), appraisals (i.e., control, challenging, threat), goal progress, and coping strategies (i.e., emotion-focused, problem-focused, avoidance-focused). Similarly, the study of Hill and Davis (2014) examined emotion regulation (i.e., cognitive appraisal, emotional suppression, control of anger inward and outward), this time reflecting the general experience of 238 coaches.

Finally, another set of studies examined *athletes' cognitive evaluations* of themselves or of their physical self, as well as *interpersonal efficacy*. The study of Mallinson et al. (2014) examined sports enjoyment, physical self-worth and various indicators of friendship quality (i.e., self-esteem enhancement and supportiveness, loyalty and intimacy, companionship and pleasant play, things in common, conflict resolution, friendship conflict) of 219 youth sports participants. With a sample of 194 vocational dancers, Quested et al. (2014) measured intrinsic motivation, body dissatisfaction, fear of failure, and self-esteem regarding dance. Finally, the study of Méndez-Giménez et al. (2014) assessed outcomes related to 331 high school students' self-concept toward their physical education class by examining their perceptions of their physical condition, physical ability, physical attractiveness, physical self-concept, and general self-concept. They also assessed students' positive affect and overall life satisfaction.

Overall, results from these studies provided sufficient evidence to support most hypotheses of the model. Regarding *Hypothesis 1a*, pure SOP (compared to non-perfectionism) was associated with positive psychological adjustment (i.e., higher positive affect, life

satisfaction, sports enjoyment, and lower levels of global burnout, and reduced sense of accomplishment), self-regulation (i.e., goal progress, control, challenge, and cognitive appraisals, and control of anger), cognitive evaluations (i.e., self-worth, intrinsic motivation, physical condition, physical ability, physical attractiveness, physical self-concept), and certain indicators of interpersonal efficacy (i.e., self-esteem enhancement and supportiveness, loyalty and intimacy, companionship and pleasant play) compared to non-perfectionism. Alternatively, pure SOP and non-perfectionism were also non-significantly related to (*Hypothesis 1c*) psychological adjustment (i.e., vitality, life satisfaction, positive and negative affect, and indicators of burnout), self-regulation (i.e., threat appraisals, problem-, emotion-, and avoidance-focused coping, and emotional suppression), cognitive evaluations (body dissatisfaction, fear of failure, self-esteem, general self-concept), and certain indicators of interpersonal efficacy (i.e., things in common, conflict resolution, friendship conflicts).

Regarding *Hypothesis 2*, non-perfectionism (compared to pure SPP) was associated with positive psychological adjustment (i.e., increased levels of vitality, positive affect, life satisfaction, and sports enjoyment, as well as decreased levels of burnout indicators and negative affect), self-regulation (i.e., goal progress, control and challenge appraisals, and control of anger, as well as lower threat appraisals, and avoidance coping), cognitive evaluations (i.e., self-worth, self-esteem, physical condition, physical ability, physical attractiveness, physical and general self-concept, and higher fear of failure), and all interpersonal efficacy indicators.

Results demonstrated that pure SPP (compared with mixed perfectionism; *Hypothesis 3*) was associated with negative psychological adjustment (i.e., lower levels of vitality, positive affect, life satisfaction, and sports enjoyment, as well as higher levels of burnout), self-regulation (i.e., goal progress, control, challenge, and cognitive appraisals, and control of anger inward and

outward), cognitive evaluations (i.e., self-worth, physical condition, physical ability, physical attractiveness, general self-concept), and most indicators of interpersonal efficacy (i.e., self-esteem enhancement and supportiveness, loyalty and intimacy, companionship and pleasant play, things in common, conflict resolution). However, contrary to Hypothesis 3, pure SPP was also related to more emotional suppression than mixed perfectionism (Crocker et al., 2014), and these two subtypes did not differ in levels of negative affect, threat appraisals, and coping (i.e., problem-, emotion-, and avoidance-focused).

Finally, pure SOP (compared with mixed perfectionism; *Hypothesis 4*) related to positive psychological adjustment (i.e., greater life satisfaction, positive affect, and sports enjoyment, and lower negative affect and burnout), self-regulation (i.e., goal progress, control and challenge appraisals, problem-focused coping, and control of anger inward and outward, while also relating to lower threat appraisals, avoidance coping, and emotional suppression), cognitive evaluations (i.e., self-worth, self-esteem, physical condition, physical ability, physical attractiveness, physical self-concept, and general self-concept, and lower body dissatisfaction), and interpersonal efficacy (i.e., self-esteem enhancement and supportiveness, loyalty and intimacy, companionship and pleasant play, friendship conflicts).

Findings from studies conducted in the sports setting demonstrated that hypotheses of the 2×2 model were well supported with positive sport outcomes, whereas some inconsistent results have occurred with negative sport outcomes. Although these findings deserve further attention and discussion, limited studies have examined both positive and negative outcomes into their design. This limitation highlights the need to study both types of outcomes at once. Similarly, results obtained with person-centered analyses (i.e., cluster analysis) were also inconsistent (e.g., Cumming & Duda, 2012; Quested, Cumming, & Duda, 2014). In this case, differences may be

explained by the fact that the clusters reported by these studies did not closely match the definition of the four subtypes proposed in the 2×2 model. Future research is required to better understand why the findings related to body image concerns were inconsistent (e.g., examination of potential moderators may untangle these findings).

Overall, a major limitation observed in studies on the 2×2 model is that most of them only reported the statistical significance of their hypotheses. One of the problems with this approach is that statistical significance is contingent upon the size of the sample. For example, a moderate effect size may reach statistical significance or not according to the sample size used. Applied to the sports setting, this limitation is even more important, as sample sizes are oftentimes smaller given the challenge of recruiting large samples of athletes. Hence, a review of studies on the 2×2 model in sports, dance, and exercise focused on examining the effect sizes rather than the mere statistical significance of the hypotheses (Gaudreau, 2016). This review concluded that the direction and strength of the effect sizes provided sufficient evidence to support hypotheses of the model even in the absence of statistical significance. Specifically, results in sports have demonstrated very limited evidence suggesting that a subtype of pure SOP should lead to worst outcomes compared to non-perfectionism. In fact, even if some findings showed a non-significant difference between pure SOP and non-perfectionism, effect sizes were weakly to moderately associated with positive sports outcomes. Furthermore, Hypothesis 2 received the most support from studies, thus supporting the premise that pure SPP should be associated with the worst outcomes. Similarly, although some results showed similar levels of pure SPP and mixed perfectionism, they did not support the idea that mixed perfectionism should be associated with worst outcomes compared to pure SPP, thus providing additional support for hypotheses proposed in the 2×2 model of perfectionism.

Academic. Five studies have examined the 2×2 model of perfectionism in the academic context, using samples of undergraduate (Douilliez & Lefèvre, 2011; Gaudreau, 2012, 2015; Gaudreau & Thompson, 2010) and high school students (Damian, Stoeber, Negru, & Baban, 2014). First, Gaudreau and Thompson (2010) examined several indicators of academic adjustment, including academic satisfaction, academic self-determined motivation, academic goal progress, as well as positive and negative affect using a sample of 397 undergraduate students. Second, Douilliez and Lefèvre (2011) measured depressive symptoms, an important clinical indicator of psychological adjustment, utilizing a sample of 338 undergraduate students. Third, Gaudreau (2012) examined academic performance through self-reported grade-point average (GPA) with a sample of 98 undergraduate students. Fourth, Damian et al. (2014) also studied psychological adjustment via positive and negative affect in a sample of 576 high school students. Fifth, Gaudreau (2015) assessed hypotheses of the 2×2 model with a recently developed self-assessment measure of perfectionism subtypes. With a sample of 301 undergraduate students, he measured indicators of academic adjustment such as self-determination, joy, goal progress, and life satisfaction. In all these academic studies, perfectionism was conceptualized as a dispositional personality trait designed to capture the general perfectionistic tendencies of students (i.e., the level of perfectionism that students exhibit in their life in general), whereas most outcomes were measured contextually (i.e., the level to which each outcome is exhibited specifically in school). Results from these studies provided support for *Hypothesis 1a* by demonstrating that pure SOP was associated with greater levels of academic satisfaction, academic self-determined motivation, academic goal progress, positive affect, joy, and self-reported grade-point average than non-perfectionism. With variables assessing negative psychological adjustment, findings also showed that pure SOP and non-

perfectionism were non-significantly related to levels of depressive symptoms and negative affect, thus disconfirming *Hypotheses 1a and 1b*. For *Hypothesis 2*, results showed that pure SPP was associated with lower academic satisfaction, academic self-determined motivation, academic goal progress, positive affect, joy, and GPA compared to non-perfectionism. Whereas Gaudreau and Thompson (2010) demonstrated that pure SPP was related to lower negative affect than non-perfectionism, results from Damian and colleagues (2014) failed to support this hypothesis. Results from Douilliez and Lefèvre (2011) also failed to support *Hypothesis 2* by showing that pure SPP and non-perfectionism were associated with similar levels of depressive symptoms. Nonetheless, all studies supported *Hypothesis 3* (except for Damian et al. 2014 with negative affect) and *Hypothesis 4* of the 2×2 model. Findings revealed that mixed perfectionism (compared to pure SPP; *Hypothesis 3*) and pure SOP (compared to mixed perfectionism; *Hypothesis 4*) were associated with greater academic satisfaction, academic self-determined motivation, academic goal progress, positive affect, joy, and GPA, while also relating to lower negative affect and depressive symptoms.

In sum, results in the academic domain supported most hypotheses, in particular with positively-laden variables assessing psychological adjustment (i.e., satisfaction, positive affect, joy), achievement (i.e., GPA, goal progress), and motivational processes (self-determined motivation). However, with outcomes assessing negative psychological adjustment (i.e., negative affect, depressive symptoms), *Hypotheses 1a and 1b* were not consistently supported, thus showing that pure SOP and non-perfectionism were non-significantly related to negative affect and depressive symptoms. Nonetheless, findings in the academic domain supported the contention that mixed perfectionism should not lead to the worst outcomes, as mixed perfectionism was shown to be associated with less depressive symptoms and negative compared

to pure SPP (*Hypothesis 3*). Furthermore, in most studies (except Douilliez & Lefèvre, 2011), pure SPP was shown to foster the lowest levels of psychological adjustment, as pure SPP was related to lower levels of negative affect compared to non-perfectionism (*Hypothesis 2*). Overall, studies in the academic setting supported hypotheses of the 2×2 model for most outcomes, although some exceptions were obtained with negatively-laden variables. These findings reaffirm the need to examine under which circumstances hypotheses of the 2×2 model are supported to better understand the various conditions or moderators that may interfere with psychological adjustment.

Toward A Multilevel Extension and Cross-Cultural Assessment of the 2×2 Model of Perfectionism

The 2×2 model of perfectionism is an important addition to the field of perfectionism that is growing in interest among researchers. The studies conducted thus far are important insofar as they helped differentiate the outcomes associated with each subtype of perfectionism, rather than merely examining the relationships between dimensions or facets of perfectionism. Furthermore, these studies offered insight on the relationships between subtypes of perfectionism and various outcomes from psychological adjustment to self-regulation behaviour to interpersonal effectiveness in different settings such as school, sport, and work. In Hewitt and Flett's (2006) definition of multidimensional perfectionism, an important feature lies in the fact that perfectionism is a personality disposition that can be manifested in a variety of life-domains. However, hypotheses of the 2×2 model of perfectionism have been tested in only three different domains of life so far, and this research has remained limited to examine only one life-domain at a time. Hence, the main purpose of this dissertation was to seek to offer a novel multilevel extension of the 2×2 model of perfectionism across several life-domains. Relationships between

perfectionism subtypes and psychological adjustment outcomes (i.e., vitality, goal progress, positive and negative affect, and stress) were examined simultaneously by comparing individuals to one another (i.e., between-person differences) and to their own average across life-domains (i.e., within-person variations). Seven life-domains (i.e., school, work, romance, friendships, family, parenting, hobbies) were selected on the basis that they tapped/represented the same cognitive (i.e., importance), affective (i.e., perceived positive or negative impact), and behavioural (i.e., frequency) components across men and women (Blais, Vallerand, Brière, Gagnon, & Pelletier, 1990) and that they represented significant life domains for personal goals (Wadsworth & Ford, 1983).

Furthermore, the demands with which undergraduate students are required to cope are likely to vary from one life-domain to another. Yet, very little research has been conducted so far to examine the associations between perfectionism and coping in several settings. Similarly, only one study has examined the relationships between perfectionism subtypes and coping so far. A second goal was thus to further support this multilevel extension of the 2×2 model, this time with an outcome of coping.

To date, research on the 2×2 model of perfectionism has focused mainly on main effects to examine the relationships between perfectionism subtypes and indicators of adjustment or self-regulation. Although studies have supported most of the main postulates of the 2×2 model, not all studies supported the hypotheses proposed by the 2×2 model of perfectionism and some findings were inconsistent across studies. To better understand these inconsistencies (along with the mixed results obtained in the perfectionism literature in general), it is important to identify potential moderators in the model, as they may modify the strength and direction of these relationships. Accordingly, another component of the perfectionism definition implies that

perfectionism is expressed in various cultures (Hewitt & Flett, 1991) although research in cross-cultural perfectionism remains sparse (for a review, see DiBartolo & Rendon, 2012). Hence, a third goal of this dissertation was to examine the potential role of moderators in the 2×2 model of perfectionism in order to further our understanding of the findings obtained so far.

Specifically, this dissertation examined the moderating role of sociocultural background of Asian Canadians and European Canadians in the 2×2 model of perfectionism.

Overall, in this dissertation, I tried to understand why results are varying across studies by considering (1) perfectionism as a multilevel construct likely to express stability (i.e., dispositional personality trait) and variability across students' life domains (i.e., within-person fluctuations); (2) the relationship between multilevel perfectionism and coping tendencies of university students; and (3) the role of a moderator (i.e., sociocultural background) in the relationships between perfectionism subtypes and school adjustment. Furthermore, whereas findings have demonstrated that outcome variables pertaining to negative adjustment seemed to lead to contradicting or null results (in comparison to positive adjustment), very little research has examined positive and negative indicators of psychological adjustment in a same study, which would be important to provide a direct comparison of the results in a same sample. This limitation reaffirms the need to not only examine outcomes of positive adjustment (e.g., vitality, goal progress, positive affect, achievement, task-oriented coping), but also of negative adjustment (e.g., negative affect, stress, disengagement-oriented coping). In this dissertation, indicators of psychological adjustment were chosen on the basis that they tapped both the positive and negative components associated with psychological adjustment, while also referring to the psychosocial, motivational, and self-regulatory correlates that have been shown to promote academic success and a positive experience for university students (for a review, see Richardson,

Abraham, & Bond, 2012; Robbins et al., 2004). These correlates have often been targeted as salient variables on which to intervene with college or undergraduate students in order to foster academic performance and retention (Robbins, Oh, Le, & Button, 2009).

Perfectionism as a Multilevel Construct

To date, the 2×2 model of perfectionism has been studied in various life contexts such as work (Li et al., 2014), sport (Crocker et al., 2014; Cumming & Duda, 2012; Gaudreau & Verner-Filion, 2012; Hill, 2013; Hill & Davis, 2014; Mallinson et al., 2014; Méndez-Giménez et al., 2014; Quested et al., 2014), and school (Damian et al., 2014; Douilliez & Lefèvre, 2011; Gaudreau, 2012; Gaudreau & Thompson, 2010). Nonetheless, some researchers have started to argue that domain-specific perfectionism may lead to varying outcomes according to life-domains (e.g., McArdle, 2010; Mitchelson & Burns, 1998). These studies are grounded within recent personality advances that have demonstrated that personality traits may fluctuate over the course of a day, week, or month thus proposing that personality may be disposed to significant changes rather than merely being a constant, static disposition (e.g., Boone et al., 2012; Fleeson, 2001; Fleeson, 2007; Kashdan & McKnight, 2011). Proposing the study of perfectionism as a *multilevel construct* that may express variability (e.g., across time, situations, or contexts) and stability (i.e., dispositional personality trait) hence seems like a promising way to reconcile both perspectives.

An important feature of the perfectionism definition lies in the fact that people are striving to reach perfection in many aspects of their lives. Thus far, the focus has mainly been on examining between-person differences and little research has focused on comparing contextual perfectionism across one's life domains. Mitchelson and Burns (1998) initiated research on domain-specific perfectionism with a study in which they compared perfectionism levels of

working mothers. They found that perfectionism was higher in the mothers' work environment than it were at home. In contrast, results from Mitchelson (2009) demonstrated higher perfectionistic standards and discrepancy between standards and behaviour at home compared to work with a sample of working mothers and fathers, suggesting that perfectionism may vary across one's life domains. In their validation study of the Sport Multidimensional Perfectionism Scale (Sport-MPS), Dunn, Craft, Causgrove Dunn, and Gotwals (2011) showed that their domain-specific measure of perfectionism in sport had greater predictive power than a global measure when attempting to predict attitudinal body-image outcomes among female figure skaters. These findings suggest that dispositional and domain-specific perfectionism may lead to different outcomes. Similarly, research conducted among intercollegiate athletes (Dunn, Gotwals, & Dunn, 2005) and talented students (McArdle, 2010) also sought to address the domain-specificity of perfectionism by comparing perfectionism levels in the school and sports settings. These findings supported the fact that domain-specific perfectionism was significantly different than global perfectionism and that levels of perfectionism significantly differed in both domains (Dunn et al., 2005). For instance, results among athletes showed that perfectionism levels were higher in sports than in school (Dunn et al., 2005), while findings obtained with talented students revealed greater levels of perfectionism in school than in sports (McArdle, 2010).

Results from McArdle (2010) further reported that cognitive appraisals and self-worth in school, as well as subjective value of sports were associated to perfectionism in school. Similarly, some researchers have proposed that people may be more prone to pursue high personal standards—an ingredient of SOP—in settings in which they devote greater valuation and importance (e.g., Mitchelson, 2009; Shafran, Cooper, & Fairburn, 2002). The main

contribution of the few studies having examined domain-specific perfectionism has been to show that mean levels of contextual perfectionism can differ from dispositional perfectionism, as well as across life-domains (Dunn et al., 2005; McArdle, 2010; Mitchelson, 2009; Mitchelson & Burns, 1998). From a developmental within-person perspective, children and adolescents might learn to develop perfectionistic traits in certain domains of their life according to their personal experiences. In certain life-domains, for example school and sports, high achievement is often valued. In school, students who excelled on their test are often rewarded publically (e.g., wall of excellence, special mention from teachers, sticker on their test). In sports, emphasis is often put on winning or making the fewest mistakes in order to climb up the ladder and gain social recognition. Perfectionistic behaviours may thus be overtly observable, promoted, and/or reinforced in performance- or achievement-driven settings, which contributes to foster socially prescribed perfectionism. However, perfectionism may also stem and vary from life-domains in which parents hold and promote perfectionistic concerns or standards, and possibly pressure their children to achieve such standards. A parent who puts significant importance on flawless table manners, for example, conveys the idea that this perfectionistic behaviour is acceptable. In other words, life-domains in which children and adolescents perceive more pressure to be and appear perfect might contribute to generate perfectionism whereas life-domains in which they perceive less pressure or importance for perfectionism may be associated with lower levels of perfectionism.

Conceptualizing personality traits as dynamic states rather than stable and invariable dispositions has also been debated amongst personality researchers. In fact, some researchers (e.g., Boone et al., 2012; Fleeson, 2001, 2007; Kashdan & McKnight, 2011) have argued that personality should account for everyday states that are likely to fluctuate across situations,

contexts, and the life span. Accordingly, these analyses revealed that personality traits (i.e., conscientiousness, neuroticism, extraversion, openness, and agreeableness) displayed variability across situations (Fleeson, 2001, 2007). Similarly, research in human motivation has demonstrated that satisfaction of the basic needs for autonomy (i.e., perceived feeling of choice and volition), competence (i.e., perceived effectiveness and ability), and relatedness (i.e., perceived closeness and connectedness with significant others) was related to autonomous motivation and well-being across multiple life domains (Milyavskaya & Koestner, 2011). Specifically, their results demonstrated that need satisfaction was associated to different levels of well-being across life domains, but that need satisfaction led to similar levels of autonomous motivation across domains.

These findings, which come from different areas of research, highlight the importance of adopting an integrative approach that will account not only for the dispositional tendencies that will differentiate individuals from one another (i.e., between-person differences) but also for the individual characteristics that are likely to vary across days, situations, or contexts for a same individual (i.e., within-person variations). Examining how personality factors may vary on a daily basis according to situational or contextual factors would allow researchers to fully capture the subtle elements that may promote individual well-being, performance, and self-regulation across one's interactions with others or across life contexts. In other words, these findings suggest that exhibiting a perfectionism disposition (i.e., in general) does not necessarily entail that one will strive toward perfection in all contexts of his or her life, just as the fact of being highly perfectionistic in certain domains does not inevitably imply that a given individual will display a general tendency toward perfectionism. For example, someone may be generally perfectionistic and his or her perfectionism may be displayed in a number of contexts such as

school, sport, work, bodily hygiene, and home cleanliness, albeit to varying degrees or for different reasons. However, that person may not be perfectionistic in relational settings such as with his or her romantic partner or family. Yet, for someone else, perfectionism may be limited to one or two areas of his or her life, such as exclusively in his or her work or studies. Hence, it is important to account for the fact that people can be compared to one another (i.e., between-person; central tendency) but they can also be compared to their own average (i.e., within-person; dispersion).

A central goal of multilevel theories is to examine the homology of the construct across levels of analysis, which will aim at providing a holistic perspective on the regularities/tendencies (i.e., between-person differences) and the variability (i.e., within-person variations) of one's individual characteristics. At the within-person level of analysis, the individuals' fluctuations are examined (e.g., fluctuations over time or different life contexts), whereas at the between-person level, individuals are compared to the average of the sample. Hence, the slope of the relationships at the within- and between-person levels of analysis could differ in terms of their magnitude and/or direction (Nezlek, 2012; see Figure 4). Relationships across both levels of analysis could thus represent distinct and independent but related areas of research. Homologous multilevel models focus on the generalizability of the model or construct of study across levels of analysis by examining whether the constructs and the relationships between constructs are equivalent across levels of analysis (Kozlowski & Klein, 2000). Providing a multilevel extension of the 2×2 model of perfectionism would be an important goal to assess whether hypotheses of the model can generalize across levels of analysis. Revisiting these hypotheses at the within-person level of analysis would generate a new focus from which to reinterpret past findings, which could help us capture the richness and subtleties that are

hidden in the global portrait that is outlined by the between-person level. Within-person analyses would complement past findings.

Multilevel Perfectionism and Coping

Psychological adjustment is an important outcome of academic success. Notwithstanding the importance to study the role of perfectionism subtypes on mental health, university students face numerous stressors with which they are required to cope as they adjust to their new academic role. A recent qualitative review identified the most recurrent stressors reported by university students as following: transition to university, relationships, lack of resources, expectations, academics, environment, diversity, and other (Hurst et al., 2013). Of particular interest for the purpose of this dissertation, expectations include living up to expectations from both self and significant others such as one's parents. It also refers to the stress generated by one's own goals and standards, including one's level of perfectionism. Hence, these findings suggest that perfectionism among university students may become a source of stress with which they are required to cope in order to maintain and preserve optimal levels of academic adjustment. Overall, this review highlighted the importance to better understand students' responses to stress and the stress management skills they use in order to create and develop interventions aimed at promoting effective coping among the university population. Although learning which types of stressors are most likely to influence students' adjustment to university is important, the next step for researchers is to better understand the way students cope and what influences their coping.

Coping can be defined as the ever-changing cognitive, affective, and behavioural process by which one's efforts are aimed toward managing a specific perceived or actual stressor that is appraised as challenging or taxing one's resources (Lazarus & Folkman, 1984). Coping refers to

a dynamic and unfolding process that is in constant change to allow one to deal with the demands of a particular stressful encounter. Using Folkman and Lazarus (1985)' words, "stress implies a disturbed process-environment relationship that coping is meant to change. Therefore, unless we focus on change we cannot learn how people come to manage stressful events and conditions" (p. 150). Coping can be reinterpreted as a multilevel construct likely to express variability (i.e., state-like variations of coping skills across specific contexts) along to stability (i.e., a dispositional tendency to use similar coping strategies in general; Gaudreau & Miranda, 2010). The examination of variability and stability are likely to offer complementary information that may be useful to understand university students' coping skills, but limited research currently exists on the relationship between multilevel perfectionism and coping. Furthermore, whereas expectations toward oneself and from significant others (important aspects of perfectionism) have been highlighted as significant stressors impeding on academic success (Hurst et al., 2013), little research has focused on the relationship between university students' perfectionism and coping strategies. Nonetheless, the demands of the various domains in which university students are invested are most likely to vary, coping is just as likely to vary accordingly. Examining the multilevel associations between perfectionism subtypes and coping is pivotal to better understand the intricacies involved in university students' coping, which is a useful skill to promote academic success.

Exploring Moderators: The Socio-Cultural Heritage

Although assessing a multilevel extension of the 2×2 model of perfectionism is an important area for future research, examining the role of moderators or mediators is also important to better understand under which circumstances and for whom does the model apply. As such, culture has been targeted as a significant factor likely to model and shape personality,

identity (i.e., self-concept), cognitions, behaviour, and psychological processes (Heine et al., 1999; Schwartz, Zamboanga, Weisskirch, & Wang, 2010). Children are socialized in an environment where the values, goal pursuits, and ideals promoted by significant agents of their development (i.e., parents and/or grand-parents) are integrated into their sense of self, which in turn, influences their thoughts, feelings, and behaviour. Parenting styles play an integral part of children's upbringing that may contribute to a variety of outcomes, but specifically to the development of perfectionism (DiBartolo & Rendon, 2012; Flett, Hewitt, Oliver, & Macdonald, 2002). Parents are primary socialization agents that may model or reinforce perfectionistic behaviour to their offspring through a variety of behaviour such as the types of demands that they hold (i.e., perfectionistic standards/strivings), their expectations toward their children's accomplishments (i.e., high parental expectations), the way they react and/or respond to their children's failures (i.e., parental criticisms), or they approve of their children's behaviour (i.e., contingent approval). In fact, some research has demonstrated that parents' perfectionism levels were positively related to their offspring's level of perfectionism, which became even more apparent within same-sex dyads (DiBartolo & Rendon, 2012). Nonetheless, parenting styles tend to vary across sociocultural contexts. For example, the *tiger parenting* style (Chua, 2011; B. S. Kim, Wong, & Maffini, 2010; S. Y. Kim, Wang, Orozco-Lapray, Shen, & Murtuza, 2012)—representing high levels of control along high levels of warmth— is specific to some Asian cultures.

Although cultural differences in perfectionism may arise according to one's parenting style, research on cross-cultural perfectionism remains sparse. In fact, the study of perfectionism among Asian Americans has remained quite limited and unexplored until the late 1990s (see B. S. Kim et al., 2010 for a review of 2009). Some studies have reported that Asian Americans

displayed significantly higher levels of facets associated with both SPP and SOP (Castro & Rice, 2003; Chang, 1998; Kawamura, Frost, & Harmatz, 2002) compared to Caucasian Americans. Kawamura et al. (2002) found that high personal standards (a facet of SOP) among female Asian Americans was positively associated with students' grade-point average but not among males. Still, facets of SPP (e.g., doubts about action, concern over mistakes, parental pressure) have been associated with various maladaptive psychological outcomes such as depression, negative affect, physiological stress, anxiety, and low self-esteem (Castro & Rice, 2003; Cheng, 2001; Cheng, Chong, & Wong, 1999; Yoon & Lau, 2008). There are currently only a handful of studies examining cross-cultural differences in perfectionism. Theoretical advances suggested that perfectionism may develop and be integrated into one's sense of self differently in members identifying as Asians compared to those identifying as North Americans. For example, perfectionism may become a risk or a normative factor according to one's level of interdependence (i.e., collectivism; DiBartolo & Rendon, 2012; Yoon & Lau, 2008). In fact, it has been argued that individuals in collectivistic nations (e.g., some Asian cultures) are characterized by a greater propensity to adjust and fit in their ways of functioning and behaving according to their social environment in an effort to preserve collective and societal harmony (Wong, Kim, & Trang, 2010). Conversely, members of individualistic societies (e.g., some North American cultures) tend to behave in a more idiosyncratic manner (Triandis, 1996). Consequently, it is pivotal to further assess the role of sociocultural identity in the relationship between perfectionism and achievement outcomes across members of Asian and North American backgrounds. The few findings obtained so far contain certain gaps that would need to be filled in order to assess a more stringent test of cross-cultural perfectionism. For example, these studies have often used only one facet or dimension of perfectionism, or a global score, which limits our

understanding of a more comprehensive analysis of perfectionism. Furthermore, some of these studies have examined the relationships between perfectionism and psychological outcomes for only one sociocultural group, making it impossible to compare these results with other sociocultural groups. In sum, there is a strong need for more thorough analyses that will account for both facets of perfectionism, along with assessing the cross-cultural invariance of the perfectionism measure to ensure valid comparisons of the results.

The Present Dissertation

The overarching goal of this dissertation was to contribute to the development of the 2×2 model of perfectionism (Gaudreau, 2012; Gaudreau & Thompson, 2010) in three ways: (1) provide a multilevel extension of the model, (2) use this multilevel extension to examine and better understand the relationship between multilevel perfectionism and coping tendencies of university students, and (3) provide a cross-cultural assessment of the 2×2 model. Articles 1 and 2 were aimed at providing a novel multilevel extension of the 2×2 model of perfectionism. In *Article 1*, we examined the relationships between perfectionism subtypes (i.e., pure SOP, pure SPP, mixed perfectionism, and non-perfectionism) and various indicators of psychological adjustment (i.e., vitality, goal progress, positive and negative affect, and stress) at both the between-person (i.e., across individuals) and within-person (i.e., across life-domains) levels of analysis. A multilevel confirmatory factor analysis was also conducted in *Article 1* to support the multilevel factorial structure of the perfectionism measure. This article, entitled “Integrating Dispositional Perfectionism and Within-Person Variations of Perfectionism Across Life Domains Into a Multilevel Extension of the 2×2 Model of Perfectionism”, was published in *Personality and Individual Differences*. A supplemental online file is available for this study and has been attached in continuity to *Article 1* to facilitate readability. Full results of the multilevel

confirmatory factor analysis are reported in Appendix A of the dissertation, and figures of main results are presented in Appendix B.

In *Article 2*, we furthered our understanding of a multilevel extension of the 2×2 model of perfectionism by studying the relationships between subtypes of perfectionism and coping (i.e., task-oriented, disengagement-oriented, and relative). This article was composed of two original studies designed to assess hypotheses of the 2×2 model at the between-person (i.e., Study 1) and within-person levels of analysis (i.e., Study 2). *Article 2* is entitled “A Multilevel Investigation of the 2×2 Model of Perfectionism: Relation Between Subtypes of Perfectionism and Coping at the Between-Person and Within-Person Levels of Analysis”.

Whereas Articles 1 and 2 were to contribute to further document the intrapersonal factors that were likely to influence the relationship between perfectionism subtypes and mental health, *Article 3* was aimed at identifying and testing a potential moderator of the 2×2 model of perfectionism. Specifically, in *Article 3*, we sought to examine the moderating role of socio-cultural background in the relationships between perfectionism subtypes and indicators of academic success (i.e., satisfaction and performance) among undergraduate students who identified themselves as belonging to one of two distinct sociocultural groups: Asian Canadians and European Canadians. In *Article 3*, we also assessed a multiple group confirmatory factor analysis in order to ensure invariance of the perfectionism measure across both sociocultural groups. *Article 3*, entitled “The 2×2 Model of Perfectionism: A Comparison Across Asian Canadians and European Canadians”, has been published in *Journal of Counseling Psychology*. The multilevel confirmatory factor analysis findings were presented in an online supplemental file but they have been placed in continuity to *Article 3* to facilitate readability of this dissertation.

Table 1

Literature Review on the 2 × 2 Model of Dispositional Perfectionism (Review from original article in 2010 to January 2016)

Authors and Outcomes	Sample		Perfectionism measures and level of analysis	Study design	Main findings					
	Occupation	Descriptives ³			H1a Pure SOP > Non	H1b Pure SOP < Non	H1c Pure SOP = Non	H2 Non vs. Pure SPP	H3 Mixed vs. Pure SPP	H4 Pure SOP vs. Mixed
<i>Work setting</i>										
1. Li, Hou, Chi, Liu, & Hager (2014)	345 Chinese employees	28.41 (5.78) 23%F	Chinese APS-R (DISPO)	<ul style="list-style-type: none"> Cluster analysis followed by ANOVA and path analyses 						
<i>Burnout</i>			GEN		*		*	n.s.	*	
<i>Sports setting</i>										
1. Gaudreau & Verner-Filion (2012)	208 athletes	18.30 (3.325) 57%M	Short HF-MPS (DISPO)	<ul style="list-style-type: none"> Moderated hierarchical regressions* Cohen's <i>d</i> 						
<i>Vitality</i>			CON		n.s.	*	*	n.s.		
<i>Positive affect</i>			CON		n.s.	*	*	n.s.		
<i>Life satisfaction</i>			GEN		n.s.	*	*	*		
2. Cumming & Duda (2012)	194 vocational dance students	16.73 (1.45) 87.11%F	F-MPS (CON)	<ul style="list-style-type: none"> Hierarchical cluster analysis <ul style="list-style-type: none"> Pure PSP: 31% 						

³ Descriptives specify the mean age and standard deviation of age in parentheses, along with the percentage of females or males in sample.

				<ul style="list-style-type: none"> ○ Non: 17% ○ Pure ECP: 31% ○ Mixed: 21% ● ANOVA 					
<i>Positive affect</i>			GEN		*		n.s.	---	n.s.
<i>Negative affect</i>			GEN			n.s.	*	---	*
<i>Physical symptoms</i>			CON			n.s.	*	---	*
<i>Social physique anxiety</i>			CON			n.s.	n.s.	---	*
<i>Physical/Emotional exhaustion</i>			CON			n.s.	n.s.	---	*
3. Hill (2013)	171 soccer players	16.17 (1.57) 100%M	Short HF-MPS (CON) Short S-MPS-2 (CON)	● Moderated hierarchical regressions ^{*Sp-Deval}					
<i>Sport burnout</i>			CON		*		*	*	*
<i>Reduced sense of accomplishment</i>			CON		*		*	*	*
<i>Emotional exhaustion</i>			CON			n.s.	*	n.s.	*
<i>Sport devaluation</i>			CON			n.s.	*	*	n.s.
4. Crocker, Gaudreau, Mosewich, & Kljajic (2014)	179 athletes in varsity sports	19.88 (1.53) 55%F	Sport-MPS-2 (CON)	● Moderated hierarchical regressions (main effects)					
<i>Positive affect</i>			SIT		*		n.s.	*	n.s.
<i>Control appraisal</i>			SIT		*		*	*	*
<i>Challenge appraisal</i>			SIT		*		*	*	*
<i>Goal progress</i>			SIT		*		*	*	*
<i>Negative affect</i>			SIT			n.s.	*	n.s.	*
<i>Threat appraisal</i>			SIT			n.s.	*	n.s.	*
<i>Emotion-focused</i>			SIT			n.s.	n.s.	n.s.	n.s.

<i>coping</i>									
<i>Problem-focused coping</i>			SIT			n.s.	n.s.	n.s.	n.s.
<i>Avoidance-focused coping</i>			SIT			n.s.	*	n.s.	*
5. Hill & Davis (2014)	238 coaches	23.92 (10.32) 26%F	HF-MPS (DISPO)	• Moderated hierarchical regressions (simple slopes for exp supp and main effects)					
<i>Cognitive appraisal</i>			GEN		*		n.s.	*	n.s.
<i>Control of anger (inward)</i>			GEN		*		*	*	*
<i>Control of anger (outward)</i>			GEN		*		*	*	*
<i>Expression suppression</i>			GEN			n.s.	n.s.	* _a	*
6. Mallinson et al. (2014)	219 youth sport participants from various school- and community-based sports	15.12 (2.02) 60%F	Sport-MPS-2 (CON)	• Hierarchical regressions (simple slopes for thgs and resol, and main effects)					
<i>Sport enjoyment</i>			CON		*		*	*	*
<i>Physical self-worth</i>			CON		*		*	*	*
<i>Self-esteem enhancement and supportiveness</i>			CON		*		*	*	*
<i>Loyalty and intimacy</i>			CON		*		*	*	*
<i>Things in common</i>			CON			n.s.	*	*	n.s.

<i>Companionship and pleasant play</i>			CON		*		*	*	*
<i>Conflict resolution</i>			CON			n.s.	*	*	n.s.
<i>Friendship conflict</i>			CON			n.s.	*	n.s.	*
7. Méndez-Giménez et al. (2014)	331 high school students in physical education class	14.29 (1.43) 41%F	IPI ⁴ (CON)	<ul style="list-style-type: none"> Hierarchical moderated regressions 					
<i>Physical condition</i>			CON		*		*	*	*
<i>Physical ability</i>			CON		*		*	*	*
<i>Life satisfaction</i>			GEN		*		*	*	*
<i>Positive affect</i>			CON		*		*	*	*
<i>Physical attractiveness</i>			CON		*		*	*	*
<i>Physical self-concept</i>			CON		*		*	n.s.	*
<i>General self-concept</i>			CON			n.s.	*	*	*
8. Quested, Cumming, & Duda (2014)	194 vocational dancers	16.73 (1.45) 87%F	F-MPS (CON)	<ul style="list-style-type: none"> Two-step cluster analysis MANOVA ANOVA Cohen's <i>d</i> 					
<i>Intrinsic motivation</i>			CON		*		n.s.	n.s.	n.s.
<i>Fear of failure</i>			CON			n.s.	*	n.s.	* _a
<i>Self-esteem</i>			CON			n.s.	*	n.s.	*

⁴ Comparable to CAPS.

<i>Body dissatisfaction</i>			CON		n.s.	n.s.	n.s.	*
<i>School setting</i>								
1. Gaudreau & Thompson (2010)	T1: 397 undergrad T2: 317 (80%)	20.39 (3.53) 86% F	Short F-MPS (DISPO) Short HF-MPS (DISPO)	<ul style="list-style-type: none"> Follow-up (goal progress) at 8th wk of semester Moderated hierarchical regressions* 				
<i>Academic satisfaction</i>			CON		*	*	*	*
<i>Academic self-determined motivation</i>			CON		*	*	*	*
<i>Academic goal progress</i>			CON		*	*	*	*
<i>Positive affect</i>			GEN		*	*	*	*
<i>Negative affect</i>			GEN		n.s.	*	*	*
2. Douilliez & Lefèvre (2011)	338 students	21.40 (3.52) 66.7%F	Short HF-MPS (DISPO) Short F-MPS (DISPO) GEN	<ul style="list-style-type: none"> Moderated hierarchical regressions 				
<i>Depression (BDI)</i>					n.s.	n.s.	*	*
3. Gaudreau (2012)	98 undergrad	21.06 (4.53) 84%F	Short HF-MPS (DISPO)	<ul style="list-style-type: none"> Moderated hierarchical regressions Cohen's <i>d</i> 				
<i>Grade-point average (self-report)</i>					*	*	*	*
4. Damian, Stoeber, Negru &	576 adolescent students	17.08 (1.14) 58%F	CAPS (DISPO)	<ul style="list-style-type: none"> Moderated regressions 				

Baban (2014)				(main effects)				
				• Cohen's <i>d</i>	*		*	*
<i>Positive affect</i>			GEN				*	*
<i>Negative affect</i>			GEN		n.s.		*	n.s.
5. Gaudreau (2015)	301 undergraduate students	19.49 (2.92) 69%F	Short HF-MPS and brief F-MPS (DISPO)	• Tests of equality of correlation pairs (Steiger <i>z</i>)				
<i>Self-determination</i>			CON		*		*	*
<i>Joy</i>			CON		*		*	*
<i>Goal progress</i>			CON		*		*	*
<i>Life satisfaction</i>			GEN		n.s.		*	*

Note. A subscript of *a* indicates that the relationship was significant in the opposite direction hypothesized. F = Female; M = Male; HF-MPS = Hewitt & Flett's Multidimensional Perfectionism Scale (Hewitt & Flett, 1991); F-MPS = Frost's Multidimensional Perfectionism Scale (Frost et al., 1990); S-MPS-2 = Sport Multidimensional Perfectionism Scale-2 (Gotwals et al., 2011); IPI = Inventario de Perfeccionismo Infantil (Lozano et al., 2012). DISPO = Dispositional; CON = Contextual; SIT = Situational; GEN = General. * Indicates that the interaction was significant or specifies for which variable it was. **H1a: Pure SOP > Non; H1b: Pure SOP < Non; H1c: Pure SOP = Non; H2: Pure SPP < Non; H3: Mixed > Pure SPP; H4: Mixed < Pure SOP.**

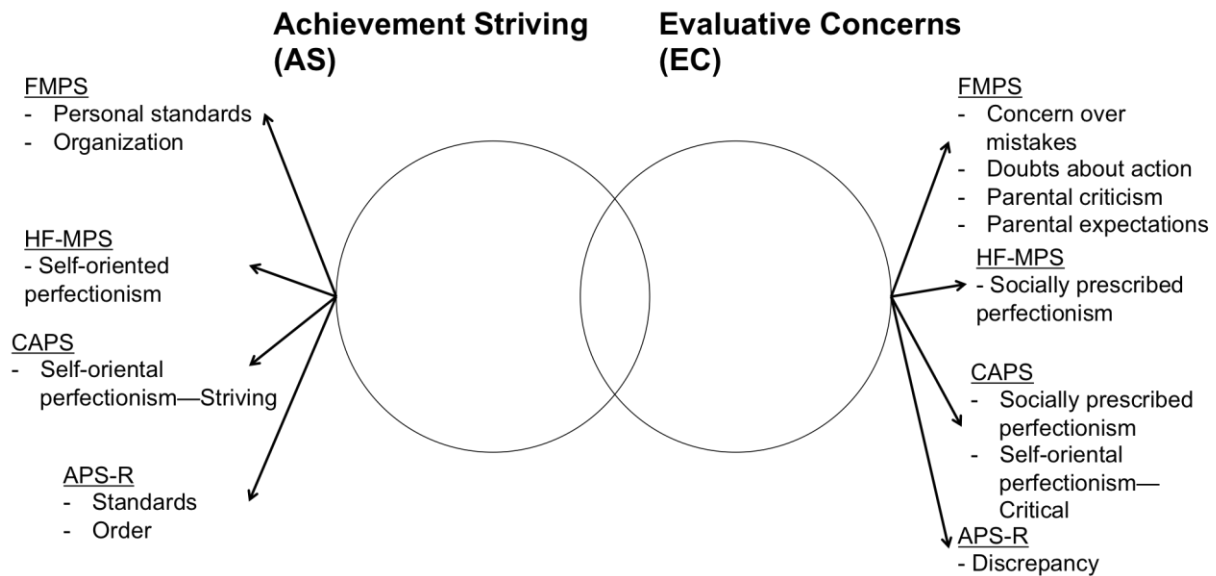


Figure 1. An integrated measurement model of perfectionism (reproduced from DiBartolo & Rendon, 2012). *Note.* The Achievement Striving’s dimension is also commonly labeled as Personal Standards Perfectionism in the extant literature (e.g., Frost et al., 1990). FMPS = Frost Multidimensional Perfectionism Scale (Frost et al., 1990), HF-MPS = Hewitt & Flett Multidimensional Perfectionism Scale (Hewitt & Flett, 1991); CAPS = Children and Adolescent Perfectionism Scale (Flett, Hewitt, Boucher, Davidson, & Munro, 2000); APS-R = Almost Perfect Scale-Revised (Slaney, Rice, Mobley, Trippi, & Ashby, 2001).

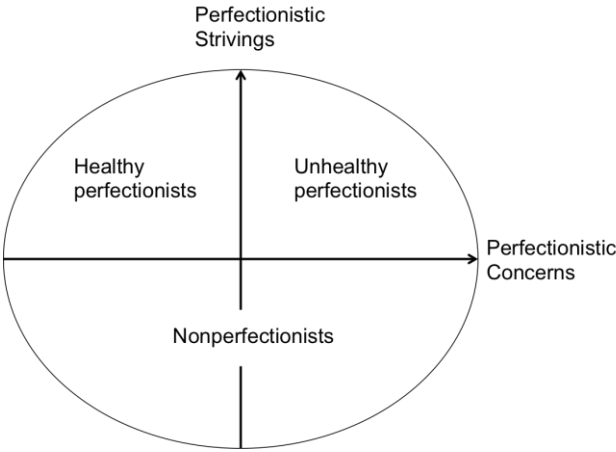


Figure 2. The Tripartite Model of Perfectionism (reproduced from Stoeber & Otto, 2006)

		Evaluative concerns perfectionism	
		Low	High
Personal standards perfectionism	Low	Non-perfectionism	Pure evaluative concerns perfectionism
	High	Pure personal standards perfectionism	Mixed perfectionism

Figure 3. The 2×2 Model of Dispositional Perfectionism (reproduced from Gaudreau & Thompson, 2010)

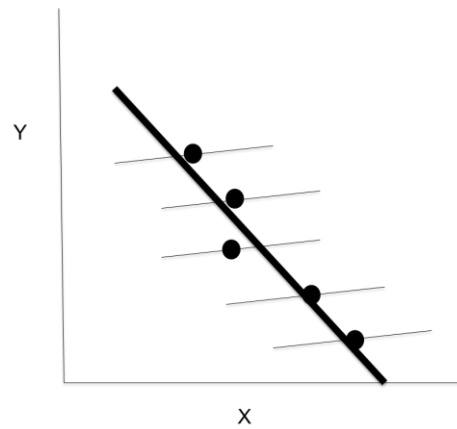


Figure 4. Relationship between X and Y at the within-person (i.e., fine lines) and between-person (i.e., bold line) levels of analysis. At the within-person level of analysis, relationships between X and Y are positive. By aggregating the within-person relationships' averages, the between-person slope between X and Y becomes negative.

**CHAPTER 3: Integrating Dispositional Perfectionism and Within-Person Variations of
Perfectionism across Life Domains into a Multilevel Extension of the 2 × 2 Model of
Perfectionism**

Véronique Franche & Patrick Gaudreau

Published in *Personality and Individual Differences*, January 2016

Abstract

This study proposed an extension of the 2×2 model of perfectionism to assess the effect of four subtypes of perfectionism (i.e., pure self-oriented, mixed, pure socially prescribed, non-perfectionism) at the between-person and within-person levels of analysis. Sample comprised 338 students (80% female) aged between 16 and 48 years old ($M = 19.03$, $SD = 3.46$). Results of multilevel confirmatory factor analysis supported the factor structure of the measure across both levels of analysis, whereas multilevel modeling supported all four hypotheses of the 2×2 model across both levels of analysis for positively-laden variables (i.e., vitality, goal progress, positive affect), while yielding unexpected findings for negative affect and stress. These findings provide firsthand support for researchers interested in adopting a complementary analysis of dispositional perfectionism, while better informing researchers on the generalizability of the consequences associated with perfectionism in various domains.

Keywords: perfectionism, multilevel modeling, life domains, achievement, well-being

**Integrating Dispositional Perfectionism and Within-Person Variations of Perfectionism
across Life Domains into a Multilevel Extension of the 2 × 2 Model of Perfectionism**

Perfectionism has traditionally been defined as a dispositional tendency that remains relatively stable over time and contexts, but some researchers have recently shown that perfectionism may also fluctuate across days (Boone et al., 2012) and significant life domains (e.g., Dunn, Craft, Causgrove Dunn, & Gotwals, 2011; McArdle, 2010). These positions, which might appear contradictory at a first glance, can be reconciled by conceptualizing perfectionism as a multilevel construct that could differ between-person (i.e., individual differences observed as a personality *dispositional trait*) while expressing variability across days, situations, or life domains (*states* or *contextualized traits* that would reflect within-person fluctuations). Accordingly, the current study proposed and tested an extension of the 2 × 2 model of perfectionism by investigating the multilevel relationships of subtypes of perfectionism with indicators of psychological adjustment (i.e., vitality, goal progress, affect, stress).

Perfectionism can be pursued for the personal importance of holding outstandingly high standards (i.e., self-oriented perfectionism; SOP) or because of an actual or perceived pressure that significant others hold toward being perfect (i.e., socially prescribed perfectionism; SPP). Findings have consistently outlined SPP as a risk factor likely to be detrimental to psychological adjustment and behavioural functioning (Hewitt & Flett, 1991). However, there is still no consensus among researchers to determine whether SOP relates positively or negatively to psychological adjustment (see Gotwals, Stoeber, Dunn, & Stoll, 2012 for a review).

The 2 × 2 model of perfectionism (Gaudreau, 2012, 2013; Gaudreau & Thompson, 2010) has been formulated to inform this debate by positing that four subtypes of perfectionism – defined as differing combinations of SOP and SPP – should each lead to varying levels of

adjustment. *Non-perfectionism* is characterized by low levels of both SOP and SPP, whereas *pure SOP* is defined as a combination of predominantly high levels of SOP and low levels of SPP. According to the 2×2 model, pure SOP may be associated with higher (*H1a*), lower (*H1b*), or equivalent (*H1c*) levels of psychological adjustment than non-perfectionism. In *pure SPP*, perfection is pursued out of high levels of SPP and low levels of SOP. The 2×2 model proposes that pure SPP might be the most damaging subtype of perfectionism, which should lead to the lowest levels of adjustment compared to non-perfectionism (*H2*). Finally, *mixed perfectionism*, which is characterized by high levels of both SOP and SPP, should lead to higher adjustment than pure SPP (*H3*) but lower adjustment than pure SOP (*H4*). Thus far, the 2×2 model of perfectionism has been examined across samples of students (Douilliez & Lefèvre, 2011; Franche, Gaudreau, & Miranda, 2012; Gaudreau, 2012; Gaudreau & Thompson, 2010), athletes (Gaudreau & Verner-Filion, 2012; Hill, 2013), and employees (Li, Hou, Chi, Liu, & Hager, 2014) and results have provided support for most hypotheses.

Toward a Multilevel Extension of the 2×2 Model of Perfectionism

During the past decades, researchers have scrutinized the effects of dispositional perfectionism in domains such as sport, school, work, and music (e.g., Gotwals et al., 2012). Similarly, studies on the 2×2 model of perfectionism have either examined general outcomes (e.g., life satisfaction) or outcomes that pertain to one specific domain of living (e.g., school satisfaction). A recent trend has emerged in which some researchers have adapted or developed measures of perfectionism in order to capture the domain-specificity of the perfectionism construct. A major contribution of this research has been the demonstration that the same individual may have a different score of dispositional and athletic perfectionism (Dunn et al., 2011). Similarly, some studies have found that mean-level scores of contextualized

perfectionism can differ across life domains such as sport versus school (Dunn, Gotwals, & Dunn, 2005; McArdle, 2010) and work versus family (e.g., Mitchelson, 2009).

In our opinion, these findings have set the table for a repositioning of perfectionism as a *multilevel construct*. More specifically, perfectionism could be conceived within a supermatrix (Fleeson & Nofhle, 2008) in which it could express both consistency (i.e., dispositional trait) and variability across situations (i.e., personality state) and contexts (i.e., contextualized trait). Considering that perfectionism can fluctuate within individuals across domains of their lives does not and should not be taken as an argument to criticize the prevailing measurement of perfectionism as a disposition. In contrast, personality can be seen as the integration of distinct but interrelated systems of influence, each operating at different hierarchical levels nested into a complex within-person organization (McAdams & Pals, 2006). As such, dispositional and contextualized measurements are likely to offer complementary information into an integrated supermatrix that would capture both the average tendency and the variability of perfectionism across multiple domains in individuals' lives. This measurement approach has already been successfully implemented to measure basic personality dimensions (Boone et al., 2012; Fleeson, 2001; Kashdan & McKnight, 2011).

An extensive corpus of knowledge exists on the relationship between perfectionism as a dispositional trait and consequential life outcomes at the between-person level of analysis. On the one hand, the *between-person level* refers to the positioning of individuals relative to a normative standard (i.e., mean of the sample). At this level, a positive correlation between SOP and life-satisfaction would indicate that individuals with higher SOP are more likely to experience life-satisfaction compared to those with lower SOP. On the other hand, the *within-person level* of contextualized perfectionism refers to the positioning of individuals in a

particular life domain relative to their own average across several domains. At this within-person level, a positive correlation between SOP and satisfaction would indicate that individuals are more satisfied than their own average in life domains for which their level of SOP is higher than their own average. It remains to be determined whether the effects of perfectionism observed at the dispositional between-person level during the last twenty years (e.g., Gotwals et al., 2012) will generalize and be *homologous* across distinct levels of analysis. As such, a multilevel approach would complement rather than contradict what is already known about perfectionism while encouraging clinical psychologists to compare clients to both normative standards (i.e., norms of the population) and to their own average of perfectionism estimated across life domains.

The Present Study

In this study, we asked participants to evaluate their perfectionism in seven life domains to estimate their average dispositional perfectionism and their own within-person variability across contexts. As such, we proposed an extension of the 2×2 model of perfectionism by examining the associations between subtypes of perfectionism and key outcomes (i.e., vitality, goal progress, affect, stress) at both the between-person level (i.e., across individuals) and the within-person level (i.e., across domains within the person). In light of the 2×2 model of perfectionism (see Gaudreau, 2012; Figure 2, panel A), it was expected that non-perfectionism would lead to lower (*H1a*) or higher (*H1b*) levels of adjustment than pure SOP, and to greater adjustment than pure SPP (*H2*). Moreover, mixed perfectionism was expected to be associated with higher adjustment than pure SPP (*H3*) but to lower adjustment than pure SOP (*H4*). These hypotheses were expected to stand across the within- and between-person levels of analysis

Method

Participants and Design

Participants were 338 undergraduate students (80% female), aged on average of 19 years ($SD = 3.46$; range = 16 to 48), who were enrolled mainly full time (97.3%) in diverse programs of study. Students were offered one participation point in their introductory psychology course in exchange for their study participation. Participants were randomly assigned to one of seven orders of presentations of the questionnaire to ensure that the order of the seven life domains (i.e., school, work, romance, friendships, family, parenting, hobbies) was counterbalanced. Participants were asked if they were invested in the first domain, after which they were either redirected to the next life domain (i.e., if they reported not being invested) or asked to complete all measures by referring to the given domain (i.e., if they reported being invested). Students were asked to complete the same measures for as many life domains in which they reported being invested but the instruction was modified to refer to each domain (e.g., “please indicate the extent to which each of the items describes yourself or the way you are acting specifically in *[school]*”). Participants had to complete at least three domains to be included in the study. As such, they indicated being invested in school (99.4%), work (34.9%), romantic relationship (34.6%), friendships (86.1%), family (91.7%), parenting (1.8%), and hobbies (63%). All measures used in this study have been widely used in psychological sciences and have consistently demonstrated good validity and reliability. Participants provided informed consent and this study was approved by a University Research Ethics Board.

Measures

Perfectionism. The 10-item version of the Multidimensional Perfectionism Scale (Cox, Enns, & Clara, 2002) was used to assess SOP (within-person $\alpha = .961$; between-person $\alpha = .99$) and SPP (within-person $\alpha = .92$; between-person $\alpha = .98$). To assess domain-specific

perfectionism, participants were asked to report the extent to which they agreed with each statement regarding their life in each domain (rather than in general) on a rating scale from 1 (Not at all agree) to 7 (Totally agree).

Vitality. Seven items (e.g., “I felt energized”; Ryan & Frederick, 1997) were used to measure subjective vitality (within-person $\alpha = .98$; between-person $\alpha = .98$). Participants were asked to reflect on the feelings and emotions that they experienced recently in each life domain and rate each item on a scale from 1 (*Not at all*) to 7 (*Totally*).

Goal progress. Five items adapted from prior studies (Dugas, Gaudreau, & Carraro, 2012) assessed goal progress (within-person $\alpha = .96$; between-person $\alpha = .99$). Participants were instructed to refer to the goals they had been pursuing during the past few weeks in each domain and rate each item (e.g., “*I have progressed on my goals*”) on a scale from 1 (*Not at all*) to 7 (*Totally*).

Affect. Nine items measured participants’ positive affect (e.g., “*joyful*”, “*enjoyment/fun*”; within-person $\alpha = .95$; between-person $\alpha = .98$) and negative affect (e.g., “*unhappy*”, “*worried/anxious*”; within-person $\alpha = .94$; between-person $\alpha = .98$) over the past few weeks (Emmons, 1992). Each item was rated on a scale from 1 (*Not at all*) to 7 (*Totally*).

Stress. Participants were asked to indicate the amount of stress they had experienced so far toward each life domain on a stress thermometer (Stanton, 1991) ranging from 0 (*No stress at all*) to 100 (*Most stress ever experienced*).

Results

Preliminary Analyses

A prerequisite to extending perfectionism as a multilevel construct is to ascertain that the measurement model of perfectionism is replicable or homologous across levels of analysis

(Kozlowski & Klein, 2000). In other words, regardless of the idiosyncratic nature of each particular life domain, the wording of questions measuring dispositional perfectionism should be slightly adaptable to measure contextual perfectionism. A multilevel confirmatory factor analysis was thus performed to assess the factor structure of perfectionism at the within-person (i.e., Level 1) and between-person levels of analysis (i.e., Level 2). The 10-item 2-factor model yielded an acceptable fit, $MLR\chi^2(76) = 350.73$ (scaling correction factor = 1.269), $p < .01$, CFI = .945, TLI = .935, RMSEA = .060, within-person SRMR = .055, between-person SRMR = .065. Factor loadings were invariant across levels of analysis, $\Delta MLR\chi^2 = 1.34$, $\Delta df = 8$, $\Delta CFI = .001$. The measurement model was deemed equivalent across levels of analysis, thus supporting the hypothesis of homology. Results are available upon request.

Plan of Analyses

Multilevel modeling (MLM) was conducted using HLM 6.04 (Raudenbush, Bryk, & Congdon, 2007) with the full information maximum likelihood robust estimator in order to analyze within-person (i.e., Level 1) and between-person (i.e., Level 2) variations in perfectionism across life domains. The first step was to examine the null (or unconditional) model in which no predictors were entered to estimate the intra-class correlations (ICC) of each variable. ICC indicated that substantial variance in SOP (39.0%), SPP (50.0%), stress (5.4%), goal progress (34.6%), positive affect (21.0%), negative affect (31.0%), and vitality (25.4%) was attributable to between-person variability, thus warranting the usage of MLM. It also showed that most of the variance was attributable to within-person fluctuations, thus revealing substantial variability of the outcomes across domains. The second step of our analyses examined the effects of SOP, SPP, and the interactive score of $SOP \times SPP$ at both levels of analysis. In the Level 1 equation, SOP and SPP were centered using group-mean centering whereas their interactive

score was entered uncentered in the equation. In the Level 2 equations, SOP and SPP were grand-mean centered and the interactive score was added uncentered. Random effects of intercepts and slopes were included and retained in the Level 2 equations. Results showed that the SOP \times SPP interactions at Level 1 and Level 2 were non-significant for all outcome variables (these results are available upon request). Therefore, main effects of SOP and SPP (after deleting the SOP \times SPP effect) were used to estimate predicted values of the four perfectionism subtypes across high (+1SD) and low (-1SD) values of SOP and SPP (e.g., Gaudreau, 2012). As detailed in Figure 2, panel A of the methodological note of Gaudreau (2012), a significant main effect of SOP would support the hypothesis that pure SOP was associated with significantly better outcomes than non-perfectionism (H1a) and that mixed perfectionism was associated with significantly better outcomes than pure SPP (H3). In contrast, a significant main effect of SPP would provide evidence for the hypothesis that non-perfectionism was associated with better outcomes than pure SPP (H2) and that pure SOP was associated with better outcomes than mixed perfectionism (H4). Results are presented in Table 1 and Table 2. Descriptive statistics and correlations among variables are reported in the supplemental file.

Main Analyses

Vitality. The positive and negative main effects of SOP and SPP were respectively significantly related to vitality at both the within- and between-person levels. These findings provided further evidence for the four hypotheses proposed in the 2 \times 2 model.

Goal progress. The positive and negative main effects of SOP and SPP were respectively significant at the within-person and between-person levels. Hence, hypotheses of the 2 \times 2 model were supported at the within- and between-person levels.

Positive affect. The positive and negative main effects of SOP and SPP were respectively

significant at both the within-person and between-person levels of analysis, thus supporting all four hypotheses at both levels.

Negative affect. Main effect of SOP was not significantly associated with negative affect at the within- and between-person levels. This result indicated that pure SOP and non-perfectionism were associated with similar levels of negative affect whereas mixed perfectionism and pure SPP were associated with comparable negative affect. H1a and H3 were not supported at either levels of analysis. Meanwhile, the main effect of SPP was positively related to negative affect at both levels. This main effect at both levels indicated that pure SPP was related to significantly higher negative affect than non-perfectionism (H2) and that pure SOP was related to lower negative affect than mixed perfectionism (H4).

Stress. *At the within-person level,* main effects of SOP and SPP were positively associated with stress. On the one hand, the main effect of SOP lent support to H1b by showing that pure SOP was related to greater stress than non-perfectionism. In contrast, H3 was contradicted, as mixed perfectionism led to higher levels of stress than pure SPP. On the other hand, the main effect of SPP demonstrated that pure SPP was associated with significantly higher stress than non-perfectionism (H2) and that pure SOP was related to lower stress than mixed perfectionism (H4).

At the between-person level, the main effect of SPP but not SOP was positively related to stress. Hence, the non-significant main effect of SOP demonstrated that pure SOP and non-perfectionism, as well as mixed perfectionism and pure SPP, were related to similar levels of stress, thereby not supporting H1a, H1b, and H3. Furthermore, the significant main effect of SPP revealed that pure SPP was associated with greater stress than non-perfectionism (H2), whereas pure SOP was associated with lower stress than mixed perfectionism (H4).

Discussion

A Multilevel Extension of the 2 × 2 Model of Perfectionism

Individual differences and intra-individual variations in perfectionism should be seen as complementary rather than contradictory levels of analysis. Our results have supported this assertion by showing the robustness of the 2 × 2 model of perfectionism across both levels of analysis. Accordingly, at the between-person level, pure SOP was associated to higher levels of vitality, goal progress, and positive affect compared to non-perfectionism (H1a) and mixed perfectionism (H4). These results were homologous at the within-person level. As expected, greater vitality, goal progress, and positive affect were observed in the domains in which individuals displayed their strongest tendency toward a subtype of pure SOP compared to life domains in which they displayed more non-perfectionism (H1a) and mixed perfectionism (H4). It thus seems like pursuing perfectionism with a combination of high SOP and low SPP can provide normative advantages compared to other individuals with non-perfectionism (i.e., between-person) as well as personal advantages in the life domains in which a person is more prone to possess such a combination of pure SOP.

Moreover, at the between-person level, pure SPP was associated to lower levels of vitality, goal progress, and positive affect compared to non-perfectionism (H2) and mixed perfectionism (H3). These results were also homologous at the within-person level. The 2 × 2 model has depicted pure SPP as potentially the most maladaptive subtype of perfectionism. Our results provide additional support for this contention. Not only does pursuing perfectionism with a combination of high SPP and low SOP can create some disadvantages compared to other individuals with non-perfectionism and mixed perfectionism (i.e., between-person) but it also seems to be linked with personal disadvantages in the life domains in which a person is more

prone to possess such a combination of pure SPP.

The aforementioned findings, depicting the relationships of perfectionism with indicators of positive psychological adjustment, lent credence to the four hypotheses of the 2×2 model. However, only two of the four hypotheses of the 2×2 model were supported at both levels of analysis with indicators of negative psychological adjustment. Consistent with expectations, pure SPP was related to higher levels of negative affect and stress than non-perfectionism (H2), whereas mixed perfectionism was related to higher levels of negative affect and stress than pure SOP (H4) at both levels of analysis. In contrast, H1a and H3 were not fully supported to predict indicators of negative psychological adjustment (i.e., negative affect and stress). Pure SOP was associated with greater stress than non-perfectionism (H1b), whereas pure SPP was related to lower stress compared to mixed perfectionism, thus contradicting H3 at the within-person level of analysis.

General negative affectivity—which denotes feelings of unpleasant engagement with life situations—and the widespread activation of stress across life domains can be taken as an indicator of negative psychological adjustment that reveals an important imbalance between the capacities/resources of the person and the demands of his or her life situations. Although pure SOP (compared to non-perfectionism) is related to a host of positively-laden outcomes, the two subtypes of perfectionism are related to similar levels of negative affect and perceived stress at the between-person level. Similarly, pure SPP was not associated with significantly lower levels of negative affect and perceived stress than mixed perfectionism, which is similar to the findings of Douilliez and Lefèvre (2011) regarding depressive symptoms. Accordingly, our results seem to indicate that pure SOP (compared to non-perfectionism) and mixed perfectionism (compared to pure SPP) might confer advantages to promote psychological health without necessarily

reducing the risks of psychological maladjustment. This intriguing finding reaffirms the need to acknowledge the potential multifaceted effects of perfectionism rather than defining subtypes of perfectionism as inherently healthy or unhealthy.

Limitations and Future Directions

In this study, the between-person variability in perceived stress was 5.4% whereas past research revealed 22.5% of between-person variability in event stressfulness (e.g., Dunkley, Zuroff, & Blankstein, 2003). It is important to highlight that participants were asked to evaluate their current level of stress in comparison to their highest level experienced so far in the life domain. Hence, comparing one's current level of stress to one's highest level inherently implicates a within-person comparison that may have contributed to decrease between-person variability. Future research should thus adopt a more traditional scale (e.g., 0 = no stress at all; 100 = extreme stress) in order to measure absolute rather than relative intensity of stress.

Furthermore, this study relied on a sample of undergraduate students. Older adults and emerging adults already involved full-time in the workforce have to conciliate slightly different domains. Future research should therefore examine the multilevel effects of perfectionism with diversified samples, such as adolescents, employees, single mothers, and retired people.

Furthermore, this study relied on self-report measures. Although self-reports provide useful information on students' perceived experience, future research should complement such measures with informant reports as a way to counterbalance the effects of shared-method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Conclusion

Researchers have recently outlined the importance of acknowledging the role of domain-specific perfectionism—in addition to the study of dispositional perfectionism—, as

perfectionism levels may fluctuate from one life domain to another. Overall, this study supported the multilevel factorial structure of perfectionism while also assessing and supporting a first multilevel extension of the 2×2 model of perfectionism. Our results should inform researchers on the importance of examining perfectionism at both levels of analysis, by way of providing complementary rather than contradicting findings.

Footnote

¹ Alphas were calculated using the typical formula of Cronbach's alpha, which was applied on the level 1 and level 2 inter-item correlation matrices respectively.

References

- Boone, L., Soenens, B., Mouratidis, A., Vansteenkiste, M., Verstuyf, J., & Braet, C. (2012). Daily fluctuations in perfectionism dimensions and their relation to eating disorder symptoms. *Journal of Research in Personality, 46*, 678-687.
doi:10.1016/j.jrp.2012.08.001
- Cox, B. J., Enns, M. W., & Clara, I. P. (2002). The multidimensional structure of perfectionism in clinically distressed and college student samples. *Psychol Assess, 14*, 365-373.
doi:10.1037/1040-3590.14.3.365
- Douilliez, C., & Lefèvre, F. (2011). Interactive effect of perfectionism dimensions on depressive symptoms: A reply to Gaudreau and Thompson (2010). *Personality and Individual Differences, 50*, 1147-1151. doi:10.1016/j.paid.2011.02.005
- Dugas, M., Gaudreau, P., & Carraro, N. (2012). Implementation planning and progress on physical activity goals: The mediating role of life-management strategies. *Research Quarterly for Exercise and Sport, 83*, 77-85. doi:10.5641/027013612X13330442605331
- Dunkley, D. M., Zuroff, D. C., & Blankstein, K. R. (2003). Self-critical perfectionism and daily affect: Dispositional and situational influences on stress and coping. *J Pers Soc Psychol, 84*, 234-252. doi:10.1037/0022-3514.84.1.234
- Dunn, J. G. H., Craft, J. M., Causgrove Dunn, J., & Gotwals, J. K. (2011). Comparing a domain-specific and global measure of perfectionism in competitive female figure skaters. *Journal of Sport Behavior, 34*(1), 25-46.
- Dunn, J. G. H., Gotwals, J. K., & Dunn, J. C. (2005). An examination of the domain specificity of perfectionism among intercollegiate student-athletes. *Personality and Individual Differences, 38*, 1439-1448. doi:10.1016/j.paid.2004.09.009

- Emmons, R. A. (1992). Abstract versus concrete goals: Personal striving level, physical illness, and psychological well-being. *J Pers Soc Psychol*, *62*, 292-300. doi:10.1037/0022-3514.62.2.292
- Fleeson, W. (2001). Toward a structure- and process-integrated view of personality: Traits as density distributions of states. *J Pers Soc Psychol*, *80*, 1011-1027. doi:10.1037//0022-3514.80.6.1011
- Fleeson, W., & Nofle, E. E. (2008). Where does personality have its influence? A supermatrix of consistency concepts. *J Pers*, *76*, 1355-1385. doi:doi: 10.1111/j.1467-6494.2008.00525.x
- Franche, V., Gaudreau, P., & Miranda, D. (2012). The 2 × 2 model of perfectionism: A comparison across Asian Canadians and European Canadians. *Journal of Counseling Psychology*, *59*, 567-574. doi:10.1037/a0028992
- Gaudreau, P. (2012). A methodological note on the interactive and main effects of dualistic personality dimensions: An example using the 2 × 2 model of perfectionism. *Personality and Individual Differences*, *52*, 26-31. doi:10.1016/j.paid.2011.08.022
- Gaudreau, P. (2013). The 2 × 2 Model of Perfectionism: Commenting the Critical Comments and Suggestions of Stoeber (2012). *Personality and Individual Differences*, *55*, 351-355. doi:10.1016/j.paid.2013.03.021
- Gaudreau, P., & Thompson, A. (2010). Testing a 2 × 2 model of dispositional perfectionism. *Personality and Individual Differences*, *48*, 532-537. doi:10.1016/j.paid.2009.11.031
- Gaudreau, P., & Verner-Filion, J. (2012). Dispositional perfectionism and well-being: A test of the 2 × 2 model of perfectionism in the sport domain. *Sport, Exercise, and Performance Psychology*, *1*, 29-43. doi:10.1037/a0025747

- Gotwals, J. K., Stoeber, J., Dunn, J. G. H., & Stoll, O. (2012). Are perfectionistic strivings in sport adaptive? A systematic review of confirmatory, contradictory, and mixed evidence. *Canadian Psychology, 53*, 263-279. doi:10.1037/a0030288
- Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *J Pers Soc Psychol, 60*, 456-470. doi:10.1016/S0191-8869%2801%2900109-X
- Hill, A. P. (2013). Perfectionism and burnout in junior soccer players: A test of the 2 × 2 model of dispositional perfectionism. *Journal of Sport and Exercise Psychology, 35*(1), 18-29.
- Kashdan, T. B., & McKnight, P. E. (2011). Dynamic, contextual approaches to studying personality in the social world. *J Pers, 79*, 1177-1190. doi:10.1111/j.1467-6494.2011.00737.x
- Kozlowski, S. W. J., & Klein, K. J. (2000). A multilevel approach to theory and research in organizations: Contextual, temporal, and emergent processes. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 3-90). San Francisco, CA: Jossey-Bass.
- Li, X., Hou, Z.-J., Chi, H.-Y., Liu, J., & Hager, M. J. (2014). The mediating role of coping in the relationship between subtypes of perfectionism and job burnout: A test of the 2 × 2 model of perfectionism with employees in China. *Personality and Individual Differences, 58*, 65-70. doi:10.1016/j.paid.2013.10.007
- McAdams, D. P., & Pals, J. L. (2006). A new Big Five: Fundamental principles for an integrative science of personality. *American Psychologist, 61*, 204-217. doi:doi: 10.1037/0003-066X.61.3.204

McArdle, S. (2010). Exploring domain-specific perfectionism. *J Pers*, 78, 493-508.

doi:10.1111/j.1467-6494.2010.00624.x

Mitchelson, J. K. (2009). Seeking the perfect balance: Perfectionism and work-family conflict.

Journal of Occupational and Organizational Psychology, 82, 349-367.

doi:10.1348/096317908x314874

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method

biases in behavioral research: A critical review of the literature and recommended

remedies. *Journal of Applied Psychology*, 88, 879-903. doi:10.1037/0021-9010.88.5.879

Raudenbush, S. W., Bryk, A. S., & Congdon, R. (2007). HLM for Windows (Version 6.04).

Lincolnwood, IL: Scientific Software International.

Ryan, R. M., & Frederick, C. (1997). On energy, personality, and health: Subjective vitality as a

dynamic reflection of well-being. *J Pers*, 65, 529-565. doi:10.1111/j.1467-

6494.1997.tb00326.x

Stanton, H. E. (1991). The reduction in secretarial stress. *Contemporary Hypnosis*, 8(1), 45-50.

Table 1

Results of Multilevel Modeling

Outcomes	Within-person						
	Intercept		SOP		SPP		
	B	SE	B	SE	B	SE	
Vitality	4.40	.05	.17**	.04	-.40**	.04	
Goal progress	4.16	.05	.40**	.04	-.15**	.04	
Positive affect	5.03	.04	.14**	.04	-.36**	.04	
Negative affect	2.67	.04	.02	.03	.41**	.04	
Stress	36.44	.80	3.70**	.79	8.73**	.87	
	Between-person						
	SOP		SPP		Random effects		
	B	SE	B	SE	μ_0	μ_1	μ_2
Vitality	.42**	.05	-.27**	.05	.44**	.05	.05
Goal progress	.44**	.06	-.20**	.06	.65**	.07**	.06*
Positive affect	.34**	.04	-.25**	.04	.35**	.07	.06
Negative affect	-.07	.04	.48**	.05	.34**	.03**	.10
Stress	-1.65	.89	6.86**	.92	42.92**	10.44	2.46

Note. Parameters are unstandardized. μ_0 , μ_1 , μ_2 = random effect of intercepts, SOP, and SPP respectively. * $p < .05$. ** $p < .01$.

Table 2

Predicted Values and Cohen's d Effects Sizes of Hypotheses

Outcomes	Within-person							
	Predicted values				Effect sizes			
	Non-perfectionism	Pure SOP	Mixed perfectionism	Pure SPP	H1	H2	H3	H4
Vitality	4.22 _a	4.73 _c	3.53 _a	3.02 _b	0.35*	0.82*	0.35*	0.82*
Goal progress	5.03 _a	6.30 _c	5.84 _a	4.57 _b	0.88*	0.32*	0.88*	0.32*
Positive affect	4.86 _a	5.31 _c	4.23 _a	3.78 _b	0.33*	0.79*	0.33*	0.79*
Negative affect	3.37 _a	3.43 _a	4.69 _b	4.63 _b	0.04	-0.93*	0.04	-0.93*
Stress	60.57 _a	72.34 _c	99.22 _a	87.46 _b	0.39*	-0.89*	0.39*	-0.89*
	Between-person							
	Predicted values				Effect sizes			
	Non-perfectionism	Pure SOP	Mixed perfectionism	Pure SPP	H1	H2	H3	H4
Vitality	5.21 _a	6.20 _c	5.53 _a	4.53 _b	1.01*	0.69*	1.01*	0.69*
Goal progress	5.15 _a	6.16 _c	5.66 _a	4.65 _b	0.97*	0.48*	0.97*	0.48*
Positive affect	5.64 _a	6.44 _c	5.81 _a	5.01 _b	0.89*	0.70*	0.89*	0.70*
Negative affect	3.37 _a	3.20 _a	4.40 _b	4.57 _b	-0.17	-1.22*	-0.17	-1.22*
Stress	44.58 _a	40.63 _a	58.13 _b	62.08 _b	-0.23	-1.02*	-0.23	-1.02*

Note. Predicted values in the same row that do not share subscripts differ at $p < .05$. H1 = Pure SOP vs. Non-perfectionism, H2 = Non-perfectionism vs. Pure SPP, H3 = Mixed perfectionism vs. Pure SPP, H4 = Pure SOP vs. Mixed perfectionism. * $p < .05$

Table 3 (Supplemental Material)

Descriptive Statistics and Correlations

Variable	1.	2.	3.	4.	5.	6.	7.
1. SOP	---						
2. SPP	.59**	---					
3. Vitality	.30**	-.04	---				
4. Goal progress	.34**	.06	.63**	---			
5. Positive affect	.24**	-.08	.82**	.55**	---		
6. Negative affect	.29**	.58**	-.28**	-.13	-.26**	---	
7. Stress	.20**	.46**	-.38**	-.12	-.38**	.68**	---
<i>M</i>	4.38	3.17	4.39	4.16	5.02	2.67	37.17
<i>SD</i>	1.18	1.24	0.98	1.03	0.89	0.97	17.12
<i>Range</i>	1-7	1-7	1-7	1-7	1-7	1-7	0-100

Note. * $p < .05$. ** $p < .01$.

**CHAPTER 4: A Multilevel Investigation of the 2×2 Model of Perfectionism: Relation
Between Subtypes of Perfectionism and Coping at the Between-Person and Within-Person
Levels of Analysis**

Véronique Franche, Patrick Gaudreau, & Kristina Kljajic

University of Ottawa

Abstract

In this study, we further tested the multilevel extension (Franche & Gaudreau, 2016) of the 2×2 model of perfectionism (Gaudreau & Thompson, 2010) by examining the relationships between subtypes of perfectionism (i.e., pure SOP, non-perfectionism, pure SPP, mixed perfectionism) and coping (i.e., task-oriented, disengagement-oriented, and relative) at the between-person (i.e., across individuals; Study 1) and within-person levels of analysis (i.e., across life domains; Study 2). In Study 1, 332 undergraduate students were recruited to complete measures of perfectionism and coping. In Study 2, an independent sample of 203 undergraduate students also completed measures of perfectionism and coping across several life domains in which they reported being invested. Results of multiple regressions at the between-person level (Study 1) were consistent with past findings, supporting that high levels of SOP were associated with task-oriented coping and high levels of SPP were related to disengagement-oriented coping. Results of multilevel analyses at the within-person level (Study 2) revealed that higher levels of SPP (i.e., pure SPP vs. non-perfectionism; mixed perfectionism vs. pure SOP) were associated with disengagement-oriented coping whereas higher levels of SOP (pure SOP vs. non-perfectionism; mixed perfectionism vs. pure SPP) were associated with higher task-oriented and lower disengagement-oriented coping. Ancillary analyses examining the relationships between subtypes of perfectionism and relative coping (i.e., a variable assessing the percentage of task-oriented coping) supported most hypotheses of the model across both studies. Overall, our findings provided additional support for examining a multilevel extension of the 2×2 model of perfectionism, particularly when examining the extent to which students use task-oriented coping relative to disengagement-oriented coping.

Keywords: perfectionism, coping, multilevel modeling

A Multilevel Investigation of the 2 × 2 Model of Perfectionism: Relation between Subtypes of Perfectionism and Coping at the Between-Person and Within-Person Levels of Analysis

Perfectionism is a personality disposition often endorsed by university students (e.g., Gaudreau, 2015). Students who are perfectionistic generally pursue and evaluate themselves based on outstandingly high standards of achievement and/or they perceive that people around them expect, evaluate, and pressure them to reach perfection (Hewitt & Flett, 1991). Like many personality dimensions, perfectionism has traditionally been studied as a characteristic that remains relatively stable over time and consistent across contexts (Flett & Hewitt, 2002). However, mounting research and a recent multilevel extension (Franche & Gaudreau, 2016) of the 2 × 2 model of perfectionism (Gaudreau & Thompson, 2010) have demonstrated that the extent to which a student is a perfectionist varies across the different contexts of their life. Moreover, such domain-by-domain variations in perfectionism within the same person are noteworthy because they can and have already been found to significantly predict psychological adjustment of students. Our goal was to further investigate the multilevel extension of the 2 × 2 model by examining the relationships between subtypes of perfectionism and coping strategies of university students at both the between- (Study 1) and within-person (Study 2) levels of analysis.

The 2 × 2 Model of Perfectionism and a Multilevel Extension

The 2 × 2 model of perfectionism (Gaudreau, 2012, 2013; Gaudreau & Thompson, 2010) proposed that perfectionism facets of self-oriented perfectionism (i.e., SOP) and socially prescribed perfectionism (i.e., SPP) can be organized into four subtypes of perfectionism¹: pure SOP, pure SPP, mixed perfectionism, and non-perfectionism. In this model, individuals with

¹ The word “subtypes” is used merely as a proxy for referring to “within-person combinations of SOP and SPP”; see Gaudreau, 2013 for a discussion on the use of the word subtype.

pure SOP are expected to reach higher (*Hypothesis 1a*) or lower (*Hypothesis 1b*) levels of adjustment compared to non-perfectionism. In contrast, individuals with pure SPP are expected to have the lowest levels of adjustment compared to non-perfectionism (*Hypothesis 2*). Furthermore, individuals with mixed perfectionism are expected to achieve higher levels of adjustment than those with pure SPP (*Hypothesis 3*) but lower levels compared to individuals with pure SOP (*Hypothesis 4*). So far, researchers have tested these hypotheses in the domains of sports (e.g., Crocker, Gaudreau, Mosewich, & Kljajic, 2014; Gaudreau & Verner-Filion, 2012; Hill & Davis, 2014), school (e.g., Douilliez & Lefèvre, 2011; Franche, Gaudreau, & Miranda, 2012; Gaudreau & Thompson, 2010), and work (Li, Hou, Chi, Liu, & Hager, 2014). These studies supported several of the hypotheses with indicators of psychological adjustment (e.g., satisfaction, affect, vitality, depressive symptoms, goal progress) and self-regulation (e.g., control of anger, emotion suppression).

Recently, Franche and Gaudreau (2016) demonstrated that perfectionism can be conceptualized as a personality trait that can express not only consistency, but also variability across contexts (e.g., life domains). On the basis of their multilevel extension of the 2×2 model, they examined the relationships between subtypes of perfectionism and psychological adjustment at two distinct levels of analysis. At the *between-person level*, they compared the psychological adjustment across individuals with different subtypes of perfectionism. This has been, thus far, the typical level of analysis examined by researchers investigating the 2×2 model of perfectionism. At the *within-person level*, they compared the perfectionism and psychological adjustment of the same individuals across their life domains in order to evaluate if they were happier and healthier in domains in which they were more or less perfectionistic than their own average. Results of multilevel analyses have supported Hypotheses 1a, 2, 3, and 4 of the 2×2

model across both levels of analysis to predict a host of positively laden variables of psychological adjustment (i.e., vitality, goal progress, and positive affect).

Despite this supportive evidence, only some hypotheses were corroborated across both levels of analysis to predict negatively valenced variables (i.e., negative affect and stress). Moreover, some findings even contradicted certain hypotheses of the 2×2 model. At the within-person level, pure SOP (compared to non-perfectionism) and mixed perfectionism (compared to pure SPP) were associated with greater levels of stress—as opposed to expected. As argued by Franche and Gaudreau (2016), it might be possible that pure SOP and mixed perfectionism could “confer advantages to promote psychological health without necessarily reducing the risks of psychological maladjustment” (p. 58). Alternatively, increased levels of stress and negative affectivity at the within-person level might hold a different psychological meaning that should not be conflated with chronic stress or negative adjustment. Domain-by-domain variations in stress indicate that a student experiences an imbalance between the demands of certain life domains and his/her resources to deal with these demands. Students might thus be drawn to momentarily activate their resources in order to cope with these domain-specific demands. As such, an elevated amount of perfectionism in certain life domains might generate a need to cope that should energize students to mobilize all sorts of efforts toward coping. Differentiating the between-person and within-person association between subtypes of perfectionism and coping could be pivotal to help reinterpret some of the unexpected findings observed with indicators of negative adjustment.

Perfectionism and Coping

Coping has been defined as the ever-changing cognitive, affective, and behavioural efforts aimed toward managing the demands of a specific stressful situation that is appraised as

challenging or exceeding a person's resources (Lazarus & Folkman, 1984). Coping strategies can be regrouped into two higher-order categories, namely task- and disengagement-oriented coping (Skinner, Edge, Altman, & Sherwood, 2003). The task-oriented coping dimension regroups strategies that are centered directly toward the stressor and the thoughts and emotions associated with it (e.g., problem-focused coping, planning, increased effort, relaxation, positive reappraisal). In contrast, disengagement-oriented coping includes efforts to disengage or distract oneself from the stressful situation or to withdraw oneself from the process of actively striving toward the achievement of goal-directed outcomes (e.g., behavioural and mental disengagement, avoidance, denial, blaming of others).

Recently, Crocker et al. (2014) examined the relationships between the four subtypes of perfectionism and coping with a sample of athletes. Their study demonstrated that pure SPP was associated with more avoidance coping than non-perfectionism (Hypothesis 2), and that pure SOP was related with less avoidance strategies than mixed perfectionism (Hypothesis 4). Although this study was important for the assessment of the 2×2 model in sport, their results surprisingly did not support hypotheses of the model with problem-focused coping. Notwithstanding, in this study, SOP was operationalized with a proxy measure (i.e., high standards). Although high standards are a central component of perfectionism, SOP also entails the personal importance attached to the pursuit of such high standards. In itself, holding high standards might not capture the approach and volitional motivation that defines and characterizes individuals with high SOP. Therefore, revisiting the hypotheses proposed by the 2×2 model using specific measures of SOP and SPP would be needed to better understand the relationship between perfectionism subtypes and coping.

According to the 2×2 model of perfectionism, a subtype of pure SOP should be

associated with a pattern of optimal coping in which individuals are using more task-oriented coping than disengagement-oriented coping. In contrast, a subtype of pure SPP should be associated with a pattern of suboptimal coping in which individuals are using less task-oriented coping than disengagement-oriented coping. In past studies, task-oriented and disengagement-oriented coping have been studied as two separate and unrelated dependent variables.

Researchers have generally reported positive associations between SOP and task-oriented coping, and between SPP and disengagement-oriented coping (e.g., Dunkley, Mandel, & Ma, 2014; Hill, Hall, & Appleton, 2010). This typical analytical approach to study coping reveals an ambiguously incomplete and misleading portrait of the relationship between perfectionism and coping. Accordingly, investigating the effects of task-oriented and disengagement-oriented coping separately makes the hardly defensible assumption that university students use coping strategies that are either oriented toward the task or away from the task (i.e., disengagement). University students are likely and have been shown to use a combination of strategies that are both task-oriented and disengagement-oriented (e.g., Doron, Trouillet, Maneveau, Ninot, & Neveu, 2015; Sideridis, 2006). Little is known about whether or not subtypes of perfectionism are differentially associated with a tendency to use task-oriented coping *to a larger extent* than disengagement-oriented coping. In other words, assessing the ratio/proportion of task-oriented coping that is being used by students compared to their overall amount of coping—rather than examining coping dimensions as two separate constructs—might provide useful complementary information to guide the interpretation of past findings and provide a better understanding of the relationship between coping and perfectionism. Revisiting the relationships between perfectionism subtypes and coping using an analytical approach of “relative coping” (e.g., Ptacek, Smith, & Dodge, 1994; Vitaliano, Maiuro, Russo, & Becker, 1987) could thus provide a

more direct assessment of the hypotheses of the model. Therefore, an additional goal of this study was to probe the relative coping approach, which we expected to support the four hypotheses of the 2×2 model of perfectionism.

The Present Studies

Given that perfectionism may express consistency and variability across life domains, students are likely to adjust their coping behaviour according to the varying demands of each of their life domains. Accordingly, coping has been conceptualized as a multilevel construct encompassing the qualities of both a *trait* (i.e., capturing our overall stable and constant tendency to cope with stress) and a *state* (i.e., referring to our momentary, "ever-changing" use of coping strategies in any given stressful encounter; Gaudreau & Miranda, 2010; Gaudreau, Nicholls, & Levy, 2010; Lazarus & Folkman, 1984). Students are often required to adopt different coping skills in order to manage the demands and reach their personal goals within each of their life domains. One might, for example, predominantly engage in active coping skills such as problem solving, relaxation, and social support in life domains in which he/she expresses higher levels of SOP. In contrast, another person may predominantly use disengagement or avoidance strategies in life domains in which he/she displays greater levels of SPP.

Both coping and perfectionism are expected to differ between people while also varying within the same person across life domains. Therefore, our goal in this study was to examine relationships of perfectionism subtypes with (a) task-oriented coping, (b) disengagement-oriented coping, and (c) relative coping (i.e., tendency to use task-oriented coping to a larger extent than disengagement-oriented coping) at both the *between-person level* (Study 1) and the *within-person level* (Study 2)

Study 1

In Study 1, we assessed dispositional perfectionism by asking students to evaluate their perfectionism tendencies in general in their lives. As such, perfectionism was conceptualized as a dispositional (“trait-like”) personality dimension likely to predict how university students are coping to handle the demands of their school-related activities. Using this measurement scheme, frequently used in the extant perfectionism literature, allowed us to examine the relationships between subtypes of perfectionism and coping at the between-person level of analysis.

We started with the traditional approach used in the extant literature by examining the association between subtypes of perfectionism and each coping dimension. Using this conceptualization of coping, we expected partial support for the hypotheses of the 2×2 model. Consistent with findings from past studies, we expected pure SOP to relate with greater task-oriented coping compared to non-perfectionism (Hypothesis 1) and to lesser disengagement-oriented coping compared to mixed perfectionism (Hypothesis 4). We also expected pure SPP to relate to greater disengagement-oriented coping than non-perfectionism (Hypothesis 2) and to lesser task-oriented coping than mixed perfectionism (Hypothesis 3).

We also conducted alternative analyses to examine the association between subtypes of perfectionism and the tendency to use task-oriented coping to a larger extent than disengagement-oriented coping (i.e., relative coping). We expected support for the four hypotheses of the 2×2 model using this conceptualization of relative coping. In other words, a subtype of pure SOP should be associated with a higher predominant usage of task-oriented coping compared to non-perfectionism (Hypothesis 1) and mixed perfectionism (Hypothesis 4) whereas a subtype of pure SPP should be associated with a lower predominant usage of task-oriented coping compared to non-perfectionism (Hypothesis 2) and mixed perfectionism (Hypothesis 3).

Method

Participants and Design. A sample of 332 undergraduate students (71% female) ranging from 17 to 58 years ($M = 19.42$; $SD = 3.06$) participated in this study. Students were enrolled mainly full time (97%) in diverse programs of study in a large Canadian university. Students were in their first (58%), second (30%), third (6%), and fourth (6%) years of study and described themselves as Caucasian (58%), African-Canadian (8%), Latino (1%), Asian (18%), Aboriginal/Natives (1%), Arabic (6%), or other (e.g., multicultural, 9%).

Participants were recruited from introductory psychology classes and were offered one participation point in their course in exchange for their study participation. The study was approved by a University Research Ethics Board and was conducted in accordance with APA ethical guidelines.

Measures

Perfectionism. The short 10-item version (Cox, Enns, & Clara, 2002) of the Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991) was used to measure students' general SOP (e.g., "*I aim for perfection when I set goals for myself*"; $\alpha = .91$) and SPP (e.g., "*People expect nothing less than perfection from me*"; $\alpha = .89$). Students were asked to rate the level to which they agreed with each statement on a scale from 1 (*Not at all*) to 7 (*Totally*). Validation studies of the short MPS revealed excellent reliability and convergent validity (Cox et al., 2002). As such, Cox et al. (2002) demonstrated the superiority of the short form as opposed to the long version (i.e., correlations higher than .94).

Coping. The Coping Inventory for Academic Striving (CIAS; Thompson, 2015) contains 44 items used to measure students' task-oriented (e.g., "*I created a plan of action for my school work*"; $\alpha = .95$) and disengagement-oriented coping (e.g., "*I distracted myself from my school*

work by thinking about other activities”; $\alpha = .90$). Students were asked to rate the extent to which each item corresponds to what they think about or do while pursuing their academic goals on a scale from 1 (*Does not correspond at all*) to 5 (*Corresponds totally*). The development and validation of the CIAS revealed good reliability (i.e., internal consistency and test-retest reliability) and validity (i.e., convergent, incremental, factorial) of the measure (Thompson, 2015)

Results

Moderated hierarchical regressions were performed to test the hypotheses of the 2×2 model (Cohen, Cohen, West, & Aiken, 2003) using the method delineated for interpreting main effects in Gaudreau (2012), given that the SOP \times SPP interactions were non-significant for both outcome variables (results available upon request). Results are presented in Tables 1 and 2.

Task-oriented coping. The main effect of SOP was positively associated with task-oriented coping, whereas the main effect of SPP was not significant, $R^2 = .200$, $F(2, 329) = 41.143$, $p < .05$. The main effect of SOP revealed that pure SOP (compared to non-perfectionism; Hypothesis 1) and mixed perfectionism (compared to pure SPP; Hypothesis 3) were associated with higher task-oriented coping. Furthermore, the non-significant main effect of SPP demonstrated that pure SPP (compared to non-perfectionism) and mixed perfectionism (compared to pure SOP) were not significantly associated with different levels of task-oriented coping. Hence, only Hypotheses 1 and 3 of the 2×2 model were supported when predicting task-oriented coping (see Figure 1, panel A).

Disengagement-oriented coping. The main effect of SPP was positively associated with disengagement-oriented coping, whereas the main effect of SOP was not significant, $R^2 = .231$, $F(2, 329) = 49.326$, $p < .05$. These results demonstrated that pure SPP (compared to non-

perfectionism; Hypothesis 2) and mixed perfectionism (compared to pure SOP; Hypothesis 4) were related to higher disengagement-oriented coping. The non-significant main effect of SOP showed that pure SOP (compared to non-perfectionism) and mixed perfectionism (compared to pure SPP) were not significantly associated with different levels of disengagement-oriented coping. Only Hypotheses 2 and 4 of the 2×2 model were supported when predicting disengagement-oriented coping (see Figure 1, panel B).

Relative coping. Results of our ancillary analyses demonstrated that the main effects of SOP and SPP were significantly associated with relative coping, $R^2 = .174$, $F(2, 329) = 34.55$, $p < .01$, thus supporting all four hypotheses of the model. Accordingly, non-perfectionism was associated with a significantly lower predominant usage of task-oriented coping compared to pure SOP (Hypothesis 1) but a greater predominant usage of task-oriented coping compared to pure SPP (Hypothesis 2). Furthermore, mixed perfectionism was associated with a significantly greater predominant usage of task-oriented coping compared to pure SPP (Hypothesis 3), but a lower predominant usage of task-oriented coping compared to pure SOP (Hypothesis 4; see Figure 1, panel C).

Brief Discussion

In our first set of analyses, we treated task-oriented coping and disengagement-oriented coping as two distinct and unrelated dependent variables. Consistent with past studies (e.g., Dunkley et al., 2014; Hill et al., 2010), our findings were rather ambiguous and provided partial support for the hypotheses of the 2×2 model of perfectionism. Pure SOP was associated with higher task-oriented coping than non-perfectionism (Hypothesis 1) and lower disengagement-oriented coping than mixed perfectionism (Hypothesis 4). In contrast, pure SPP was associated with higher disengagement-oriented coping non-perfectionism (Hypothesis 2) and lower task-

oriented coping than mixed perfectionism (Hypothesis 3).

Although consistent with past studies, these findings are counterintuitive because they do not take into account that many students are using a mixture of task-oriented and disengagement-oriented coping to handle their school-related demands. Hence, in our second set of analyses, we examined the differential association of subtypes of perfectionism with the tendency of students to predominantly use task-oriented coping than disengagement-oriented coping (i.e., relative coping). Our findings with this relative conceptualization of coping supported all four hypotheses of the 2×2 model of perfectionism. Consistent with our expectations, it appears that a subtype of pure SOP (compared to both non-perfectionism and mixed perfectionism) is associated with an optimal usage of coping in which the students are using more task-oriented than disengagement-oriented coping. In contrast, a subtype of pure SPP (compared to both non-perfectionism and mixed perfectionism) is associated with a suboptimal usage of coping in which students are using less task-oriented coping than disengagement-oriented coping. In fact, pure SPP was the only subtype of perfectionism in which the proportion of disengagement-oriented coping was higher than task-oriented coping. This finding reaffirms once again the 2×2 model's assertion that a subtype of pure SPP (as opposed to mixed perfectionism) represents the most damaging subtype of perfectionism and should be linked with the lowest levels of adjustment. The relative coping findings from Study 1 are noteworthy because they indicate that subtypes of perfectionism are indeed associated with a pattern of multidimensional coping that is consistent with hypotheses and past studies looking at psychological adjustment within the 2×2 model of perfectionism.

Study 2

In Study 1, we compared coping across individuals with different subtypes of

perfectionism. In Study 2, we aimed at replicating the findings from Study 1, this time at the within-person level of analysis. In Study 2, we adopted the measurement scheme of Gaudreau and Franche (2016) by asking students to evaluate their domain-specific perfectionism and domain-specific coping in each of six life domains (i.e., school, work, romance, friendship, family, and leisure) that are important in the lives of emerging adults. As such, perfectionism was conceptualized as a contextualized (“state-like”) personality dimension that should display substantial domain-by-domain variability, thus allowing us to reexamine the relationships between subtypes of perfectionism and coping, this time at the within-person level of analysis. Consistent with Study 1, we tested the four hypotheses of the 2×2 model using (a) task-oriented coping, (b) disengagement-oriented coping, and (c) relative coping.

Method

Participants and Design. A sample of 203 undergraduate students (77% female) ranging from 17 to 32 years ($M = 19.23$; $SD = 2.24$) participated in this study. Students were enrolled mainly full time (93%) in diverse programs of study in a large Canadian university. Students were in their first (72%), second (18%), third (4%), and fourth and above (6%) years of study and described themselves as Caucasian (62%), African-American (8%), Asian (11%), Arabic (9%), or other (e.g., multicultural, 9%).

Students were recruited from introductory psychology classes and were offered one participation point in their course in exchange for their study participation. Following the same design protocol as Franche and Gaudreau (2016), an original sample of participants completed socio demographic information after which they were redirected to domain-specific measures of perfectionism and coping for each life-domain in which they indicated being invested (i.e., school, work, romance, friendship, family, and leisure). This study was approved by a University

Research Ethics Board and was conducted in accordance with APA ethical guidelines.

Measures.

Perfectionism. As per Study 1. However, in order to assess domain-specific perfectionism, participants were asked to refer to their life in each domain rather than in general while completing the measure (e.g., “*One of my goals in school is to be perfect in everything I do*”).

Coping. The problem-focused (6 items; e.g., “*I looked for ways to solve the problem or change the stressful situation*”) and avoidance (5 items; e.g., “*I tried to get out of the stressful situation as soon as I could to reduce the stress*”) coping subscales from the Coping Function Questionnaire (CFQ; Kowalski & Crocker, 2001) were used to measure students’ task-oriented and disengagement-oriented coping strategies respectively. Given that coping was measured repeatedly in several life domains in Study 2, this measure was favoured to the CIAS (Thompson, 2015) because it was shorter to administrate and not limited to the school domain. Participants were asked to indicate the extent to which each item represents what they did to deal with the stress and demands of each domain on a scale ranging from 1 (*does not correspond at all*) to 5 (*corresponds very strongly*). Validation of the CFQ supported the factor structure of the measure, along with its invariance across gender. Furthermore, the measure demonstrated good internal consistency, as well as good divergent and convergent validity (Kowalski & Crocker, 2001).

Results

Multilevel modeling (MLM) was conducted to analyze within-person variations in perfectionism across life-domains with the robust maximum likelihood estimator in Mplus 7.4. The first step was to examine the null/unconditional model with no predictors in order to

estimate intra-class correlations (ICC) of each outcome. The second step of our analyses examined the fixed effects of SOP, SPP, and the interactive score of SOP X SPP at the within-person level of analysis. SOP and SPP were centered using group-mean centering whereas their interactive score was entered uncentered in the equation. Random effects were freely estimated as long as the model could converge (Nezlek, 2012). Results showed that the SOP x SPP interaction was non-significant for task-oriented coping and disengagement-oriented coping (results available upon request). Therefore, main effects of SOP and SPP (after deleting the SOP x SPP effect) were used to estimate predicted values of the four perfectionism subtypes across high (+1SD) and low (-1SD) values of SOP and SPP (e.g., as per Cohen et al., 2003; Gaudreau, 2012). Results are presented in Tables 1 and 2.

Task-oriented coping. The null model (log likelihood = -1146.814) indicated that substantial variance in task-oriented was attributable to between-person variability (ICC = 0.398). Most of the variance (60.2%) was attributable to within-person variations, thus revealing substantial variability of the outcomes across life domains. The main effect model, with the two fixed and two random effects of SOP and SPP, provided an improved fit compared to the null model (log likelihood = -1113.29; scaled $\Delta \chi^2(4) = 73.75, p < .01; R^2 = .157$). The significant main effect of SOP demonstrated that pure SOP (compared to non-perfectionism; Hypothesis 1) and mixed perfectionism (compared to pure SPP; Hypothesis 3) were related to greater task-oriented coping. However, the non-significant main effect of SPP demonstrated that pure SPP (compared to non-perfectionism) and mixed perfectionism (compared to pure SOP) were not associated with significantly different task-oriented coping. Hence, only Hypotheses 1 and 3 of the 2×2 model were supported when predicting task-oriented coping (see Figure 2, panel A).

Disengagement-oriented coping. The null model (log likelihood = -1247.940) indicated

that substantial variance in disengagement-oriented was attributable to between-person variability ($ICC = 0.346$). Most of the variance (65.4%) was attributable to within-person variations, thus revealing substantial variability of the outcomes across life domains. The main effect model, with the two fixed and two random effects of SOP and SPP, provided an improved fit compared to the null model (log likelihood = -1238.78; scaled $\Delta \chi^2(4) = 17.60$, $p < .01$; $R^2 = .049$). The negative and positive main effects of SOP and SPP were respectively significantly associated with disengagement-oriented coping at the within-person level. Pure SOP was associated with significantly lower disengagement-oriented coping than non-perfectionism (Hypothesis 1) and mixed perfectionism (Hypothesis 4). Pure SPP was associated with significantly higher disengagement-oriented coping than non-perfectionism (Hypothesis 2) and mixed perfectionism (Hypothesis 3). All these results were consistent with the four hypotheses of the 2×2 model (see Figure 2, panel B).

Relative coping. The null model (log likelihood = -3139.680) indicated that substantial variance in relative coping was attributable to between-person variability (0.283). Most of the variance (71.7%) was attributable to within-person variations. The main effect model, with the two fixed and two random effects of SOP and SPP, provided an improved fit compared to the null model (log likelihood = -3100.575; scaled $\Delta \chi^2(4) = 82.90$, $p < .01$; $R^2 = .111$). Furthermore, the interactive model with the fixed and random effects of $SOP \times SPP$ provided the best model fit (log likelihood = -3090.763; scaled $\Delta \chi^2(2) = 33.13$, $p < .01$; $\Delta R^2 = .056$). Given that the $SOP \times SPP$ interaction was statistically significant (see Table 1), simple slope analyses were thus conducted to estimate the effects of SOP and SPP at high (+1SD) and low (-1SD) values of SPP and SOP respectively in order to enable comparisons of the four perfectionism subtypes. These results supported three of the four hypotheses of the model. As such, the first simple slope

demonstrated that pure SOP was associated with a significantly higher predominant usage of task-oriented coping compared to non-perfectionism (Hypothesis 1), $B = 1.626, t = 4.618, p < .01$. The second simple slope showed that pure SPP was associated with a significantly lower predominant usage of task-oriented coping compared to non-perfectionism (Hypothesis 2), $B = -2.064, t = -5.404, p < .01$. Furthermore, the third simple slope supported that mixed perfectionism was associated with a significantly higher predominant usage of task-oriented coping compared to pure SPP (Hypothesis 3), $B = 3.496, t = 9.933, p < .01$. Contrary to expectations, the fourth simple slope revealed that pure SPP and mixed perfectionism were not significantly differently associated with relative coping, $B = -0.034, t = -0.088, p > .05$. Hypothesis 4 was thus not supported (see Figure 2, panel C).

Brief Discussion

The goal of Study 2 was to examine the relationships between perfectionism subtypes and coping across life domains of a same individual (i.e., within-person domain-by-domain variability). Our results supported all four hypotheses of the 2×2 model with disengagement-oriented coping, two hypotheses with task-oriented coping, and three hypotheses with relative coping. A subtype of pure SPP was associated with the least optimal pattern of coping compared to both non-perfectionism (Hypothesis 2) and mixed perfectionism (Hypothesis 3). Results regarding mixed perfectionism partially supported Hypothesis 4. Although mixed perfectionism was associated with more disengagement-oriented coping than a subtype of pure SOP, both of these subtypes were unexpectedly associated with comparable levels of task-oriented coping and relative coping. Nevertheless, a subtype of pure SOP was associated with an optimal pattern of coping (Hypothesis 1). Students relied on more task-oriented coping, less disengagement-oriented coping, and a greater predominant usage of task-oriented coping in their life domains in

which their SOP was higher and their SPP was lower (i.e., pure SOP) compared to life domains in which their SOP and SPP were lower (i.e., non-perfectionism). Overall, these findings provided support to the multilevel extension of the 2×2 model by showing that domain-by-domain variability in subtypes of perfectionism are meaningfully associated to the domain-by-domain variability in coping efforts of students.

General Discussion

Recent research on the 2×2 model of perfectionism proposed the need to conceptualize and operationalize perfectionism as a multilevel construct likely to express trait-like consistency and state-like variability across life domains (Franche & Gaudreau, 2016). In this study, we investigated the relationships between subtypes of perfectionism and coping (i.e., task-oriented, disengagement-oriented, and relative coping) at the between-person (i.e., dispositional perfectionism, across individuals; Study 1) and within-person levels of analysis (i.e., contextual perfectionism, within-person across domains of life; Study 2). To reach such a goal, we used two independent samples, two different measures of coping, as well as distinct yet complementary methods of analysis. Overall, our findings offered further support for a multilevel extension of the 2×2 model of perfectionism, as well as a multilevel assessment of perfectionism and personality in general.

Our findings showed that SOP relates to a tendency to approach situations with task-oriented coping. People with higher SOP are using more task-oriented coping than their counterparts (Study 1). In contexts in which people have higher SOP, they also use task-oriented coping to a larger extent than their own personal average (Study 2). The association between SOP and task-oriented is therefore quite comparable at the between-person and within-person levels of analysis. This finding could explicate why subtypes of perfectionism with elevated

SOP—pure SOP (compared to non-perfectionism) and mixed perfectionism (compared to pure SPP)—are generally associated with better psychological and emotional outcomes at both the within-person (Franché & Gaudreau, 2016) and between-person levels (e.g., Gaudreau, 2012; Gaudreau & Thompson, 2010).

Our findings also indicated that SPP relates to a tendency to cope in a suboptimal manner. People with higher levels of SPP are using more disengagement-oriented coping than their counterparts (Study 1). In contexts in which people have higher SPP, they also use disengagement-oriented to a larger extent than their own personal average (Study 2). The association between SPP and disengagement-oriented is therefore quite comparable at the between-person and within-person levels of analysis. This finding could explain why subtypes of perfectionism with elevated SPP—pure SPP (compared to non-perfectionism) and mixed perfectionism (compared to pure SOP)—are, for the most part, associated with worse psychological and emotional outcomes at both the within-person (Franché & Gaudreau, 2016) and between-person levels (e.g., Gaudreau, 2012; Gaudreau & Thompson, 2010).

Moving Beyond the Dimensions Themselves: The Implications of Relative Coping

Although results of the main analyses of this study are important to further our understanding of the relationship between perfectionism and coping within the confines of the 2 × 2 model, examining task-oriented and disengagement-oriented coping as two separate and unrelated indicators offers an incomplete understanding of this complex relationship. Accordingly, university students are likely to use a combination of both task-oriented and disengagement-oriented coping, rather than either one or the other (e.g., Doron et al., 2015; Sideridis, 2006). Yet, by examining the relationships between perfectionism subtypes and task-oriented coping, and between perfectionism subtypes and disengagement-oriented coping, we

lose track of the kind of information that helps reconsider whether a person predominantly relies on task-oriented coping or disengagement-oriented coping.

This study was the first to investigate and demonstrate that subtypes of perfectionism are differentially associated with a tendency to use task-oriented coping *to a larger extent* than disengagement-oriented coping (i.e., relative coping). Subtypes were distinctively associated to relative coping in a way that supported four hypotheses at the between-person level (Study 1) and three hypotheses at the within-person level (Study 2). Pure SOP was associated with a tendency to use task-oriented coping to a larger extent than disengagement-oriented coping compared to non-perfectionism at both levels of analysis (Hypothesis 1). Students with pure SOP seemed to make usage of a greater proportion of task-oriented coping than students with non-perfectionism (Study 1). In life domains in which they reported higher levels of pure SOP, these students also seemed to use a greater proportion of task-oriented coping compared to their own average (Study 2). In contrast, pure SPP was associated with a tendency to use disengagement-oriented coping to a larger extent than task-oriented coping compared to non-perfectionism (Hypothesis 2). Students with pure SPP endorsed a greater proportion of disengagement-oriented coping compared to students with non-perfectionism (Study 1). In life domains in which students reported greater pure SPP, they also tended to use a greater proportion of disengagement-oriented coping than their own average (Study 2).

In both of our studies, pure SPP was the only subtype of perfectionism in which university students' proportion of disengagement-oriented coping was greater than task-oriented across both levels of analysis. This finding reaffirms the idea that a subtype of pure SPP – rather than mixed perfectionism – should be associated with suboptimal coping and lower psychological adjustment (Hypothesis 3). Students with mixed perfectionism made greater use of

task-oriented coping compared to disengagement-oriented coping than students with pure SPP (Study 1). In life domains in which they reported higher levels of mixed perfectionism, these students also seemed to use a greater proportion of task-oriented coping compared to their own average (Study 2).

Some of our findings regarding mixed perfectionism are noteworthy. In Study 1, students with mixed perfectionism reported a lower percentage of task-oriented coping compared to students with a subtype of pure SOP (54.53% vs. 61.26%; Cohen's $d = 0.87$), thus supporting Hypothesis 4 of the 2×2 model at the between-person level. In Study 2, the percentage of task-oriented coping did not significantly differ in life domains in which they had subtypes of mixed perfectionism (56.72%) compared to life domains in which they had pure SOP (56.72% vs. 56.79%; Cohen's $d = 0.01$). This finding is important because it shows that the effects of perfectionism are not always identical at the between- and within-person levels, thus showing that unique information can be gleaned by espousing a multilevel extension of the 2×2 model. Mixed perfectionism at the contextual level appears to be equivalent to pure SOP as both subtypes were associated with the highest level of relative coping among the four subtypes of perfectionism (Study 2). It seems like high levels of SOP can buffer the negative effect of SPP on the contextual coping efforts of students. The effects of SPP might become debilitating when students have high levels of both SPP and SOP at the dispositional level (Study 1), thus reducing the percentage of coping oriented toward the task. Future research aimed at replicating these findings with different samples, measures, and research methods (e.g., prospective design) is thus needed to further investigate the relationships between perfectionism subtypes and the tendency to use task-oriented coping to a larger extent than disengagement-oriented coping.

Limitations and Future Directions

In Study 2, our coping measure was useful to examine the dimensions of coping (i.e., task-oriented and disengagement-oriented), but not the strategies themselves (e.g., relaxation, problem solving, distraction, venting of unpleasant emotions). Future research could opt for a measure that captures the specificity of the strategies being used by students in order to examine the relationships between subtypes of perfectionism and various coping strategies. Furthermore, in Study 2, perfectionism was measured in six life domains. Nonetheless, the goals and activities pursued by individuals might conflict and interfere with one another both within and across life domains. Individuals of different cultural backgrounds might cope with these contextual hassles in differing ways, which might influence their ability to reach desired outcomes. Research in cross-cultural psychology demonstrated that, compared with Westerners, Asians were more prone to appraise seeming contradictions with dialectical reasoning (e.g., Peng & Nisbett, 1999). Hence, they might endorse more easily conflicting goals between life domains by trying to find a compromise—“a middle way”—to reconcile this disequilibrium. Although this study was not designed to examine cross-cultural differences in perfectionism, future research on the 2×2 model should account for the role of sociocultural background in the relationships between subtypes of perfectionism and academic outcomes.

In both of our studies, we used self-report measures with a sample of undergraduate students. Although self-reports are reliable to obtain participants' subjective experience, future research should complement self-reports with objective data or informant-reports in order to reduce method biases (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). For example, it could be possible to generate behavioural indicators of perfectionism that could inform researchers on the perfectionistic tendency of individuals. In the household, we could probe for behaviours such as the folding of towels, linen, or clothing, cleanliness, or positioning of home decoration or

Christmas lighting. In school, we could identify behaviours such as note taking (e.g., how flawless are students' books and workbooks). In relationships, we could inquire on the efforts made to speak flawlessly or correct others' speech. In an experimental design, researchers could subsequently use these behavioural indicators in order to observe and rate participants' perfectionism. Alternatively, objective data of perfectionism could be obtained through an experimental task in which participants would be required to complete an impossible task (e.g., crossword, puzzle) and then be given different feedback before completing their perfectionism measure (e.g., critical feedback through which emphasis is put on mistakes in the experimental condition vs. neutral feedback in the control condition). Physiological indicators of stress (e.g., heart rate, sweating) could also be monitored throughout the task to monitor the levels of stress generated by the feedback provided to participants.

Conclusion

Overall, results from our two studies provided further support for a multilevel extension of the 2×2 model of perfectionism with variables of coping. Investigating within-person variations in perfectionism and their associations with key outcomes and processes is pivotal to provide clinical psychologists with a roadmap to understand that some people are more perfectionistic than others but everyone can also be more perfectionistic in some domains of their lives. Knowing that individuals' levels of contextual adjustment are lower in domains in which they hold their highest levels of contextual SPP could indicate that most individuals — regardless of their dispositional perfectionism tendency — might be at risk for experiencing lower levels of psychological adjustment in certain domains of their lives. Such findings thus stress the importance to compare clients against both normative standards (i.e., norms of the population) and their own central tendency and dispersion of perfectionism across life domains.

References

- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum.
- Cox, B. J., Enns, M. W., & Clara, I. P. (2002). The multidimensional structure of perfectionism in clinically distressed and college student samples. *Psychol Assess, 14*, 365-373.
doi:10.1037/1040-3590.14.3.365
- Crocker, P. R. E., Gaudreau, P., Mosewich, A. D., & Kljajic, K. (2014). Perfectionism and the stress process in intercollegiate athletes: Examining the 2 × 2 model of perfectionism in sport competition. *International Journal of Sport Psychology, 45*, 325-348.
doi:10.7352/IJSP2014.45.325
- Doron, J., Trouillet, R., Maneveau, A., Ninot, G., & Neveu, D. (2015). Coping profiles, perceived stress and health-related behaviors: A cluster analysis approach. *Health Promotion International, 30*, 88-100. doi:10.1093/heapro/dau090
- Douilliez, C., & Lefèvre, F. (2011). Interactive effect of perfectionism dimensions on depressive symptoms: A reply to Gaudreau and Thompson (2010). *Personality and Individual Differences, 50*, 1147-1151. doi:10.1016/j.paid.2011.02.005
- Dunkley, D. M., Mandel, T., & Ma, D. (2014). Perfectionism, neuroticism, and daily stress reactivity and coping effectiveness 6 months and 3 years later. *Journal of Counseling Psychology, 61*, 616-633. doi:10.1037/cou0000036
- Flett, G. L., & Hewitt, P. L. (2002). Perfectionism and maladjustment: An overview of theoretical, definitional, and treatment issue. In G. L. Flett & P. L. Hewitt (Eds.), *Perfectionism: Theory, research, and treatment* (pp. 5-31). Washington, DC: American Psychological Association.

- Franché, V., & Gaudreau, P. (2016). Integrating dispositional perfectionism and within-person variations of perfectionism across life domains into a multilevel extension of the 2×2 model of perfectionism. *Personality and Individual Differences, 89*, 55-59. doi:10.1016/j.paid.2015.09.046
- Franché, V., Gaudreau, P., & Miranda, D. (2012). The 2×2 model of perfectionism: A comparison across Asian Canadians and European Canadians. *Journal of Counseling Psychology, 59*, 567-574. doi:10.1037/a0028992
- Gaudreau, P. (2012). A methodological note on the interactive and main effects of dualistic personality dimensions: An example using the 2×2 model of perfectionism. *Personality and Individual Differences, 52*, 26-31. doi:10.1016/j.paid.2011.08.022
- Gaudreau, P. (2013). The 2×2 model of perfectionism: Commenting the critical comments and suggestions of Stoeber (2012). *Personality and Individual Differences, 55*, 351-355. doi:10.1016/j.paid.2013.03.021
- Gaudreau, P., & Miranda, D. (2010). Coping across time, situations, and contexts: A conceptual and methodological overview of stability, consistency, and change. In A. R. Nicholls (Ed.), *Coping in sport: Theory, methods, and related constructs* (pp. 15-32). New York: Nova Science.
- Gaudreau, P., Nicholls, A., & Levy, A. R. (2010). The ups and downs of coping and sport achievement: An episodic process analysis of within-person associations. *Journal of Sport and Exercise Psychology, 32*(2), 298-311.
- Gaudreau, P., & Thompson, A. (2010). Testing a 2×2 model of dispositional perfectionism. *Personality and Individual Differences, 48*, 532-537. doi:10.1016/j.paid.2009.11.031

- Gaudreau, P., & Verner-Filion, J. (2012). Dispositional perfectionism and well-being: A test of the 2 × 2 model of perfectionism in the sport domain. *Sport, Exercise, and Performance Psychology, 1*, 29-43. doi:10.1037/a0025747
- Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *J Pers Soc Psychol, 60*, 456-470. doi:10.1016/S0191-8869%2801%2900109-X
- Hill, A. P., & Davis, P. A. (2014). Perfectionism and emotion regulation in coaches: A test of the 2 × 2 model of dispositional perfectionism. *Motivation and Emotion, 38*, 715-726. doi:10.1007/s11031-014-9404-7
- Hill, A. P., Hall, H. K., & Appleton, P. R. (2010). Perfectionism and athlete burnout in junior elite athletes: The mediating role of coping tendencies. *Anxiety, Stress and Coping, 23*, 415-430. doi:10.1080/10615800903330966
- Kowalski, K. C., & Crocker, P. R. E. (2001). Development and validation of the Coping Function Questionnaire for adolescents in sport. *Journal of Sport and Exercise Psychology, 23*(2), 136-155.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Li, X., Hou, Z.-J., Chi, H.-Y., Liu, J., & Hager, M. J. (2014). The mediating role of coping in the relationship between subtypes of perfectionism and job burnout: A test of the 2 × 2 model of perfectionism with employees in China. *Personality and Individual Differences, 58*, 65-70. doi:10.1016/j.paid.2013.10.007
- Nezlek, J. B. (2012). Multilevel modeling analyses of diary-style data. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 357-383). New York: Guilford Press.

Peng, K., & Nisbett, R. E. (1999). Culture, dialectics, and reasoning about contradiction.

American Psychologist, 54, 741-754. doi:10.1037/0003-066X.54.9.741

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method

biases in behavioral research: A critical review of the literature and recommended

remedies. *Journal of Applied Psychology*, 88, 879-903. doi:10.1037/0021-9010.88.5.879

Ptacek, J. T., Smith, R. E., & Dodge, K. L. (1994). Gender differences in coping with stress:

When stressor and appraisals do not differ. *Personality and Social Psychology Bulletin*,

20, 421-430. doi:10.1177/0146167294204009

Sideridis, G. (2006). Coping is not an 'either' 'or': The interaction of coping strategies in

regulating affect, arousal and performance. *Stress and Health*, 22, 315-327.

doi:10.1002/smi.1114

Skinner, E. A., Edge, K., Altman, J., & Sherwood, H. (2003). Searching for the structure of

coping: A review and critique of category systems for classifying ways of coping.

Psychol Bull, 129, 216–269. doi:10.1037/0033-2909.129.2.216

Thompson, A. (2015). *Coping with stress in undergraduate university students: Development*

and validation of the Coping Inventory for Academic Striving (CIAS) to examine key

educational outcomes in correlational and experimental studies. (Doctoral dissertation).

Retrieved from <http://hdl.handle.net/10393/32469>

Vitaliano, P. P., Maiuro, R. D., Russo, J., & Becker, J. (1987). Raw versus relative scores in the

assessment of coping strategies. *Journal of Behavioral Medicine*, 10, 1-18.

doi:10.1007/BF00845124

Table 1

Results of Multiple Regressions (Study 1) and Multilevel Analyses (Study 2)

	Task-oriented coping		Disengagement-oriented coping		Relative coping ¹	
	B	SE	B	SE	B	SE
	Study 1					
Predictors	B	SE	B	SE	B	SE
SOP	0.200**	0.025	-0.023	0.025	1.864**	0.289
SPP	-0.009	0.025	0.233**	0.025	-2.296**	0.300
Intercept	2.314**	0.104	1.941**	0.104	54.348**	1.228
	Study 2					
Fixed effects	B	SE	B	SE	B	SE
SOP	0.176**	.030	-0.127**	.037	2.561**	.352
SPP	0.045	.035	0.145**	.036	-1.049**	.382
SOP × SPP	----	----	----	----	0.969**	.322
Intercept	3.168	.054	2.704	.058	54.077	.512
Random effects						
μ_0	0.459**		0.468**		34.698**	
μ_1	0.010		0.009		0.718	
μ_2	0.028*		0.006		0.194	
μ_3	----		----		2.026*	

Note. Parameters are unstandardized. μ_0 , μ_1 , μ_2 , and μ_3 = random effects of intercepts, SOP, SPP, and SOP × SPP respectively. * $p < .05$. ** $p < .01$. ¹Task-oriented coping / (task-oriented coping + disengagement-oriented coping).

Table 2

Predicted Values and Cohen's d Effect Sizes of the Four Hypotheses of The 2 × 2 Model of Perfectionism

Outcomes	Study 1							
	Predicted values				Effect sizes <i>d</i>			
	Non-perfectionism	Pure SOP	Mixed perfectionism	Pure SPP	H1	H2	H3	H4
Task-oriented coping	2.86	3.47	3.44	2.83	0.91**	-0.04	0.91**	-0.04
Disengagement-oriented coping	2.28	2.21	2.90	2.97	-0.10	1.00**	-0.10	1.00**
Relative coping ¹	55.60	61.26	54.53	48.86	0.73**	0.87**	0.73**	0.87**
	Study 2							
	Predicted values				Effect sizes <i>d</i>			
	Non-perfectionism	Pure SOP	Mixed perfectionism	Pure SPP	H1	H2	H3	H4
Task-oriented coping	2.94	3.31	3.40	3.03	0.54**	-0.13 _a	0.54**	-0.13 _a
Disengagement-oriented coping	2.70	2.43	2.71	2.98	0.39**	0.41**	0.39**	0.41**
Relative coping	53.39	56.79	56.72	49.40	0.32**	0.37**	0.68**	0.01

Note. A subscript of *a* indicates that the effect size was in opposite direction than expected. H1 = Pure SOP vs. Non-perfectionism, H2 = Non-perfectionism vs. Pure SPP, H3 = Mixed perfectionism vs. Pure SPP, H4 = Pure SOP vs. Mixed perfectionism. * $p < .05$. ** $p < .01$. ¹ Task-oriented coping / (task-oriented coping + disengagement-oriented coping).

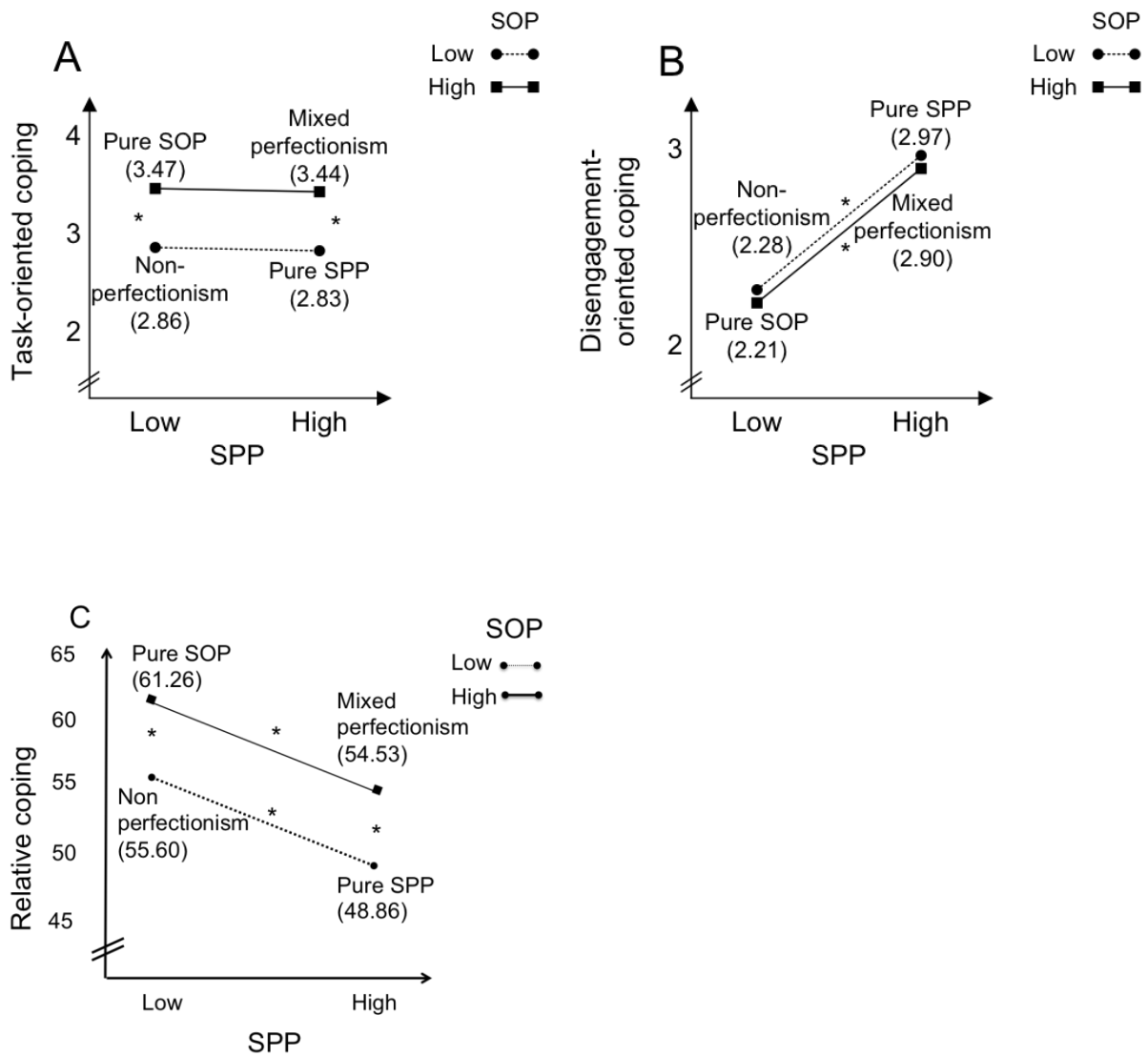


Figure 1. Predicted values of task-oriented (panel A), disengagement-oriented (panel B), and relative (panel C) coping across the four subtypes of perfectionism at the between-person level of analysis (Study 1). Predicted values are reported in parentheses. *denotes a significant difference at $p < .05$ between two subtypes of perfectionism.

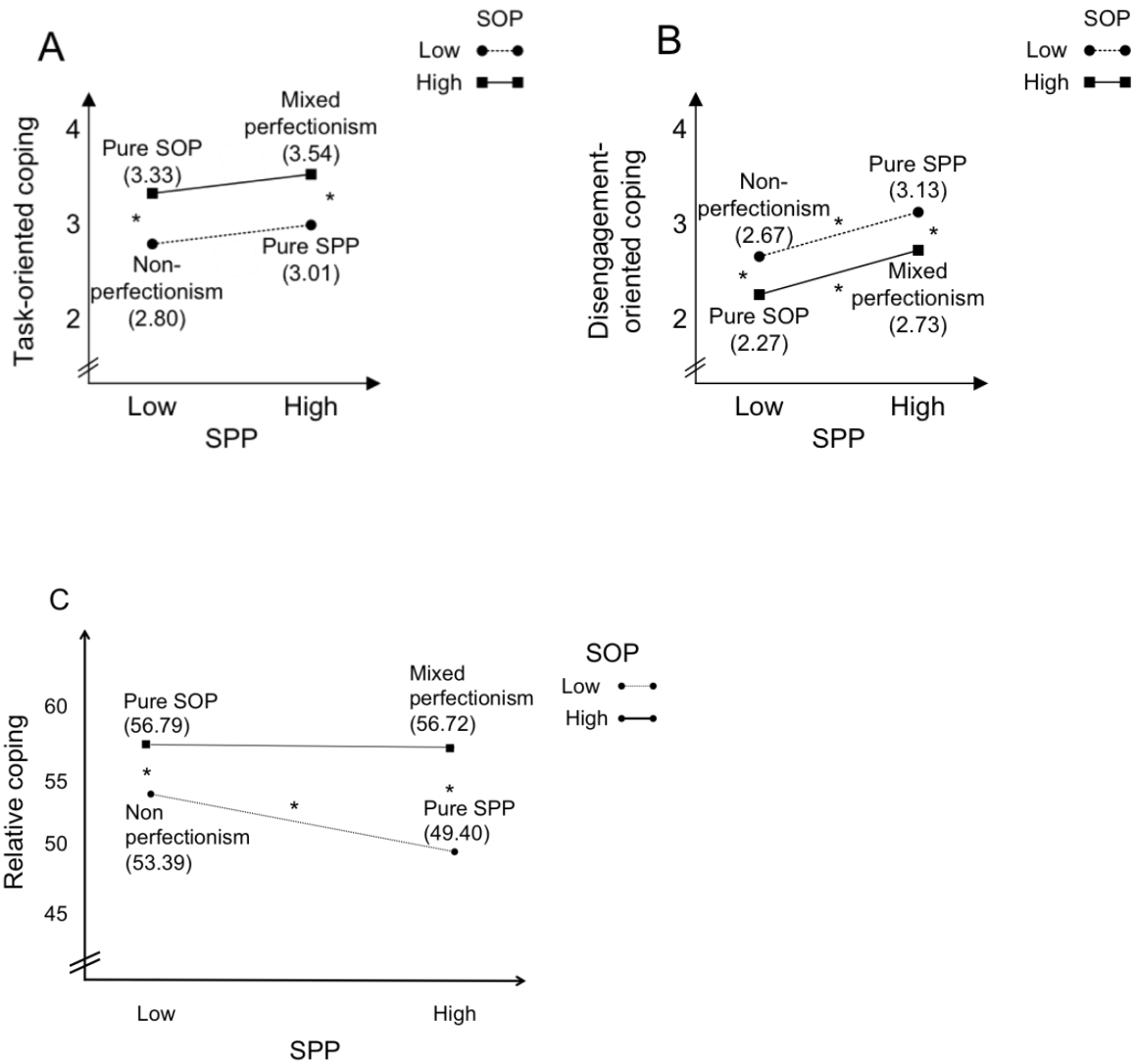


Figure 2. Predicted values of task-oriented (panel A), disengagement-oriented (panel B), and relative (panel C) coping across the four subtypes of perfectionism at the within-person level of analysis (Study 2). Predicted values are reported in parentheses. *denotes a significant difference at $p < .05$ between two subtypes of perfectionism.

**CHAPTER 5: The 2 × 2 Model of Perfectionism: A Comparison Across Asian Canadians
and European Canadians**

Véronique Franche, Patrick Gaudreau, & Dave Miranda

Published in *Journal of Counseling Psychology*, October 2012

Copyright © 2017 American Psychological Association. Reproduced with permission. The official citation that should be used in referencing this material is: Franche, V., Gaudreau, P., & Miranda, D. (2012). The 2 × 2 Model of Perfectionism: A Comparison Across Asian Canadians and European Canadians. *Journal of Counseling Psychology*, 59, 567-574. doi: 10.1037/a0028992. This article may not exactly replicate the authoritative document published in the APA journal. It is not the copy of record. No further reproduction or distribution is permitted without written permission from the American Psychological Association.

Abstract

The 2×2 model of perfectionism examines whether four within-person combinations of self-oriented and socially prescribed perfectionism (i.e., pure SOP, mixed perfectionism, pure SPP, non-perfectionism) can be distinctively associated to psychological adjustment. This study examined whether the relationship between the four subtypes of perfectionism proposed in the 2×2 model (Gaudreau & Thompson, 2010) and academic outcomes (i.e., academic satisfaction and grade-point average) differed across two sociocultural groups: Asian Canadians and European Canadians. A sample of 697 undergraduate students (23% Asian Canadians) completed self-report measures of dispositional perfectionism, academic satisfaction, and grade-point average. Results replicated most of the 2×2 model's hypotheses on ratings of grade-point average, thus supporting that non-perfectionism was associated to lower GPA than pure SOP (Hypothesis 1a) but to higher GPA than pure SPP (Hypothesis 2). Results also reported that mixed perfectionism was related to higher GPA than pure SPP (Hypothesis 3) but to similar levels than pure SOP, thus rejecting Hypothesis 4. Furthermore, results provided evidence for cross-cultural differences in academic satisfaction. While all four hypotheses were supported among European Canadians, only Hypotheses 1a and 3 were supported among Asian Canadians. Future lines of research are discussed in light of the importance of acknowledging the role of culture when studying the influence of dispositional perfectionism on academic outcomes.

Keywords: Perfectionism, achievement, well-being, culture, Asian, education

The 2 × 2 Model of Perfectionism: A Comparison across Asian Canadians and European Canadians

Perfectionism is a multidimensional personality disposition (e.g., Hewitt & Flett, 1991) that represents a tendency to strive for perfection and to evaluate, judge, and define oneself according to outstandingly high self-imposed (*self-oriented perfectionism*) and/or socially prescribed standards (*socially prescribed perfectionism*). Recently, *the 2 × 2 model of perfectionism* proposed a novel quadripartite conceptualization positing that the within-person combinations of self-oriented perfectionism (SOP) and socially prescribed perfectionism (SPP) – rather than the traits themselves – should be taken into account in examining the outcomes of perfectionism (see Gaudreau & Thompson, 2010). This line of reasoning, anchored in the variable-centered tradition, assumes that the intersections between low and high levels of SOP and SPP can be used as a heuristic to define and distinguish four prototypical subtypes of perfectionism. Of note, the model uses the parlance of a Latin square design merely as an analogy because the four subtypes of perfectionism are not and should not be analyzed and interpreted as naturally existing categories. As such, this study relied on a Multiple Group Latent Moderation Structural model (see Appendix) to examine the cross-cultural generality and specificity of the associations between distinct subtypes of perfectionism and academic adjustment of Asian and European Canadian students.

Four Subtypes of Perfectionism

The first subtype of the 2 × 2 model, *non-perfectionism*, corresponds to co-occurring low levels of SOP and SPP. The second subtype, *pure self-oriented perfectionism* (pure SOP), is characterized by high levels of SOP and low levels of SPP, thus representing individuals who hold perfectionistic standards stemming mainly from the self. Comparing these two subtypes

offers a way of recasting the debate on the adaptive vs. maladaptive outcomes of SOP. Considering the unsettled nature of this debate, the 2×2 model proposes three alternative hypotheses. Tenants of the healthiness, unhealthiness, and neutral nature of SOP (see Stoeber & Otto, 2006 for a review) would respectively expect that pure SOP should lead to better (Hypothesis 1a), poorer (Hypothesis 1b), and equivalent (Hypothesis 1c) psychological outcomes than non-perfectionism. Up to now, pure SOP has been associated to higher academic self-determined motivation, satisfaction, positive affectivity, goal progress (Gaudreau & Thompson, 2010), performance (Gaudreau, 2012), and marginally less depressive symptoms (Douilliez & Lefèvre, 2011) than non-perfectionism, thereby providing support for Hypothesis 1a. Also, two studies have demonstrated similar levels of negative affectivity (Gaudreau & Thompson, 2010) and well-being (Gaudreau & Verner-Filion, 2012) between pure SOP and non-perfectionism, thus lending support for Hypothesis 1c.

The third subtype, *pure socially prescribed perfectionism* (pure SPP), is typified by a combination of high levels of SPP and low levels of SOP, and represents individuals who strive toward perfection because of perceived pressure from significant others and to reach socially driven standards of excellence. Considering that pure SPP might be seen as a type of “externally regulated perfectionism” (Gaudreau & Thompson, 2010, p. 533), it should be associated with the lowest levels of internalization and psychological adjustment compared to all other subtypes (Hypothesis 2). Accordingly, studies conducted with students and athletes both reported that pure SPP was related to more depressive symptoms (Douilliez & Lefèvre, 2011) and negative affectivity, as well as to lower academic self-determined motivation, satisfaction, positive affectivity, goal progress (Gaudreau & Thompson, 2010), performance (Gaudreau, 2012), and well-being (Gaudreau & Verner-Filion, 2012) than all other subtypes.

The final subtype, *mixed perfectionism*, is represented by concurrent high levels of both SOP and SPP. The 2×2 model postulates that mixed perfectionism should be related to increased and decreased psychological adjustment compared to pure SPP (Hypothesis 3) and pure SOP (Hypothesis 4), respectively. Consistent with these hypotheses, mixed perfectionism has been linked to lower negative affectivity and higher academic self-determined motivation, satisfaction, positive affectivity, goal progress (Gaudreau & Thompson, 2010), performance (Gaudreau, 2012), and well-being (Gaudreau & Verner-Filion, 2012) compared to pure SPP; but to similar levels of depressive symptoms (Douilliez & Lefèvre, 2011). Furthermore, mixed perfectionism has been associated with more depressive symptoms (Douilliez & Lefèvre, 2011) and negative affectivity, and lower academic self-determined motivation, satisfaction, positive affectivity, goal progress (Gaudreau & Thompson, 2010), and performance (Gaudreau, 2012) than pure SOP. However, one study with competitive athletes reported comparable levels of well-being between these two subtypes (Gaudreau & Verner-Filion, 2012).

Perfectionism among Asian Americans

The aforementioned studies have supported the overarching postulate that the four subtypes of perfectionism should distinctively relate to consequential outcomes. However, research using the 2×2 model has yet to consider the potential moderating role of culture. This limitation is hardly surprising given the recentness of the 2×2 model and the scant empirical attention allocated to cultural similarities and differences in the perfectionism literature. A recent review of studies conducted with members of ethnic minority groups living in the United States has provided a roadmap for studying perfectionism across cultures (DiBartolo & Rendon, 2012). A pivotal goal for researchers is to establish the equivalence of the perfectionism dimensions across cultures before enabling unbiased comparisons of the mean-levels of the dimensions of

perfectionism and/or their associations with important life outcomes. Although limited attention has been allocated to this issue, two multiple group confirmatory factor analysis studies have provided encouraging support for the measurement invariance of some characteristics of the perfectionism construct in African Americans (e.g., Mobley et al., 2005) and Asian Americans (Wang, 2010). However, research remains needed to examine more stringent forms of cross-cultural measurement invariance across European Americans and Asian Americans.

Some studies have also revealed that mean-level facets conceptually associated with SPP (e.g., concerns over mistakes, doubts about action, parental expectations) are significantly higher among Asian Americans than European Americans (e.g., DiBartolo & Rendon, 2012; Kawamura, Frost, & Harmatz, 2002). Despite these cultural differences, studies examining perfectionism-outcome relations among Asian Americans are scarce. Nevertheless, researchers have found that high personal standards — an important ingredient of SOP — was positively associated with academic grade-point average among female Asian American university students (Kawamura et al., 2002). Furthermore, the aforementioned facets conceptually associated with SPP have been shown to relate to various maladjustment outcomes such as depression, negative affectivity, stress, anxiety, and low self-esteem (e.g., DiBartolo & Rendon, 2012; Wang, 2010).

The Present Study

The 2×2 model of perfectionism offers an interesting platform to investigate the cross-cultural specificities and/or generalities in the relation between subtypes of perfectionism and consequential life outcomes. The goal of the present study was threefold. A first goal was to test for the stringent forms of measurement invariance (e.g., Vandenberg & Lance, 2000) of the short form of the *Multidimensional Perfectionism Scale* (MPS; Hewitt & Flett, 1991) across two sociocultural groups (i.e., Asian and European Canadians). Establishing the measurement

invariance of perfectionism was considered as a prerequisite to enable unbiased comparisons across European and Asian Canadians. Second, this study aimed at replicating the original 2×2 model of perfectionism (Gaudreau & Thompson, 2010) by testing whether subtypes of perfectionism are distinctively associated to key indicators of academic adjustment, namely academic satisfaction and grade-point average (GPA).

A third goal of this study was to examine whether the differential associations of the four subtypes of perfectionism with indicators of academic adjustment differ across cultures. Results for European Canadians should mirror the four hypotheses of the 2×2 model as they had initially been tested in mainly European Canadian samples. As reviewed above, Asian Americans and European Americans report comparable scores on facets associated with SOP. Similarly, research in human motivation has revealed that autonomy—perceiving oneself as the initiator of one’s actions and feeling volitional about one’s decisions—relates to equally positive outcomes across individualistic and collectivistic cultures (Ryan & Deci, 2011). It is thus plausible that pure SOP will be associated with higher GPA and academic satisfaction in both Asian and European Canadians (Hypothesis 1). Thwarting the satisfaction of the need for autonomy with coercive, punitive, and conditionally rewarding behaviors has been shown to be detrimental to psychological adjustment in both Asian and European countries (Ryan & Deci, 2011). Thus, it is hypothesized that a pure SPP subtype will be associated to the lowest levels of GPA and academic satisfaction across both Asian and European Canadian samples (Hypothesis 2).

What seems more uncertain is how the meaning attached to, and the outcomes associated with mixed perfectionism might differ across cultures. The mere presence of SPP—in both mixed perfectionism and pure SPP—could make these two subtypes equally vulnerable to

psychological maladjustment in Asian Canadians as their sense of self is more relational and contingent on social membership. This viewpoint will hereby be referred to as the *socially prescribed perfectionism as an aggravating factor hypothesis*.

An alternative line of reasoning indicates that East Asians operate more by *holistic* appraisal and dialectical thinking, in which they pay more attention to the wholeness of the context by transcending contradiction and finding equilibrium between opposing assumptions (Nisbett, Peng, Choi, & Norenzayan, 2001). As such, East Asians can more easily endorse self-beliefs that are seemingly mixed, contradictory, opposing, or even ambivalent (Hamamura, Heine, & Paulhus, 2008). Therefore, because of their capacity to integrate different sources of influence in a cohesive manner—such as the one reported in a mixed profile of perfectionism—Asian Canadians may find more harmony and meaning in mixed perfectionism than European Canadians. In several Asian cultures, social expectations, pressure, and family support are inherently associated with the traditional values of promoting academic excellence that are conveyed to students at their youngest age (Yee, 1992). In this context, high levels of SPP (when combined with high levels of SOP) would therefore represent a fully functioning subtype in which the values promoted by social agencies are closely aligned, coherent, and in harmony with those endorsed by the individual. As such, the social contingencies encompassed in SPP for Asian Canadians might be seen as an inherent component of their cultural makeup. As a consequence, mixed perfectionism might relate to comparably high levels of academic satisfaction than pure SOP among Asian Canadians. This viewpoint will hereby be described as the *socially prescribed perfectionism as a cultural makeup hypothesis*.

Method

Participants and Design

Participants were selected to participate in this study if they met one of the two inclusion criteria: (1) they described themselves as Asian Canadians; or (2) they represented European Canadians (i.e., self-described Caucasians, born in Canada along with both of their parents, whose primary language was English). Students were recruited from large introductory psychology classes during the semester and were offered one point in their course if they agreed to participate in this online study. All participants provided informed consent and the study was approved by and conducted according to the guidelines of a Canadian university's research ethics board.

Asian Canadians. The sample comprised 159 undergraduate students (64% female) ranging from 16 to 54 years of age ($M = 19.32$, $SD = 4.23$). Students were in their freshman (72%), junior (17%), sophomore (6%), and senior or above (5%) year of study and they were enrolled mostly full time (94%) in various programs such as arts (8.2%), sciences (31.3%), social sciences (28.6%), health sciences (24.5%), or others (7.4%). Participants from this sample were for the most part born in Canada (57.7%), where they have spent most of their life (79.2%). In contrast, both their mother and father were born outside of Canada (98.7%, respectively).

European Canadians. The sample consisted of 538 students (70% female) ranging from 16 to 49 years of age ($M = 19.36$, $SD = 3.36$). Participants were in their freshman (73.7%), junior (14.5%), sophomore (4.8%), senior or above (6.9%) year of study and they were enrolled mostly full time (96%) in diverse programs such as arts (16%), sciences (15%), social sciences (38%), health sciences (27%), or others (4%).

Measures

Descriptive statistics and correlations are displayed in Table 1 for both samples. Dispositional perfectionism was measured using the short 10-item version of the

Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991). Validation of this measure demonstrated excellent convergent validity, with inter-correlations between the short and original versions being over .94 (Cox, Enns, & Clara, 2002). A confirmatory factor analysis conducted by Cox et al. (2002) also indicated a superior fit for the short form in comparison to the original version. Participants were asked to report their general agreement with each statement on a 7-point scale ranging from 1 (*Not at all agree*) to 7 (*Very strongly agree*). In this study, SOP ($\alpha = .87$; e.g., “*One of my goal is to be perfect in everything I do*”) and SPP ($\alpha = .85$; e.g., “*I feel that people are demanding too much of me*”) displayed good internal consistency.

To capture students’ overall academic standing so far at the university, participants were asked to answer the stem “*How would you describe your grade point average?*” on a 1 (*F*) to 9 (*A+*) scale.

School satisfaction (e.g., “*I enjoy school activities*”) was measured using an 8-item subscale from the *Multidimensional Students’ Life Satisfaction Scale* (MSLSS; Huebner et al., 1998). Students were asked to report to what extent (1 = *Strongly disagree*; 7 = *Strongly agree*) they agreed with each statement in regard to their life as a student at the present moment. In this study, the internal consistency was good ($\alpha = .86$).

Results

Measurement Invariance of Perfectionism

Multiple group confirmatory factor analysis was used to test the cross-cultural invariance of the perfectionism measure using MPLUS 6.02 with the maximum likelihood robust estimator (Muthén & Muthén, 2010). Results presented in the supplemental materials indicated that the loadings, variances/covariances of the latent variables, residuals of the items, and intercepts of nine of 10 items were invariant across the Asian Canadian and European Canadian samples.

Overall, these results provided the sufficient and needed conditions to ensure that subsequent comparisons of perfectionism across the two groups are unbiased by measurement non-equivalence.

Main Analyses

Overview. Hypotheses of the 2×2 model were tested using the approach delineated by Gaudreau and Thompson (2010) and Gaudreau (2012). However, this approach (originally developed for multiple regressions) was adapted to estimate the interaction between SOP and SPP within the confines of the Latent Moderated Structural (LMS) model implemented in MPLUS with a full information maximum likelihood (FIML) robust estimator (Kelava et al., 2011; Klein & Moosbrugger, 2000). This approach directly estimates the SOP x SPP latent variable without requiring the tedious and somewhat arbitrary manual specification of product terms of the indicators. The FIML also imputes the missing data (i.e., less than 1% in this sample). Multiple groups were included in our LMS model by treating the model as a mixture model with known classes (1 = Asian-Canadians, 2 = European-Canadians) with random effects that allowed the parameters of the model to be freely estimated across groups. Our MPLUS input codes are available in the Appendix. Two levels of data integration were required to test these models with a total number of 225 points to be integrated. Conventional fit indices are not available for LMS models given that models that require data integration algorithms do not estimate a baseline model used in the calculation of relative fit indices. In all of our models, the loadings, error terms, variances/covariances, and intercepts were constrained to equality across the two groups. A first model was tested in which the effects of SOP, SPP, and SOP x SPP were freely estimated in each group. If non-significant, the SOP x SPP effect was fixed to zero to properly estimate the main effects of SOP and SPP, as recently recommended by Gaudreau

(2012). Models in which these parameters were freely estimated and constrained to equality across Asian and European Canadians were compared with the difference in scaled loglikelihood multiplied by 2, thus resulting in a scaled $\Delta\chi^2$. A significant $\Delta\chi^2$ would indicate that the effects significantly differed across Asian and European Canadians. In this case, the first model was retained to properly estimate the association between perfectionism and the outcome variable separately in each cultural group.

In the presence of a significant interaction, simple slope analyses were conducted to estimate the effect of SOP at high (+1SD) and low (-1SD) values of SPP, as well as the effect of SPP at high (+1SD) and low (-1SD) levels of SOP, thus enabling statistical comparisons of the predicted values of the four subtypes of perfectionism (see Gaudreau & Thompson, 2010). However, in the absence of a significant interaction, the main effects of SOP and SPP (in a model fixing the SOP x SPP effect to zero) were used to calculate and compare the predicted values of the four subtypes of perfectionism (see Gaudreau, 2012).

GPA. The first model, which assumed that culture would moderate the effects of SOP, SPP, and SOP x SPP, resulted in a loglikelihood of -13486.57 with 43 parameters (scaled correction = 1.078). The second model, which assumed that the three effects were invariant across groups, resulted in a loglikelihood of -13488.25 with 40 parameters (scaled correction = 1.075). The addition of equality constraints did not significantly worsen the goodness of fit of the model ($\Delta\chi^2 = 3.01$, $\Delta df = 3$, $p > .05$). This model was retained as the best fitting and most parsimonious model. Culture did not significantly moderate the relation of SOP, SPP, and SOP x SPP with GPA. Nonetheless, the SOP x SPP ($B = 0.092$, $S.E. = 0.089$, $p < .05$) was significantly associated with GPA after controlling for the effects of SOP ($B = 0.554$, $S.E. = 0.079$, $p < .01$) and SPP ($B = -0.235$, $S.E. = 0.079$, $p < .01$). Simple slope analyses were conducted in order to

obtain the predicted values of GPA for each of the four subtypes of perfectionism, pooled across the samples of Asian and European Canadians. Figure 1 depicts the results obtained with the simple slopes and reports the predicted values of GPA for each subtype of perfectionism.

Results of the first simple slope provided support for Hypothesis 1a by showing that pure SOP was associated with higher GPA than non-perfectionism, $B = 0.451$, $S.E. = 0.094$, $p < .01$. A second simple slope revealed that pure SPP was associated with lower GPA compared to non-perfectionism, $B = -.356$, $S.E. = 0.0988$, $p < .01$, thus supporting Hypothesis 2. The third simple slope indicated that mixed perfectionism was significantly related to higher GPA compared to pure SPP, $B = 0.657$, $S.E. = 0.094$, $p < .01$, which is consistent with Hypothesis 3. Finally, the fourth and last simple slope analysis showed that the GPA of pure SOP and mixed perfectionism did not significantly differ, $B = -0.114$, $S.E. = 0.098$, $p > .05$, thus invalidating Hypothesis 4.

Academic satisfaction. Two latent variables of academic satisfaction were included in our analyses: academic satisfaction and reversed academic dissatisfaction. Multiple group confirmatory analyses of academic satisfaction are reported in the Appendix. Positively worded items loaded on a factor labeled academic satisfaction whereas negatively worded items (reverse scored) loaded on a factor labeled reversed academic dissatisfaction. The first model, which assumed that culture would moderate the effects of SOP, SPP, and SOP x SPP, resulted in a loglikelihood of -20749.10 with 71 parameters (scaled correction = 1.172). In this model, the SOP x SPP did not significantly predict academic satisfaction (European Canadian, $B = 0.032$, $S.E. = 0.048$, $p > .05$; Asian Canadian, $B = -0.015$, $S.E. = 0.055$, $p > .05$) and reversed academic dissatisfaction (European Canadian, $B = 0.002$, $S.E. = 0.055$, $p > .05$; Asian Canadian, $B = -0.114$, $S.E. = 0.095$, $p > .05$). As recommended by Gaudreau (2012), the SOP x SPP effect was constrained to zero to specifically examine the main effects of SOP and SPP. This second model

resulted in a loglikelihood of -20750.43 with 69 parameters (scaled correction = 1.176). The scaled difference ($\Delta\chi^2 = 2.57$, $\Delta df = 2$, $p > .05$) did not reach significance, thus indicating that deleting the SOP x SPP effect lost no information. A third model, which constrained the main effect of SOP to equality across groups, yielded a loglikelihood of -20750.51 with 67 parameters (scaled correction = 1.176). The fit of this model did not significantly differ from the previous model ($\Delta\chi^2 = 0.14$, $\Delta df = 2$, $p > .05$). The fourth model, which constrained the main effect of SPP to equality across groups, resulted in a loglikelihood of -20754.02 with 65 parameters (scaled correction = 1.811). The fit of this model significantly differed from the previous model ($\Delta\chi^2 = 6.92$, $\Delta df = 2$, $p < .05$). The third model was retained as the most parsimonious model in which the relationship between SOP and academic satisfaction was invariant across groups whereas the relationship between SPP and academic satisfaction significantly differ across European and Asian Canadians.

Results among *Asian Canadians* indicated that academic satisfaction was significantly associated with SOP ($B = .347$, $S.E. = 0.057$, $p < .01$), but non-significantly related to SPP ($B = 0.006$, $S.E. = 0.094$, $p > .05$). Results were similar for the association of reversed academic dissatisfaction with SOP ($B = .296$, $S.E. = 0.069$, $p < .01$) and SPP ($B = -0.114$, $S.E. = 0.129$, $p > .05$). Using these results, the predicted values of academic satisfaction were calculated for the four subtypes of perfectionism in the sample of Asian Canadians (see Figure 2). The main effect of SOP was taken as evidence to support the hypothesis that pure SOP was associated with significantly higher academic satisfaction compared to non-perfectionism (Hypothesis 1a). This main effect also revealed that mixed perfectionism was associated with significantly higher academic satisfaction compared to pure SPP (Hypothesis 3). Meanwhile, the non-significant main effect of SPP indicated that pure SPP was associated with comparable academic

satisfaction than non-perfectionism. Moreover, this non-significant main effect indicated that pure SOP was associated with comparable academic satisfaction than mixed perfectionism. Altogether, these last results contradict Hypothesis 2 and Hypothesis 4 of the general 2×2 model, but they are nonetheless providing support for the *socially prescribed perfectionism as a cultural makeup hypothesis* rather than the *socially prescribed perfectionism as an aggravating factor hypothesis*.

For *European Canadians*, SOP ($B = .347$, $S.E. = 0.057$, $p < .01$) and SPP ($B = -0.265$, $S.E. = 0.072$, $p < .01$) were positively and negatively associated with academic satisfaction, respectively. Results were similar for the association of reversed academic dissatisfaction with SOP ($B = .296$, $S.E. = 0.069$, $p < .01$) and SPP ($B = -0.445$, $S.E. = 0.083$, $p < .01$). The predicted values of academic satisfaction of European Canadians are reported in Figure 3 for the four subtypes of perfectionism. The main effects of SOP and SPP, and the predicted values were taken as evidence to support all four hypotheses of the 2×2 model. These results are consistent with past research in which the four hypotheses were tested in mainly European Canadians.

Discussion

Measuring Perfectionism in a Cross-Cultural Context

Little attention has been paid to studying perfectionism in North American Asians and this study offered a rare opportunity to scrutinize the structure of this construct – as measured with a well-known and highly employed measure of perfectionism – across two important sociocultural groups of the Canadian population. Results from the confirmatory factor analysis were similar to prior validation of the questionnaire (Cox et al., 2002) and showed full invariance of loadings, variances, covariance, and residuals across Asian Canadians and European Canadians. The invariance of intercepts, known to be an overly strict and stringent test of

measurement invariance (e.g., Vandenberg & Lance, 2000), was nonetheless achieved for all except one item (i.e., “*My family expects me to be perfect*”).

Methodologically, these results are important because they indicate that both sociocultural groups interpreted the items similarly and thus, our results are probably not an artifact of the measure used in this study. These findings are theoretically important because perfectionism entails mental representations about the self that seem to develop in close continuity with perceived pressure and contingencies from the social environment. Assuming that socialization in different cultures can shape and develop different self-representations (Heine et al., 1999; Kitayama et al., 2007), it is even more impressive to observe that the core content of the perfectionism construct remained invariant across the two sociocultural samples in this study.

The 2 × 2 Model in a Cross-Cultural Context

The positive or negative outcomes associated with SOP remains a pervasive debate in the perfectionism literature. Our findings showed that pure SOP was associated with higher GPA and academic satisfaction compared to non-perfectionism in both the Asian and European Canadian samples. Such findings, which are in line with those obtained in prior studies (Gaudreau, 2012; Gaudreau & Thompson, 2010), provide further support for Hypothesis 1a of the 2 × 2 model.

Consistent with recent research (Gaudreau, 2012; Gaudreau & Thompson, 2010; Gaudreau & Verner-Filion, 2012), this study also revealed that mixed perfectionism was linked to higher GPA and academic satisfaction compared to pure SPP, in both Asian and European Canadian students (Hypothesis 3). This is theoretically important because it provides additional arguments, this time in both Asian Canadian and European Canadian students, for the hypothesis that mixed perfectionism should not be seen as the most debilitating subtype of perfectionism.

So far, our results depicted a certain amount of cross-cultural generalities. Of particular interest, they showed that culture moderated the relationship between subtypes of perfectionism and academic satisfaction (see Figures 2 and 3). Consistent with past research on the 2×2 model, pure SOP was associated to significantly higher satisfaction than mixed perfectionism in European Canadians (Hypothesis 4). For Asian Canadians, however, pure SOP and mixed perfectionism were found to lead to comparably high levels of satisfaction. This result seems to support our *socially prescribed perfectionism as a cultural makeup hypothesis*.

As eloquently explained by Yee (1992), the social pressure toward excessive performance standards is part of a cultural tradition among Asians that fosters and reinforces the importance of educational attainment. Students from Asian cultures are socialized in, and come to value and prefer, a system in which parents and members of the larger community expect them to reach the highest levels of school achievement. As such, the presence of high levels of SPP in mixed perfectionism is less of a deterrent because it might be seen as being part of the broader cultural makeup shared among many Asian Canadians. Meanwhile, the presence of high levels of SOP in mixed perfectionism indicates that the values, goals, and contingencies promoted by traditional values and reinforced by social agents are aligned with those endorsed by the individual. Goodness of fit between self-endorsement and traditional social values may express balance between self- and socially driven motives and explain why mixed perfectionism was not associated to lower levels of academic satisfaction compared to pure SOP.

Academic adjustment is a multilayered psychosocial phenomenon. What might work to promote academic success might be worthless to foster feelings of interest, pleasure, and satisfaction (Hulleman et al., 2010). Our results showed that mixed perfectionism and pure SOP were associated with comparable levels of academic achievement in both samples. It thus seems

like Asian Canadian students with mixed perfectionism are reaching both the achievement and satisfaction targets known to play an important part in the whole positive academic experience of students. This is consistent with the notion that mixed perfectionism might actually be a harmonious dialectical form of perfectionism within a holistic system of thoughts that typifies many Asian Canadians. In contrast, European Canadians with mixed perfectionism can be characterized by a more specialized or asynchronous profile of adjustment in which they perform equally well while being significantly less satisfied with their school experience compared to pure SOP. This is also in line with the idea that mixed perfectionism might be contradictory insofar as it is appraised within a more analytic system of thought that represents many European Canadians. Overall, these nuanced results illustrate the need to consider culture as a moderator of the association between subtypes of perfectionism and consequential life outcomes.

Limitations and Conclusion

Although self-reported measures represent a reliable way to measure personal variables such as perfectionism and satisfaction, future research should try to complement self-reported measures with objective criteria (i.e., grade-point average) or reports from informants in order to control for the effects of shared-method variance (Podsakoff, MacKenzie, Lee, & Podsakoff 2003). This study used a cross-sectional correlational design, which has informed us on the significant strengths of the relationships between perfectionism and outcome variables, but not on their directions. Further research adopting longitudinal designs could thus be useful to examine the cross-lagged associations between perfectionism and key educational outcomes.

Asian Canadians were treated as a monolithic group. Future research should try to account for the regional, ethnic, and religious diversities encompassed in the broader Asian population (e.g., DiBartolo & Rendon, 2012) while considering the influence of acculturation

(Ryder, Alden, & Paulhus, 2000) by comparing first and second generations of Asian Canadians. Similarly, measuring the degree to which North American Asians identify with collectivistic or individualistic values or in terms of an independent and interdependent self might be useful to examine whether the cross-cultural differences in perfectionism are attenuated by acculturation and individualistic self-construal of some Asian Canadians.

On a final note, the socialization in Asian American families seems to play a ubiquitous role in the development and acquisition of perfectionism because having higher perfectionistic expectations will lead parents to reinforce and/or model perfectionism (DiBartolo & Rendon, 2012). However, Yoon and Lau (2008) demonstrated that high levels of parental warmth might be a sufficient condition to attenuate the negative outcomes usually reported with high parental expectations, criticism, and pressure. Given these particular findings, future research conducted among Asian Americans should thus address the need to consider perceived parenting style.

Results of this study provided further support for the idea that subtypes of perfectionism defined in the 2×2 model of perfectionism offer a useful heuristic to differentiate the outcomes associated with distinct within-person combinations of SOP and SPP. This study extends prior research by offering novel insight on the cross-cultural specificities and generalities of the relationships between subtypes of perfectionism and key educational outcomes in Asian and European Canadians. Overall, these results inform the debate on the adaptive vs. maladaptive nature of perfectionism, while outlining the importance of considering the unique pattern of associations that might characterize members of ethnic minority groups living in North America. Future work should examine the differential associations of subtypes of perfectionism with indicators of adjustment and maladjustment (e.g., depression, test anxiety, burnout).

References

- Cox, B. J., Enns, M. W., & Clara, I. P. (2002). The multidimensional structure of perfectionism in clinically distressed and college student samples. *Psychological Assessment, 14*, 365-373. doi: 10.1037/1040-3590.14.3.365
- DiBartolo, P. M., & Rendon, M. J. (2012). A critical examination of the construct of perfectionism and its relationship to mental health in Asian and African Americans using a cross-cultural framework. *Clinical Psychology Review, 32*, 139-152. doi: 10.1016/j.cpr.2011.09.007
- Douilliez, C., & Lefèvre, F. (2011). Interactive effect of perfectionism dimensions on depressive symptoms: A reply to Gaudreau and Thompson (2010). *Journal of Personality and Individual Differences, 50*, 1147-1151. doi: 10.1016/j.paid.2011.02.005
- Gaudreau, P. (2012). A methodological note on the interactive and main effects of dualistic personality dimensions: An example using the 2×2 model of perfectionism. *Personality and Individual Differences, 52*, 26-31. doi: 10.1016/j.paid.2011.08.022
- Gaudreau, P., & Thompson, A. (2010). Testing a 2×2 model of dispositional perfectionism. *Personality and Individual Differences, 48*, 532-537. doi: 10.1016/j.paid.2009.11.031
- Gaudreau, P., & Verner-Filion, J. (2012). Dispositional perfectionism and well-being: A test of the 2×2 model of perfectionism in the sport domain. *Sport, Exercise and Performance Psychology, 1*, 1, 29-43. doi: 10.1037/a0025747
- Hamamura, T., Heine, S. J., & Paulhus, D. L. (2008). Cultural differences in response styles: The role of dialectical thinking. *Personality and Individual Differences, 44*, 932-942. doi: 10.1016/j.paid.2007.10.034
- Heine, S. J., Lehman, D. R., Markus, H. R., & Kitayama, S. (1999). Is there a universal need for

- positive self-regard? *Psychological Review*, *106*, 766-794. doi: 10.1037/0033-295X.106.4.766
- Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology*, *60*, 456-470. doi: 10.1037/0022-3514.60.3.456
- Huebner, S. E., Laughlin, J. E., Ash, C., & Gilman, R. (1998). Further validation of the multidimensional students' life satisfaction scale. *Journal of Psychoeducational Assessment*, *16*, 118-134. doi: 10.1177/073428299801600202
- Hulleman, C. S., Schragar, S. M., Bodmann, S. M., & Harackiewicz, J. M. (2010). A meta-analytic review of achievement goal measures: Different labels for the same constructs or different constructs with similar labels? *Psychological Bulletin*, *136*, 422-449. doi: 10.1037/a0018947
- Kawamura, K. Y., Frost, R. O., & Harmatz, M. G. (2002). The relationship of perceived parenting styles to perfectionism. *Personality and Individual Differences*, *32*, 317-327. doi: 10.1016/S0191-8869%2801%2900026-5
- Kelava, A., Werner, C. S., Schermelleh-Engel, K., Moosbrugger, H., Zapf, D., Ma, Y., ... West, S. G. (2011). Advanced nonlinear latent variable modeling: Distribution analytic LMS and QML estimators of interaction and quadratic effects. *Structural Equation Modeling*, *18*, 465-491. doi:10.1080/10705511.2011.582408
- Kitayama, S., Duffy, S., & Uchida, Y. (2007). Self as cultural mode of being. In S. Kitayama & D. Cohen (Eds.). *Handbook of cultural psychology* (pp. 136-174). New York: The Guilford Press.

- Klein, A. G., & Moosbrugger, H. (2000). Maximum likelihood estimation of latent interaction effects with the LMS method. *Psychometrika*, *65*, 457–474. doi:10.1007/BF02296338
- Mobley, M., Slaney, R. B., & Rice, K. G. (2005). Cultural validity of the Almost Perfect Scale Revised for African American college students. *Journal of Counseling Psychology*, *52*, 629-639. doi: 10.1037/0022-0167.52.4.629
- Muthén, L. K., & Muthén, B. O. (2010). *MPlus user's guide: Statistical analysis with latent variables* (6th ed.). Los Angeles, CA: Muthén & Muthén.
- Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought: Holistic versus analytic cognition. *Psychological Review*, *108*, 291-310. doi: 10.1037/0033-295X.108.2.291
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*, 879-903. doi: 10.1037/0021-9010.88.5.879
- Ryan, R. M., & Deci, E. L. (2011). A Self-Determination Theory perspective on social, institutional, cultural, and economic supports for autonomy and their importance for well-being. In V. I. Chirkov, R. M. Ryan, & K. M. Sheldon (Eds.), *Human autonomy in cross-cultural context: Perspectives on the psychology of agency, freedom, and well-being*, Cross-cultural advancements in positive psychology (Volume 1, pp. 45-64). New York, NY: Springer Science + Business Media.
- Ryder, A., Alden, L. E., & Paulhus, D. L. (2000). Is acculturation unidimensional or bidimensional? A head-to-head comparison in the prediction of personality, self-identity, and adjustment. *Journal of Personality and Social Psychology*, *79*, 45-65. doi: 10.1037//0022-3514.79.1.49

- Spector, P.E., Van Katwyk, P.T., Brannick, M.T., & Chen, P.Y. (1997). When two factors don't reflect two constructs: How item characteristics can produce artifactual factors. *Journal of Management*, 23, 659-677. doi:10.1016/S0149-2063(97)90020-9
- Stoeber, J., & Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence, challenges. *Personality and Social Psychology Review*, 10, 295-319. doi : 10.1207/s15327957pspr1004_2
- Vandenberg, R. J., & Lance, C. E. (2000). Review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organization Research Methods*, 3, 4-69. doi: 10.1177/109442810031002
- Wang, K. T. (2010). The Family Almost Perfect Scale: Development, psychometric properties, and comparing Asian and European Americans. *Asian American Journal of Psychology*, 1, 186-199. doi: 10.1037/a0020732
- Yee, A. H. (1992). Asians as stereotypes and students: Misperceptions that persist. *Educational Psychology*, 4, 95-132. doi: 10.1007/BF01322396
- Yoon, J., & Lau, A. S. (2008). Maladaptive perfectionism and depressive symptoms among Asian American college students: Contributions of interdependence and parental relations. *Cultural Diversity and Ethnic Minority Psychology*, 14, 92-101. doi: 10.1037/1099-9809.14.2.92

Table 1

Inter-correlations and Descriptive Statistics

Variable	European		Asian		<i>F</i>	<i>d</i>	<i>l</i>	2	3	4
	Canadian		Canadian							
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>						
1. SOP	4.31	1.36	4.57	1.37	4.45*	0.19	—	.44**	.31**	.20*
2. SPP	2.94	1.36	3.35	1.36	11.07*	0.30	.51**	—	.07	-.01
3. Academic satisfaction	5.05	1.04	4.92	1.07	2.13	-0.14	.18**	-.10*	—	.28**
4. GPA	6.25	1.58	6.48	1.75	1.99	0.12	.34**	.09*	.28**	—

Note. Inter-correlations of European Canadians ($n = 538$) and Asian Canadians ($n = 158$) are presented below and above the diagonal, respectively. SOP = Self-oriented perfectionism; SPP = Socially prescribed perfectionism; GPA = Grade-point average. * $p < .05$. ** $p < .01$.

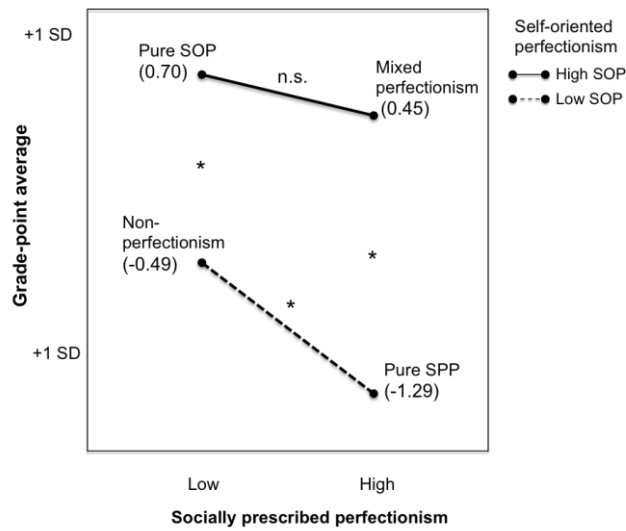


Figure 1. Results of simple slope analyses between subtypes of perfectionism among Asian and European Canadians. Predicted values of GPA are reported in parentheses. *represents a significant difference at $p < .05$ between subtypes.

Figure 1. Results of simple slope analyses between subtypes of perfectionism among Asian and European Canadians.

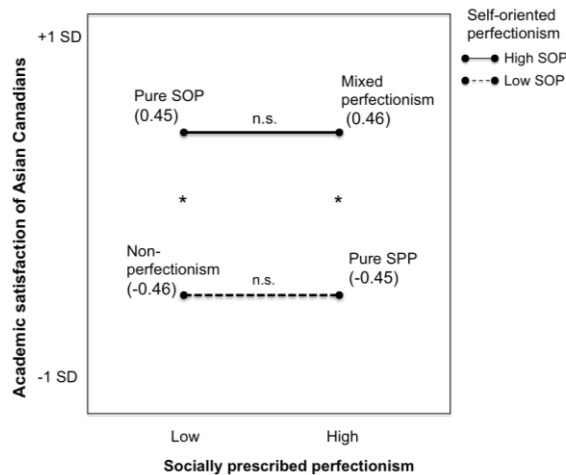


Figure 2. Predicted values of academic satisfaction among Asian Canadians across the four subtypes of perfectionism. Predicted values are reported in parentheses. Main effects of SPP are explicitly displayed horizontally whereas main effects of SOP are implicitly displayed vertically (Gaudreau, 2012). *represents a significant difference between two subtypes of perfectionism.

Figure 2. Predicted values of academic satisfaction among Asian Canadians across the four subtypes of perfectionism.

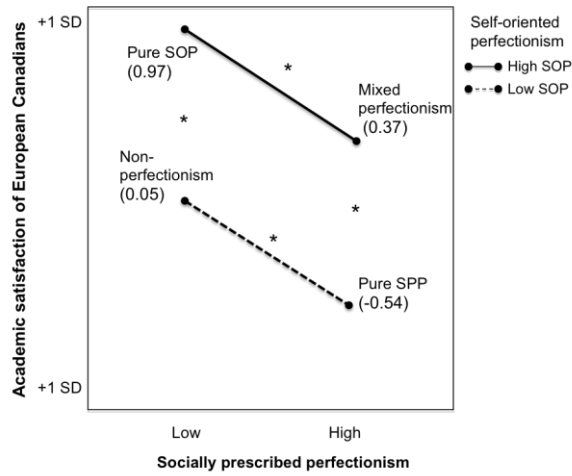


Figure 3. Predicted values of academic satisfaction among European Canadians across the four subtypes of perfectionism. Predicted values are reported in parentheses. Main effects of SPP are explicitly displayed horizontally whereas main effects of SOP are implicitly displayed vertically (Gaudreau, 2012). *represents a significant difference between two subtypes of perfectionism.

Figure 3. Predicted values of academic satisfaction among European Candians across the four subtypes of perfectionism.

Supplemental Material

Measurement Invariance of Perfectionism

A multiple group confirmatory factor analysis was conducted to test the cross-cultural invariance of the perfectionism measure using MPLUS 6.02 with the full information maximum likelihood robust estimator (Muthén & Muthén, 2010). Along with the χ^2 statistic, the following goodness-of-fit indices were used to evaluate the model: comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Values between .90 and .94 for the CFI and TLI indicate acceptable fit whereas values of .95 and higher indicate relatively good fit. Values smaller than .08 for the RMSEA and SRMR indicate acceptable fit whereas values smaller than .05 indicate close fit. As recommended by Vandenberg and Lance (2000), either a substantial change in CFI ($\Delta\text{CFI} > -.01$) or a significant change in the χ^2 ($p < .01$) was a condition to reject the null hypothesis of factorial invariance.

The first model tested a two-factor model with the same fixed and freed parameters in each group to estimate the configural invariance of the model. This model yielded an acceptable fit: $\chi^2 = 317.60$, $\text{SB}\chi^2 = 284.25$, $df = 68$, $p < .001$, $\text{CFI} = .92$, $\text{TLI} = .90$, $\text{RMSEA} = .10$, $\text{SRMR} = .065$. The average standardized factor loadings of self-oriented perfectionism (.76 in European Canadians and .75 in Asian Canadians) and socially prescribed perfectionism (.73 in European Canadians and .71 in Asian Canadians) were all acceptable. Subsequent models provided evidence for the invariance of factor loadings ($\Delta\text{SB}\chi^2 = 5.20$, $\Delta df = 8$, $p > .05$, $\Delta\text{CFI} = -.001$), factors' variances and covariance ($\Delta\text{SB}\chi^2 = 1.09$, $\Delta df = 3$, $p > .05$, $\Delta\text{CFI} < -.001$), and items' residual ($\Delta\text{SB}\chi^2 = 14.11$, $\Delta df = 10$, $p > .05$, $\Delta\text{CFI} < -.001$). Testing the invariance of the intercepts ($\Delta\text{SB}\chi^2 = 39.18$, $\Delta df = 10$, $p < .05$, $\Delta\text{CFI} = -.011$) revealed that the intercept of item 8

(i.e., “*My family expects me to be perfect*”) could be considered non-invariant across samples. After relaxing this equality constraint, the scalar invariance of 9 out of 10 items was assumed ($\Delta SB\chi^2 = 17.64$, $\Delta df = 9$, $p > .05$, $\Delta CFI = -.006$), thus providing sufficient evidence of the most stringent form of measurement invariance for the two dimensions of perfectionism. A final model indicated that the latent means of SOP ($\kappa = 0.22$, $\phi = 1.75$, $p < .05$, Cohen’s $d = .13$) and SPP ($\kappa = .33$, $\phi = 1.24$, $p < .01$, Cohen’s $d = .27$) were significantly higher among Asian Canadians than European Canadians.

Measurement Model of Academic Satisfaction

The academic satisfaction scale contains five positively worded items and three negatively worded items. Reversed items are generally useful to reduce lenient responding. Nevertheless, reversed items create challenge for the unidimensionality of latent variables because positively and negatively worded items tend to load on separate factors despite the absence of substantial justification for a bidimensional factor structure (e.g., Spector, Van Katwyk, Brannick, & Chen, 1997). In this study, we explored the tenability of both the unidimensional and bidimensional factor structure of the academic satisfaction scale. Results of the unidimensional model (without equality constraints across groups) failed to provide non-ambiguous evidence for the tenability of this factor model: $SB\chi^2 = 219.81$, $df = 40$, $p < .001$, $CFI = .906$, $TLI = .868$, $RMSEA = .11$, $SRMR = .060$. Modification indices suggested that the addition of correlated uniqueness for the negatively worded items would significantly improve the model fit. This evidence thus pointed out the necessity of considering a bidimensional factor structure. Results of the bidimensional model (without equality constraints across groups) provided more convincing evidence for the goodness of fit of this model: $SB\chi^2 = 98.29$, $df = 38$, $p < .001$, $CFI = .968$, $TLI = .953$, $RMSEA = .068$, $SRMR = .033$. The average standardized

factor loadings of the positively worded items (.75 in European Canadians and .74 in Asian Canadians) and the negatively worded items (.70 in European Canadians and .72 in Asian Canadians) were all acceptable and the inter-factor correlation suggested a moderately high level of overlap between the two dimensions of academic satisfaction (.78 in European Canadians and .73 in Asian Canadians). Further analyses provided evidence for the invariance of loadings ($\Delta SB\chi^2 = 7.84$, $\Delta df = 6$, $p > .05$, $\Delta CFI = -.001$), variances/covariances ($\Delta SB\chi^2 = 2.56$, $\Delta df = 3$, $p > .05$, $\Delta CFI < -.001$), uniquenesses ($\Delta SB\chi^2 = 8.31$, $\Delta df = 8$, $p > .05$, $\Delta CFI = +.001$), and intercepts ($\Delta SB\chi^2 = 13.04$, $\Delta df = 8$, $p > .05$, $\Delta CFI = -.003$) across European Canadians and Asian Canadians. Overall, this bidimensional model of academic satisfaction was retained in subsequent analyses because it provided an invariably good fit to the data in both samples of European and Asian Canadians.

Multiple Group Latent Moderation Structural Models

The user's manual of MPLUS (version 6.02; see example 5.13) contains the proper input codes to estimate the Latent Moderation Structural (LMS) model developed by Klein and Moosbrugger (2000). The approach described in the MPLUS user's manual cannot readily accommodate multiple group models. The online technical support service of MPLUS was consulted in order to generate input codes that would enable the estimation of Multiple Group LMS models. A publicly available syntax code posted by Linda Muthén on the online MPLUS discussion forum enabled us to properly estimate our Multiple Group LMS:

<http://www.statmodel.com/discussion/messages/11/7276.html?1305212732>

We further expanded these input codes in order to allow us to add cross-group equality constraints on the SOP, SPP, and SOP x SPP effects. Our annotated input codes for a model *without* cross-group equality constraints (SOP, SPP, and SOP x SPP freely estimated in each

group) are reported in Table A1. Our annotated input codes for a model *with* cross-group equality constraints (SOP, SPP, and SOP x SPP constrained to equality across groups) are reported in Table A2.

Complementary Analyses of Reversed Academic Dissatisfaction

Our multiple group LMS models of academic satisfaction contained two outcomes: academic satisfaction and reversed academic dissatisfaction. The manuscript reported the main effects of SOP and SPP for both academic satisfaction and reversed academic dissatisfaction. The results were very similar for both outcomes and, therefore, the manuscript did not present the predicted values of reversed academic dissatisfaction. It is important to note that the interpretation (in light of the four hypotheses of the 2×2 model) was identical for both academic satisfaction and reversed academic dissatisfaction. Nonetheless, the predicted values of reversed academic dissatisfaction of the four subtypes of perfectionism are presented in Table A3 for European Canadians and Asian Canadians.

Table A1

MPLUS Input Codes for the Multiple Group LMS model with the SOP, SPP, and SOP x SPP Effects Freely Estimated in Each Group

DATA:

FILE IS "C:\Users\Desktop\MPLUS\AsianCan\Fall2010_AasianCan.dat";

VARIABLE:

**NAMES ARE id_code gpa mod perf1 perf2 perf3 perf4 perf5 perf6 perf7 perf8
perf9 perf10 acasat1 acasat2 acasat3 acasat4r acasat5r acasat6 acasat7 acasat8r
gpar;**

USEVARIABLES ARE

gpar cperf1 cperf2 cperf3 cperf4 cperf5 cperf6 cperf7 cperf8 cperf9 cperf10;

!GPA from 1(F) to 9(A+).

!Centered scores of perfectionism.

MISSING ARE ALL (999);

CLASSES = C(2); !Class 1 = European Canadians; Class 2 = Asian Canadians

KNOWNCLASS IS C (mod = 1 mod = 2);

! The multiple group latent moderation structural model is estimated as a mixture model.

! The KNOWNCLASS code is the trick used to conduct a multiple group analysis.

DEFINE:

cperf1 = perf1 - 4.013; !All variables are centered to facilitate simple slope analyses

cperf2 = perf2 - 3.192;

cperf3 = perf3 - 3.911;

cperf4 = perf4 - 2.885;

cperf5 = perf5 - 4.518;

cperf6 = perf6 - 3.129;

cperf7 = perf7 - 4.924;

cperf8 = perf8 - 3.173;

cperf9 = perf9 - 4.516;

cperf10 = perf10 - 2.769;

ANALYSIS:

TYPE IS MIXTURE RANDOM;

!Random effects allow the parameter to vary across the two groups

ALGORITHM = INTEGRATION;

!Random effects require the data integration algorithm.

ITERATIONS = 1000;

CONVERGENCE = 0.00005;

COVERAGE = 0.10;

Table 1 to be continued

Table A1

Continued

**OUTPUT: SAMPSTAT MODINDICES RESIDUAL STANDARDIZED
CINTERVAL TECH1 TECH3;**

!Tech 3 is needed to obtain the ACOV matrix to estimate simple slopes

!See <http://www.quantpsy.org/interact/mlr2.htm>

! The loadings, residuals, intercepts, variances, and covariances are constrained to equality across groups because they are not written in the class1 and class2 model.

MODEL:**%OVERALL%****SOP BY cperf1@1 cperf3 cperf5 cperf7 cperf9;****SPP BY cperf2@1 cperf4 cperf6 cperf8 cperf10;****GRADE BY gpar@1;****GRADE@1;****GRADE ON SOP SPP; !Main effects of SOP and SPP****SOPxSPP | SOP XWITH SPP;****GRADE on SOPxSPP; !Interactive effect of SOP X SPP**

! In this model, SOP, SPP, and SOP x SPP are freely estimated in each group because they are written in both the class1 and class2 models.

%C#1% !Class 1 = European Canadians**GRADE on SOP;****GRADE ON SPP;****GRADE on SOPxSPP;****%C#2% !Class 2 = Asian Canadians****GRADE on SOP;****GRADE ON SPP;****GRADE on SOPxSPP;**

 Note. Our personal notes were added in bold characters after the symbol !.

Table A2

MPLUS Input Codes for the Multiple Group LMS model with the SOP, SPP, and SOP x SPP

Effects Constrained to Equality Across Groups

! The first part of the input codes is identical in Table 1 and Table 2.

! The loadings, residuals, intercepts, variances, and covariances are constrained to equality across groups because they are not written in the class1 and class2 model (as per Table 1).

! In this model, SOP, SPP, and SOP x SPP are now constrained to equality across groups because they are written in the overall model rather than in both the class1 and class2 models (which are no longer included in the input codes).

MODEL:

%OVERALL%

SOP BY cperf1@1 cperf3 cperf5 cperf7 cperf9;

SPP BY cperf2@1 cperf4 cperf6 cperf8 cperf10;

GRADE BY gpar@1;

GRADE@1;

GRADE ON SOP SPP; !Main effects of SOP and SPP

SOPxSPP | SOP XWITH SPP;

GRADE on SOPxSPP; !Interactive effect of SOP X SPP

Note. Our personal notes were added in bold characters after the symbol !.

Table A3

Predicted Values of Reversed Academic Dissatisfaction for the Four Subtypes of Perfectionism in Asian Canadian and European Canadian Samples

Subtypes	Asian Canadians	European Canadians
Pure SOP	0.51	1.05
Mixed perfectionism	0.26	0.17
Non perfectionism	-0.26	0.27
Pure SPP	-0.51	-0.72

CHAPTER 6: General Discussion of Dissertation

The purpose of this dissertation was to contribute to the development of the 2×2 model of perfectionism by conducting a literature review of the 2×2 model and proposing three original articles aimed at demystifying the ambiguous findings observed so far. Overall, the goals of this dissertation were threefold: 1) Propose a multilevel extension of the 2×2 model of perfectionism to examine the relationships between subtypes of perfectionism and psychological adjustment across several life domains (i.e., within-person), as well as across individuals (i.e., between-person); 2) Use the multilevel extension to examine the relationships between multilevel subtypes of perfectionism and coping of university students; and 3) Propose a cross-cultural assessment of the 2×2 model by comparing the relationships between perfectionism subtypes and academic adjustment across two sociocultural groups (i.e., Euro Canadians and Asian Canadians). The summaries of each article's main findings are discussed below and they are also summarized in Table 1.

Table 1. Summary of Findings Across the Three Articles of Dissertation

Between-person	<u>Article 1</u>		<u>Article 2</u>		<u>Article 3</u>	
	Within-person	Between-person	Within-person	European	Asian	
<u>Hypothesis 1: SOP should be associated to better adjustment than non-perfectionism</u>						
Vitality ¹	Vitality ¹	Task coping ¹	Task coping ¹	GPA ¹	GPA ¹	
Goal progress ¹	Goal progress ¹	Disengagement coping ²	Disengagement coping ¹	Satisfaction ¹	Satisfaction ¹	
Positive affect ¹	Positive affect ¹	Relative coping ¹	Relative coping ¹			
Negative affect ²	Negative affect ²					
Stress ²	Stress ³					
<u>Hypothesis 2: Non-perfectionism should be associated to better adjustment than pure SPP</u>						
Vitality ¹	Vitality ¹	Task coping ²	Task coping ³	GPA ¹	GPA ¹	
Goal progress ¹	Goal progress ¹	Disengagement coping ¹	Disengagement coping ¹	Satisfaction ¹	Satisfaction ²	
Positive affect ¹	Positive affect ¹	Relative coping ¹	Relative coping ¹			
Negative affect ¹	Negative affect ¹					
Stress ¹	Stress ¹					
<u>Hypothesis 3: Mixed perfectionism should be associated to better adjustment than pure SPP</u>						
Vitality ¹	Vitality ¹	Task coping ¹	Task coping ¹	GPA ¹	GPA ¹	
Goal progress ¹	Goal progress ¹	Disengagement coping ²	Disengagement coping ¹	Satisfaction ¹	Satisfaction ¹	
Positive affect ¹	Positive affect ¹	Relative coping ¹	Relative coping ¹			
Negative affect ²	Negative affect ²					
Stress ²	Stress ³					
<u>Hypothesis 4: Pure SOP should be associated to better adjustment than mixed perfectionism</u>						
Vitality ¹	Vitality ¹	Task coping ²	Task coping ³	GPA ²	GPA ¹	
Goal progress ¹	Goal progress ¹	Disengagement coping ¹	Disengagement coping ¹	Satisfaction ¹	Satisfaction ²	
Positive affect ¹	Positive affect ¹	Relative coping ¹	Relative coping ²			
Negative affect ¹	Negative affect ¹					
Stress ¹	Stress ¹					

Note. 1 = Results supported the hypothesis. 2 = Results showed a non-significant effect. 3 = Results showed an effect that contradicted the direction of the hypothesis.

Key Findings and Contributions from *Article 1*: A Multilevel Extension of the 2 × 2 Model of Perfectionism

To date, research conducted on perfectionism has focused almost exclusively on achievement-related settings in which outstanding levels of performance are usually recognized as a trademark for personal or professional success. *Article 1* offered a rare opportunity to scrutinize the multilevel construct of perfectionism, as examined both across individuals (i.e., between-person differences) and across a diversified set of life domains (i.e., within-person variations). Overall, *Article 1* aimed at providing a novel multilevel extension of the 2 × 2 model of perfectionism in order to examine the within- and between-person relationships between subtypes of perfectionism and various indicators of psychological adjustment (i.e., vitality, goal progress, positive and negative affect, stress). A preliminary objective of this study was to support the factorial structure of the perfectionism measure in order to ensure that the construct of study was equivalent across levels of analysis. In other words, it was deemed fundamental to validate whether the measure captured the same construct of study when perfectionism was compared across individuals (i.e., between-person) and when compared across several domains nested within an individual (i.e., within-person) in order to reduce research method bias. Results from our multilevel confirmatory factor analysis (MCFA) supported the factorial structure of the short form of the Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991) across both levels of analysis. These findings provided evidence for the factorial homology of dispositional and contextual perfectionism by revealing that the factorial structure across life-domains (i.e., within-person) was equivalent to the factorial structure across individuals (i.e., between-person). Theoretically, these results are important because they show that contextual (i.e., domain-specific) and dispositional perfectionism can be conceptualized using the same basic sets of

dimensions and indicators with the same questionnaire adapted to suit the purpose of comparing individual characteristics that are likely to fluctuate across life domains. To our knowledge, we were the first to propose and support the multilevel factorial structure of the short MPS. This finding is important to encourage future research on multilevel perfectionism.

A second objective of *Article 1* was to examine the multilevel associations between subtypes of perfectionism and university students' psychological adjustment. Our findings provided evidence to support all four hypotheses of the 2×2 model of perfectionism across both levels of analysis with indicators of positive adjustment, namely vitality, goal progress, and positive affect. In sum, pure SOP was associated with greater levels of positive adjustment compared to non-perfectionism (Hypothesis 1) and mixed perfectionism (Hypothesis 4). Furthermore, pure SPP was shown to relate to lower levels of positive adjustment compared to non-perfectionism (Hypothesis 2) and mixed perfectionism (Hypothesis 3). These results are consistent with past research conducted with various samples on the 2×2 model of perfectionism at the between-person level of analysis (e.g., Gaudreau, 2012; Gaudreau, 2015; Gaudreau & Thompson, 2010). They contributed to support for the first time the hypotheses of the model with indicators of positive adjustment at the within-person level. Overall, our findings reveal that mixed perfectionism should lead to better psychological adjustment compared to a subtype of pure SPP, but poorer psychological adjustment compared to pure SOP. They also provided support showing that a subtype of pure SPP should lead to the lowest levels of adjustment compared to all other three subtypes.

Notwithstanding the contribution of examining positive adjustment, in this study, it was also considered important to include indicators of negative adjustment in order to provide adequate comparisons of indicators often linked to contradictory findings in past literature. In past

research, it has been consistently demonstrated that SOP was associated positively with positive indicators of psychological adjustment, while SPP was negatively related to it. On the contrary, relationships between perfectionism and indicators of psychological maladjustment are not as consistent. As such, while SPP almost constantly related to psychological maladjustment, findings are still equivocal regarding the relationship between SOP and psychological maladjustment, with researchers supporting a positive relationship and others supporting a negative one (e.g., see Gotwals, Stoeber, Dunn, & Stoll, 2012; Stoeber & Otto, 2006 for a review). Hence, in this study, both positive and negative indicators were included in a same design. Similarly to what had been observed so far in the literature, our results provided full support for hypotheses of the 2×2 model of perfectionism with positively-valence outcomes, while offering partial support with negatively laden outcomes (i.e., negative affect and stress). Our results showed that pure SPP was associated with greater negative affect and stress compared to non-perfectionism, which is consistent with Hypothesis 2. Results also supported Hypothesis 4 by demonstrating that pure SPP was related to greater negative affect and stress compared to mixed perfectionism. These findings supported once again the assertion that a subtype of pure SPP is likely to be the most detrimental to mental health, leading to the worst levels of psychological adjustment.

Nonetheless, results failed to support Hypothesis 1, revealing that pure SOP and non-perfectionism were not differently associated with negative affect and stress at the between-person level, while pure SOP was related to greater stress but non-significant negative affect than non-perfectionism at the within-person level. In other words, university students who held greater levels of pure SOP (compared to those with non-perfectionism) did not experience an increase in stress or negative affect. However, in life domains in which university students held

more pressure toward oneself to achieve exceedingly high standards (i.e., when levels of pure SOP exceeded one's average), pure SOP was associated with more stress compared to a subtype of non-perfectionism, although university students did not experience greater negative affect. Overall, these results reaffirm the assertion that holding high levels of SOP in combination with low levels of SPP—as in a subtype of pure SOP—is linked with overall better adjustment compared to a subtype of non-perfectionism (i.e., greater vitality, goal progress, positive affect, and similar negative affect). This finding did not generally support the alternative viewpoint that pure SOP should be associated with worse outcomes than non-perfectionism.

Finally, results examining Hypothesis 3 led to similar findings than Hypothesis 1. Mixed perfectionism and pure SPP were associated with similar levels of negative affect and stress at the between-person level, while mixed perfectionism was associated with greater stress but similar negative affect compared to pure SPP at the within-person level. Hence, in life domains in which university students experience greater mixed perfectionism than average, the combined presence of high levels of SOP and SPP seems to create more stress to the individual in comparison to a subtype of pure SPP. Students with a subtype of mixed perfectionism were still able to reach greater psychological adjustment than those with pure SPP (i.e., more vitality, goal progress, positive affect, and similar negative affect).

In sum, while it seems like mixed perfectionism (compared to pure SPP) and pure SOP (compared to non-perfectionism) may be associated with increased stress at the within-person level, these subtypes were not associated with poorer overall adjustment. It seems like such subtypes are able to confer personal advantages to individuals in order to promote psychological adjustment, although they may not entirely protect against psychological maladjustment. In other words, at the within-person level, stress seems to not necessarily be an indicator of

maladjustment, but rather an indicator of activation. In contrast, at the between-person level, stress could be an indicator communicating a chronic imbalance between the demands and resources. At the episodic level (i.e., within-person level), being activated could provide the needed energy to deal with specific life demands and challenges. However, at the general level (i.e., between-person level), being chronically stressed could be more likely to lead to serious health and psychological issues. Future research was thus needed to examine the relationships between perfectionism subtypes and coping in order to explore whether multilevel differences may help better understand this intriguing finding.

Key Findings from *Article 2*: Multilevel Perfectionism and Coping

In *Article 2*, it was deemed important to examine the way students cope with increased demands (compared to their own average). In fact, Lazarus and Folkman (1984) defined coping as a self-regulatory process that takes place when one's level of stress becomes greater than average (i.e., when the demands of a situation exceed the resources of the person). Whereas this definition involves within-person comparisons, most of the research on coping and perfectionism was conducted at the between-person level. Although this research has been informative for researchers and practitioners in exposing the psychological consequences associated with a general disposition to pursue certain coping strategies and styles, less research has investigated the within-person coping mechanisms put in place by university students in order to cope with increased demands or stress in particular life domains (Gaudreau & Miranda, 2010). Hence, the goal of *Article 2* was to provide further support to a multilevel extension of the 2×2 model of perfectionism while also aiming at better understanding the role of perfectionism subtypes on university students' coping tendencies. In this article, between-person (Study 1) and within-person (Study 2) analyses were conducted with two separate samples.

At the *between-person level*, results depicted similar findings than observed in past research. In fact, university students with pure SOP (compared to non-perfectionism) and mixed perfectionism (compared to pure SPP) were associated with higher levels of task-oriented coping (i.e., TOC) but not statistically different levels of disengagement-oriented coping (i.e., DOC). Conversely, university students with subtypes of pure SPP (compared to non-perfectionism) and mixed perfectionism (compared to pure SOP) were associated with higher levels of DOC but not statistically different levels of TOC. However, at the *within-person level*, results led to intriguing findings. Life domains in which individuals displayed greater pure SOP (compared to non-perfectionism; Hypothesis 1) and mixed perfectionism (compared to pure SPP; Hypothesis 3) than average, these subtypes were associated with significantly greater levels of TOC and lower levels of DOC. In life domains in which mixed perfectionism (compared to pure SOP) and pure SPP (compared to non-perfectionism) were higher than one's average, these subtypes were associated with greater levels of DOC, but also with a higher usage of TOC. Findings from *Article 2* reaffirmed some central assertions of the 2×2 model. They supported once again that pure SPP should be seen as the most debilitating subtype of perfectionism, and not mixed perfectionism.

Examining the relationships between perfectionism subtypes and both coping dimensions separately (i.e., as independent outcomes) constitutes a current limitation by providing only a partial assessment of the relationships between perfectionism and coping. University students do not use only one set of coping strategies. Rather, they are likely to cope by using a combination of strategies that are both task-oriented and disengagement-oriented. As an example, students may exert efforts toward problem solving, planning, and relaxation (i.e., task-oriented), while at the same time making usage of disengagement-oriented strategies such as venting or blaming of

others. Whereas examining the coping dimensions that are related to students' perfectionism is informative to a certain extent, it does not provide sufficient information regarding the proportion of task-oriented or disengagement-oriented coping that is being used by students. The use of disengagement-oriented coping might not interfere with optimal psychological adjustment as long as it is combined with a greater proportion of task-oriented coping. Hence, a novel and important addition of *Article 2* was to propose and examine the multilevel relationships between perfectionism subtypes and university students' proportion of task-oriented coping (i.e., relative coping). Accordingly, whereas the main findings of *Article 2* did not support all of the 2×2 model's hypotheses, examining the relationships between perfectionism subtypes and relative coping provided a more direct and comprehensive assessment of the model, which enabled us to support all but one of the hypotheses. In fact, at the within-person level, pure SOP and mixed perfectionism seemed to be comparably associated with the highest levels of relative coping among the four subtypes of perfectionism. This finding was important because it suggests that high levels of SOP might buffer the effect of momentarily high levels of SPP at the contextual level in a way that promotes a greater proportion of task-oriented coping although endorsing chronic high levels of SPP at the dispositional level might become debilitating for students who then tend to use a lower proportion of task-oriented coping.

Key Findings and Contributions from *Article 3*: A Cross-Cultural Assessment of the 2×2 Model

In *Article 3*, we proposed that moderators of the 2×2 model should be assessed in order to determine for whom and/or under which circumstances hypotheses of the model are supported. In addition, a central assumption of the perfectionism definition implies that perfectionism is a personality trait present across cultures (Hewitt & Flett, 1991). A limited

number of studies have examined the relationship between perfectionism and sociocultural identity (for a review, see DiBartolo & Rendon, 2012; Kim, Wong, & Maffini, 2010). In *Article 3*, the overarching goal was to provide a first cross-cultural assessment of the 2×2 model of perfectionism by comparing whether the relationships between subtypes of perfectionism and academic adjustment differed across individuals from two different sociocultural backgrounds.

In this study, participants involved university students identifying as European Canadians and Asian Canadians. However, a prerequisite to conduct our analyses and test our hypotheses involved supporting that the perfectionism measure used in our study was deemed adequate to measure perfectionism equivalently across both groups. In other words, a preliminary objective was to test the equivalence of the factorial structure of the short MPS through a multi-group confirmatory factor analysis (MCFA). These results provided evidence to support the most stringent form of measurement invariance for the two dimensions of perfectionism across both sociocultural groups, thus ensuring that further comparisons of perfectionism across both groups would not be biased by measurement non-equivalence. These findings were methodologically important for future researchers interested in measuring cross-cultural differences in perfectionism with the short MPS.

The second objective of *Article 3* was to examine whether sociocultural background acted as a significant moderator of the relationships between subtypes of perfectionism and two indicators of academic adjustment, namely academic satisfaction and self-reported grade-point average (GPA). Results from our latent moderated structural model (LMS) showed that there was no moderating effect of sociocultural background when predicting *self-reported GPA*. Notwithstanding, although there were no cross-cultural differences, results provided evidence to support all four hypotheses of the 2×2 model of perfectionism for both sociocultural groups.

However, when predicting satisfaction, sociocultural background played a significant moderating role in differentiating the relationships between subtypes of perfectionism and *academic satisfaction*. With European Canadians, results mirrored what previous findings had obtained so far with samples of Caucasians/North Americans, supporting all four hypotheses of the 2×2 model of perfectionism. With Asian Canadians, however, we had two culturally sensitive competing hypotheses according to the meaning that Asian Canadians might attach to a subtype of mixed perfectionism. We hypothesized that high levels of SPP would make Asian Canadians more vulnerable to psychological maladjustment regardless of its combination with high (i.e., mixed perfectionism) or low (i.e., pure SPP) levels of SOP. This hypothesis was referred to as the *socially prescribed perfectionism as an aggravating factor* hypothesis. We also argued that social expectations as well as family pressure and support were integrant characteristics of the cultural makeup in which Asian Canadians are socialized (Yee, 1992). Coupled with their tendency to view and appraise the world in a holistic manner, Asian Canadians might be more likely to integrate and endorse beliefs that appear contradictory to European Canadians in a cohesive manner (e.g., Hamamura, Heine, & Paulhus, 2008), thus making Asian Canadians with a subtype of mixed perfectionism as equally satisfied or psychologically adjusted as a subtype of pure SOP. This hypothesis represented our *socially prescribed perfectionism as a cultural makeup* hypothesis.

In *Article 3*, our findings supported this latter hypothesis, suggesting that Asian Canadians with a subtype of mixed perfectionism (compared to pure SOP) were able to reach high levels of both academic satisfaction and GPA. In contrast, their European Canadian counterparts with mixed perfectionism (compared to pure SOP) seemed to be able to perform equally well, but with lower satisfaction toward their academic experience. These findings

supported the assertion that a subtype of mixed perfectionism might be interpreted differently according to one's sociocultural background. Overall, the findings of *Article 3* were important for the development of the 2×2 model of perfectionism because they assessed the role of cultural diversity, which constitutes a current limitation of the perfectionism literature. This study demonstrated similarities and disparities between the two sociocultural groups, which contributes to deepen our understanding of what might seem like mixed findings.

Limitations and Future Research Directions

This dissertation made a significant contribution to the study of perfectionism by holding significant theoretical, methodological, and practical implications. Notwithstanding, there are several methodological limitations that deserve to be acknowledged for the development of future studies. These limitations are discussed below along with ideas to attenuate or control them in future research and propel future work in the area.

Population

Student population. The samples used in all three articles of this dissertation consisted of undergraduate students enrolled in a large Canadian bilingual university. The academic setting in which university students evolve is however likely to foster variability in students' profiles. For example, the challenges, demands, and admission requirements associated with a competitive private university are likely to attract slightly different profiles of undergraduate students than the requirements of a public university whose mandate is to enable a larger pool of students to access postsecondary education. Specifically, participants in our studies all belonged to a public university in which the admission grade-point average usually revolves around 80-85%. The level of competition to access postsecondary education at this university is average compared to a private university that may exclusively recruit students with an average grade-

point average over 90%. Undergraduate students from these settings may exhibit slightly different profiles than students involved in our studies, such as greater levels of perfectionistic standards in general. Hence, it remains to be determined if results from our studies could generalize to undergraduate students from diverse academic settings. Similarly, university students at different levels of training are also likely to display different characteristics or conciliate slightly different life domains. Further research could replicate our findings with samples of graduate students or students in professional programs such as medical school in order to explore the role of potential differences in perfectionism scores.

Undergraduate students represented a specific niche of participants that was targeted for the purpose of this dissertation for several reasons. Undergraduate students are at a developmental period of transitions, situated at the crossroads between adolescence and emerging adulthood. Although school still occupies a great deal of importance in their daily activities, undergraduate students can still engage in their hobbies/leisure/sport activities, while also spending time with their friends and families, and possibly developing and nurturing a romantic relationship. Furthermore, a significant proportion of undergraduates hold a part-time job in addition to their studies (i.e., over 30% in our samples). As a result, undergraduate students are still actively engaged in a large array of life domains, which was of pivotal importance for the purpose of this dissertation. Transitory developmental periods are not however limited to the experience of undergraduate students. For example, the transition of adults having to conciliate with increased responsibilities, such as adjusting to a new job, the role of a parent, or even retirement in later adulthood all represent different instances during which one is required to conciliate slightly different life domains. Hence, revisiting the findings from this dissertation with different populations across different points of developmental transitions

would represent an area of research worth exploring for future research. Similarly, the samples used in our studies comprised students aged between 16 and 53 years old. Students of varying ages may be required to conciliate slightly different life domains, may cope differently with contextual stressors, or attribute more or less personal importance to their grades. Examining the potential moderating role of age could be an important area worth exploring in future research with undergraduate students.

Gender. Participants' gender in this dissertation represented a majority of female participants, with 80% of the sample in *Article 1*, 71% in Study 1 and 77% in Study 2 of *Article 2*, as well as 64% in the Asian Canadian sample and 70% in the European Canadian sample of *Article 3* described as female. These proportions of gender are not representative only of the samples recruited in this dissertation; in fact, these proportions are fairly common in research in perfectionism, especially in the academic domain (e.g., see Table 1 in *Chapter 2*). This finding is not surprising given the ever-growing number of women to enroll in university over the past decades. In fact, according to the 2006 Census (Statistics Canada, 2008), 60% of university students between the ages of 25 and 29 consisted of women, in comparison to 32% of students observed 30 years ago, and this proportion is likely to increase over the next decades. In our studies, we respected the natural distribution of participants without controlling to obtain an equally distributed proportion of men and women, which would have created a bias of overrepresenting the proportion of men in the university setting. Conversely, the high percentage of women might suggest a potential bias of selection whereby women were more prone than men to participate to our perfectionism studies. To circumvent this bias, future work could aim at recruiting participants in various settings in which the proportion of gender may be more equally shared, such as high school settings. Similarly, future study could aim at replicating a

representative proportion of women enrolled in university (i.e., 60%) in their research design through random recruitment (e.g., sending 6 women study invites for each 4 men study invites) or by redirecting participants to another section of the survey once the proportion of women targeted for the study is obtained. Furthermore, some studies have shown no gender differences in perfectionism levels (e.g., Hassan, Abd-El-Fattah, Abd-El-Maugoud, & Badary, 2012; Hewitt & Flett, 1991; Jonge & Waller, 2003) and a review of meta-analyses conducted by Hyde (2005) supported a *gender similarity hypothesis* suggesting that men and women do not systematically exhibit significant gender differences on most psychological variables. Gender differences reported by this review were in fact circumscribed to verbal, visuo-spatial, and mathematical abilities, as well as aggressivity levels. Nonetheless, although perfectionism levels may not differ according to gender, the relationships between perfectionism subtypes and outcomes may vary in strength for men and women. Future work could thus explore whether gender significantly influences these relationships by examining its potential moderating role.

Measures

Self-report. In this dissertation, self-report questionnaires were used to measure all study variables. Self-report measures represent a reliable source of information to measure subjective psychological variables although they may be prone to common method variance biases (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In terms of self-report grades, for example, studies have shown high congruence between self-report and objective grade-point average (GPA; e.g., Kuncel et al., 2005). One main limitation with self-report GPA, however, is that GPA calculation varies significantly. For example, GPA might comprise semester, year, or cumulative grades, which might result in slightly different definitions of GPA for students when they are asked to self-report rather than use objective grades. In addition, self-report GPA is

contingent upon storage and memory retrieval of students. Yet, students with low grades and low ability might be less likely to accurately report their grades (Kuncel et al., 2005). Students with low grades might also be more prone to enhance their grades on self-report measures to circumvent the negative affect produced by the acknowledgment of low grades and enhance their positive view of self (Talento-Miller & Peyton, 2006). To avoid such bias, future work could complement self-report measures with other informant-reports (Sherry et al., 2013). Informants engage with participants in various domains of life (e.g., romantic partner, coworker, psychologist, family member). They could thus be likely to provide different, non-redundant information of participants' perfectionism traits. Informants are prime candidates to witness and judge participants' overt or external perfectionistic behaviours (e.g., checking, verbal self-criticisms) and concerns (e.g, complaints about perceived pressure to be perfect by significant others). Although participants would still represent the best source of information to rate their internal traits and thoughts, studies have shown moderate correlations between self- and informant-report perfectionism and similar relations with indicators of depression (Flett, Besser, & Hewitt, 2005; Olino & Klein, 2015; Sherry et al., 2013). However, it remains to be examined if the congruence between self- and informant-reports differs across subtypes of perfectionism from the 2×2 model of perfectionism.

SPP entails a perceived pressure to reach high standards of performance. Perhaps individuals in the pure SPP subtype experience greater disconnect between their socially driven self-perceptions and the perceptions that significant others have about them. In contrast, individuals with a mixed perfectionism subtype might experience higher similarity between self- and informant-reports given that they are more likely to endorse the perfectionistic values and ideals promoted by members of their social environment. If certain subtypes are indeed

associated with a greater disconnect between self- and informant-reports, this line of research would inform perfectionism researchers on the need to control for this bias in future research.

Short versions. In *Articles 1 and 2*, participants were asked to complete measures repeatedly for as many life domains as they were engaged in. As is common ground for assessing perfectionism in cases in which administering the long version would be too long, demanding, or time-consuming (Stoeber, in press), short forms were favored over the original versions in order to foster participants' retention. Whereas the use of short forms may represent a limit to the current dissertation in the sense that participants' responses to current items may be more strongly influenced by their responses to previous items (Podsakoff et al., 2003), validation studies have shown strong support for the validity of the short Multidimensional Perfectionism Scale (Cox, Enns, & Clara, 2002; Stoeber, in press). In fact, in a first validation study, Cox et al. (2002) showed excellent convergent validity between the original/long version of the Multidimensional Perfectionism Scale (Hewitt & Flett, 1991) and the short form (i.e., reported inter-correlations above .94). Their findings also demonstrated that the short form showed superior fit than the long version (i.e., clearer factor structure), suggesting its effectiveness to capture the most salient items of each perfectionism facet, a finding recently revisited and supported by Stoeber (in press). Future research could examine whether similar findings would be observed with the original version in order to ensure generalizability of the findings. Similarly, our studies examined facets of perfectionism (i.e., SOP/SPP) rather than the dimensions (i.e., PSP/ECP). Future research could complement measures of perfectionism facets with measures of dimensions in order to examine hypotheses of the 2×2 model.

Reversed items. Reversed items are often included in questionnaires as a useful strategy to circumvent acquiescence bias when measuring outcomes of psychological adjustment such as

academic satisfaction (Marsh, 1986). In fact, when responding to the items, participants who have a tendency to respond similarly to all items are disrupted in their response style by those reversed items. Providing answers to reversed items may require greater verbal reasoning skills if participants are asked questions for which double negative logic applies (Marsh, 1986). Hence, by including reversed items, researchers assume that they are measuring the same construct of study although the negative statement may invoke a slightly different concept. Reversed items may become a method bias in research (Podsakoff et al., 2003). In *Article 3*, we took steps to reduce the effect of this bias by conducting a latent moderated structural model in which positive and negative items of academic satisfaction were represented as distinct latent variables. Future research could control for this bias by using structural equation models in which positive and negative items would be conceptualized as two latent variables or as one latent variable with the addition of a method factor (Gaudreau, Gunnell, Hoar, Thompson, & Lelièvre, 2015).

Design

The study design favored in the current dissertation was cross-sectional. Although this design provides information on the strength of the relations between two variables, it does not inform researchers on the direction of the relationships. In fact, it is up to researchers to determine which variable represents the outcome. In certain situations, however, a variable considered an outcome might become an antecedent. For example, although several studies have supported the relationship between perfectionism and depression (e.g., Flett, Besser, & Hewitt, 2005; Sherry et al., 2013), depression might, in return, influence perfectionism (Asseraf & Vaillancourt, 2015). The use of prospective or longitudinal designs in which perfectionism and psychological variables are measured at separate time intervals would be useful to examine the direction of the relationships. Future research might further explore this idea by using cross-

lagged analyses that would enable researchers to better capture and understand the reciprocal relationships between perfectionism subtypes and psychological adjustment indicators. Similarly, perfectionism might influence the development or trajectory of psychological adjustment (e.g., Gaudreau, Louvet, & Kljajic, submitted; Vaillancourt & Haltigan, 2017). Future research examining growth curve models would thus be useful to examine the relationships between perfectionism subtypes and changes in psychological adjustment or across time.

In *Article 2*, coping was measured at any point during the semester compared to being measured at specific, targeted time-points (e.g., beginning of semester, exam periods). The demands with which university students deal throughout the course of a semester may change considerably according to the period of the semester (Carver & Scheier, 1994; Raffety, Smith, & Ptacek, 1997). For example, exam periods may generate significant levels of stress to university students, creating an imbalance between their resources and the demands of their studies. Hence, their coping process may vary considerably when they are in significant stressful periods compared to their general activity. Likewise, university students' coping skills may differ in a momentary stressful situation (e.g., during their exam) that is nested within a stressful period of their semester (e.g., exam period). Future research could focus on significant periods during which university students would be more likely to express greater levels of stress (e.g., difficult events, conflicts between domains, following a failure) in order to examine the multilevel relationships between perfectionism subtypes and achievement/adjustment outcomes. Future work could also focus on measuring coping once a week during an entire semester to examine whether the fluctuations in coping are similar across subtypes of perfectionism.

Retrospective Coping Bias

Retrospective coping bias is another significant bias with which researchers are faced

when retrospectively measuring coping, as was the case in *Article 2* of this dissertation. Researchers have shown that many factors may affect participants' recollection of the coping strategies they used in a specific stressful encounter, even though the time lag is considered short-term (Ptacek, Smith, Espe, & Raffety, 1994; Stone et al., 1998). Participants may recall more easily the strategies they used more frequently, the ones they used first or last, or the ones they employed when their stress reached its peak. Participants may also be biased according to the outcome of their coping process, as well as to temporal factors. Results from a study examining the correspondence between retrospective self-reports of coping 5 days after an exam and daily coping measurements during the exam period revealed that students recalled the coping strategies they used with moderate accuracy at best (Ptacek et al., 1994). Likewise, another study demonstrated a relatively poor correspondence between momentary records of coping and retrospective coping measurement 48 hours after a stressful event, with approximately 30% of participants failing to report items previously endorsed and 30% endorsing items not previously reported (Stone et al., 1998). This study also showed that participants had a tendency to underreport their cognitive coping strategies while over reporting their behavioural ones. These findings support the fact that recall may bias to a certain extent participants' responses by minimizing or underreporting some of the coping strategies used in the momentary unfolding of the event. However, retrospective assessment still allows to access participants' broad representation of their coping process. In future research, it would thus be useful to adapt the study design in order to complement cross-sectional coping measures with repeated measures capturing momentary coping strategies in order to gain greater accuracy of the coping process.

Consistency Motif Bias

Researchers have demonstrated that when participants are asked to think back on their

perceptions and behaviour, they have a general tendency to organize the information in order to maintain consistency in their responses (Podsakoff et al., 2003). Some participants make a conscious effort to appear consistent throughout the questionnaire completion, which may bias their responses because they disengage from the automatic/implicit process in order to provide rational and controlled responses. This bias is called *consistency motif*. Consistency motif may influence researchers' findings by artificially increasing the internal consistency of study subscales, which would bias the strength of the relationship between the independent and dependent variables. In this dissertation, the internal consistency of our subscales and the inter-correlations between variables were comparable to findings observed in past research. Although this bias is common in all research, the tendency to appear consistent may be strongly associated with perfectionism. As such, participants who display greater levels of perfectionism may be more prone to want to control their responses in order to complete the questionnaire "perfectly". Similarly, different subtypes of perfectionism may be differently influenced by consistency motif bias. For example, students with a subtype of pure SPP—who perceive that significant others exert pressure on them to pursue perfectionistic standards—may have a greater tendency to want to answer their questionnaire in a consistent manner in order to provide a "perfectly completed questionnaire". Researchers have yet to examine whether higher perfectionism scores (or different subtypes of perfectionism) may be more strongly associated with consistency motif bias. Similarly, sociocultural background may also predispose participants to answer in a more or less consistent way. For example, Asians have a tendency to perceive their world in a more holistic vision, whereas North Americans are more prone to develop analytic thoughts (e.g., Hamamura et al., 2008; Nisbett, Peng, Choi, & Norenzayan, 2001). Hence, Asians may respond in a more consistent way than North Americans. It remains to be determined empirically if some

sociocultural groups display greater consistency motif bias and if this bias has a significant influence on the findings.

Negative Affectivity Bias

Negative affectivity bias represents the tendency to overestimate one's negative experiences and underestimate the positive ones (Podsakoff et al., 2003). Although it involves a within-person comparison of one's experiences, it also implicates comparing oneself to the subjective experience of others. Negative affectivity bias also implies a negative evaluation of the world. It may involve perceiving others as more successful and idealizing the lives of others. Negative affectivity is generally considered a dispositional trait, suggesting that individuals who display greater levels of negative affectivity may be biased in responding to questionnaires (Podsakoff et al., 2003). Research remains to be conducted in order to examine if individuals with high levels of perfectionism may be more predisposed toward this bias. Research on achievement goals has demonstrated that SPP was more likely to be associated with normative goals (i.e., wanting to be better than others) whereas SOP was more likely associated with self-referenced goals (i.e., wanting to master a task and improve over time). Hence, individuals who report greater levels of SPP were shown to pursue goals involving a between-person comparison (e.g., ranks, grades). Individuals who pursue perfectionistic standards out of perceived pressure were thus more prone to strive toward being one of the best in their activities. In contrast, individuals who pursued perfectionistic standards out of personal importance were more likely to strive toward goals involving an intrapersonal comparison, whereby one aims toward self-improving and self-transcendence by aspiring to surpass one's past experiences. Inspired by this area of research, it is possible that individuals with different subtypes of perfectionism may be more or less predisposed by a negative affectivity bias, which could influence the relationships

between perfectionism subtypes and consequential outcomes. For example, endorsing to a greater extent a negative affectivity bias may bias one's responses by inflating the levels reported on negatively laden variables, which could partly help explain some of the ambiguous findings observed so far in the perfectionism literature. Future research examining the effect of negative affectivity bias could hold significant implications for the study of perfectionism.

Implications of Dissertation for Research

Theoretical Implications: Supporting an Open-Ended Theoretical Formulation of the 2 × 2 Model of Perfectionism

Findings obtained across the articles of this dissertation hold significant theoretical implications for the study of perfectionism by contributing to the development and extension of the 2 × 2 model of perfectionism. The 2 × 2 model has been formulated as an *open-ended theoretical system* (Gaudreau, 2013) in order to integrate and synthesize past findings on perfectionism while offering a parsimonious platform that enabled researchers to theorize, propose, and examine mechanisms (e.g., mediation, moderation) that may explain the relationships between perfectionism subtypes and their antecedents, processes, or life outcomes. Since its publication in 2010, the 2 × 2 model of perfectionism has received considerable attention from researchers interested to obtain alternative answers to the debate on the healthiness/unhealthiness nature of SOP, which led to interesting exchanges of ideas, discussions, and propositions among researchers (see Gaudreau, 2013; Stoeber, 2012, 2014). In his first commentary, Stoeber (2012) advocated for two alternative versions of the 2 × 2 model, each composed of three hypotheses, rather than a single version encompassing four hypotheses with alternative Hypotheses 1. In Version A of the 2 × 2 model of perfectionism, Hypotheses 1a (i.e., pure SOP should relate to better adjustment than non-perfectionism), 2 (i.e., non-

perfectionism should relate to better adjustment than pure SPP), and 4 (i.e., pure SOP should relate to better adjustment than mixed perfectionism) would have been retained, whereas in Version B of the model, Hypotheses 1b (i.e., non-perfectionism should relate to better adjustment than pure SOP), 2 (i.e., non-perfectionism should relate to better adjustment than pure SPP), and 4 (i.e., pure SOP should relate to better adjustment than mixed perfectionism) would have been preserved. The 2×2 model of perfectionism was later clarified (see Gaudreau, 2013) and ended up being embraced (Stoeber, 2014) for its parsimony and comprehensiveness of the perfectionism literature. In fact, as an open-ended theoretical system, the 2×2 model of perfectionism enables researchers to investigate potential moderators of the relationships between perfectionism subtypes and life outcomes, which constituted a significant limitation of the initial two-version model proposed by Stoeber (2012).

Findings from this dissertation contributed to support this central theoretical assertion by embracing that the flexibility allotted to this conceptualization rendered possible the understanding of the relationships between perfectionism subtypes and several indicators of positive and negative psychological adjustment (*Article 1*), coping (*Article 2*), and academic adjustment, in addition to the assessment of sociocultural identity as a moderator (*Article 3*). For example, in *Article 3*, if we had followed Stoeber's (2012) initial proposal, we would have been forced to refute both versions of the model, thus leading to inconclusive conclusions regarding our findings. In contrast, using the formulation of the 2×2 model of perfectionism enabled us to uncover the role of sociocultural background as a moderator of the relationships between subtypes of perfectionism and academic adjustment by supporting our *SPP as a cultural makeup hypothesis*. Assessing all four hypotheses of the 2×2 model allowed us to propose that Asian-Canadian students with a subtype of mixed perfectionism were able to achieve similarly high

levels of GPA and remain equally satisfied compared to students with a subtype of pure SOP. In contrast, their European-Canadian counterparts were shown to achieve similarly high levels of GPA while reporting being significantly less satisfied with their academic experience.

Similarly, the neutrality of the labels used to define the four subtypes in the 2×2 model enabled us to examine and integrate the findings of *Articles 1 and 2* without being biased from the adaptive or maladaptive label generally associated with positively or negatively valence outcomes respectively. For example, by discarding the fact that stress is negatively laden, it enabled us to propose alternative conceptualizations of stress according to the level of analysis that was examined. At the between-person level, stress was considered an indicator of chronic stress, meaning that students endorsing generally greater levels of stress could be more vulnerable to psychological maladjustment. At the within-person level, stress could signal an imbalance to the student, thus gearing them with the needed energy to cope with the task in an active and approached manner. In such a case, stress would represent a fully functional factor of psychological adjustment, despite its negative label. Overall, studies from this dissertation contributed to enrich the ongoing discussion regarding the proposal of an open-ended theoretical system, while also contributing significantly to the theoretical development of a complementary multilevel model of perfectionism (*Articles 1 and 2*) and cross-cultural assessment of perfectionism (*Article 3*).

Methodological Implications

Throughout the articles of this dissertation, a conscious effort was made to consider and address methodological concerns often expressed among researchers. In an attempt to reduce method bias, we opted to counterbalance the seven versions of our questionnaires in *Article 1* and *Article 2* in order to prevent obtaining more information on the first domains completed by

participants and to promote a balanced completion of the questionnaires across the seven life domains pre-established. This decision was further backed by the fact that participants would be randomly assigned to one of seven versions, increasing the methodological value of the study because the assignment to a version would be left to chance, thus circumventing the need of controlling for it.

In *Article 1*, we examined the intra-class correlations—the proportion of variability attributed to within-person and between-person differences—for each variable assessed in the study. This decision was conducted in order to provide support for a multilevel extension of the 2×2 model of perfectionism. Regarding perfectionism, our findings demonstrated that over 61% of the variance in SOP and 50% in SPP was attributable to within-person differences. This finding is important because it means that in our study, variations in SOP across domains (i.e., within-person differences) accounted for 61% of the variability in SOP, whereas individual differences (i.e., between-person differences) accounted for 39% of it. In other words, for SOP, more variance was attributed to within-person, indicating a larger portion of variability in SOP across domains of life compared to variations across individuals. Unfortunately, although the within-person level displayed greater variability, it has currently received far less theoretical and empirical attention in the current state of research. Similarly, the variance in SPP was shared equally across within- and between-person differences. Overall, these findings provided the empirical foundations to support a multilevel extension of perfectionism. Our method enabled us to demonstrate that perfectionism encompasses variability at both the within- and between-person levels of analysis, hence providing methodological support for the fact that both levels of analysis are worth pursuing in future research.

This careful attention to research method details, across the three articles of this

dissertation, contributed to enhance its methodological quality and value by making significant contributions and implications for the research in perfectionism in two central ways: 1) supporting the measurement invariance of the short Multidimensional Perfectionism Scale (Cox et al., 2002; Hewitt & Flett, 1991) across a) levels of analysis (i.e., *multilevel invariance*; *Article 1*) and b) sociocultural groups (i.e., *multi-group invariance*; *Article 3*), and 2) developing a multi-group latent moderated structural equation modeling (LMS) syntax file (*Article 3*). In fact, although these two main methodological advances were integrated into the content of two articles, each one of these could have easily made a unique significant contribution for the scientific literature in and of itself.

Measurement invariance. In *Article 1*, we proposed a novel multilevel extension of perfectionism. Repositioning perfectionism as a multilevel construct entails that perfectionism at a dispositional/between-person level should represent a conceptually distinct construct of study than perfectionism at a contextual/within-person level. In fact, a contextual measure of perfectionism has been developed to capture the specificities inherent to perfectionism in the sport context (Dunn, Craft, Causgrove Dunn, & Gotwals, 2011). Nonetheless, the study design of *Article 1* comprised two main limitations that prevented us from using contextual rather than dispositional measures of perfectionism. Although a contextual measure of perfectionism in sport exists, such measures to assess perfectionism in all of the seven life domains involved in this study were not available. In addition, the use of seven different measures of perfectionism would have represented a significant methodological limitation of our design given that measures might not be similar in their scales, number of items, and psychometric properties, hence making it difficult to assume that contextual measurements of perfectionism would be equivalent. However, given the repetitive nature of our study design, short versions of perfectionism

measures were required to prevent and minimize participant dropout. The validity of the short version of the MPS (Hewitt & Flett, 1991) had been supported in previous research (Cox et al., 2002) and this version has been widely used amongst researchers in perfectionism over the years. It remained to be determined if its factorial structure at the within-person level was equivalent to that at the between-person in order to support our use of this measure. In other words, if non-equivalence were established, it would have meant that our choice of measure was not adequate to measure within-person perfectionism. Our invariance analyses proved otherwise, suggesting that researchers now possess the required methodological grounds to pursue the study of multilevel perfectionism using the short MPS.

Likewise, in *Article 3*, we proposed a cross-cultural assessment of perfectionism. This area of research contained a rather limited number of studies and the perfectionism measures used in these studies had not been thoroughly validated cross-culturally or across the two sociocultural groups involved in this study. Hence, similarly as in *Article 1*, invariance analyses were considered a requirement in order to ensure that our perfectionism measure was able to capture similar or equivalent mental representations that Asian-Canadians and European-Canadians hold of perfectionism. Accordingly, our findings supported the cross-cultural factorial invariance of the short MPS with the most stringent forms of invariance testing. These findings thus provided once again the required methodological conditions to support the use of the short MPS in the study of perfectionism across Asian-Canadians and European-Canadians.

Multi-group LMS Syntax. In *Article 3*, we assessed for the role of a moderator in the 2×2 model (i.e., sociocultural background), as had been stressed as an important area for future research following the review of literature that was conducted in *Chapter 2*. Assessing for moderators of the 2×2 model of perfectionism required the use of a sophisticated method of

analyses, which had yet to be developed. This shortcoming inspired us to develop a latent moderated structural equation modeling (LMS) syntax code to enable researchers to test moderation hypotheses of the four hypotheses comprised in the 2×2 model of perfectionism in MPlus (Muthén & Muthén, 2007). The methodological attention and thoroughness that we employed in the development of our syntax codes later enthused the development of a latent mediated moderation structural equation model (LMMS) to test mediation analyses of the 2×2 model of perfectionism (Gaudreau, Franche, & Gareau, 2016). Despite the significant implication of these research methods to test for the role of moderators and mediators of the 2×2 model of perfectionism, these syntax codes can also be useful for researchers in other fields of research. Hence, the methodological contribution of our LMS syntax code reaches beyond a mere contribution for the perfectionism literature and expands to research in various areas.

Practical Implications

Counseling culturally diverse populations. From a practical standpoint, findings from *Article 3* revealed sociocultural differences in academic satisfaction for mixed perfectionism and supported our *SPP as a cultural makeup hypothesis*. Asian-Canadians with a subtype of mixed perfectionism were shown to experience similar academic satisfaction than pure SOP, suggesting that Asian-Canadians may find more harmony in a subtype of mixed perfectionism that entails a combination of both personal and family/social pressure and perfectionistic standards compared to European-Canadians, who reported being significantly less satisfied with their school experience. Hence, one's cultural makeup is likely to influence the associations between perfectionism and psychological adjustment, an important factor to keep in mind for health professionals and practitioners intervening with culturally diverse populations.

Prior research—although not directly related to perfectionism—has demonstrated that

Asian Americans preferred a more directive style of counseling than European Americans, which in turn enhanced their intrinsic motivation (Pan, Huey, & Hernandez, 2011). In a seminal human motivation research, Iyengar and Lepper (1999) found that Asian-American children preferred the condition in which they were led to believe that their mother made a choice for them than the condition in which they were allowed to make their own choice. Mixed perfectionism might be seen as a fully functional and comparable subtype of perfectionism than pure SOP in samples of Asian-Canadians. As culture can shape one's personality and thus, response to treatments, these findings inform practitioners on the importance of clearly identifying one's perfectionism style in order to better intervene with their clients. Several studies have recommended that practitioners culturally adapt their interventions when dealing with members of an ethnic minority (e.g., Hinton, Rivera, Hofmann, Barlow, & Otto, 2012). For example, Pan et al. (2011) demonstrated that very subtle alterations in a practitioner's style and intervention could be conveyed without increasing the length of the treatment. However, there is still debate concerning the enhanced benefits of such adaptations (Smith, Constantine, Dunn, Dinehart, & Montoya, 2006). Future work will thus be needed in order to propose interventions that will gain acceptable agreement within the scientific community.

Should we promote perfectionism? Looking back and moving forward, one question remains: should perfectionism be promoted in individuals who already endorse high levels of perfectionism? Part of the answer to this question resides in the subtype of perfectionism that individuals exhibit. It has been demonstrated that certain subtypes of perfectionism were more likely to be associated with positive outcomes than others (i.e., pure SOP, mixed perfectionism compared to pure SPP), thus preserving a high level of functioning, achievement, and adjustment in individuals. In contrast, certain subtypes of perfectionism have been shown to foster negative

outcomes or thwart the achievement of positive outcomes (i.e., pure SPP, mixed perfectionism compared to pure SOP). A general consensus of past findings allowed researchers to support that SPP represents a detrimental form of perfectionism likely to result in consequential effects of psychological maladjustment (see *Chapter 2* for a review). Hence, features of SPP should not be promoted among individuals; in fact, they should be prevented or targeted for intervention.

What is less intuitive to answer is whether more “healthy” forms of perfectionism should be promoted. Individuals who display features of SOP have been shown to nurture high levels of achievement (e.g., grade-point average; sport performance), psychological adjustment (e.g., well-being, satisfaction, positive affective states, vitality), and self-regulation (e.g., coping, goal progress, self-determined motivation). It seems like individuals with a subtype of pure SOP are able to thrive and be fully functional, without being negatively influenced by their high standards of perfectionism. However, under certain circumstances, high SOP might not completely protect the individual against negative outcomes of adjustment (see *Article 1, Chapter 3* for example). Several findings from past research revealed positive relationships between SOP and indicators of psychological maladjustment (e.g., negative affective states, depressive symptoms; see *Chapter 2* for a review). It seems like under specific circumstances, high standards of perfectionism might render individuals more vulnerable to psychological distress and maladjustment. For example, just about everyone is likely to be affected, at some point across their lifespan, by particularly difficult or stressful situations of life that may make them more vulnerable (e.g., mood disorders, interpersonal difficulties such as divorce or grief, loss of employment). In such instances, endorsing very high standards of perfectionism might become a risk factor, preventing individuals to restore functional levels of psychological adjustment. For example, perfectionism is a personality trait often associated with mental disorders in clinical

samples (e.g., Brannan & Petrie, 2008; Hewitt et al., 2002; Yorulmaz, Karanci, & Tekok-Kilic, 2006). Hence, it seems like achievement and maladjustment are able to coexist within individuals characterized with high SOP. Although SOP may not always be associated with negative adjustment, embracing high levels of perfectionism seems to remain a vulnerability factor likely to unfold according to personal characteristics or significant life events. Overall, our knowledge of nearly 25 years of research on the subject leads to inform us that it be wiser not to promote perfectionism among individuals, but rather let the natural tendency unfold by itself. Much more research is needed in order to uncover the role of specific moderators or mediators that may explain the paradoxical relationship between SOP and life outcomes before we could provide a definitive answer to this question.

Conclusion

The study of perfectionism comprises mixed or ambiguous findings deserving further examination from researchers. The “adaptive” vs. “maladaptive” nature of self-oriented perfectionism (SOP) still remains an unsettled debate for researchers in perfectionism (e.g., Gotwals et al., 2012). The need for researchers to propose novel research venues and identify the conditions under which SOP could lead to seemingly mixed results has largely contributed to propel the development of alternative theoretical models. The 2×2 model of perfectionism (Gaudreau, 2012; Gaudreau & Thompson, 2010) was formulated as an open-ended theoretical framework aimed at advancing and revisiting past findings in order to propose novel hypotheses aimed at better understanding the complexity and intricacies behind the relationship between SOP and mental health. Over the past five years, the 2×2 model of perfectionism has received considerable attention from researchers interested to clarify (Stoeber, 2012) and test the model (e.g., Douilliez & Lefèvre, 2011; Hill, 2013).

The articles presented in this dissertation contributed to this growing enthusiasm by addressing several gaps that remained to be examined in order to demystify the ambiguous findings obtained so far. Through the design of four studies regrouped into three articles, the current dissertation achieved three main objectives: (1) provide a multilevel extension of the model, (2) use this multilevel extension to examine and better understand the relationship between multilevel perfectionism and coping tendencies of university students, and (3) provide a cross-cultural assessment of the 2×2 model. Despite the unique contribution that each article holds for research in perfectionism, this dissertation also comprised significant *theoretical* (i.e., development and extension of the 2×2 model by supporting its open-ended theoretical formulation; support for the pursuit of contextual and dispositional study of perfectionism as complementary areas of research), *methodological* (i.e., multilevel and cross-cultural measurement invariance; development of research methods/protocol to assess moderation hypotheses of the 2×2 model), and *practical implications* (i.e., inform practitioners on the multilevel nature of perfectionism that may render individuals to be more vulnerable in specific domains of their life; support a cultural makeup hypothesis that is likely to influence the style of therapy preferred by clients of diverse backgrounds) that generalize over and above the perfectionism literature. With barely six years having passed since the publication of the 2×2 model of perfectionism, the model has attracted a number of interested parties that have contributed to the clarification of the model, formulation of alternative research methods to test the hypotheses, and assessment of the four hypotheses. This growing enthusiasm supports the original and significant contribution of this model for the perfectionism literature. It is our conviction that the current dissertation further contributed to the advancement of the 2×2 model that is booming and still comprises several areas worth exploring in future research.

References (Chapters 1, 2, and 6)

- Asseraf, M., & Vaillancourt, T. (2015). Longitudinal links between perfectionism and depression in children. *Journal of Abnormal Child Psychology*, *43*, 895-908. doi: 10.1007/s10802-014-9947-9
- Besser, A., Flett, G. L., Hewitt, P. L., & Guez, J. (2008). Perfectionism, and cognitions, affect, self-esteem, and physiological reactions in a performance situation. *Journal of Rational-Emotive & Cognitive Behavior Therapy*, *26*, 206-228. doi:10.1007/s10942-007-0067-0
- Bieling, P. J., Israeli, A., & Antony, M. M. (2004). Is perfectionism good, bad, or both? Examining models of the perfectionism construct. *Personality and Individual Differences*, *36*, 1373-1385. doi:10.1016/S0191-8869(03)00235-6
- Blais, M. R., Vallerand, R. J., Brière, N. M., Gagnon, A., & Pelletier, L. G. (1990). Significance, structure, and gender differences in life domains of college students. *Sex Roles*, *22*, 199-212. doi:10.1007/BF00288192
- Boone, L., Soenens, B., Mouratidis, A., Vansteenkiste, M., Verstuyf, J., & Braet, C. (2012). Daily fluctuations in perfectionism dimensions and their relation to eating disorder symptoms. *Journal of Research in Personality*, *46*, 678-687. doi:10.1016/j.jrp.2012.08.001
- Brannan, M. E., & Petrie, T. A. (2008). Moderators of the body dissatisfaction-eating disorder symptomatology relationship: Replication and extension. *Journal of Counseling Psychology*, *55*, 263-275. doi:10.1037/0022-0167.55.2.263
- Broman-Fulks, J. J., Hill, R. W., & Green, B. A. (2008). Is perfectionism categorical or dimensional? A taxometric analysis. *Journal of Personality Assessment*, *90*, 481-490. doi:10.1080/00223890802248802

- Canada, S. (2008). Why are the majority of university students women? Retrieved from <http://www.statcan.gc.ca/pub/81-004-x/2008001/article/10561-eng.htm>
- Carver, C. S., & Scheier, M. F. (1994). Situational coping and coping dispositions in stressful transaction. *J Pers Soc Psychol*, *66*(1), 184-195.
- Castro, J. R., & Rice, K. G. (2003). Perfectionism and ethnicity: Implications for depressive symptoms and self-reported academic achievement. *Cultural Diversity and Ethnic Minority Psychology*, *9*, 64-78. doi:10.1037/1099-9809.9.1.64
- Chang, E. C. (1998). Cultural differences, perfectionism, and suicidal risk in a college population: Does social problem solving still matter? *Cognitive Therapy and Research*, *22*, 237-254. doi:10.1023/A:1018792709351
- Cheng, S. K. (2001). Life stress, problem solving, perfectionism, and depressive symptoms in Chinese. *Cognitive Therapy and Research*, *25*, 303-333. doi:10.1023/A:1010788513083
- Cheng, S. K., Chong, G. H., & Wong, C. (1999). Chinese Frost Multidimensional Perfectionism Scale: A validation and prediction of self-esteem and psychological distress. *Journal of Clinical Psychology*, *55*, 1051-1061. doi:10.1002/%28SICI%291097-4679%28199909%2955:9%3C1051::AID-JCLP3%3E3.0.CO;2-1
- Chua, A. (2011). *Battle hymn of the tiger mother*. New York: NY: Penguin Press.
- Cox, B. J., Enns, M. W., & Clara, I. P. (2002). The multidimensional structure of perfectionism in clinically distressed and college student samples. *Psychol Assess*, *14*, 365-373. doi:10.1037/1040-3590.14.3.365
- Crocker, P. R. E., Gaudreau, P., Mosewich, A. D., & Kljajic, K. (2014). Perfectionism and the stress process in intercollegiate athletes: Examining the 2 × 2 model of perfectionism in sport competition. *International Journal of Sport Psychology*, *45*, 325-348.

doi:10.7352/IJSP2014.45.325

Cumming, J., & Duda, J. L. (2012). Profiles of perfectionism, body-related concerns, and indicators of psychological health in vocational dance students: An investigation of the 2 × 2 model of perfectionism. *Psychology of Sport and Exercise, 13*, 729-738.

doi:10.1016/j.psychsport.2012.05.004

Damian, L. E., Stoeber, J., Negru, O., & Baban, A. (2014). Positive and negative affect in adolescents: An investigation of the 2 × 2 model of perfectionism. *Cognition, Brain, Behavior. An Interdisciplinary Journal, 18*(1), 1-16.

DiBartolo, P. M., & Rendon, M. J. (2012). A critical examination of the construct of perfectionism and its relationship to mental health in Asian and African Americans using a cross-cultural framework. *Clin Psychol Rev, 32*, 139-152.

doi:10.1016/j.cpr.2011.09.007

Douilliez, C., & Lefèvre, F. (2011). Interactive effect of perfectionism dimensions on depressive symptoms: A reply to Gaudreau and Thompson (2010). *Personality and Individual Differences, 50*, 1147-1151. doi:10.1016/j.paid.2011.02.005

Dunkley, D. M., Blankstein, K. R., Masheb, R. M., & Grilo, C. M. (2006). Personal standards and evaluative concerns dimensions of “clinical” perfectionism: A reply to Shafran et al. (2002, 2003) and Hewitt et al. (2003). *Behaviour Research and Therapy, 44*, 63-84.

doi:10.1016/j.brat.2004.12.004

Dunkley, D. M., Mandel, T., & Ma, D. (2014). Perfectionism, neuroticism, and daily stress reactivity and coping effectiveness 6 months and 3 years later. *Journal of Counseling Psychology, 61*, 616-633. doi:10.1037/cou0000036

Dunkley, D. M., Zuroff, D. C., & Blankstein, K. R. (2003). Self-critical perfectionism and daily

- affect: Dispositional and situational influences on stress and coping. *J Pers Soc Psychol*, 84, 234-252. doi:10.1037/0022-3514.84.1.234
- Dunn, J. G. H., Craft, J. M., Causgrove Dunn, J., & Gotwals, J. K. (2011). Comparing a domain-specific and global measure of perfectionism in competitive female figure skaters. *Journal of Sport Behavior*, 34(1), 25-46.
- Dunn, J. G. H., Gotwals, J. K., & Dunn, J. C. (2005). An examination of the domain specificity of perfectionism among intercollegiate student-athletes. *Personality and Individual Differences*, 38, 1439-1448. doi:10.1016/j.paid.2004.09.009
- Fleeson, W. (2001). Toward a structure- and process-integrated view of personality: Traits as density distributions of states. *J Pers Soc Psychol*, 80, 1011-1027. doi:10.1037//0022-3514.80.6.1011
- Fleeson, W. (2007). Situation-based contingencies underlying trait-content manifestation in behavior. *J Pers*, 75, 825-861. doi:10.1111/j.1467-6494.2007.00458.x
- Flett, G. L., Besser, A., & Hewitt, P. L. (2005). Perfectionism, ego defense styles, and depression: A comparison of self-reports versus informant ratings. *Journal of Personality*, 73, 1355-1396. doi: 10.1111/j.1467-6494.2005.00352.x
- Flett, G. L., & Hewitt, P. L. (2002). Perfectionism and maladjustment: An overview of theoretical, definitional, and treatment issue. In G. L. Flett & P. L. Hewitt (Eds.), *Perfectionism: Theory, research, and treatment* (pp. 5-31). Washington, DC: American Psychological Association.
- Flett, G. L., Hewitt, P. L., Boucher, D. J., Davidson, L. A., & Munro, Y. (2000). *The Child-Adolescent Perfectionism Scale: Development, validation, and association with adjustment*. Unpublished manuscript.

- Flett, G. L., Hewitt, P. L., Oliver, J. M., & Macdonald, S. (2002). Perfectionism in children and their parents: A developmental analysis. In G. L. Flett & P. L. Hewitt (Eds.), *Perfectionism: Theory, research, and treatment* (pp. 89-132). Washington, DC: American Psychological Association.
- Flett, G. L., Madorsky, D., Hewitt, P. L., & Heisel, M. J. (2002). Perfectionism cognitions, rumination, and psychological distress. *Journal of Rational-Emotive & Cognitive Behavior Therapy, 20*, 33-47. doi:10.1023/A:1015128904007
- Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *J Pers Soc Psychol, 48*, 150-170.
- Franco-Paredes, K., Mancilla-Diaz, J. M., Vazquez-Arévalo, R., Lopez-Aguilar, X., & Alvarez-Rayon, G. (2005). Perfectionism and eating disorders: a review of the literature. *European Eating Disorders Review, 13*, 61-70. doi:10.1002/erv.605
- Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*, 449-468. doi:10.1007/BF01172967
- Gaudreau, P. (2012). A methodological note on the interactive and main effects of dualistic personality dimensions: An example using the 2 × 2 model of perfectionism. *Personality and Individual Differences, 52*, 26-31. doi:10.1016/j.paid.2011.08.022
- Gaudreau, P. (2013). The 2 × 2 model of perfectionism: Commenting the critical comments and suggestions of Stoeber (2012). *Personality and Individual Differences, 55*, 351-355. doi:10.1016/j.paid.2013.03.021
- Gaudreau, P. (2015). Self-assessment of the four subtypes of perfectionism in the 2 × 2 model of perfectionism. *Personality and Individual Differences, 84*, 52-62. doi:10.1016/j.paid.2014.10.039

- Gaudreau, P. (2016). The 2×2 model of perfectionism in sport, dance, and exercise. In A. Hill (Ed.), *The Psychology of Perfectionism in Sport, Dance and Exercise*: Routledge.
- Gaudreau, P., Franche, V., & Gareau, A. (2016). A latent mediated moderation of perfectionism, motivation, and academic satisfaction: Advancing the 2×2 model of perfectionism through substantive-methodological synergy. *Journal of Psychoeducational Assessment*, *34*, 688-701. doi:10.1177/0734282916651778
- Gaudreau, P., Gunnell, K., Hoar, S., Thompson, A., & Lelièvre, J. (2015). Optimism, pessimism, and coping in a dual-domain model of sport and school satisfaction. *Sport, Exercise, and Performance Psychology*, *4*, 140-152. doi:10.1037/spy0000032
- Gaudreau, P., Louvet, B., & Kljajic, K. (submitted for publication). The performance trajectory of physical education students across subtypes of perfectionism: A growth curve model of the 2×2 model of perfectionism.
- Gaudreau, P., & Miranda, D. (2010). Coping across time, situations, and contexts: A conceptual and methodological overview of stability, consistency, and change. In A. R. Nicholls (Ed.), *Coping in sport: Theory, methods, and related constructs* (pp. 15-32). New York: Nova Science.
- Gaudreau, P., & Thompson, A. (2010). Testing a 2×2 model of dispositional perfectionism. *Personality and Individual Differences*, *48*, 532-537. doi:10.1016/j.paid.2009.11.031
- Gaudreau, P., & Verner-Filion, J. (2012). Dispositional perfectionism and well-being: A test of the 2×2 model of perfectionism in the sport domain. *Sport, Exercise, and Performance Psychology*, *1*, 29-43. doi:10.1037/a0025747
- Gotwals, J. K., Stoeber, J., Dunn, J. G. H., & Stoll, O. (2012). Are perfectionistic strivings in sport adaptive? A systematic review of confirmatory, contradictory, and mixed evidence.

- Canadian Psychology*, 53, 263-279. doi:10.1037/a0030288
- Hamachek, D. E. (1978). Psychodynamics of normal and neurotic perfectionism. *Psychology: A Journal of Human Behavior*, 15(1), 27-33.
- Hamamura, T., Heine, S. J., & Paulhus, D. L. (2008). Cultural differences in response styles: The role of dialectical thinking. *Personality and Individual Differences*, 44, 932-942.
doi:10.1016/j.paid.2007.10.034
- Hassan, H. K., Abd-El-Fattah, S. M., Abd-El-Maugoud, M. K., & Badary, A. H. A. (2012). Perfectionism and performance expectations at university: Does gender still matter? *European Journal of Education and Psychology*, 5(2), 133-147.
- Heine, S. J., Lehman, D. R., Markus, H. R., & Kitayama, S. (1999). Is there a universal need for positive self-regard? *Psychol Rev*, 106, 766-794. doi:10.1037/0033-295X.106.4.766
- Hewitt, P. L., Caelian, C. F., Flett, G. L., Sherry, S. B., Collins, L., & Flynn, C. A. (2002). Perfectionism in children: Associations with depression, anxiety, and anger. *Personality and Individual Differences*, 32, 1049-1061. doi:10.1016/S0191-8869%2801%2900109-X
- Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *J Pers Soc Psychol*, 60, 456-470. doi:10.1016/S0191-8869%2801%2900109-X
- Hewitt, P. L., & Flett, G. L. (2006). Perfectionism and stress process in psychopathology. In G. L. Flett & P. L. Hewitt (Eds.), *Perfectionism: Theory, research, and treatment*. Washington, DC: American Psychological Association.
- Hill, A. P. (2013). Perfectionism and burnout in junior soccer players: A test of the 2 × 2 model of dispositional perfectionism. *Journal of Sport and Exercise Psychology*, 35(1), 18-29.
- Hill, A. P., & Davis, P. A. (2014). Perfectionism and emotion regulation in coaches: A test of the

- 2 × 2 model of dispositional perfectionism. *Motivation and Emotion*, 38, 715-726.
doi:10.1007/s11031-014-9404-7
- Hinton, D. E., Rivera, E. I., Hofmann, S. G., Barlow, D. H., & Otto, M. W. (2012). Adapting CBT for traumatized refugees and ethnic minority patients: Examples from culturally adapted CBT (CA-CBT). *Transcultural Psychiatry*, 49, 340-365.
doi:10.1177/1363461512441595
- Hurst, C. S., Baranik, L. E., & Daniel, F. (2013). College student stressors: A review of the qualitative research. *Stress and Health*, 29, 275-285. doi:10.1002/smi.2465
- Hyde, J. S. (2005). The gender similarities hypothesis. *American Psychologist*, 60, 581-592. doi:10.1037/0003-066X.60.6.581
- Iyengar, S. S., & Lepper, M. R. (1999). Rethinking the value of choice: A cultural perspective on intrinsic motivation. *J Pers Soc Psychol*, 76, 349-366. doi:10.1037/0022-3514.76.3.349
- Jonge, L., & Waller, G. (2003). Perfectionism levels in African-American and Caucasian adolescents. *Personality and Individual Differences*, 34, 1447-1451. doi:10.1016/S0191-8869(02)00126-5
- Judge, T. A., & Erez, A. (2007). Interaction and intersection: The constellation of emotional stability and extraversion in predicting performance. *Personnel Psychology*, 60, 573-596. doi:10.1111/j.1744-6570.2007.00084.x
- Kashdan, T. B., & McKnight, P. E. (2011). Dynamic, contextual approaches to studying personality in the social world. *J Pers*, 79, 1177-1190. doi:10.1111/j.1467-6494.2011.00737.x
- Kawamura, K. Y., Frost, R. O., & Harmatz, M. G. (2002). The relationship of perceived parenting styles to perfectionism. *Personality and Individual Differences*, 32, 317-327.

- doi:10.1016/S0191-8869%2801%2900026-5
- Kim, B. S., Wong, Y., & Maffini, C. S. (2010). Annual review of Asian American Psychology, 2009. *Asian American Journal of Psychology, 1*, 227-260. doi:10.1037/a0022157
- Kim, S. Y., Wang, Y., Orozco-Lapray, D., Shen, Y., & Murtuza, M. (2012). Does “tiger parenting” exist? Parenting profiles of Chinese Americans and adolescent developmental outcomes. *Asian American Journal of Psychology*, Online first publication.
doi:10.1037/a0030612
- Kozlowski, S. W. J., & Klein, K. J. (2000). A multilevel approach to theory and research in organizations: Contextual, temporal, and emergent processes. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 3-90). San Francisco, CA: Jossey-Bass.
- Kuncel, N. R., Credé, M., & Thomas, L. L. (2005). The validity of self-reported grade point averages, class ranks, and test scores: A meta-analysis and review of the literature. *Review of Educational Research, 75*, 63-82. doi: 10.3102/00346543075001063
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Li, X., Hou, Z.-J., Chi, H.-Y., Liu, J., & Hager, M. J. (2014). The mediating role of coping in the relationship between subtypes of perfectionism and job burnout: A test of the 2 × 2 model of perfectionism with employees in China. *Personality and Individual Differences, 58*, 65-70. doi:10.1016/j.paid.2013.10.007
- Mallinson, S. H., Hill, A., Hall, H. K., & Gotwals, J. K. (2014). The 2 × 2 model of perfectionism and school- and community-based sport participation. *Psychology in the Schools, 51*, 972-985. doi:10.1002/pits.21796
- Marsh, H. W. (1986). The bias of negatively worded items in rating scales for young children: A

- cognitive-developmental phenomenon. *Developmental Psychology*, 22(1), 37-49.
- McArdle, S. (2010). Exploring domain-specific perfectionism. *J Pers*, 78, 493-508.
doi:10.1111/j.1467-6494.2010.00624.x
- Méndez-Giménez, A., Cecchini-Estrada, J.-A., & Fernandez-Rio, J. (2014). El modelo de perfeccionismo disposicional 2×2 en la adolescencia: Una comprobación en el contexto de la educación física. *Universitas Psychologica*, 13, 1333-1343.
doi:10.11144/Javeriana.UPSY13-4.mpda
- Mills, J. S., & Blankstein, K. R. (2000). Perfectionism, intrinsic vs extrinsic motivation, and motivated strategies for learning: A multidimensional analysis of university students. *Personality and Individual Differences*, 29, 1191-1204. doi:10.1016/S0191-8869(00)00003-9
- Milyavskaya, M., & Koestner, R. (2011). Psychological needs, motivation, and well-being: A test of self-determination theory across multiple domains. *Personality and Individual Differences*, 50, 387-391. doi:10.1016/j.paid.2010.10.029
- Miquelon, P., Vallerand, R. J., Grouzet, F. M. E., & Cardinal, G. (2005). Perfectionism, academic motivation, and psychological adjustment: An integrative model. *Personality and Social Psychology Bulletin*, 31, 913-924. doi:10.1177/0146167204272298
- Mitchelson, J. K. (2009). Seeking the perfect balance: Perfectionism and work-family conflict. *Journal of Occupational and Organizational Psychology*, 82, 349-367.
doi:10.1348/096317908x314874
- Mitchelson, J. K., & Burns, L. R. (1998). Career mothers and perfectionism: Stress at work and at home. *Personality and Individual Differences*, 25, 477-485. doi:10.1016/S0191-8869(98)00069-5

- Molnar, D. S., Reker, D. L., Culp, N. A., Sadava, S. W., & DeCourville, N. H. (2006). A mediated model of perfectionism, affect, and physical health. *Journal of Research in Personality, 40*, 482-500. doi:10.1016/j.jrp.2005.04.002
- Muthén, L. K., & Muthén, B. O. (2007). *MPlus user's guide: Statistical analysis with latent variables* (5th ed.). Los Angeles, CA: Muthén & Muthén.
- Nezlek, J. B. (2012). Multilevel modeling analyses of diary-style data. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 357-383). New York: Guilford Press.
- Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought: Holistic versus analytic cognition. *Psychol Rev, 108*, 291-310. doi:10.1037/0033-295X.108.2.291
- O'Connor, D. B. (2007). The relations between perfectionism and suicidality: A systematic review. *Suicide & Life-Threatening Behavior, 37*(6), 698-714.
- O'Connor, R. C., Rasmussen, S., & Hawton, K. (2010). Predicting depression, anxiety, and self-harm in adolescents: The role of perfectionism and acute life stress. *Behaviour Research and Therapy, 48*, 52-59. doi:10.1016/j.brat.2009.09.008
- Olino, T. M., & Klein, D. N. (2015). Psychometric comparison of self- and informant-reports of personality. *Assessment, 22*, 655-664. doi: 10.1177/1073191114567942
- Pan, D., Huey, S. J., & Hernandez, D. (2011). Culturally adapted versus standard exposure treatment for phobic Asian Americans: Treatment efficacy, moderators, and predictors. *Cultural Diversity and Ethnic Minority Psychology, 17*, 11-22. doi:10.1037/a0022534
- Pearson, C. A., & Gleaves, D. H. (2006). The multiple dimensions of perfectionism and their relation with eating disorder features. *Personality and Individual Differences, 41*, 225-

235. doi:10.1016/j.paid.2006.01.013
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*, 879-903. doi:10.1037/0021-9010.88.5.879
- Ptacek, J. T., Smith, R. E., Espe, K., & Raffety, B. (1994). Limited correspondence between daily coping reports and retrospective coping recall. *Psychol Assess, 6*(1), 41-49.
- Quested, E., Cumming, J., & Duda, J. L. (2014). Profiles of perfectionism, motivation, and self-evaluations among dancers: An extended analysis of Cumming and Duda (2012). *International Journal of Sport Psychology, 45*, 349-368. doi:10.7352/IJSP2014.45.349
- Raffety, B. D., Smith, R. E., & Ptacek, J. T. (1997). Facilitating and debilitating trait anxiety, situational anxiety, and coping with an anticipated stressor: A process analysis. *J Pers Soc Psychol, 72*(4), 892-906.
- Rice, K. G., & Ashby, J. S. (2007). An efficient method for classifying perfectionists. *Journal of Counseling Psychology, 54*, 72-85. doi:10.1037/0022-0167.54.1.72
- Rice, K. G., Kubal, A. E., & Preusser, K. J. (2004). Perfectionism and children's self-concept: Further validation of the Adaptive/Maladaptive Perfectionism Scale. *Psychology in the Schools, 41*, 279-290. doi:10.1002/pits.10160
- Rice, K. G., & Slaney, R. B. (2002). Clusters of perfectionists: Two studies of emotional adjustment and academic achievement. *Measurement and Evaluation in Counseling and Development, 35*, 35-48.
- Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychol Bull, 138*, 353-387. doi:10.1037/a0026838

- Robbins, S. B., Lauver, K., Le, H., Davis, D., Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychol Bull*, *130*, 261-288. doi:10.1037/0033-2909.130.2.261
- Robbins, S. B., Oh, I. S., Le, H., & Button, C. (2009). Intervention effects on college performance and retention as mediated by motivational, emotional, and social control factors: Integrated meta-analytic path analyses. *Journal of Applied Psychology*, *94*, 1163-1184. doi:10.1037/a0015738
- Schwartz, S. J., Zamboanga, B. L., Weisskirch, R. S., & Wang, S. C. (2010). The relationships of personal and cultural identity to adaptive and maladaptive psychosocial functioning in emerging adults. *The Journal of Social Psychology*, *150*(1), 1-33.
- Shafran, R., Cooper, Z., & Fairburn, C. G. (2002). Clinical perfectionism: A cognitive-behavioural analysis. *Behaviour Research and Therapy*, *40*, 773-791. doi:10.1016/S0005-7967%2801%2900059-6
- Sherry, S. B., Nealis, L. J., Macneil, M. A., Steward, S. H., Sherry, D. L., & Smith, M. M. (2013). Informant reports add incrementally to the understanding of the perfectionism-depression connection: Evidence from a prospective longitudinal study. *Personality and Individual Differences*, *54*, 957-960. doi:10.1016/j.paid.2013.01.002
- Sironic, A., & Reeve, R. A. (2012). More evidence for four perfectionism subgroups. *Personality and Individual Differences*, *53*, 437-442. doi:10.1016/j.paid.2012.04.003
- Skinner, E. A., Edge, K., Altman, J., & Sherwood, H. (2003). Searching for the structure of coping: A review and critique of category systems for classifying ways of coping. *Psychol Bull*, *129*, 216-269. doi:10.1037/0033-2909.129.2.216
- Slade, P. D., & Owens, G. R. (1998). A dual process model of perfectionism based on

- reinforcement theory. *Behavior Modification*, 3, 372-390.
doi:10.1177/01454455980223010
- Slaney, R. B., Rice, K. G., Mobley, M., Trippi, J., & Ashby, J. S. (2001). The Revised Almost Perfect Scale. *Measurement and Evaluation in Counseling and Development*, 34(3), 130-145.
- Smith, T. B., Constantine, M. G., Dunn, T. W., Dinehart, J. M., & Montoya, J. A. (2006). Multicultural education in the mental health professions: A meta-analytic review. *Journal of Counseling Psychology*, 53, 132-145. doi:10.1037/0022-0167.53.1.132
- Stoeber, J. (2012). The 2 × 2 model of perfectionism: A critical comment and some suggestions. *Personality and Individual Differences*, 53, 541-545. doi:10.1016/j.paid.2012.04.029
- Stoeber, J. (2014). Perfectionism in sport and dance: A double-edged sword. *International Journal of Sport Psychology*, 45(4), 385-394.
- Stoeber, J. (in press). Comparing two short forms of the Hewitt–Flett Multidimensional Perfectionism Scale. *Assessment*. doi:10.1177/1073191116659740
- Stoeber, J., Feast, A. R., & Hayward, J. A. (2009). Self-oriented and socially prescribed perfectionism: Differential relationships with intrinsic and extrinsic motivation and test anxiety. *Personality and Individual Differences*, 47, 423-428.
doi:10.1016/j.paid.2009.04.014
- Stoeber, J., & Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence, challenges. *Personality and Social Psychology Review*, 10, 295-319.
doi:10.1207/s15327957pspr1004_2
- Stone, A. A., Schwartz, J. E., Neale, J. M., Shiffman, S., Marco, C. A., Hickcox, M., . . . Cruise, L. J. (1998). A comparison of coping assessed by ecological momentary assessment and

- retrospective recall. *J Pers Soc Psychol*, 74(6), 1670-1680.
- Talento-Miller, E., & Peyton, J. (2006). Moderators of the accuracy of self-report grade point average. *GMAC Research Reports*, 1-13.
- Terry-Short, L. A., Owens, R. G., Slade, P. D., & Dewey, M. E. (1995). Positive and negative perfectionism. *Personality and Individual Differences*, 18, 663-668. doi:10.1016/0191-8869(94)00192-U
- Triandis, H. C. (1996). The psychological measurement of cultural syndromes. *American Psychologist*, 51(4), 407-415.
- Vaillancourt, T., & Haltigan, J. D. (2017). Joint trajectories of depression and perfectionism across adolescence and childhood risk factors. *Development and Psychopathology*, 13, 1-17. doi: 10.1017/S0954579417000979
- Verner-Filion, J., & Gaudreau, P. (2010). From perfectionism to academic adjustment: The mediating role of achievement goals. *Personality and Individual Differences*, 49, 181-186. doi:10.1016/j.paid.2010.03.029
- Wadsworth, M., & Ford, D. H. (1983). Assessment of personal goal hierarchies. *Journal of Counseling Psychology*, 30, 514-526. doi:10.1037/0022-0167.30.4.514
- Witcher, L. A., Alexander, E. S., Onwueabuzie, A. J., Collins, K. M., & Witcher, A. E. (2007). The relationship between psychology students' level of perfectionism and achievement in a graduate-level research methodology course. *Personality and Individual Differences*, 43, 1396-1405. doi:10.1016/j.paid.2007.04.016
- Witt, L. A., Burke, L. A., Barrick, M. A., & Mount, M. K. (2002). The interactive effects of Conscientiousness and Agreeableness on job performance. *Journal of Applied Psychology*, 87, 164-169. doi:10.1037//0021-9010.87.1.164

- Wong, Y. J., Kim, S. H., & Trang, K. K. (2010). Asian Americans' adherence to Asian values, attributions about depression, and coping strategies. *Cultural Diversity and Ethnic Minority Psychology, 16*, 1-8. doi:10.1037/a0015045
- Yee, A. H. (1992). Asians as stereotypes and students: Misperceptions that persist. *Educational Psychology, 4*, 95-132. doi:10.1007/BF01322396
- Yoon, J., & Lau, A. S. (2008). Maladaptive perfectionism and depressive symptoms among Asian American college students: Contributions of interdependence and parental relations. *Cultural Diversity and Ethnic Minority Psychology, 14*, 92-101. doi:10.1037/1099-9809.14.2.92
- Yorulmaz, O., Karanci, A. N., & Tekok-Kilic, A. (2006). What are the roles of perfectionism and responsibility in checking and cleaning compulsions? *J Anxiety Disord, 20*, 312-327. doi:10.1016/j.janxdis.2005.02.009

Appendices

Appendix A: Results from the Multilevel Confirmatory Factor Analysis (*Chapter 3, Article*

1)

A prerequisite to extending perfectionism as a multilevel construct is to ascertain that the measurement model of perfectionism is replicable or homologous across distinct levels of analysis (Kozlowski & Klein, 2000). Although the Multidimensional Perfectionism Scale (Hewitt & Flett, 1991) was initially developed for between-person level analyses, a multilevel measurement model would posit that perfectionism should be operationalized as an invariant phenomenon across levels of analysis that can be measured using the same scale and indicators. Hence, regardless of the idiosyncratic nature of each particular life domain, the wording of questions measuring dispositional perfectionism should be slightly adaptable to measure contextual perfectionism. A multilevel confirmatory factor analysis (MCFA) was thus performed on the perfectionism measure in order to evaluate if participants' responding differed at the within-person (i.e., Level 1) and between-person levels of analysis (i.e., Level 2). A secondary goal of this study was to determine whether between-person and within-person variance in perfectionism are characterized by the same number of key dimensions (i.e., SOP and SPP) measured with the same set of underlying indicators.

MCFA was performed in MPLUS 6.12 (Muthén & Muthén, 2007) using the full information maximum likelihood robust estimator. CFI and TLI values varying between .90 and .94 implied acceptable fit whereas values greater than .95 indicated relatively good fit. Acceptable fit was further supported when values of RMSEA and SRMR were smaller than .08 whereas close fit was inferred when values were smaller than .05. Intra-class correlations (ICC) for each item were first analyzed to examine the amount of variability that was accountable at the between-person level. As recommended, values of ICCs higher than .10 were taken as evidence

to warrant multilevel analyses by indicating substantial within-person variability. The ICCs of the 10 items ranged between .30 and .44 ($M = .38$), thus demonstrating sufficient between-person variability for a MCFA.

Results of a two-factor configural model (in which no equality constraint was specified) demonstrated good fit: $\chi^2(68) = 349.39$ (scaling correction factor = 1.187), $p < .01$, CFI = .944, TLI = .926, RMSEA = .064, within-person SRMR = .055, between-person SRMR = .068, BIC = 31,678.60. All factor loadings were significant at Level 1 and Level 2. The standardized loadings of the items ranged between .77 and .88 for SOP and between .66 and .78 for SPP. Furthermore, the correlations between the two factors were .53 at Level 1 and .69 at Level 2. Residual variances at Level 1 ranged between .23 and .56 and were all significantly different from zero. At Level 2, residual variances were significant for items 3 to 7 and 9, which ranged from .09 to .22, but were non significant for items 1, 2, 8, and 10. Results of the metric model (in which we constrained the factor loadings to equality across both levels of analysis) yielded a non-significant difference in chi-square: $\Delta\chi^2 = 1.34$, $\Delta df = 8$, $\Delta CFI = .001$. The fit of this model was acceptable: $\chi^2(76) = 350.73$ (scaling correction factor = 1.269), $p < .01$, CFI = .945, TLI = .935, RMSEA = .060, within-person SRMR = .055, between-person SRMR = .065, BIC = 31,653.79. This model provided evidence for the homology of the structural model of perfectionism across the dispositional (between-person) and contextual (within-person) levels of analysis. The ICCs of the latent factors were .39 for SOP and .50 for SPP. A third model assessed the invariance of the factors' covariance in order to establish whether the covariance between SOP and SPP was equivalent at both levels of analysis. For instance, if the covariance varies across levels of analysis, it could result in a decrease of statistical power, which in turn, could bias the strength and interpretation of the relationships across levels. This model resulted in a non-significant difference in chi-square, thus demonstrating invariance: $\Delta\chi^2 = .038$, $\Delta df = 1$, $\Delta CFI = .00$. The fit

of this model was acceptable: $\chi^2 (77) = 351.11$ (scaling correction factor = 1.268), $p < .01$, CFI = .945, TLI = .936, RMSEA = .060, within-person SRMR = .055, between-person SRMR = .062, BIC = 31,647.10.

Appendix B: Figures of the Predicted Values of Multilevel Modeling (*Chapter 3, Article 1*)

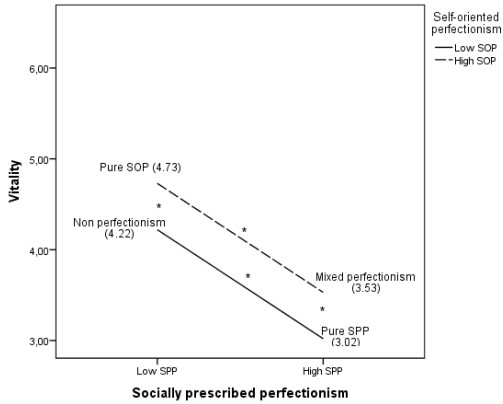


Figure 2, panel A. Predicted values of within-person vitality across the four subtypes of perfectionism. Predicted values are reported in parentheses. Main effects of SOP and SPP are explicitly and implicitly displayed horizontally and vertically, respectively. * represents a significant difference between subtypes.

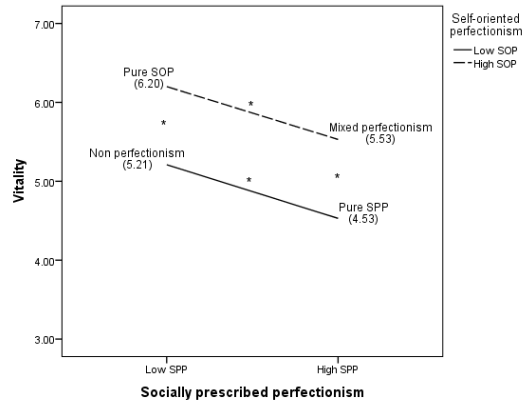


Figure 2, panel B. Predicted values of between-person vitality across the four subtypes of perfectionism. Predicted values are reported in parentheses. Main effects of SOP and SPP are explicitly and implicitly displayed horizontally and vertically, respectively. * represents a significant difference between subtypes.

Figure 1. Predicted values of within- (panel A) and between-person (panel B) vitality across the four subtypes of perfectionism.

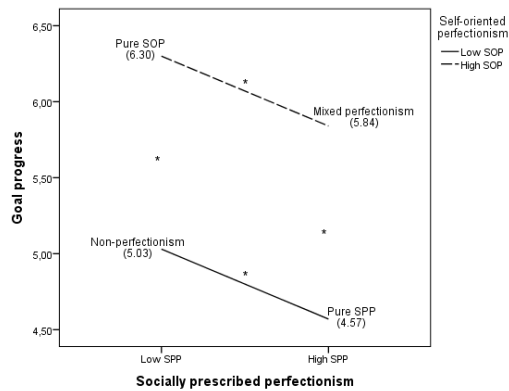


Figure 3, panel A. Predicted values of within-person goal progress across the four subtypes of perfectionism. Predicted values are reported in parentheses. Main effects of SOP and SPP are explicitly and implicitly displayed horizontally and vertically, respectively. * represents a significant difference between subtypes.

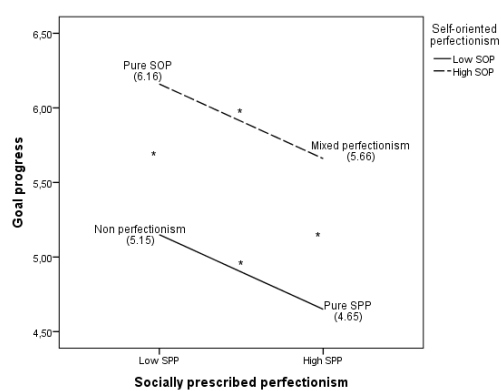


Figure 3, panel B. Predicted values of between-person goal progress across the four subtypes of perfectionism. Predicted values are reported in parentheses. Main effects of SOP and SPP are explicitly and implicitly displayed horizontally and vertically, respectively. * represents a significant difference between subtypes.

Figure 2. Predicted values of within- (panel A) and between-person (panel B) goal progress across the four subtypes of perfectionism.

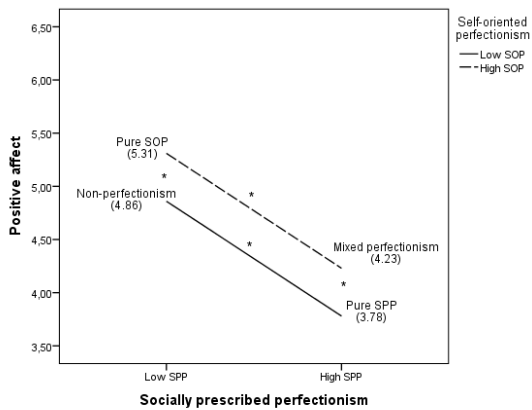


Figure 4, panel A. Predicted values of within-person positive affect across the four subtypes of perfectionism. Predicted values are reported in parentheses. Main effects of SOP and SPP are explicitly and implicitly displayed horizontally and vertically, respectively. * represents a significant difference between subtypes.

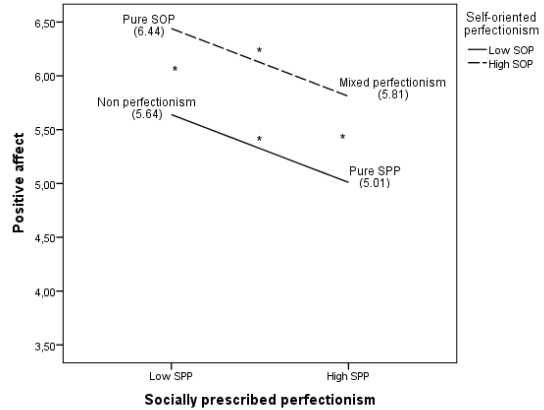


Figure 4, panel B. Predicted values of between-person positive affect across the four subtypes of perfectionism. Predicted values are reported in parentheses. Main effects of SOP and SPP are explicitly and implicitly displayed horizontally and vertically, respectively. * represents a significant difference between subtypes.

Figure 3. Predicted values of within- (panel A) and between-person (panel B) positive affect across the four subtypes of perfectionism.



Figure 5, panel A. Predicted values of within-person negative affect across the four subtypes of perfectionism. Predicted values are reported in parentheses. Main effects of SOP and SPP are explicitly and implicitly displayed horizontally and vertically, respectively. * represents a significant difference between subtypes.

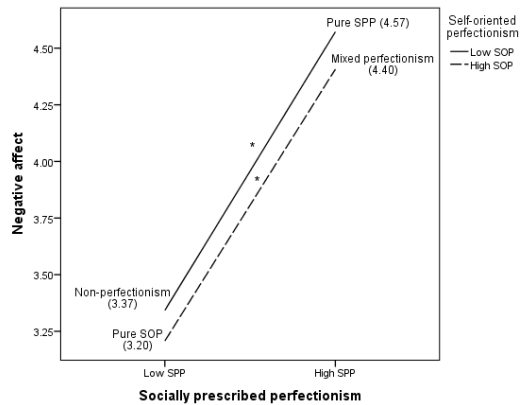


Figure 5, panel B. Predicted values of between-person negative affect across the four subtypes of perfectionism. Predicted values are reported in parentheses. Main effects of SOP and SPP are explicitly and implicitly displayed horizontally and vertically, respectively. * represents a significant difference between subtypes.

Figure 4. Predicted values of within- (panel A) and between-person (panel B) negative affect across the four subtypes of perfectionism.

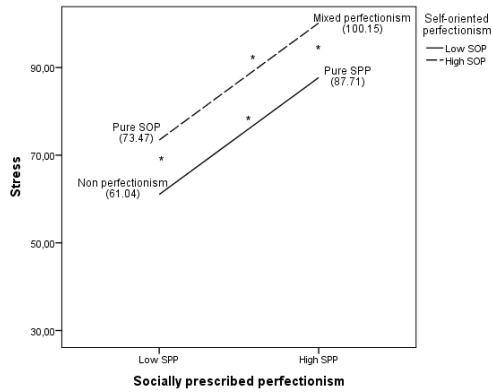


Figure 6, panel A. Predicted values of within-person stress across the four subtypes of perfectionism. Predicted values are reported in parentheses. Main effects of SOP and SPP are explicitly and implicitly displayed horizontally and vertically, respectively. * represents a significant difference between subtypes.

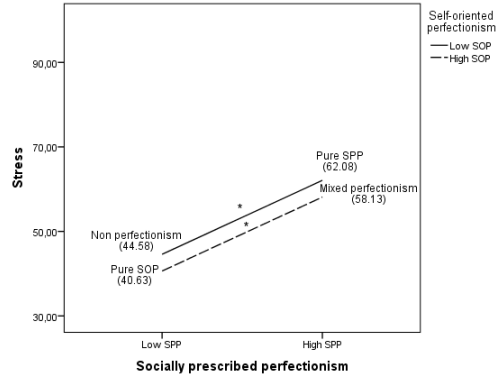


Figure 6, panel B. Predicted values of between-person stress across the four subtypes of perfectionism. Predicted values are reported in parentheses. Main effects of SOP and SPP are explicitly and implicitly displayed horizontally and vertically, respectively. * represents a significant difference between subtypes.

Figure 5. Predicted values of within- (panel A) and between-person (panel B) stress across the four subtypes of perfectionism.

Appendix C : Questionnaire From Article 1

Section 1: Background information

1. Gender

Please indicate your sex Male Female

2. Language

What is your native language? English French Other

3. Age

What is your age? _____

4. Ethnicity

How do you describe yourself in terms of your cultural background?

Aboriginal/native Caucasian (white) African-American (black) Hispanic (latino) Asian

Arabic Other ethnic or cultural groups

If you selected "other", please specify: _____

5. Geographic location

Where do you live?

[Participants will choose their location within a choice of the 13 provinces of Canada, 52 states of US, or other]

Section 2: Your tendencies in your school activities

Part 1: Information about your life in school

1. Are you enrolled in school? Yes No

If no... 2. What is the highest degree of education obtained?

High-school College University certificate

University (bachelors) University (Masters) University (Ph.D.)

[REDIRECT PARTICIPANT TO NEXT DOMAIN]

If yes... 2. What is the level of your academic training?

Freshman (1st year) Junior (2nd year) Sophomore (3rd year) Senior (4th year) Graduate (Masters) Graduate (Ph.D.)

3. What is your academic standing? Full-time Part-time

4. In what program are you mainly enrolled? _____

5. School satisfaction

Please think about the thoughts and feelings that you've had about school during the past few weeks and rate the extent to which you agree with each statement.

<i>Not at all agree</i>	<i>Very slightly agree</i>	<i>Slightly agree</i>	<i>Moderately agree</i>	<i>Strongly agree</i>	<i>Very strongly agree</i>	<i>Totally agree</i>
-------------------------	----------------------------	-----------------------	-------------------------	-----------------------	----------------------------	----------------------

1. I look forward to going to school.
2. I like being in school.
3. School is interesting.
4. I wish I didn't have to go to school (rev).
5. There are many things about school I don't like (rev).
6. I enjoy school activities.
7. I learn a lot at school.
8. I feel bad at school (rev).

Part 2: Perfectionism in [domain #1] (Hewitt & Flett – MPS; 1991)

Listed below are a number of statements concerning personal characteristics and traits. Please indicate the extent to which each of the items describes yourself or the way you are acting specifically in [domain #1].

<i>Not at all</i>	<i>Very slightly</i>	<i>Slightly</i>	<i>Moderately</i>	<i>Strongly</i>	<i>Very strongly</i>	<i>Totally</i>
-------------------	----------------------	-----------------	-------------------	-----------------	----------------------	----------------

1. One of my goals (in domain #1) is to be perfect in everything I do.....
2. Anything that I do that is less than excellent (in domain #1) will be seen as poor work by those around me
3. I do whatever is possible be as perfect as I can (in domain #1).....
4. I feel that people are demanding too much of me (in domain #1).....
5. I aim for perfection when I set goals for myself (in domain #1).....
6. Even if they don't let me know, people are upset when I fail at a task (in domain #1).....
7. I set very high standards for myself (in domain #1).....
8. My family expects me to be perfect (in domain #1).....
9. I must always be successful (in domain #1).....
10. People expect nothing less than perfection from me (in domain #1).....

Part 3: Emotions in [domain #1] (Positive affect and Negative Affect, short version of Emmons, 1992)

This scale consists of a number of words that describe different feelings and emotions that you may have experienced [in domain #1]. For each item indicate to what extent you felt this way **over the past few weeks** [in domain #1].

Not at all	Very slightly	Slightly	Moderately	Strongly	Very strongly	Totally
------------	---------------	----------	------------	----------	---------------	---------

1. Joyful.....
2. Unhappy.....
3. Worried/anxious....
4. Enjoyment/fun.....
5. Depressed.....
6. Pleased.....
7. Happy.....
8. Angry/hostile.....
9. Frustrated.....

Part 4: Vitality in [domain #1] (Ryan & Frederick, 1997)

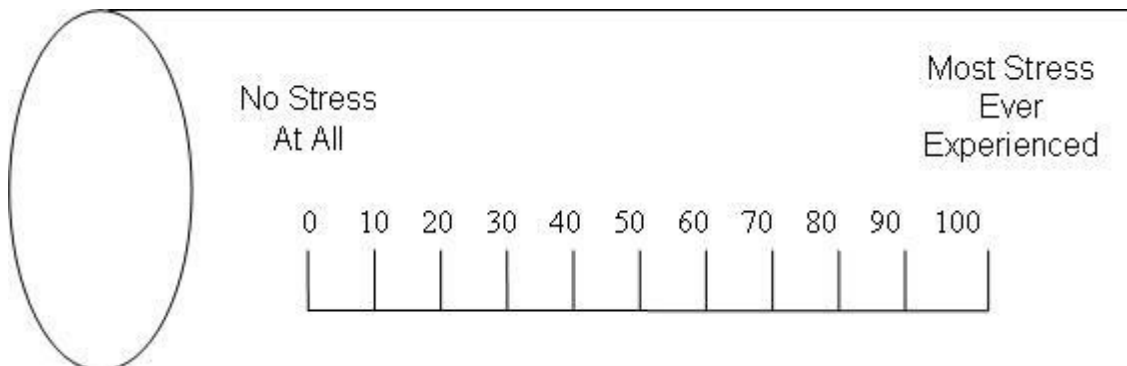
This scale consists of a number of words and sentences that describe different feelings and emotions that you may have experienced recently [in domain #1]. For each item, indicate to what extent you felt this way **over the past few weeks** [in domain #1].

Not at all	Very slightly	Slightly	Moderately	Strongly	Very strongly	Totally
------------	---------------	----------	------------	----------	---------------	---------

1. I felt alive and vital.
2. I don't feel very energetic (rev).
3. I felt so alive I just wanted to burst.
4. I had energy and spirit.
5. I was looking forward to each new day.
6. I felt alert and awake.
7. I felt energized.

Part 5: Stress in [domain #1]

Using the rating scale above, please write down the number that corresponds to how stressed you have felt during the past few weeks when you are thinking about [domain #1]...



_____ / 100

Part 6: Goal progress in [domain #1]

Please refer to goals you have been pursuing during the past few weeks in [domain #1].

<i>Not at all</i>	<i>Very slightly</i>	<i>Slightly</i>	<i>Moderately</i>	<i>Strongly</i>	<i>Very strongly</i>	<i>Totally</i>
-------------------	----------------------	-----------------	-------------------	-----------------	----------------------	----------------

IN [DOMAIN #1]...

1. ... you have progressed on your goals.
2. ... you have moved forward in the pursuit of your goals.
3. ... you have come closer to reaching your goals.
4. ... you have made progress toward the realization of your goals.
5. ... you have advanced toward your goals.

***** PARTS 2 TO 6 WILL BE PRESENTED FOR EACH LIFE DOMAIN in section 3 to section 8 *****

Section 3: Your tendencies at work

Part 1: Information about your life at work

1. Are you currently employed? Yes No
[If no... REDIRECT TO NEXT DOMAIN]

If yes... 2. How many hours per week? _____

3. What type of work do you occupy? _____

4. Job satisfaction (Job satisfaction Questionnaire; Judge et al., 1998—Journal of Applied Psychology)

Please think about the thoughts and feelings that you've had about work during the past few weeks and rate the extent to which you agree with each statement.

<i>Not at all agree</i>	<i>Very slightly agree</i>	<i>Slightly agree</i>	<i>Moderately agree</i>	<i>Strongly agree</i>	<i>Very strongly agree</i>	<i>Totally agree</i>
-------------------------	----------------------------	-----------------------	-------------------------	-----------------------	----------------------------	----------------------

1. I feel fairly satisfied with my present job.
2. Most days I am enthusiastic about my work.
3. Each day at work seems like it will never end. (tbr)
4. I find real enjoyment in my work.
5. I consider my job to be rather unpleasant (tbr)

[PARTS 2 TO 6 WILL BE PRESENTED HERE]

Section 4: Your tendencies in your romantic relationship

Part 1: Information about your romantic relationship

1. Are you invested in a romantic relationship? Yes No

[If no... REDIRECT TO NEXT DOMAIN]

If answered yes... 2. For how long have you been together as a couple? _____

3. Do you live together? Yes No

4. Are you married? Yes No

5. Is your romantic partner currently employed? Yes No If yes, how many hours per week? _____

6. Dyadic adjustment (short form of the Dyadic Adjustment Scale – DAS-4; Sabourin, Valois & Lussier, 2005)

<i>All the time</i>	<i>Most of the time</i>	<i>More often than not</i>	<i>Occasionally</i>	<i>Rarely</i>	<i>Never</i>
---------------------	-------------------------	----------------------------	---------------------	---------------	--------------

- How often do you discuss or have you considered divorce, separation, or terminating your relationship?
- In general, how often do you think that things between you and your partner are going well?
- Do you confide in your mate?
- The dots on the following line represent different degrees of happiness in your relationship. The middle point, “happy”, represents the degree of happiness of most relationships. Please rate the extent that best describes the degree of happiness, all things considered, of your relationship.

0 1 2 3 4 5 6
 ● ● ● ● ● ● ●

 Extremely Unhappy Fairly unhappy A little unhappy Happy Very happy Extremely happy Perfect

[PARTS 2 TO 6 WILL BE PRESENTED HERE]

Section 5: Your tendencies in your friendships

Part 1: Information about your friendships

1. Are you invested in relationships with your friends? Yes No

2. Friendship satisfaction

Please think about the thoughts and feelings that you’ve had about your friends during the past few weeks and rate the extent to which you agree with each statement.

<i>Not at all agree</i>	<i>Very slightly agree</i>	<i>Slightly agree</i>	<i>Moderately agree</i>	<i>Strongly agree</i>	<i>Very strongly agree</i>	<i>Totally agree</i>
-------------------------	----------------------------	-----------------------	-------------------------	-----------------------	----------------------------	----------------------

1. My friends treat me well.
2. My friends are nice to me.
3. I wish I had different friends (rev).
4. My friends are mean to me (rev).
5. My friends are great
6. I have a bad time with my friends (rev).
7. I have a lot of fun with my friends.
8. I have enough friends.
9. My friends will help me if I need it.

[PARTS 2 TO 6 WILL BE PRESENTED HERE]

Section 6: Your tendencies in your family

Part 1: Information about your family

1. Are you invested in relationships with your family (parents, brother/sister)? Yes No

2. Family satisfaction

Please think about the thoughts and feelings that you've had about your family (parents, brother/sister) during the past few weeks and rate the extent to which you agree with each statement.

<i>Not at all agree</i>	<i>Very slightly agree</i>	<i>Slightly agree</i>	<i>Moderately agree</i>	<i>Strongly agree</i>	<i>Very strongly agree</i>	<i>Totally agree</i>
-------------------------	----------------------------	-----------------------	-------------------------	-----------------------	----------------------------	----------------------

1. I enjoy being at home with my family.
2. My family gets along well together.
3. I like spending time with my family.
4. My family and I doing fun things together.
5. My family is better than most.
6. Members of my family talk nicely to one another.
7. My family treats me fairly.

[PARTS 2 TO 6 WILL BE PRESENTED HERE]

Section 7: Your tendencies with your children

Part 1: Information about your children

1. Do you have children? Yes No
[If no... REDIRECT TO NEXT DOMAIN]

If answered yes... 2. How many? _____

3. How old are they? _____
[PARTS 2 TO 6 WILL BE PRESENTED HERE]

4. Parenting satisfaction

Below are five statements with which you may agree or disagree. Using the rating scale below, indicate your agreement with each item regarding your life as [domain] over the past few weeks. Please be open and honest in your responding.

<i>Not at all agree</i>	<i>Very slightly agree</i>	<i>Slightly agree</i>	<i>Moderately agree</i>	<i>Strongly agree</i>	<i>Very strongly agree</i>	<i>Totally agree</i>
-----------------------------	------------------------------------	---------------------------	-----------------------------	---------------------------	------------------------------------	--------------------------

1. In most ways, my life in [domain] is close to my ideal.
2. The conditions of my life [in domain] are excellent.
3. I am satisfied with my life [in domain].
4. So far I have gotten the important things I want in my life [in domain].
5. If I could live my life [in domain] over, I would change almost nothing.

Section 8: Your tendencies in your hobby/leisure activities

Part 1: Information about your hobby/leisure activities

1. Do you currently have a hobby/leisure activity? Yes No
[If no... redirect to end of survey]

If yes... 2. Could you identify the hobbies/leisure activities that you are currently pursuing?

3. Hobbies/leisure activities satisfaction

Below are five statements with which you may agree or disagree. Using the rating scale below, indicate your agreement with each item regarding your life as [domain] over the past few weeks. Please be open and honest in your responding.

<i>Not at all agree</i>	<i>Very slightly agree</i>	<i>Slightly agree</i>	<i>Moderately agree</i>	<i>Strongly agree</i>	<i>Very strongly agree</i>	<i>Totally agree</i>
-----------------------------	------------------------------------	---------------------------	-----------------------------	---------------------------	------------------------------------	--------------------------

1. In most ways, my life in [domain] is close to my ideal.

2. The conditions of my life [in domain] are excellent.
3. I am satisfied with my life [in domain].
4. So far I have gotten the important things I want in my life [in domain].
5. If I could live my life [in domain] over, I would change almost nothing.

[PARTS 2 TO 6 WILL BE PRESENTED HERE]

Debriefing

The goal of this study was to understand the fluctuating degrees in individuals' perfectionism across diverse life domains. This study examined the potential associations between perfectionism and various indicators of psychological adjustment. Our study distinguishes *self-oriented perfectionism*, which reflects a strong desire to reach high standards of excellence according to personal self-settled strivings, *from socially-prescribed perfectionism*, which is characterized by the desire to reach perfection based on the pressure stemming from one's social environment. In other words, people can pursue outstandingly high perfectionistic standards according to self-imposed criteria (self-oriented perfectionism) or because of socially perceived expectations (socially prescribed perfectionism). In this study, we expect to demonstrate that individuals pursue perfectionism at varying degrees and for different motives across several life domains, and that perfectionism could lead to different outcomes depending on the context.

Would you like to receive further information about the results of this study once available:
Yes ____ No ____

Thanks for your participation in this project.

Appendix D : Questionnaire From Article 2

Section 1: Background information

1. Gender

Please indicate your sex Male Female

2. Language

What is your native language? English French Other

3. Age

What is your age? _____

4. Ethnicity

How do you describe yourself in terms of your cultural background?

Aboriginal/native Caucasian (white) African-American (black) Hispanic (latino) Asian

Arabic Other ethnic or cultural groups

If you selected "other", please specify: _____

5. Geographic location

Where do you live?

[Participants will choose their location within a choice of the 13 provinces of Canada, 52 states of US, or other]

Section 2: Your general tendencies (Study 1)

Part 1 : Perfectionism

Please indicate the extent to which each of the items describes yourself or the way you are acting generally in your life.

<i>Not at all</i>	<i>Very slightly</i>	<i>Slightly</i>	<i>Moderately</i>	<i>Strongly</i>	<i>Very strongly</i>	<i>Totally</i>
-------------------	----------------------	-----------------	-------------------	-----------------	----------------------	----------------

1. One of my goals is to be perfect in everything I do.....
2. Anything that I do that is less than excellent will be seen as poor work by those around me
3. I do whatever is possible be as perfect as I can.....
4. I feel that people are demanding too much of me.....
5. I aim for perfection when I set goals for myself.....
6. Even if they don't let me know, people are upset when I fail at a task.....
7. I set very high standards for myself.....
8. My family expects me to be perfect.....
9. I must always be successful.....
10. People expect nothing less than perfection from me.....

Part 2 : Coping tendencies (Coping Inventory for Academic Striving)

Each of the following items represents what students may do to deal with the stress associated with the pursuit of an academic goal during midterm exams. Please rate the extent to which each item corresponds to what you thought about or did while pursuing your academic goal during your preparation for your midterm exams.

<i>Does not correspond at all</i>	<i>Corresponds a little</i>	<i>Corresponds moderately</i>	<i>Corresponds strongly</i>	<i>Corresponds totally</i>
-----------------------------------	-----------------------------	-------------------------------	-----------------------------	----------------------------

1. I tried to visualize that I was in total control.
2. I expressed my irritation about school.
3. I followed a schedule.
4. I distanced myself from my peers.
5. I was determined to put a high level of effort in my academic activities.
6. I distracted myself from my school work by thinking about other activities.
7. I eliminated my doubts about my school work by thinking positively.
8. I asked for advice.
9. I attempted to calm myself down.
10. I tried to identify the potential challenges of the situation.
11. I lost all hope of completing my school work.
12. I visualized myself performing well.
13. I voiced my discontent with the academic situation.
14. I created a plan of action for my school work.
15. I avoided having to talk to other students.
16. I gave my best effort.
17. I tried to think about things other than my school work.
18. I replaced my negative thoughts about my school work with positive thoughts.
19. I asked my peers for advice concerning my school work.
20. I tried to reduce the stress I was feeling.
21. I analyzed the situation in order to improve my performance.
22. I became dejected and felt that all efforts exerted in my school work were futile.
23. I mentally rehearsed completing the tasks involved in my academic work.
24. I expressed my displeasure regarding school.
25. I refrained from social interactions with other students.
26. I put effort in my work.
27. I diverted my attention from the academic situation.
28. I tried to interpret the situation in a positive manner.
29. I asked for help to determine how to best accomplish my school work.
30. I used some techniques in an attempt to relax.
31. I analyzed the requirements of my school work.
32. I quit believing in my ability to manage my school work.
33. I visualized myself doing my best academic performance.
34. I expressed my annoyance with my school work.
35. I developed timetable for when I would perform my school work.

- 36. I kept everyone at a distance.
- 37. I gave a quality effort.
- 38. I occupied myself, so I did not have to think about my school work.
- 39. I maintained a positive focus when thinking about my school work.
- 40. I tried to seek out advice of knowledgeable people.
- 41. I tried to manage my nervousness by relaxing.
- 42. I sought to understand the situation in order to manage my academic work.
- 43. I let myself feel hopeless and discouraged.
- 44. I did not talk to other students.

Section 3 : Your tendencies in your school activities (Study 2)

Part 1: Information about your life in school

1. Are you enrolled in school? Yes No

If no... 2. What is the highest degree of education obtained?

High-school College University certificate
 University (bachelors) University (Masters) University (Ph.D.)
 [REDIRECT PARTICIPANT TO NEXT DOMAIN]

If yes... 2. What is the level of your academic training?

Freshman (1st year) Junior (2nd year) Sophomore (3rd year)Senior (4th year) Graduate
 (Masters) Graduate (Ph.D.)

3. What is your academic standing? Full-time Part-time

4. In what program are you mainly enrolled? _____

Part 2 : Perfectionism in [domain #1] (Hewitt & Flett – MPS; 1991)

Listed below are a number of statements concerning personal characteristics and traits. Please indicate the extent to which each of the items describes yourself or the way you are acting specifically in [domain #1].

<i>Not at all</i>	<i>Very slightly</i>	<i>Slightly</i>	<i>Moderately</i>	<i>Strongly</i>	<i>Very strongly</i>	<i>Totally</i>
-------------------	----------------------	-----------------	-------------------	-----------------	----------------------	----------------

- 1. One of my goals (in domain #1) is to be perfect in everything I do.....
- 2. Anything that I do that is less than excellent (in domain #1) will be seen as poor work by those around me
- 3. I do whatever is possible be as perfect as I can (in domain #1).....
- 4. I feel that people are demanding too much of me (in domain #1).....
- 5. I aim for perfection when I set goals for myself (in domain #1).....
- 6. Even if they don't let me know, people are upset when I fail at a task (in domain #1).....

- 7. I set very high standards for myself (in domain #1).....
- 8. My family expects me to be perfect (in domain #1).....
- 9. I must always be successful (in domain #1).....
- 10. People expect nothing less than perfection from me (in domain #1).....

Part 3: Your coping strategies in [domain #1]

Each life domain can contain a stressful element. Using the scale below, indicate the extent to which the items represent what you did to deal with the stress and demands in [domain #1].

<i>Does not correspond at all</i>	<i>Corresponds a little</i>	<i>Corresponds moderately</i>	<i>Corresponds strongly</i>	<i>Corresponds very strongly</i>
-----------------------------------	-----------------------------	-------------------------------	-----------------------------	----------------------------------

To deal with the stress in [domain #1]...

- 1. I tried to find a way to change the stressful situation.
- 2. I tried to get out of the stressful situation as soon as I could to reduce the stress.
- 3. I worked harder to try to change the stressful situation.
- 4. I tried to leave or avoid the stressful situation to get away from the problem or reduce the stress.
- 5. I used strategies to change the stressful situation in order to deal with the stress.
- 6. I tried to get out of the stressful situation to get away from the stress.
- 7. I did my best to change the stressful situation.
- 8. I tried to get away from the stressful situation to reduce the stress.
- 9. I looked for ways to solve the problem or change the stressful situation.
- 10. In order to reduce the stress I tried to get myself out of the stressful situation.
- 11. I stayed in the stressful situation and tried to change it

***** PARTS 2 AND 3 WILL BE PRESENTED FOR EACH LIFE DOMAIN in section 3 to section 7 *****

Section 3: Your tendencies at work

Part 1: Information about your life at work

1. Are you currently employed? Yes No
 [If no... REDIRECT TO NEXT DOMAIN]

If yes... 2. How many hours per week? _____

3. What type of work do you occupy? _____

[PARTS 2 & 3 WILL BE PRESENTED HERE]

Section 4: Your tendencies in your romantic relationship

Part 1: Information about your romantic relationship

1. Are you invested in a romantic relationship? Yes No

[If no... REDIRECT TO NEXT DOMAIN]

If answered yes... 2. For how long have you been together as a couple? _____

3. Do you live together? Yes No

4. Are you married? Yes No

5. Is your romantic partner currently employed? Yes No If yes, how many hours per week? _____

[PARTS 2 & 3 WILL BE PRESENTED HERE]

Section 5: Your tendencies in your friendships

Part 1: Information about your friendships

1. Are you invested in relationships with your friends? Yes No

[PARTS 2 & 3 WILL BE PRESENTED HERE]

Section 6: Your tendencies in your family

Part 1: Information about your family

1. Are you invested in relationships with your family (parents, brother/sister)? Yes No

[PARTS 2 & 3 WILL BE PRESENTED HERE]

Section 7: Your tendencies in your hobby/leisure activities

Part 1: Information about your hobby/leisure activities

1. Do you currently have a hobby/leisure activity? Yes No

[If no... redirect to end of survey]

If yes... 2. Could you identify the hobbies/leisure activities that you are currently pursuing?

[PARTS 2 & 3 WILL BE PRESENTED HERE]

**Appendix E : Questionnaire From Article 3
Section 1: Background information**

1. Gender

Please indicate your sex Male Female

2. Language

What is your native language? English French Other

3. Age

What is your age? _____

4. Ethnicity

How do you describe yourself in terms of your cultural background?

Aboriginal/native Caucasian (white) African-American (black) Hispanic (latino) Asian
Arabic Other ethnic or cultural groups

If you selected "other", please specify: _____

5. Geographic location

Where do you live? _____

6. Where were you born? _____

7. What is the level of your academic training?

Freshman (1st year) Junior (2nd year) Sophomore (3rd year)Senior (4th year) Graduate
(Masters) Graduate (Ph.D.)

8. What is your academic standing? Full-time Part-time

9. In what program are you mainly enrolled? _____

10. School satisfaction

Please think about the thoughts and feelings that you've had about school during the past few weeks and rate the extent to which you agree with each statement.

<i>Not at all agree</i>	<i>Very slightly agree</i>	<i>Slightly agree</i>	<i>Moderately agree</i>	<i>Strongly agree</i>	<i>Very strongly agree</i>	<i>Totally agree</i>
-------------------------	----------------------------	-----------------------	-------------------------	-----------------------	----------------------------	----------------------

1. I look forward to going to school.
2. I like being in school.
3. School is interesting.
4. I wish I didn't have to go to school (rev).
5. There are many things about school I don't like (rev).
6. I enjoy school activities.

- 7. I learn a lot at school.
- 8. I feel bad at school (rev).

11. Perfectionism

Please indicate the extent to which each of the items describes yourself or the way you are acting generally in your life.

<i>Not at all</i>	<i>Very slightly</i>	<i>Slightly</i>	<i>Moderately</i>	<i>Strongly</i>	<i>Very strongly</i>	<i>Totally</i>
-------------------	----------------------	-----------------	-------------------	-----------------	----------------------	----------------

- 1. One of my goals is to be perfect in everything I do.....
- 2. Anything that I do that is less than excellent will be seen as poor work by those around me
- 3. I do whatever is possible be as perfect as I can.....
- 4. I feel that people are demanding too much of me.....
- 5. I aim for perfection when I set goals for myself.....
- 6. Even if they don't let me know, people are upset when I fail at a task.....
- 7. I set very high standards for myself.....
- 8. My family expects me to be perfect.....
- 9. I must always be successful.....
- 10. People expect nothing less than perfection from me.....

Appendix F : Research Ethics Board Approvals Article 1 & Article 2, Study 2

File Number: 08-11-29

Date (mm/dd/yyyy): 10/04/2011



Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

Ethics Approval Notice Social Science and Humanities REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

<u>First Name</u>	<u>Last Name</u>	<u>Affiliation</u>	<u>Role</u>
Patrick	Gaudreau	Social Sciences / Psychology	Principal Investigator

File Number: 08-11-29

Type of Project: Professor

Title: Are You Perfectionist in Important Areas of Your Life?

<u>Approval Date (mm/dd/yyyy)</u>	<u>Expiry Date (mm/dd/yyyy)</u>	<u>Approval Type</u>
10/04/2011	10/03/2012	Ia

(Ia: Approval, Ib: Approval for initial stage only)

Special Conditions / Comments:

N/A

File Number: 08-11-29

Date (mm/dd/yyyy): 09/28/2012



Université d'Ottawa **University of Ottawa**
 Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

Ethics Approval Notice

Social Science and Humanities REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

<u>First Name</u>	<u>Last Name</u>	<u>Affiliation</u>	<u>Role</u>
Patrick	Gaudreau	Social Sciences / Psychology	Principal Investigator
Véronique	Franche	Social Sciences / Psychology	Student Researcher
Kristina	Kljajic		Research Assistant

File Number: 08-11-29

Type of Project: Professor

Title: Are You Perfectionist in Important Areas of Your Life?

Renewal Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
10/04/2012	10/03/2013	Ia

(Ia: Approval, Ib: Approval for initial stage only)

Special Conditions / Comments:

N/A

File Number: 08-11-29

Date (mm/dd/yyyy): 09/23/2013



Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

Ethics Approval Notice
Social Science and Humanities REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

<u>First Name</u>	<u>Last Name</u>	<u>Affiliation</u>	<u>Role</u>
Patrick	Gaudreau	Social Sciences / Psychology	Principal Investigator
Véronique	Franche	Social Sciences / Psychology	Student Researcher
Kristina	Kljajic		Research Assistant

File Number: 08-11-29

Type of Project: Professor

Title: Are You Perfectionist in Important Areas of Your Life?

Renewal Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
10/04/2013	10/03/2014	Ia

(Ia: Approval, Ib: Approval for initial stage only)

Special Conditions / Comments:
N/A

File Number: 08-11-29

Date (mm/dd/yyyy): 11/03/2014



Université d'Ottawa **University of Ottawa**
 Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

Ethics Renewal Notice

Social Sciences and Humanities REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

<u>First Name</u>	<u>Last Name</u>	<u>Affiliation</u>	<u>Role</u>
Patrick	Gaudreau	Social Sciences / Psychology	Principal Investigator
Véronique	Franche	Social Sciences / Psychology	Student Researcher
Kristina	Kljajic	Social Sciences / Psychology	Research Assistant

File Number: 08-11-29

Type of Project: Professor

Title: Are You Perfectionist in Important Areas of Your Life?

Renewal Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
10/04/2014	10/03/2015	Ia

(Ia: Approval, Ib: Approval for initial stage only)

Special Conditions / Comments:

N/A

Article 2, Study 1

File Number: H12-13-12

Date (mm/dd/yyyy): 01/16/2014



Université d'Ottawa **University of Ottawa**
 Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

Ethics Approval Notice**Health Sciences and Science REB****Principal Investigator / Supervisor / Co-investigator(s) / Student(s)**

<u>First Name</u>	<u>Last Name</u>	<u>Affiliation</u>	<u>Role</u>
Patrick	Gaudreau	Social Sciences / Psychology	Principal Investigator
Kristina	Kljajic	Social Sciences / Psychology	Co-investigator

File Number: H12-13-12

Type of Project: Professor

Title: How do you regulate your time and effort in university

<u>Approval Date (mm/dd/yyyy)</u>	<u>Expiry Date (mm/dd/yyyy)</u>	<u>Approval Type</u>
01/16/2014	01/15/2015	Ia

(Ia: Approval, Ib: Approval for initial stage only)

Special Conditions / Comments:
 N/A

File Number: H12-13-12

Date (mm/dd/yyyy): 08/24/2015



Université d'Ottawa **University of Ottawa**
 Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

Ethics Approval Notice
Health Sciences and Science REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

<u>First Name</u>	<u>Last Name</u>	<u>Affiliation</u>	<u>Role</u>
Patrick	Gaudreau	Social Sciences / Psychology	Principal Investigator
Kristina	Kljajic	Social Sciences / Psychology	Co-investigator

File Number: H12-13-12

Type of Project: Professor

Title: How do you regulate your time and effort in university

<u>Renewal Date (mm/dd/yyyy)</u>	<u>Expiry Date (mm/dd/yyyy)</u>	<u>Approval Type</u>
01/16/2015	01/15/2016	Ia

(Ia: Approval, Ib: Approval for initial stage only)

Special Conditions / Comments:
 N/A

File Number: H12-13-12

Date (mm/dd/yyyy): 02/22/2016



Université d'Ottawa **University of Ottawa**
 Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

Ethics Approval Notice
Health Sciences and Science REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

<u>First Name</u>	<u>Last Name</u>	<u>Affiliation</u>	<u>Role</u>
Patrick	Gaudreau	Social Sciences / Psychology	Principal Investigator
Kristina	Kljajic	Social Sciences / Psychology	Co-investigator

File Number: H12-13-12**Type of Project:** Professor**Title:** How do you regulate your time and effort in university

Renewal Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
01/16/2016	01/15/2017	Ia

(Ia: Approval, Ib: Approval for initial stage only)

Special Conditions / Comments:
 N/A

File Number: H12-13-12

Date (mm/dd/yyyy): 03/17/2017



Université d'Ottawa **University of Ottawa**
 Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

Ethics Approval Notice
Health Sciences and Science REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

<u>First Name</u>	<u>Last Name</u>	<u>Affiliation</u>	<u>Role</u>
Patrick	Gaudreau	Social Sciences / Psychology	Principal Investigator
Véronique	Franche	Social Sciences / Psychology	Co-investigator
Kristina	Kljajic	Social Sciences / Psychology	Co-investigator

File Number: H12-13-12**Type of Project:** Professor**Title:** How do you regulate your time and effort in university

Renewal Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
01/16/2017	01/15/2018	Renewal

Special Conditions / Comments:
 N/A

Article 3

File Number: 08-08-13

Date (mm/dd/yyyy): 08/19/2010



Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

Ethics Approval Notice
Social Science and Humanities REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

<u>First Name</u>	<u>Last Name</u>	<u>Affiliation</u>	<u>Role</u>
Patrick	Gaudreau	Social Sciences / Psychology	Principal Investigator
Natasha	Carraro	Social Sciences / Psychology	Research Assistant
Marie-Claude	Fecteau	Social Sciences / Psychology	Research Assistant
Dave	Miranda	Social Sciences / Psychology	Research Assistant
Amanda	Thompson	Social Sciences / Gerontology	Research Assistant
Jérémie	Vernier-Fillion	Social Sciences / Psychology	Research Assistant

File Number: 08-08-13**Type of Project:** Professor**Title:** A Daily Look into Academic Goal Pursuits

Renewal Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
10/27/2010	10/26/2011	Ia

(Ia: Approval, Ib: Approval for initial stage only)

Special Conditions / Comments:
N/A