Using Developmental Cascade Models to Explain Directionality between Rejection Sensitivity and Maladaptive Traits across Adolescence

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Abstract

The fundamental need to belong is considered one of the most basic human requirements, and universally motivates human behaviour. When this need to belong is not met, it increases the risk of mental health problems like depression, which was of interest in this dissertation. Due to the psychological consequences of not being accepted by others, humans are very attuned to perceived threats to belonging and have developed types of defense mechanisms to protect themselves against social exclusion. One such defense mechanism is rejection sensitivity, and the role of rejection sensitivity as it relates to depression was the underlying theme of this dissertation.

Along with rejection sensitivity, there exist external and internal factors that serve as threats to belonging, and which are associated with depression. Two of these factors, rejection (an interpersonal factor) and perfectionism (an intrapersonal factor) were examined in relation to depression. Study 1 focused on peer rejection and the developmental pathways involved in its relation to rejection sensitivity, depression, and aggression in adolescence. Results showed that rejection and rejection sensitivity were preceded by either depression or aggression across adolescence, and although depression initiated the cascade leading to rejection sensitivity, there was a bidirectional relation across late adolescence as rejection sensitivity also predicted future depression. Study 2 focused on two types of perfectionism (i.e., self-oriented and socially prescribed), including the developmental pathways associated with their relation to rejection sensitivity and depression in adolescence. Socially prescribed perfectionism was directly related to future depression and rejection sensitivity mediated the relation between self-oriented perfectionism and depression. Depression initiated the cascade leading to rejection sensitivity and supported a bidirectional relation across late adolescence. Study 3 also focused on perfectionism, but cross-sectionally in young adults, and examined three types of perfectionism (i.e., self-

oriented, socially prescribed, and other-oriented). Rejection sensitivity and socially prescribed perfectionism were positively related to depression, and other-oriented perfectionism was negatively related to depression; however, self-oriented perfectionism did not contribute significantly to depression. Contrary to what was predicted, rejection sensitivity was not a significant moderator in the relation between perfectionism and depression. Overall, rejection sensitivity, a defense mechanism against threats to the need to belong, played a significant role in the development and maintenance of depression in the absence of actual rejection, as well as in conjunction with specific types of perfectionism.

TABLE OF CONTENTS

Title Page i

Acknowledgements ii

Abstract iv

Table of Contents vi

List of Tables ix

List of Figures x

Preface xi

General Introduction 1

Rejection Sensitivity 2

Depression 4

Interpersonal Factor: Rejection 6

Intrapersonal Factor: Perfectionism 7

Developmental Cascades 10

Overview of Studies 10

Study 1: The Temporal Precedence of Peer Rejection, Rejection Sensitivity, Depression, and Aggression across Adolescence 13

Title Page 14

Abstract 15

Introduction 16

Method 23

Analytic Plan 25

Results 26

Discussion 29

Summary 33

References 35

Study 2: The Temporal Precedence of Perfectionism, Depression, and Rejection Sensitivity across Adolescence 48

Title Page 49

Abstract 50

Introduction 51

Method 58

Analytic Plan 60

Results 61

Discussion 63

Conclusion 68

References 70

Study 3: Perfectionism, Depression, and Rejection Sensitivity in Early Adulthood 84

Title Page 85

Abstract 86

Introduction 87

Method 94

Analytic Plan 97

Results 98

Discussion 99

Conclusion 102

References 104

General Discussion 118

Summary of Research Findings 118

Integration of Findings and Implications 120

Limitations and Future Directions 125

Conclusion 129

References for General Introduction and Discussion 131

Appendix 144

List of Tables

Study 1: The Temporal Precedence of Peer Rejection, Rejection Sensitivity, Depression, and Aggression across Adolescence

Table 1: Descriptive Statistics 45

Table 2: Model Fit Statistics 46

Study 2: The Temporal Precedence of Perfectionism, Depression, and Rejection Sensitivity across Adolescence

Table 1: Descriptive Statistics 80

Table 2: Model Fit Statistics 81

Table 3: Parameter Estimates for Indirect Effects 82

Study 3: Perfectionism, Depression, and Rejection Sensitivity in Early Adulthood

Table 1: Descriptive Statistics 114

Table 2: Regression Analysis Summary for Self-Oriented Perfectionism and Rejection Sensitivity Predicting Depression 115

Table 3: Regression Analysis Summary for Socially Prescribed Perfectionism and Rejection Sensitivity Predicting Depression 116

Table 4: Regression Analysis Summary for Other-Oriented Perfectionism and Rejection Sensitivity Predicting Depression 117

List of Figures

Study 1: The Temporal Precedence of Peer Rejection, Rejection Sensitivity, Depression, and Aggression across Adolescence

Figure 1: Cascade Model of Depression, Aggression, Rejection, and Rejection Sensitivity 47

Study 2: The Temporal Precedence of Perfectionism, Depression, and Rejection Sensitivity across Adolescence

Figure 1: Cascade Model of Self-Oriented Perfectionism, Socially Prescribed Perfectionism, Depression, and Rejection Sensitivity 83

Preface

Academic Contributions

Christina Beeson was the first author of the paper entitled "The Temporal Precedence of Peer Rejection, Rejection Sensitivity, Depression, and Aggression across Adolescence". First author contributions included: literature review; writing of the manuscript; performed statistical analyses; incorporated changes related to feedback from her supervisor and from the second author. In the context of the longitudinal study in general, she conducted some of the parent interviews in 2013, as well as helped with data entry and data cleaning in 2016-2018. Heather Brittain was the second author of this paper. Heather provided training on the statistical technique used in this study and double-checked the analyses for correctness along with the third author. Heather also provided statistical guidance and expertise and provided edits and comments on the manuscript. Dr. Tracy Vaillancourt was the third author, primary investigator of the McMaster Teen Study, and is the first author's thesis supervisor. Dr. Vaillancourt allowed use of the data set and provided expertise and feedback at each phase of the preparation of the manuscript. She reviewed and provided final approval of the manuscript submitted for publication. The manuscript has been accepted for publication.

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supervisor. Dr. Vaillancourt allowed use of the data set and provided expertise, edits, and feedback at each phase of the preparation of the manuscript.

Christina Beeson was the first author of the paper entitled “Perfectionism, Rejection Sensitivity, and Depression in Early Adulthood”. First author contributions included the literature review, writing of the manuscript, performed statistical analyses, and incorporated changes related to feedback from her supervisor. In the context of the longitudinal study in general, she conducted some of the parent interviews in 2013, as well as helped with data entry and data cleaning in 2016-2018. Dr. Tracy Vaillancourt was the second author, primary investigator of the McMaster Teen Study, and is the first author’s thesis supervisor. Dr. Vaillancourt allowed use of the data set and provided expertise, edits, and feedback at each phase of the preparation of the manuscript.

General Introduction

According to classical research theories, humans have a number of fundamental needs that motivate behaviour; for instance, one such theory, the original model of Maslow's Hierarchy of Needs, organized human needs into five categories: basic physiological needs, followed by security, love and belongingness, esteem, and self-actualization needs (Maslow, 1943). As further research into these categories was conducted, the original model expanded upon these to include cognitive, aesthetic, and transcendence needs (Maslow, 1970a; Maslow, 1970b); however, even with the addition of these, the fundamental need to belong is still accepted as one of the most basic human requirements. Humans are motivated to form close bonds with others, and this can be seen, for example, in the formation of parent-child attachment, friendships, romantic relationships, and general belongingness to groups, through which social identity is established (Baumeister & Leary, 1995; Dunham & Emory, 2014). When the need to belong is fulfilled, and social relationships and connection are formed, the individual is rewarded with positive emotion; however, when this need to belong is not met, or in some cases, even when imagined or potential threats to relationships are experienced, the individual may suffer from a range of negative emotions or behaviour (Beaumeister & Leary, 1995), such as aggression, hostility, social withdrawal, solitude, and depression (Dodge et al., 2003; Rubin, Coplan, & Bowker, 2009). It is evident that acceptance by others is of high importance to humans in general and the consequences of this need not being met are often dire.

Due to the serious psychological consequences of not being accepted by others, humans are very attuned to perceived threats to belonging and have developed types of defense mechanisms to protect themselves against social exclusion (MacDonald & Leary, 2005). These allow a person to be able to identify and react to instances of negative interpersonal interactions

in order to avoid the harmful outcomes of exclusion. However, as is the case with many other psychological defense mechanisms, those which serve to protect against social exclusion are not always adaptive and may have harmful consequences of their own. One such defense mechanism is rejection sensitivity.

Rejection Sensitivity

Rejection sensitivity first appeared as a concept in academic literature almost 50 years ago (Mehrabian, 1970) and was originally created as one way to assess a person's weakness in social skills (Mehrabian, 1976). Since then, the definition has expanded, and currently, rejection sensitivity is known as a disposition where the tendency for an individual is to anxiously or angrily expect and readily perceive rejection in both overt and ambiguous situations (Downey et al., 1998). Not only is someone high in rejection sensitivity more likely to believe they are or will be rejected by others, they also tend to have more intense emotional reactions in situations where rejection is possible (Downey et al., 1998; Zimmer-Gembeck et al., 2016), resulting in long lasting maladaptive cognitions and behaviour (Downey & Feldman, 1996; Downey et al., 1998).

The development of rejection sensitivity is thought to stem from early social experiences, wherein the progression and dynamics of previous relationships create a social cognition upon which future relationships are formed (Reis & Downey, 1999). This social cognition is a framework made up of both positive and negative social experiences and builds expectations for how future social interactions will unfold. As such, some research on rejection sensitivity focuses on the contributions of parent-child relationships and their influences via Attachment Theory (Bowlby, 1969), finding that parenting styles predict rejection sensitivity (Erozkan, 2009). Other studies examine how previous peer relationships, specifically those that

are or are perceived to be rejecting, lay the groundwork for increased rejection sensitivity (Downey & Feldman, 1996; Feldman & Downey, 1994; Rosenbach & Renneberg, 2014).

To explain how the expectations and perceptions of rejection (i.e., rejection sensitivity) lead to reactions to rejection and to psychological maladjustment, Downey and Feldman (1996) proposed the Rejection Sensitivity Model. Originally, the Rejection Sensitivity Model only included anxious reactions to perceived rejection, but shortly after it was postulated, rejection sensitivity theory was expanded to include two distinct defensive reactions to rejection that are seen in those high in rejection sensitivity (Downey, Bonica, & Rincón, 1999). Specifically, an individual high on rejection sensitivity will either react anxiously to perceived rejection, which has been found to be related to internalizing problems such as depression or social anxiety, or they will react in anger, which has been linked to externalizing behaviour such as aggression (Downey et al., 1998). These emotional and behavioural responses, which are often exaggerated (Downey et al., 1998; Zimmer-Gembeck et al., 2016), may lead to actual rejection by the peer group, creating a self-fulfilling prophecy. Research to date has provided support for the expanded rejection sensitivity theory, with rejection sensitivity following experiences of rejection (Downey & Feldman, 1996; Feldman & Downey, 1994; Rosenbach & Renneberg, 2014) and rejection sensitivity being related to depression (Chango et al., 2012; London et al., 2007) and/or aggression in the rejected individual (Zimmer-Gembeck & Nesdale, 2012; Zimmer-Gembeck et al., 2016). Rejection sensitivity may not always be initiated by experiences of peer rejection directly. Zimmer-Gembeck et al. (2016) found that rejection sensitivity was preceded by higher levels of depression symptoms where past experiences of rejection were not measured.

Depression

According to the diathesis-stress model of depression, individuals possess vulnerabilities which, when exposed to environmental stressors, may lead to the development of depressive symptoms (Caspi et al., 2003). One such vulnerability is thought to be a person's cognitive biases, which initiate and allow the continuation of depression (e.g., Alloy et al., 2006; Beck, 1967; Clark, Beck, & Alford, 1999). Individuals who are vulnerable to developing depression possess a negative cognitive schema made up of beliefs about the self, the world, and the future (Beck, 1970). This schema develops from the tendency to focus on and process negative information over a long period of time, leaving the individual more likely to have negative self-attributions, as well as to notice and remember negative events, or interpret neutral events as negative (Beck, 1976; Clark, Beck, & Alford, 1999).

The twelve-month prevalence rate of major depressive disorder in the United States is about 7% (American Psychiatric Association [APA], 2013) and in Canada it is 4.7% (Knoll & MacLennan, 2017; Patten et al., 2016). However, depressive symptoms also more commonly occur at non-clinical levels in the general population, with a lifetime prevalence rate as high as 20% (Merikangas et al., 2010; Thapar, 2012). Although depression is rare in childhood, it increases throughout adolescence (APA, 2013), and becomes more stable toward the end of adolescence and early adulthood (Rudolph et al., 2009; Vaillancourt & Haltigan, 2017). Young adults aged 18 to 29 are more likely to be depressed than older adults (Kessler et al., 2003), and due to the stability of depression over time, a common predictor of depression in young adults the presence of depression in adolescence (Kessler et al., 2005). Adolescents who are depressed are more likely to have poorer family and peer relationships (e.g., Fröjd et al., 2008; Kupersmidt, Coie, & Dodge, 1996) and are more likely to be sensitive to rejection (Zimmer-Gembeck et al.,

2016). It important to note that adolescents with subthreshold levels of depression have been shown to not differ from adolescents diagnosed with major depressive disorder with respect to "self-harming behaviour, level of impairment, depression in adulthood, and rate of treatment for the disorder" (Krygsman & Vaillancourt, 2017, p.20; see also Angold et al., 1999, Rutter et al., 2006). In this dissertation, the focus is on symptoms of depression, and not the disorder per se, but we used the term depression for brevity.

The role of rejection sensitivity as it relates to depression was the underlying theme inspiring this dissertation. With the increasing importance of peer relationships across development (Harris, 1995), adolescence is one key developmental period where both rejection sensitivity and depression are emergent (Marston, Hare, & Allen, 2010). Further, rejection sensitivity has consistently been found to be one mechanism predicting depression among older adolescents approaching adulthood (Marston, Hare, & Allen, 2010; Zimmer-Gembeck et al., 2016). As such, we focused on older adolescents and emerging young adults in this dissertation. Rejection sensitivity, although it serves as a reaction to feelings of rejection or exclusion by others, also serves as a threat to interpersonal connection, as it can lead to actual lack of acceptance by others (Zimmer-Gembeck et al., 2016). There are many variables, whether they have an external source through social interactions or have an internal basis via personality traits that serve as a threat to interpersonal connection and belonging and with which rejection sensitivity may contribute. Two of these variables were examined in detail. Specifically, this dissertation focused on peer rejection, an interpersonal factor which is a common problem in childhood and adolescence, and perfectionism, a maladaptive personality trait which jeopardizes social connection.

Interpersonal Factor: Rejection

Rejection is a painful experience which occurs when individuals are actively excluded, banished, or not accepted into a social group (Nesdale & Zimmer-Gembeck, 2014) and tends to be stable over time (Krygsman & Vaillancourt, 2017; Rubin, Bukowski, & Parker, 2006). Children who are rejected by their peers often struggle with general social interactions (Crick & Dodge, 1994), such as interpreting peers' social cues (Dodge & Feldman, 1990). Rejection is related to maladaptive cognitions and behaviour, such as anger, aggression, anxiety, and depression (Dodge et al., 2003; Zimmer-Gembeck et al., 2009).

There are three competing models which identify the direction of the relation between depression and negative interpersonal interactions, such as rejection. The first, known as the *interpersonal risk model*, focusses on depression as an outcome of negative interpersonal interactions and relationships (e.g., Nolan, Flynn, & Garber, 2003; Prinstein & Aikins, 2004; Schwartz et al., 2015; Sentse et al., 2010; Ttofi et al., 2011; Zimmer-Gembeck, Waters, & Kindermann, 2010). The second is known as the *symptoms-driven model,* where depressive symptoms precede peer rejection (Connolly et al., 1992; Joiner, 2001). The guiding theory behind the symptoms-driven model is the *scar hypothesis*, which postulates that individuals who have suffered through internalizing problems such as depression have long-lasting effects in other areas of their lives, including interpersonal relationships (Kochel, Ladd, & Rudolph, 2012; Krygsman & Vaillancourt, 2017; Nolen-Hoeksema, Girgus, & Seligman, 1992; Rohde, Lewinsohn, & Seeley, 1990; Vaillancourt et al., 2013). The third and final theory is the *transactional model*, where there is bidirectionality in the relation between depression and peer rejection over time (Sameroff, 2009). In a transactional model, the changes which naturally occur in the individual's relationships as well as the changing depressive symptoms over time are

important. Both the stability and the changes that arise across time influence one another. Some researchers have found support for the transactional model with regard to peer rejection and depressive symptoms (Vernberg, 1990; Zimmer-Gembeck et al., 2016).

Rejection is a direct threat to the need for love and belonging, as it is the act of being excluded from important others and/or groups. Rejection has been linked with rejection sensitivity and depression across a multitude of studies (e.g., Downey & Feldman, 1996; Feldman & Downey, 1994; Rubin, Coplan, & Bowker, 2009).

Intrapersonal Factor: Perfectionism

The other variable which can act as a threat to interpersonal connection that we examined was perfectionism. Perfectionism is a multidimensional personality construct characterized by the establishment of unattainably high standards, excessive avoidance of mistakes, preoccupation with negative evaluation and judgement from others, harsh self-criticism, and/or severe criticism of others (Hewitt & Flett, 1991). Opinions are mixed on whether or not perfectionism is or can be adaptive, but most current research is conducted with the assumption that perfectionism is maladaptive, with higher levels even being related to psychopathology (Flett & Hewitt, 2002). Psychological outcomes related to perfectionism can differ depending on the target of the perfectionistic behaviour. The multidimensional aspect of perfectionism creates the opportunity for perfectionistic tendencies to be directed from others toward the self (i.e., socially prescribed perfectionism), from the self toward the self (i.e., self-oriented perfectionism), or from the self toward others (i.e., other-oriented perfectionism; Hewitt & Flett, 1991).

Individuals who are high in socially prescribed perfectionism believe that others demand perfection of them and feel like they cannot achieve the high standards expected of them, which can result in the need to attempt to display outward perfection (Hewitt & Flett, 1991). Socially

prescribed perfectionism is linked to a number of negative mental health outcomes, such as depression, anxiety, and suicide (Cox, Clara, & Enns, 2009; Hewitt & Flett, 1991; Roxborough et al., 2012), even after controlling for known predictors such as neuroticism (Sherry & Hall, 2009). Socially prescribed perfectionism is also related to numerous physical health outcomes, including poor sleep and somatic manifestations (e.g., digestive problems; Molnar et al., 2006). Individuals who are high in socially prescribed perfectionism are also more likely to have interpersonal difficulties (Habke & Flynn, 2002).

Self-oriented perfectionism originates from within a person and includes unrealistic and unattainably high standards for oneself in which perfection is demanded (Hewitt & Flett, 1991). Researchers have found that although self-oriented perfectionism is linked to depression, the relation is weaker to mental health outcomes when compared to socially prescribed perfectionism (Asseraf & Vaillancourt, 2015; Cox & Enns, 2003; Flett et al., 2011, Hewitt et al., 1996; O'Connor et al., 2010).

Other-oriented perfectionism occurs when an individual demands perfection from others and is related to a multitude of interpersonal problems as others inevitably fail to live up to these expectations (Hewitt & Flett, 1991). Although socially prescribed perfectionism and self-oriented perfectionism are studied starting in childhood, continuing into adulthood, other-oriented perfectionism is examined solely in adult populations as there is no evidence that it emerges before then (Flett et al., 2016). Other-oriented perfectionism has been less-studied to date, but is linked to psychopathy, narcissism, and social dominance (Stoeber, 2014), but unlike socially prescribed perfectionism and self-oriented perfectionism, it has not been found to be positively related to depression (Asseraf & Vaillancourt, 2015; Cox & Enns, 2003; Flett et al.,

2011, Hewitt et al., 1996; O'Connor et al., 2010); however, there is evidence that it has a negative relation with depression (Chen, Hewitt, & Flett, 2015).

Perfectionism has been found to be related to depression via social disconnection, which impacts acceptance and belongingness. Perfectionists tend to have interpersonal difficulties leading to social disconnection from others (Sherry, Mackinnon, & Gautreau, 2016). To explain these interpersonal difficulties, Hewitt et al. (2006) developed the Social Disconnection Model, which proposes a mechanism for the link between perfectionism and negative mental health outcomes (e.g., depression, anxiety, suicide), with social disconnection being the mediating variable connecting the two.

It is the social disconnection that perfectionists experience that leads to a sense of not belonging, isolation, or even perceived rejection (Hewitt et al., 2006). The unrealistic expectations that perfectionists believe others have of them cannot be achieved, and thus they constantly believe that they are disappointing others (Hewitt et al., 2006). Perfectionists are more likely to interpret ambiguous social interactions as negative and may feel rejected or excluded from others as a result (Sherry et al., 2013). The rejection they interpret may be real or simply perceived. The social disconnection from which perfectionists suffer may be predicted by perceived lack of social support (Sherry et al., 2008) or insecure attachment (Chen, Hewitt, & Flett, 2015).

The maladaptive way in which perfectionists view their social interactions, that is, being more prone to interpret ambiguous situations as disapproval and rejection by others (Hewitt et al., 2006; Sherry et al., 2013) has similar features to that which those high in rejection sensitivity experience. Indeed, studies have found that perfectionism and rejection sensitivity are positively related (e.g., Flett, Besser, & Hewitt, 2014).

Developmental Cascades

One of the biggest limitations of the studies in the literature on rejection sensitivity and depression is that many of them are unidirectional and presume depression is the outcome variable. This narrow approach fails to consider that the relation between variables across development may be dynamic and bidirectional, influencing one another over time (Vaillancourt et al., 2013). In order to test the possibility of bidirectional relations or to test the temporal precedence between variables throughout development, researchers have begun using developmental cascade models. In order to expand the literature in this area, we used developmental cascade models in two of our three studies.

Developmental cascades refer to the interactions across levels, domains, and systems over time, resulting in cumulative outcomes over the course of development across the lifespan (Masten & Cicchetti, 2010, p. 491). An advantage of this type of analysis is that the directionality of effects can be explored. That is, cascade models can differentiate if relations are direct and unidirectional, direct and bidirectional, or indirect through mediating variables (Masten & Cicchetti, 2010).

Overview of Studies

In Study 1, we were interested in examining an interpersonal factor that can impact belongingness (i.e., rejection). Specifically, we examined the temporal ordering of rejection, rejection sensitivity, depression, and aggression in a longitudinal sample of adolescents from Grade 9 to Grade 12 using a developmental cascade model. The sample was made up of 544 adolescents (55.7% girls) who were assessed annually throughout the four years used in this study. Prior studies have had mixed results with regard to the direction of the relation between rejection, rejection sensitivity, depression, and aggression, and to our knowledge, no previous

study has integrated all of these variables in one model. We therefore examined the associations between rejection, rejection sensitivity, depression, and aggression in an exploratory nature.

In Study 2, we were interested in examining an intrapersonal factor that can impact belongingness (i.e., perfectionism). Specifically, we examined the temporal ordering of two types of perfectionism (i.e., socially prescribed perfectionism and self-oriented perfectionism), rejection sensitivity, and depression in a longitudinal sample of adolescents from Grade 9 to Grade 12 using a developmental cascade model. The sample was made up of 544 adolescents (55.7% girls) who were assessed annually throughout the four years of this study. There are only two published studies that examine rejection sensitivity as it pertains to perfectionism and depression, and our study was the first to our knowledge to use a longitudinal sample of adolescents to examine the developmental pathways of these variables across adolescence. Because there are no prior studies which examine perfectionism, rejection sensitivity and depression longitudinally, we examined the associations between these variables in an exploratory nature.

In Study 3, we were interested in building upon our findings from Study 2, and further examining an intrapersonal factor that can impact belongingness (i.e., perfectionism). Specifically, we examined the moderating role of rejection sensitivity between three types of perfectionism (i.e., socially prescribed perfectionism, self-oriented perfectionism, and other-oriented perfectionism) and depression in a Canadian young adult sample who were in their second year post high school. There are only two published studies that examine rejection sensitivity as it pertains to perfectionism and depression, one which did not include other-oriented perfectionism and the other which was conducted in a unique sample of Israeli young adults. Our study expanded on these by including other-oriented perfectionism and by using a

large sample of North American young adults. The sample was made up of 353 young adults (62% women, M_{age} = 19.41) and used a moderation regression analysis. We expected to find a positive relation between rejection sensitivity and depression, between self-oriented perfectionism and depression, and between socially prescribed perfectionism and depression, and we expected to find a negative relation between other-oriented perfectionism and depression. We expected rejection sensitivity would moderate the relations between each type of perfectionism and depression such that at high levels of rejection sensitivity, the relation between socially prescribed perfectionism and depression would be strongest.

Study 1: The Temporal Precedence of Peer Rejection, Rejection Sensitivity, Depression, and Aggression across Adolescence

The Temporal Precedence of Peer Rejection, Rejection Sensitivity, Depression, and Aggression across Adolescence

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Abstract

We examined the temporal precedence between perceived peer rejection, rejection sensitivity, depression, and aggression in a sample of 544 adolescents (55.7% girls; M_{age} = 14.96 years at the first measured time point) assessed yearly from Grade 9 to Grade 12. Using developmental cascade modelling to analyze the data, our study supported the symptoms-driven and social process models, in that perceived rejection was preceded by either depression or aggression at different times across adolescence. Similarly, rejection sensitivity was also preceded by depression and/or aggression. Although depression initiated the cascade leading to rejection sensitivity, our model also supported a bidirectional relation across late adolescence as rejection sensitivity also predicted future depression. Overall, our findings provide support that internalizing and externalizing problems lead to interpersonal difficulties with peers, such as perceived rejection and demonstrate the unique role of rejection sensitivity with regard to depression and aggression independent from perceived peer rejection.

Keywords: rejection, rejection sensitivity, depression, aggression, cascade models

The Temporal Precedence of Peer Rejection, Rejection Sensitivity, Depression and Aggression across Adolescence

The need to belong is universal to all humans, found in all cultures around the world and among all ages of development [1]. Beginning early in childhood, children seek out social interactions with others to form groups and friendships to fulfill this fundamental need. This behaviour increases as children approach middle childhood and early adolescence, when peers increase in importance during social development [2]. Belonging to a group is psychologically protective [1] and solidifies an individual's social identity [3]. When the need for inclusion is not met, and children feel like they are outright rejected by their peers, negative outcomes can ensue, such as hostility, social withdrawal, solitude, and depression in some children [4], or aggression in other children [5]. There is also evidence suggesting that peer rejection can be a consequence rather than a cause of internalizing and externalizing problems [e.g., 6, 7].

Peer Rejection

Peer rejection is a painful experience which occurs when an individual is actively disliked by his or her peers [8]. Peer rejection may also refer to individuals who are excluded, banished, or not accepted into a social group [9]. Those who are rejected by their peers tend to continue to experience rejection over time [6, 10].

Although some researchers have found that peer rejection is related to a multitude of maladaptive outcomes, such as anxiety, loneliness, social withdrawal, depression, anger, hostility, and aggression [5, 11, 12, 13], similar maladaptive traits and behaviour have also been attributed as causes of rejection. Specifically, children who are aggressive, socially withdrawn [6], irritable, impulsive [14], or behaviourally inhibited [15] have been found to have a higher likelihood of being rejected by their peers [6]. These findings present opposing directionality,

and it follows that there may be a cyclical nature over time to the relation between rejection and depressive or aggressive outcomes. Researchers have also found that the act of being rejected by peers may cause children to be sensitive to future peer rejection, called rejection sensitivity [16].

Rejection Sensitivity

Rejection sensitivity is the tendency for an individual to be more likely to anxiously or angrily expect and perceive rejection in both overt and ambiguous situations [17]. Additionally, those who are higher in rejection sensitivity tend to have stronger emotional reactions to real or perceived rejection [17, 18], resulting in long lasting maladaptive behaviour [17, 19]. Although rejection sensitivity aligns itself closely to social anxiety disorder (i.e., social phobia) in that both touch upon the anxious expectations that one experiences when rejected by others [20, 21], the difference between the two is that rejection sensitivity is made up of the expectation and perception of *rejection*, along with strong emotional reactions to perceived rejection, whereas social anxiety involves the intense fear, anxiety, or avoidance surrounding social situations where one may be judged by others [20]. The DSM-5 does not specify fear of rejection per se in its diagnostic criteria of social anxiety, but it does mention a fear of negative evaluation that occurs in one or more social situations where scrutiny by others is possible, such as meeting unfamiliar people, eating in public, giving a speech, or having a conversation with others [20]. In this study, the focus is on rejection sensitivity with an acknowledgment of its overlap with social anxiety.

Downey and Feldman [19] postulated the Rejection Sensitivity Model, where an individual who is repeatedly excluded from the peer group may develop expectations of rejection (i.e., rejection sensitivity). Thus, when in a situation where rejection is a possibility, the individual is more likely to interpret ambiguous social cues as evidence of rejection. This, in

turn, causes a negative emotional response, such as anger or anxiety, as well as an increased likelihood of maladaptive behaviour. These emotional and behavioural responses, when exaggerated, may lead to actual rejection by the peer group, creating a self-fulfilling prophecy.

Shortly after it was postulated, rejection sensitivity theory was expanded to include two specific and distinct defensive reactions to rejection that are seen in those high in rejection sensitivity [22]. Specifically, a rejected individual will either react anxiously to being rejected, which has been found to be related to internalizing problems such as depression or social anxiety, or they will react in anger, which has been linked to externalizing behaviour such as aggression [17]. In other words, rejected children and youth high in rejection sensitivity either get sad or mad—reactions that were assessed in the present study.

Research to date has provided support for the expanded rejection sensitivity theory in that rejection sensitivity follows experiences of rejection [16, 19, 23] and that rejection sensitivity is in turn linked to depression [24, 25] and/or aggression in the rejected individual [20, 26]. Interestingly, rejection sensitivity may not always be initiated by experiences of peer rejection directly. In Zimmer-Gembeck et al. [20], where past experiences of rejection were not measured, they found that rejection sensitivity was preceded by higher levels of depression symptoms. Depression in adolescence is linked to numerous stressors, such as academic achievement [27], family life [e.g., 28, 29], and of relevance to the present study, social status with peers, including rejection [e.g., 13, 30, 31].

Rejection and Depression: Competing Models

When it comes to explaining the relation between rejection and depression, the general focus in the literature is on depression being the outcome of peer rejection [e.g., 13, 32, 33, 34, 35, 36]. As is the case with many variables' relation to depression, internalizing problems are

often viewed as the result of negative interpersonal interactions and relationships. This direction of the relation is known as the *interpersonal risk model*.

Fewer studies have found support in the direction of depressive symptoms leading to individuals being rejected by the peer group, known as the *symptoms-driven model* [30, 37]. The guiding theory behind the symptoms-driven model is the *scar hypothesis*, which postulates that individuals who have suffered through internalizing problems such as depression have lasting effects in other areas of their lives, including interpersonal relationships [7, 10, 38, 39, 40].

Another theory to consider is the *transactional model*, where there is bidirectionality in the relation between depression and rejection over time [31]. In a transactional model, the changes which naturally occur in the individual's relationships with peers and experiences with peer rejection, as well as the changing depressive symptoms over time, are important. Both the stability and the changes that arise across time influence one another. Some researchers have found support for there being a bidirectional relation between peer rejection and depressive symptoms [18, 41].

Rejection and Aggression: Competing Models

Another potential reaction the perception of being rejected by peers is aggression. Peer aggression takes many forms and may be direct or indirect. Although most adolescent aggression by girls and boys is indirect [42], physical aggression is still used by some teens [43], which helps explain the notable correlation between indirect (i.e., relational) and direct aggression in childhood and adolescence ($\bar{r}$= .76) [42]. Given this high degree of intercorrelation, we examined both forms of aggression as a composite when examining links with peer rejection.

There are two theories which explain the association between aggression and peer rejection and how they influence one another over time, the *social process model* [44] and the

peer socialization model [45]. The social process model postulates that stable behaviour such as withdrawal or aggression may influence the types of peer interactions a person may have, such as being the target of peer rejection [46]. This model has been empirically supported by Ostrov [47] in young children, as well as by Zimmer-Gembeck and Duffy [48] in early adolescent girls, and by Ostrov et al. [49] in young adults, where relational aggression predicted later relational victimization in girls and women. Conversely, the peer socialization model postulates that peer rejection is the catalyst for increased aggressive behaviour over time [45]. That is, individuals who are rejected by their peers are more likely to behave aggressively toward others in the future. This model has been supported in preschool age children [50], preadolescents [51, 52], and adolescents [53]. A meta-analysis conducted by Wu et al. [54] also provided support for the peer socialization model, with a medium effect size ($r = 0.25$); however, only this direction of the relation was considered. Since there is support for both models, it follows that the association between aggression and peer rejection may be bidirectional and they may influence one another over time. Indeed, one study has found that that aggression and peer rejection were bidirectionally related [55].

Developmental Cascades

In order to test the possibility of bidirectional relations or to test the temporal precedence between variables throughout development, researchers have begun using developmental cascade models. Developmental cascades refer to the interactions across levels, domains, and systems over time, resulting in cumulative outcomes over the course of development across the lifespan [56, p. 491]. Cascade models control for both the stability in constructs over time, as well as concurrent associations across developmental domains [56]. An advantage of this type of analysis is that the directionality of effects can be explored. That is,

cascade models can differentiate if relations are direct and unidirectional, direct and bidirectional, or indirect through mediating variables [56].

Present Study

With the increasing importance of peer relationships across development [2], adolescence is one key developmental period where both rejection sensitivity and depression are emergent [57]. Further, rejection sensitivity has consistently been found to be one mechanism predicting depression among older adolescents approaching adulthood [18, 57]. As such, the developmental period on which we focussed for this study was adolescence.

To the best of our knowledge no studies have used developmental cascade models to examine the temporal ordering of perceived rejection, rejection sensitivity, depression, and aggression. Accordingly, we examined the directionality of these relations beginning when participants were in Grade 9 and ending when they were in Grade 12. We used a cascade model to explore the role of perceived peer rejection and rejection sensitivity within a more complex developmental system involving mental health and behaviour systems.

Most studies to date looking at rejection sensitivity have found that it increases following experiences of rejection [16, 19, 23]. There is also evidence that individuals who are high in rejection sensitivity are more likely to display higher levels of depressive [24, 25] and/or aggressive symptoms [18, 26]. Likewise, although there have been studies which support depression as the outcome of being rejected by peers [e.g., 13, 32, 33, 35, 36], many recent studies have also supported that mental health problems may explain poorer peer relationships [e.g., 7, 10, 38], and that the relation is reciprocal [18]. The relation between rejection and aggression is also mixed, with some studies supporting that aggression leads to more instances of

poor peer relationships [29, 46, 47, 49], whereas other studies provide evidence that rejection precedes aggressive behaviour [e.g., 45, 53, 54].

Given these discrepant findings it is difficult to predict the directionality of associations. As one example, rejection sensitivity may initiate the cascade (i.e., rejection sensitivity → depressive symptoms and/or aggression → perceived peer rejection), it may play a mediating role (i.e., depressive symptoms and/or aggression → rejection sensitivity → perceived peer rejection), or it may be the outcome of the cascade (i.e., depressive symptoms and/or aggression → perceived peer rejection → rejection sensitivity). Therefore, we examined the associations between perceived rejection, rejection sensitivity, depression, and aggression in an exploratory nature. Due to the exploratory nature of our study and the possibility of mediation effects, we also examined potential indirect pathways emerging from our analyses.

Previous studies have found that household income and parental education are related to mental health problems, such as depression, in childhood and adolescence [58]. A meta-analysis has also found that externalizing problems, such as aggression, have a small but significant relation to socioeconomic factors such as household income and parental education [59]. Knowing these variables are related to depression and aggression, we controlled for household income and parental education in our analyses. We also controlled for biological sex, which has been linked to rejection, depression, and aggression in previous studies. For instance, girls are more likely to have increased symptoms of depression than boys [e.g., 60, 61], and boys are more likely to use direct aggression than girls [42]. Finally, we controlled for race/ethnicity in our analyses, categorized as White and non-White due to the large number of participants who identified as White. Studies have shown that some children may be excluded from groups due to their ethnic identity [62], and thus ethnicity may have an impact on perceived rejection.

Method

Participants and Procedure

Participants were drawn from the McMaster Teen Study, an on-going longitudinal study designed to examine the relations between peer victimization, mental health, and academic achievement using a multi-method, multi-informant approach. In the spring of 2008, participants in Grade 5 (M_{age} = 10.91; 53% girls) were recruited from 51 randomly selected public primary schools (87 schools were eligible) located in a large Southern Ontario Public School Board. From the recruitment process, 875 participants agreed to take part in the study, and 544 (55.7% girls) participated in at least one time point between Grade 9 and Grade 12, the time frame used in this study. Parents of participating children provided written annual consent for their child and the students provided written assent for their participation in the study. Participants were compensated for their time with gift cards for completed questionnaires.

Longitudinal data were used beginning in Grade 9, when the average age of participants was 14.96 years, due to the availability of the variables used in this study. Participants were predominantly White (83%) and middle-class, which is representative of the demographic characteristics of the area from which the participants were recruited. Most parents (74%) reported having college or university education at the beginning of data collection.

Measures

Peer Rejection. Perceived peer rejection was measured using items from the interpersonal relations subscale of the Behavioural Assessment System for Children – Second Edition self-report of personality adolescent version [BASC-2 SRP-A; 59], which is designed for use with adolescents still in secondary school (ages 12-21). There are four items measuring peer rejection in the BASC-2 SRP-A. Two items are rated using *true* or *false* (2 = *true*, 0 = *false*)

(e.g., “My classmates don’t like to be with me.”) and two items are rated on a 4-point scale where 0 = *never,* 1 = *sometimes,* 2 = *often,* and 3 = *almost always* (e.g., “Other kids hate to be with me.”). Scores were calculated per the BASC manual using a sum. The interpersonal relations scale has high factor loadings on personal adjustment (.74). The internal consistency in our study for these items ranged from .74 to .85.

Rejection Sensitivity. Rejection sensitivity was measured starting in Grade 10 using the Brief Fear of Negative Evaluation Scale – II (BFNE-II) through self-reports [63]. This scale has 12 items (e.g., “I am afraid that others will not approve of me”) which are rated on a 5-point scale ranging from 0 = *not at all characteristic of me* to 5 = *extremely characteristic of me*, and were averaged to create a total score, where higher values indicate higher levels of rejection sensitivity. The internal consistency of the BFNE-II was excellent ($\alpha = .95$) and the scale fits a 2-factor solution; one theoretical (i.e., social anxiety and fear) and one method. The method-based factor comprises items from the scale that are reverse-worded. The BFNE-II has been validated in undergraduate students 18 years to 39 years of age [64], as well as more recently in adolescents [65]. The internal consistency of the BFNE-II for our study was consistent ($\alpha = .97$) across the measured times (Grades 10-12).

Depression. Participants’ self-reported symptoms of depression were measured using a subscale of the BASC-2 SRP-A [64]. The depression subscale assesses common symptoms of depression such as loneliness, sadness, and hopelessness through 12 items. True or false (*0 = false, 2 = true*; e.g., “Nothing is fun anymore”) and 4-point Likert scale items (*0 = never, 1 = sometimes, 2 = often,* and *3 = almost always*; e.g., “I feel sad”) are included. The clinical scales and adaptive scales have good internal consistency, $\alpha = .67$ - $.86$ and $\alpha = .81$ - $.83$, respectively. The depression subscale has high factor loadings on internalizing problems (.84). Self-reported

symptoms of depression were calculated by summing the scores of the items. Higher calculated sums are equivalent to higher symptoms of depression. The internal consistency of the depression composite for our study over time was high (α = .87-.91; Grade 9 to Grade 12).

Peer aggression. Peer aggression was assessed using the Aggressive Behaviour Scale [66], a self-report measure which looks at engagement in aggression at each time point. The Aggressive Behaviour Scale assesses both overt and relational aggression. Each of the 24 items were answered on a 4-point scale, where 0 = *not at all true* and 3 = *completely true* (e.g., "I am the kind of person who tells my friends to stop liking someone."). This measure was initially validated with children ages 11 to 16 and can be used with young adults, and there is good internal consistency for both the overt aggression subscales (from .79 to .84) and the relational aggression subscales (from .62-.78) [66]. Due to the high correlation between types of aggression (r_{grade9}=.59, p<.001, $r_{grade10}$=.50, p<.001, $r_{grade11}$=.57, p<.001, $r_{grade12}$=.53, p<.001), as well as the complexity of our analytical model, items were averaged into a single aggression variable. This combining of aggressive forms has also been used as an approach by other researchers [18]. The internal consistency of the Aggressive Behaviour Scale for our study was high (α = .89-.90; Grade 9 to Grade 12).

Analytic Plan

Analyses were performed using Mplus v8.0 [67] using maximum likelihood robust estimation with missing data. In order to test for fit in a cascade model, a series of nested models were performed and statistical fit between the models was assessed at each step. Models were assessed using the χ^2 test of significance, the root mean square error of approximation (RMSEA), the comparative fix index (CFI), and the Tucker–Lewis Index (TLI). Non-significant χ^2 values indicate good fit, RMSEA values <.06 indicate close fit, and CFI and TLI values >.95 indicate

adequate fit, [68, 69]. Nested models were compared using the Satorra-Bentler scaled chi-square test. After testing each model, the most parsimonious one with the best statistical fit was identified [70]. Once the final model was identified, selected indirect effects that were of theoretical interest were tested using maximum likelihood estimation with bootstrapped confidence intervals (with 5000 draws) since the distributions of indirect effects are often non-normal. Household income, parental education, race/ethnicity, and biological sex were included in each of the models as control variables. Model 1 included covariance terms between each of the variables assessed at the same time point (e.g., Grade 9 depression and Grade 9 rejection). In Model 2, one-year stability paths were added between repeated variables at consecutive time points (e.g., Grade 9 aggression to Grade 10 aggression), and in Model 3, two-year stability paths were added (e.g., Grade 9 aggression to Grade 11 aggression). Cross lagged paths between different variables at consecutive time points were added in Model 4 (e.g., Grade 9 depression to Grade 10 rejection).

Results

Missing data

The analytic sample (n=544) was compared to those who were not included but who participated in at least one of the follow up waves (i.e., Grades 6 to 8) of the study (n=159) on prior perceived peer rejection, depression, aggression, family income, and parental education using independent t-tests and on gender and ethnicity using chi-square tests. Participants in the analytic sample were more likely to be from families with higher household incomes, $t(201.353)=3.974$, $p<.001$, and to have parents with higher education levels, $t(676)=4.873$, $p<.001$. Girls were more represented in the analytic sample than those who only participated in earlier waves, $\chi^2(1)=8.255$, $p=.003$. No other differences were found.

In the analytic sample, Little's Missing Completely at Random test of study variables indicated that data from Grades 9-12 were not missing completely at random, $\chi^2(374)=463.238$, $p=.001$. We further investigated *t*-tests between those with missing data on one variable with data present on others. Of 196 tests conducted, we found that only two were significant after applying the Benjamini-Hochberg false discovery rate procedure [71]. Those who were missing reports of depression in Grade 10 had lower rates of aggression in the same year and those missing Grade 10 aggression had lower rates of Grade 10 rejection. It should be noted that both of the comparisons involved less than 5% of the sample in the missing group and may not be valid comparisons, and due to the low percentage of missing data, there is likely no meaningful impact on our results.

Descriptive statistics

Data were tested for assumptions of normality. All values of skewness and kurtosis were under the acceptable range of 3 for skewness and 10 for kurtosis [72]. Correlations, means, and standard deviations of all the study variables can be found in Table 1. All correlations were statistically significant between our variables of interest.

Sex differences were examined using independent *t*-tests. Across all four years girls had higher scores on depression than boys, $ps<.001$. Girls also reported higher peer rejection, $ps<.01$, and rejection sensitivity, $ps<.001$, than boys across all assessments. Girls and boys did not differ on levels of aggression, $ps>.05$.

Developmental models

Model fit statistics for each model are found in Table 2. The baseline model included all covariates and the within-time covariances between variables; this model had poor fit to the data. In Model 2, all the one-year across-time stability paths were added, which resulted in a

significantly better fit, $\Delta\chi_{SB}^2(11)=533.829$, $p<.001$. In Model 3, we added the two-year stability pathways, which was a significantly better fit than Model 2, $\Delta\chi_{SB}^2(7)=53.645$, $p<.001$. In Model 4, the cross-lagged paths between perceived peer rejection, rejection sensitivity, depression, and aggression at adjacent time points were included, which was a significantly better fit than Model 3, $\Delta\chi_{SB}^2(33)=102.214$, $p<.001$. In Model 5 non-significant covariate paths were trimmed. The resulting model did not significantly differ from Model 4, $\Delta\chi_{SB}^2(47)=39.047$, $p=.789$, and was chosen as the final model. The standardized model parameters are displayed in Figure 1.

In the final model there were positive concurrent associations between all variables. All of the one-year stability paths and all but one of the two-year stability paths (rejection Grade 10 to Grade 12) were statistically significant. We also found a number of longitudinal associations. Reciprocal relations emerged between depression and rejection sensitivity, that is, in Grades 9 and 11 depression was positively associated with rejection sensitivity the following year and in Grades 10 and 11 rejection sensitivity predicted depression one year later. Depression in Grade 9 and Grade 11 also predicted perceived rejection in each of the following years, that is, in Grade 10 and Grade 12. Grade 9 aggression was positively associated with Grade 10 rejection sensitivity. Grade 11 aggression predicted perceived rejection in Grade 12.

Indirect effects. A number of possible indirect effects of theoretical interest were tested using bootstrapped confidence intervals (N = 5,000; with 95% confidence intervals). None of the four-lag indirect effects were statistically significant. Of the three-wave indirect effects, two were statistically significant: Grade 9 depression to Grade 10 rejection sensitivity to Grade 11 depression, b=0.019[0.001, 0.047], β=0.018[0.001,0.045]; and Grade 10 rejection sensitivity to Grade 11 depression to Grade 12 perceived rejection, b=0.036[0.003, 0.081], β=0.025[0.002, 0.054].

Discussion

The purpose of this study was to examine the directionality of the relations between perceived peer rejection, rejection sensitivity, depression, and aggression across adolescence. To do this, we built an integrated cascade model using all four of these variables across four years of adolescent development. Our study is the first to our knowledge to use an integrated cascade model to study these variables and their relation over time.

There were no paths in the direction of perceived rejection leading to rejection sensitivity, a relation that has been found in previous research [16, 19, 23]. Our measure of rejection sensitivity looks specifically at the fear of being rejected by others, which is a defining feature of social anxiety [73]. Research has shown that those who are high in social anxiety are less likely to display negative emotions and behaviour when faced with negative interpersonal experiences [74]. A possible explanation for our findings may be that although the adolescents in our study may be preoccupied with being rejected, that preoccupation may cause them to work harder by suppressing negative emotions and behaviour to ensure they are not rejected by their peers [74]. Although this may be a reaction that is protective against peer rejection, the suppression of negative emotions may also have a more general impact on interpersonal interactions in that even positive experiences are avoided with this technique [75]. It is possible that there may be other unmeasured social interactions which suffer from this preoccupation with rejection.

We found that rejection sensitivity predicted depression at two time points, from Grade 10 to Grade 11 and from Grade 11 to Grade 12 and depression was also a predictor of rejection sensitivity across two time points (i.e., Grade 9 to Grade 10 and Grade 11 to Grade 12). This suggests that rejection sensitivity and depression may have a bidirectional relation across time.

Indeed, we found a statistically significant indirect pathway from Grade 9 depression to Grade 10 rejection sensitivity to Grade 11 depression. This significant indirect pathway provides evidence that there is a reciprocal relation between depression and rejection sensitivity across adolescence, which has been previously found [57]. Depressed individuals are more likely to recall memories of everyday experiences in a negative way [76, 77], creating a mental framework of depressive cognitive schemas [78] and leading to the belief that the relationship is or will be rejecting, thus increasing rejection sensitivity [17, 18]. In turn, as those who are high in rejection sensitivity are more likely to perceive and overreact to perceived rejection or threats of rejection [17, 18], rejection sensitivity may lead to more consistent negative social interactions which threaten belonging, and in turn, lead to increased future depression [24, 25]. Alternatively, our measure of rejection sensitivity, the fear of negative evaluation, is reflective of anxious rejection sensitivity and shares features with social anxiety, which is commonly comorbid with depression [79, 80, 81]. This could explain why rejection sensitivity and depression predict one another across time.

In our study, depression preceded perceived rejection at one time point, from Grade 11 to Grade 12, providing support for the symptoms-driven model. Depressed adolescents can develop a mental scar from depressive symptoms, which can lead to them experiencing negative peer interactions, including perceived or actual rejection. For example, adolescents who are depressed may struggle with developing social skills [82], or may be less adept at handling negative social interactions and interpersonal challenges [83], creating situations where they are rejected by their peers as a result of these deficits.

Additionally, there was also a significant indirect path from Grade 10 rejection sensitivity to Grade 11 depression to Grade 12 perceived rejection. Individuals high in rejection

sensitivity are more likely to interpret ambiguous social cues as evidence of rejection, invoking an exaggerated, anxious negative emotional response which is linked to increased depression [24, 25]. In turn, through the mental scar caused by depression, individuals may perceive themselves to be rejected by their peers [40]. Essentially, experiencing rejection sensitivity can lead to a self-fulfilling prophecy, where individuals perceive themselves as rejected by their peers, through the mediating role of depression.

With regard to aggression, we found support for the social process model, where individuals who are aggressive subsequently perceive themselves to be rejected by their peers. This relation was found specifically for aggression from Grade 11 to Grade 12. Although we did find one association from aggression to perceived rejection in our sample of both boys and girls, we may not have found as many pathways between these variables because we controlled for sex in our analyses. It is possible that separate analyses for girls would have revealed this relation at other time points of our model, which was found in one previous study [48].

Limitations

Although the use of cascade modelling is an important strength for the current study and provides support for the direction of the relations of interest, it still cannot determine causality and is not without weakness. For instance, some researchers have criticized cross-lagged panel models, such as cascade models, as representing a weighted blend of between- and within-person effects as opposed to actual within-person relationships over time, which may have an impact on their interpretation [84, 85]. Researchers should aim to replicate the findings from the current study using other analytical methods which distinguish between- and within-person effects, such as random intercept cross-lagged panel models, in order to provide stronger evidence of the directionality of our findings. Another potential limitation of our study was that

rejection sensitivity was only measured starting in Grade 10 and thus we cannot determine the temporal precedence before Grade 10 on this variable. For instance, a child could already be attuned to sensing rejection in situations before perceiving higher levels of rejection, depression, or aggression as measured in Grade 9. Based on prior research coupled with our findings starting from Grade 10, we would expect that Grade 9 rejection sensitivity would predict Grade 10 depression. It would be beneficial for future studies to have a measurement of this variable earlier in development in order to increase confidence in this pathway. Additionally, the measure we used for rejection sensitivity may be argued to be a component of social anxiety, which shares features with rejection sensitivity. It may be beneficial for future researchers to replicate these findings using another measure of rejection sensitivity. A further limitation of our study was that we were unable to examine sex as a moderator. Due to the number of variables in our model, our sample size was not large enough to include a minimum of five cases per model parameter and examining sex as a moderator would be underpowered. As a result, we controlled for sex as a covariate in our model. Similarly, due to the complexity of our model and our sample size, we were unable to separate types of aggressive behaviour in our model and we therefore created an aggregate aggression variable. Researchers should include larger sample sizes in order to test sex as a moderator, to separate types of aggressive behaviour, and to test for indirect effects. As all measures used in this study were self-reports, shared-method variance is also a possible limitation of this study, which may have inflated the results. Finally, despite the fact that our dataset was representative of the geographic area from which our sample was drawn in terms of household income and education at the time the overall study began, attrition may mean that the sample may not be representative of the random sampling as it was at the first time point.

Future studies should include a random sampling from differing areas to fully represent a range of socioeconomic status to confirm if our results are generalizable across a wider population.

Summary

Rejection has been linked with internalizing (e.g., depression) and externalizing (e.g., aggression) difficulties, but until recently, the directionality of this relation was assumed to be rejection as the cause of these difficulties. However, this directionality may not always be the case. Our study provides support to the growing literature on perceived rejection as the outcome of negative internalizing and externalizing behaviour. Using developmental cascade modelling, we found that both depression and aggression are precursors to perceived peer rejection, providing support for the symptoms-driven model and the social process model, respectively. Further, we found that rejection sensitivity also plays a role in the persistence of depressive symptoms across adolescence, with depressive symptoms predicting rejection sensitivity, but the two measures contributing to each other at future time points across development. This is an interesting finding, as it is the fear of and preoccupation with rejection that is consistently related to depressive symptoms, and not solely perceived rejection on its own.

These findings provide a broader and more comprehensive view of internalizing and externalizing problems as predictors of interpersonal difficulties, such as perceived peer rejection. Further, our study demonstrates the unique role of rejection sensitivity with regard to depression and aggression independent from perceived peer rejection. Perhaps rejection sensitivity is more than a measure of, or an outcome of, rejection and plays a role in the maintenance of depression in adolescence, when acceptance by peers is of utmost importance.

Depression and depressive symptoms in adolescence can have serious consequences for the affected individuals. There are many known causes and outcomes of depression in

adolescence, but how they are linked to depression or to one another are not always clear, especially developmentally. With the knowledge of our finding that rejection sensitivity and depression influence each other over time across adolescence, one could look to treat symptoms of rejection sensitivity in order to also decrease symptoms of depression. Understanding this relation between depressive symptoms and rejection sensitivity may provide another tool in the treatment of adolescent depression.

Compliance with Ethical Standards

Conflict of interest. The authors declare no conflict of interest.

Ethical Approval. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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Table 1. Descriptive Statistics

	DEP9	DEP10	DEP11	DEP12	REJ9	REJ10	REJ11	REJ12	AGG9	AGG10	AGG11	AGG12	RS10	RS11	RS12
DEP9	1														
DEP10	.64	1													
DEP11	.52	.65	1												
DEP12	.47	.51	.59	1											
REJ9	.67	.39	.31	.29	1										
REJ10	.47	.67	.47	.34	.53	1									
REJ11	.35	.44	.61	.31	.46	.61	1								
REJ12	.37	.35	.49	.54	.30	.40	.53	1							
AGG9	.38	.27	.29	.25	.28	.21	.18	.25	1						
AGG10	.23	.31	.27	.23	.20	.29	.18	.29	.64	1					
AGG11	.21	.23	.34	.28	.18	.22	.25	.30	.66	.73	1				
AGG12	.30	.34	.32	.38	.21	.24	.21	.34	.56	.68	.74	1			
RS10	.31	.49	.39	.40	.25	.37	.28	.25	.31	.33	.28	.34	1		
RS11	.25	.34	.50	.41	.21	.28	.44	.33	.25	.18	.29	.28	.63	1	
RS12	.29	.36	.41	.51	.25	.30	.28	.46	.17	.18	.26	.33	.52	.64	1
M	4.44	5.17	5.09	5.21	0.83	0.97	1.00	0.97	0.34	0.33	0.31	0.31	2.64	2.61	2.61
SD	5.69	6.01	5.67	5.41	1.62	1.81	1.82	1.59	0.32	0.33	0.33	0.33	1.08	1.06	1.07

Note: DEP = depression; REJ = rejection; AGG = aggression; RS = rejection sensitivity

Table 2. Model Fit Statistics

	χ^2	df	c	*p*	RMSEA (90% CI)	CFI	TLI	cd	vs.	$\Delta\chi^2$	*p*	Δdf
Model 1: within-time covariances	1281.808	84	1.708	<.001	.162(.154,.170)	.546	.108	-	-	-	-	-
Model 2: within-time covariances and one-year stability	229.888	73	1.441	<.001	.063(.054, .072)	.941	.866	3.481	2 vs 1	533.829	<.001	11
Model 3: within-time covariances, one- and two-year stability	159.616	66	1.372	<.001	.051(.041, .050)	.965	.911	2.093	3 vs 2	53.645	<.001	7
Model 4: within-time covariances, and one- and two-year stability paths, cross-lagged paths	56.180	33	1.335	.007	.036(.019, .052)	.991	.956	1.408	4 vs 3	102.214	<.001	33
Model 5: trimmed covariates	100.011	80	1.448	.065	.021(.000,.034)	.992	.984	1.011	4 vs 5	39.047	.789	47

Model 5 is the final model. df = degrees of freedom; c = weighting constant under maximum likelihood robust estimation; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; cd = weighting constant for the Satorra-Bentler scaled chi-square test

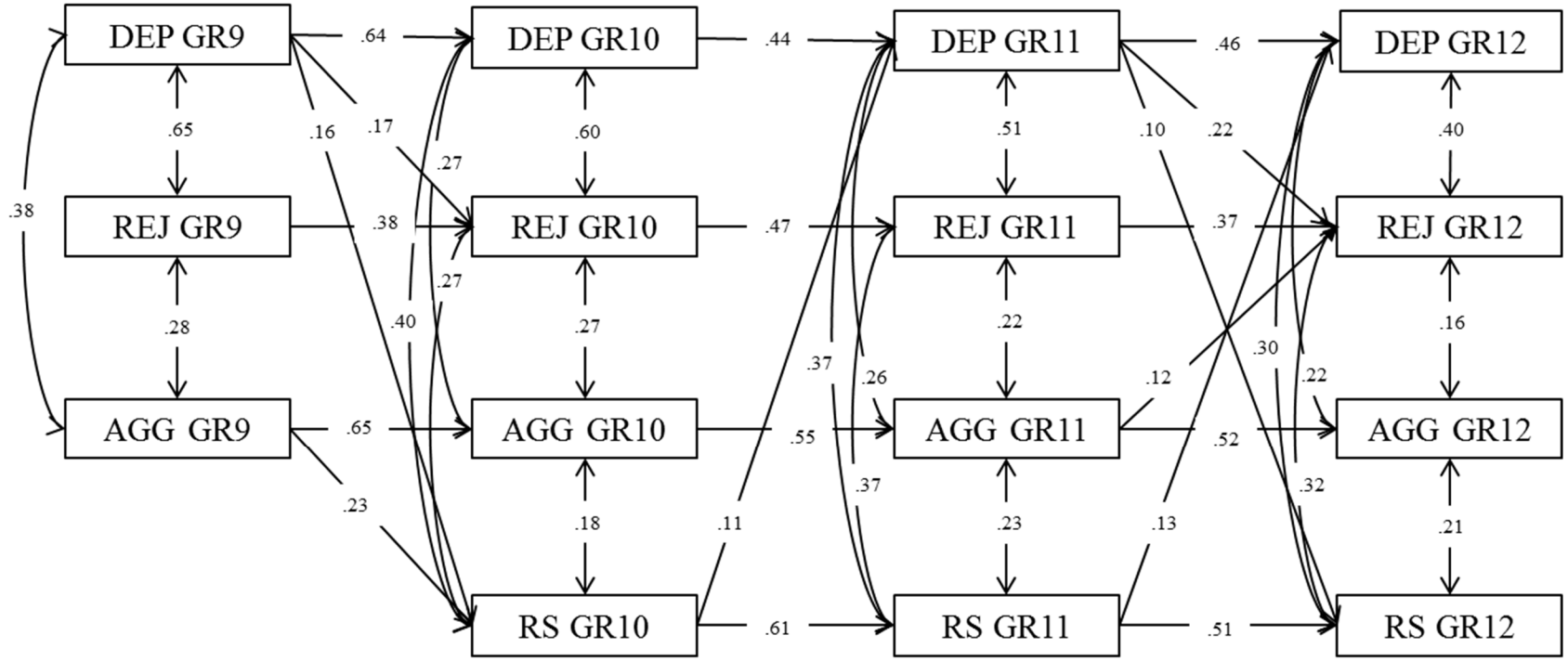

Figure 1: Cascade Model of Depression, Aggression, Rejection, and Rejection Sensitivity. DEP = depression; REJ = rejection; AGG = aggression; RS = rejection sensitivity. Standardized parameter estimates in the model are significant at $p<.05$. All non-significant paths, two-lag paths, and those involving significant (untrimmed) covariates are included in the model but not shown for ease of interpretation.

Study 2: The Temporal Precedence of Perfectionism, Depression, and Rejection Sensitivity across Adolescence

The Temporal Precedence of Perfectionism, Depression, and Rejection Sensitivity across Adolescence

Christina M. L. Beeson

Abstract

The temporal precedence between perfectionism, depression, and rejection sensitivity was examined across four years of adolescent development (N = 544; grades 9-12). Using developmental cascade models, mixed results were found. Socially prescribed perfectionism was concurrently related to depression at each time point assessed, and in late adolescence, socially prescribed perfectionism predicted increases in depression symptoms one year later. Although self-oriented perfectionism was only concurrently related to depression in middle adolescence, the Social Disconnection Model was supported in that rejection sensitivity mediated the relation between self-oriented perfectionism and depression. Depression was also found to predict rejection sensitivity; however, our model also supported a bidirectional relation across late adolescence as rejection sensitivity also predicted future depression. Overall, our findings provide support that different forms of perfectionism are related directly or indirectly with depression, and rejection sensitivity plays a role in the development and maintenance of depression.

The Temporal Precedence of Perfectionism, Depression, and Rejection Sensitivity across Adolescence

Perfection is humanly impossible to achieve; however, striving for perfection is a common ambition for many people. This is truer now than it was 30 years ago, as perfectionism has increased by up to 33% since 1989 in college aged students from the United States, Canada, and the United Kingdom (Curran & Hill, 2019). People are more demanding of perfection from others and themselves, resulting in individuals working harder to achieve the unachievable. As perfectionism has been linked with mental health problems (e.g., Cox & Enns, 2003; Hewitt & Flett, 1991) and interpersonal difficulties (e.g., Habke & Flynn, 2002; Hewitt et al., 2006), this increase in perfectionistic tendencies warrants research into how perfectionism may play a role in development.

Perfectionism

Perfectionism is a maladaptive personality construct which includes self-imposed, unrealistically high standards against which a person evaluates him or herself, often leading to negative self-evaluation (Shafran, Cooper, & Fairburn, 2002). Through being unable to meet these unrealistic standards, a person who has perfectionistic traits is more vulnerable to developing symptoms of depression through negative cognitive biases (Beck, Rush, Shaw, & Emery, 1979).

Perfectionism can be divided into three main types based on the target of the perfectionistic behaviour, perfectionistic concerns, and perfectionistic strivings (Dunkley & Bankstein, 2000; Stoeber & Otto, 2006). Individuals who have perfectionistic concerns are likely to be highly critical of themselves and have strong, negative reactions to real or perceived failure. These individuals believe that others demand perfection of them and feel like they cannot

achieve the high standards expected of them. This is also called socially prescribed perfectionism (Hewitt & Flett, 1991). Socially prescribed perfectionism is linked to a number of negative mental health outcomes, such as depression, anxiety, and suicide (Cox, Clara, & Enns, 2009; Hewitt & Flett, 1991; Roxborough et al., 2012), even after controlling for known predictors such as neuroticism (Sherry & Hall, 2009). Perfectionistic concerns are also related to a number of physical health outcomes, including poor sleep and somatic manifestations (e.g., digestive problems; Molnar, Reker, Culp, Sadava, & DeCourville, 2006). Individuals who are high in perfectionistic concerns are also more likely to have interpersonal difficulties (Habke & Flynn, 2002).

The other component of perfectionism, perfectionistic strivings, come more from within a person, and include unrealistically high standards for oneself in which perfection is demanded. It is also known as self-oriented perfectionism. Researchers have found that although self-oriented perfectionism is linked to depression, the relation is weaker to mental health outcomes when compared to socially prescribed perfectionism (Asseraf & Vaillancourt, 2015; Cox & Enns, 2003; Flett et al., 2011, Hewitt et al., 1996; O'Connor et al., 2010).

Other-oriented perfectionism is when an individual demands perfection from others, and is related to a host of interpersonal problems (Hewitt & Flett, 1991) such as psychopathy, narcissism, and social dominance (Stoeber, 2014). However, unlike socially prescribed perfectionism and self-oriented perfectionism, it is not related to depression (Asseraf & Vaillancourt, 2015; Cox & Enns, 2003; Flett et al., 2011, Hewitt et al., 1996; O'Connor et al., 2010). Unlike socially prescribed perfectionism and self-oriented perfectionism, which have been examined in children and adolescents, other-oriented perfectionism has only been examined in adult samples in previous research, as there is no evidence that it emerges before adulthood

(Flett et al., 2016). As a result, this study only focused on socially prescribed and self-oriented perfectionism.

Recently, Vaillancourt and Haltigan (2017) looked at the developmental trajectory of perfectionism in Canadian youth and found three distinct trajectories across adolescence, low stable (41.6%), moderate increasing (40.5%), and high increasing (17.9%). It is concerning that most youth in this study had increasing perfectionistic traits across adolescence because of the poor mental health outcomes associated with perfectionism.

Depression

Depression is a well known mental disorder affecting adolescents, with a lifetime prevalence rate ranging from 1 in 10 to 1 in 5 (Avenevoli et al., 2015; Merikangas et al., 2010; Thapar, 2012). Adolescence is an especially challenging time in development, as it is during this developmental period where depression often emerges and increases in prevalence (American Psychiatric Association [APA], 2013) before stabilizing toward the end of the adolescent years (Rudolph, 2009; Vaillancourt & Haltigan, 2017).

Several researchers have found that negative thoughts initiate and allow the continuation of depression (e.g., Alloy et al., 2006; Beck, 1967; Clark, Beck, & Alford, 1999). Specifically, individuals who are vulnerable to developing depression pay attention to and process negative information from experiences, resulting in a negative cognitive bias (Beck, 1976; Clark, Beck, & Alford, 1999). This bias can cause negative self-attributions, leading to an increased risk in the development of depression or depressive symptoms (Alloy et al., 2006).

In addition to negative cognitive biases, a number of other variables are also known to be correlated to the development of depression in adolescence, such as gender, with girls being more likely to have depressive symptoms and depression than boys (e.g., 24% of girls compared

to 15% of boys; Salk et al., 2016), as well as poor academic achievement (Fröjd et al., 2008), poor family life (e.g., Aseltine, 1996; Greenburger & Chen, 1996), and of relevance to the present study, perfectionism (e.g., Vaillancourt & Haltigan, 2017).

Social Disconnection Model

Perfectionists tend to have interpersonal difficulties and can thus be socially disconnected from others (Sherry, Mackinnon, & Gautreau, 2016). This can be due to a number of factors, including being overly dependent and needy, or being harsh, hostile, and rejecting of others (Habke & Flynn, 2002). This maladaptive interpersonal behaviour is often triggered by real or perceived criticism or failure.

To explain these interpersonal difficulties, Hewitt et al. (2006) developed the Social Disconnection Model, which proposes a mechanism for the link between perfectionism and negative mental health outcomes (e.g., depression, anxiety, suicide), wherein social disconnection is the mediating variable connecting the two. This model has been recently expanded to include the other forms of perfectionism (i.e., self-oriented perfectionism and other-oriented perfectionism), as these types of perfectionism are also linked to social disconnection and interpersonal problems (Sherry, Mackinnon, & Gautreau, 2016).

It is the social disconnection that perfectionists experience that leads to a sense of not belonging, isolation, or even perceived rejection (Hewitt et al., 2006). The unrealistic expectations that perfectionists believe others have of them cannot be achieved, and thus they constantly believe, often in error, that they are disappointing others (Hewitt et al., 2006). Perfectionists are more likely to interpret ambiguous, daily social interactions as negative and disapproving, resulting in feelings of rejection and exclusion by others (Sherry et al., 2013), whether true or not. The social disconnection from which perfectionists suffer can stem from a

number of predictors, including perceived lack of social support (Sherry et al., 2008) and insecure attachment (Chen, Hewitt, & Flett, 2015).

The maladaptive way in which perfectionists view their social interactions, that is, being more prone to interpret ambiguous situations as disapproval and rejection by others (Hewitt et al., 2006; Sherry et al., 2013) has similar features to that which those high in rejection sensitivity experience. From this, it follows that there is a likely relation between perfectionism and rejection sensitivity.

Rejection sensitivity is a personality construct wherein an individual, when faced with overt or ambiguous social situations where rejection is possible, is more likely to expect and perceive rejection, whether or not rejection is actually occurring (Downey et al., 1998). Individuals who are higher on rejection sensitivity are not only ready to interpret social cues as evidence of rejection, they do so with a heightened emotional reactivity (Downey et al., 1998; Zimmer-Gembeck et al., 2016), which may lead to continuing emotional and social problems (Downey & Feldman, 1996; Downey et al., 1998). Several researchers have studied rejection sensitivity as a direct outcome of rejection (Downey & Feldman, 1996; Feldman & Downey, 1994; Rosenbach & Renneberg, 2014); however, researchers have also demonstrated that rejection sensitivity exists in the absence of direct rejection (Zimmer-Gembeck et al., 2016).

Rejection sensitivity shares many common features with social anxiety. Specifically, both involve the anxious cognitions that one experiences when rejected or judged by others (APA, 2013; Park, 2007). However, while rejection sensitivity measures an individual's expectation and perception of rejection, coupled with the emotional reactions to potentially rejecting situations, social anxiety involves the intense feelings of fear, anxiety, or avoidance of social situations where judgement by others may occur (APA, 2013).

To date, very few studies have looked at the relation between perfectionism, rejection sensitivity, and depression. Flett, Besser, and Hewitt (2014) studied a community sample of 183 young adults from Israel. Using a cross-sectional design, they found that participants who were high in both socially prescribed perfectionism and rejection sensitivity were more vulnerable to experiencing symptoms of depression, whereas those low in both socially prescribed perfectionism and rejection sensitivity were not. One issue of this study, however, is that the direction of the relation between these variables was implied from cross-sectional data, where depression was used as an outcome variable. Although this study provided novel information in that it was the first to look at the role rejection sensitivity may have in the link between perfectionism and depression, causal conclusions and the directionality of the relation cannot be drawn. Another recent study by Magson et al. (2019) looked at the relation between perfectionism, rejection sensitivity, and depression using the framework of the Social Disconnection Model. In a sample of 510 pre-adolescents from Australia, they found that both self-oriented perfectionism and socially prescribed perfectionism were related to higher levels of interpersonal difficulty, including rejection sensitivity, as well as to higher levels of depression and other mental health outcomes. Again, however, this study used a cross-sectional study design, and the direction of the relation between these variables can only be implied.

Although the use of cross-sectional data can provide preliminary results where relations between variables can be uncovered, cross-sectional data cannot be used to assess dynamic and bidirectional associations which influence one another over time (Vaillancourt et al., 2013). These types of associations can only be tested using longitudinal data. One type of analysis that can test the dynamic and reciprocal relations of variables across time is developmental cascade modelling, where interactions of variables across levels, domains, and systems can result in

cumulative outcomes over the course of development across the lifespan (Masten & Cicchetti, 2010, p. 491).

Present Study

In the present study, we examined the relation between perfectionism, depression, and rejection sensitivity from a developmental perspective. To date, only two known studies have looked at the relation between these variables. One found that participants who were high in both socially prescribed perfectionism and rejection sensitivity were more vulnerable to experiencing symptoms of depression, whereas those low in both socially prescribed perfectionism and rejection sensitivity were not (Flett, Besser, & Hewitt, 2014), while the other found that higher levels of both socially prescribed and self-oriented perfectionism were related to higher rejection sensitivity as well as higher levels of depression (Magson et al., 2019). However, these studies were correlational and thus directionality could not be determined. To the best of our knowledge, this study is the first to analyze the developing relation across adolescence using longitudinal data and a developmental cascade model.

Although prior studies found depression to be the outcome variable in the relation between perfectionism and rejection sensitivity, the cross-sectional nature of the data assumed this direction of the relation. Vaillancourt and Haltigan (2017), using longitudinal data, found evidence for the scar hypothesis, where individuals with higher depressive symptoms display higher perfectionistic tendencies over time. It is also possible that, based on the transactional model, depression and perfectionism may influence one another over time. The role of rejection sensitivity in the relation is also yet unknown. Rejection sensitivity may initiate the cascade, it may play a mediating role, or it may be the outcome of the cascade. Therefore, we examined the role of rejection sensitivity in an exploratory manner.

Previous studies have found that household income and parental education are related to mental health problems, such as depression, in childhood and adolescence (Reiss, 2013). Knowing these variables are related to depression, we controlled for household income and parental education in our analyses. We also controlled for biological sex, which has been linked to depression in previous studies. For instance, girls are more likely to have increased symptoms of depression than boys (e.g., Hankin et al., 1998; Salk et al., 2016; Vaillancourt & Haltigan, 2017), and although some researchers have found that there are no sex differences in rejection sensitivity (McLachlan et al., 2010; Zimmer-Gembeck et al. 2007), others have found that girls are more likely to report rejection sensitivity than are boys (Zimmer-Gembeck et al., 2014) or that boys have higher levels of rejection sensitivity than girls (Marsten, Hare, & Allen, 2010). Finally, some researchers have found that there may be cultural differences in levels of perfectionism; specifically, one study found that White participants had higher levels of socially prescribed perfectionism than African Americans (Nilsson et al., 1999). For this reason, we controlled for race/ethnicity in our analyses.

Method

Participants and Procedure

Participants were drawn from the McMaster Teen Study, an on-going longitudinal study originally designed to examine the relations between peer victimization, mental health, and academic achievement using a multi-method, multi-informant approach. In the spring of 2008, participants were recruited from 51 randomly selected public primary schools located in a large Southern Ontario Public School Board. From the recruitment process, 875 participants agreed to take part in the study with 703 actually participating (80% retention rate) in the longitudinal arm of the study. For this study, 544 (55.7% girls) participated in at least one time point between

Grade 9 and Grade 12. Parents of participating children provided annual consent for their own participation in a telephone interview and consent for their child and the students provided assent for their participation in the study. Participants were compensated for their time with gift cards for completed questionnaires and interviews.

Longitudinal data were used beginning in Grade 9, when the average age of participants was 14.90 years (SD = 0.35), due to the availability of the variables used in this study. Participants were predominantly White (83%) and middle-class, which is representative of the demographic characteristics of the area from which the participants were recruited. Most parents (74%) reported having college or university education at the beginning of data collection.

Measures

Perfectionism. Perfectionism was measured using the Child and Adolescent Perfectionism Scale (CAPS), which were self-reported by the youth at each time point (Flett et al., 1997). This scale has 22 items which are rated on a 5-point Likert-type scale ranging from 1 = *not at all true of me* and 5 = *very true of me*, with higher scores indicating higher levels of perfectionism. The CAPS assesses both self-oriented perfectionism (e.g., "I try to be perfect in everything I do.") and socially prescribed perfectionism (e.g., "There are people in my life who expect me to be perfect."). Scores for self-oriented perfectionism and socially prescribed perfectionism were averaged to create a mean score for each type of perfectionism. The internal consistency for the CAPS for the McMaster Teen Study was high across the time range studied (i.e., Grade 9 to Grade 12; range α = .88 - .92).

Depression. Participants' self-reported symptoms of depression were measured using the self-report of personality (adolescent version) subscale of the BASC-2 (Reynolds & Kamphaus, 2004), which is designed for use with adolescents still in secondary school (SRP-A; ages 12-21).

The depression subscale assesses common symptoms of depression such as loneliness, sadness, and hopelessness through 12 items. True or false (*0 = false, 2 = true*; example item, "Nothing is fun anymore") and 4-point Likert scale items (*0 = never, 1 = sometimes, 2 = often,* and *3 = almost always*; example item, "I feel sad") are included. Self-reported symptoms of depression were calculated by summing the scores of the items. Higher calculated sums are equivalent to higher symptoms of depression. The internal consistency of the BASC-2 over time for the McMaster Teen Study was high (α = .87-.91; Grade 9 to Grade 12).

Rejection Sensitivity. Rejection sensitivity was measured through self-reports starting in Grade 10 using the Brief Fear of Negative Evaluation Scale – II (BFNE-II) (Carleton et al., 2006). This scale has 12 items (e.g., "I am afraid that others will not approve of me") which are rated on a 5-point scale ranging from 0 = *not at all characteristic of me* to 5 = *extremely characteristic of me*, and were averaged to create a total score, where higher values indicate higher levels of rejection sensitivity. The internal consistency of the BFNE-II has been shown to be excellent, and was consistent (α = .97) across the measured times (Grades 10-12).

Analytic Plan

Analyses were completed using maximum likelihood robust estimation with missing data in Mplus v8.0 (Muthén &Muthén, 1998–2017). In order to test for fit in a cascade model, a series of nested models was performed and statistical fit between the models was assessed at each step using the χ^2 test of significance, the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the Tucker–Lewis Index (TLI). Non-significant χ^2 values indicate good fit, RMSEA values <.06 indicate close fit, and CFI and TLI values >.95 indicate adequate fit (Browne & Cudeck, 1992; Hu & Bentler, 1999). Nested models were compared using the Satorra Bentler scaled chi-square test and the Akaike information criterion (AIC). After testing

each model, the most parsimonious one with the best statistical fit was identified (Masten et al., 2005). Once the final model was identified, potential indirect effects were tested using bootstrapped confidence intervals (with 5000 draws). Household income, parental education, race/ethnicity, and biological sex were included in each of the models as control variables. Model 1 included covariance terms between each of the variables assessed at the same time point (e.g., Grade 9 depression and Grade 9 self-oriented perfectionism). In Model 2 one-year stability paths were added between repeated variables at consecutive time points (e.g., Grade 9 socially prescribed perfectionism to Grade 10 socially prescribed perfectionism), and in Model 3, two-year stability paths were added (e.g., Grade 9 socially prescribed perfectionism to Grade 11 socially prescribed perfectionism). Cross lagged paths between different variables at consecutive time points were added in Model 4 (e.g., Grade 9 depression to Grade 10 self-oriented perfectionism).

Results

Missing data

Little's Missing Completely at Random test of study variables indicated that data from Grades 9-12 were not missing completely at random, $\chi 2(474)=599.035$, $p=.000$. Accordingly, the analytic sample (n=544) was compared to those who were not included but who participated in at least one of the follow up waves (i.e. Grades 6 to 8) of the study (n=159) on prior perfectionism, depression, rejection sensitivity, family income, and parental education using independent *t*-tests and on gender and ethnicity using chi-square tests. Participants in the analytic sample were more likely to be from families with higher household incomes, $t(770)=6.993$, $p<.001$. No other differences were found.

Descriptive statistics

Assumptions of normality for our data were confirmed, with all values of skewness and kurtosis being within the acceptable range of 3 for skewness and 10 for kurtosis (Kline, 2011). Correlations, means, and standard deviations of the included study variables are presented in Table 1.

In order to determine if sex differences existed within the data, independent *t*-tests were used for each variable of interest. Across all four years girls had higher depression scores than boys, *p*s<.001. Girls also reported higher rejection sensitivity, *p*s<.001, than boys across all assessments. There were no significant differences between girls and boys with regard to either socially prescribed perfectionism or self-oriented perfectionism at any time point.

Developmental models

Model fit statistics for each model are found in Table 2. The baseline model included all covariates and the within-time covariances between variables; this model had poor fit to the data. In Model 2, all the one-year across-time stability paths were added, which resulted in a significantly better fit, $\Delta\chi SB2(11)= 1233.839$, p<.001. In Model 3, we added the two-year stability pathways, which was a significantly better fit than Model 2, $\Delta\chi SB2(7)= 87.112$, p<.001. In Model 4, the cross-lagged paths between perfectionism, depression, and rejection sensitivity at adjacent time points were included, which was a significantly better fit than Model 3, $\Delta\chi SB2(33)= 129.047$, p<.001. In Model 5, non-significant covariate paths were trimmed. The resulting model did not significantly differ from Model 4, $\Delta\chi SB2(52)= 56.692$, p=.304, and was chosen as the final model. The standardized model parameters are shown in Figure 1.

In our final model there were positive concurrent associations between all variables except between depression and self-oriented perfectionism in Grade 11 and Grade 12, where no

associations were present. All of the one-year stability paths and all of the two-year stability paths were statistically significant. We also found a number of cross-lag associations. Self-oriented perfectionism in Grade 9 predicted rejection sensitivity in Grade 10. In Grade 11, self-oriented perfectionism was positively associated with socially-prescribed perfectionism in Grade 12. Socially-prescribed perfectionism in Grade 11 predicted higher levels of depression in Grade 12. Reciprocal relations emerged between depression and rejection sensitivity, that is, in Grades 9 and 11 depression was positively associated with rejection sensitivity the following year and in Grades 10 and 11 rejection sensitivity predicted depression one year later.

Indirect effects

Six possible indirect effects were tested using bootstrapped confidence intervals (N = 5,000; with 95% confidence intervals). Specifically, we tested the following indirect effects: Grade 9 self-oriented perfectionism to Grade 10 rejection sensitivity to Grade 11 depression to Grade 12 rejection sensitivity, including both three-year pathways with these variables; as well as Grade 9 depression to Grade 10 rejection sensitivity to Grade 11 depression to Grade 12 rejection sensitivity, and both three-year pathways with these variables. Two of the indirect effects were statistically significant, specifically Grade 9 self-oriented perfectionism to Grade 10 rejection sensitivity to Grade 11 depression and Grade 9 depression to Grade 10 rejection sensitivity to Grade 11 depression (see Table 3).

Discussion

The purpose of this study was to determine the directionality of the relations between two types of perfectionism, depression, and rejection sensitivity across late adolescence using developmental cascade modelling. To our knowledge, no researchers have used an integrated

cascade model to study these variables and their relation over time in a sample of adolescents assessed across four years of development.

Socially prescribed perfectionism, self-oriented perfectionism, depression, and rejection sensitivity were stable across time. This finding coincides with what has been found in previous research, as it has been found that perfectionism (Rice & Aldea, 2006), depression (Cole et al., 2002), and rejection sensitivity (Downey & Feldman, 1996; Downey et al., 1998; Marsten, Hare, & Allen, 2010) are stable across adolescence. Within time, all the variables were significantly related to one another at each time point, except for depression and self-oriented perfectionism in Grade 11 and Grade 12. This also provides support for findings from previous studies, where perfectionism is concurrently related to depression (e.g., Cox, Clara, & Enns, 2009; Hewitt & Flett, 1991; Roxborough et al., 2012), as well as to rejection sensitivity (Flett, Besser, & Hewitt, 2014; Magson et al., 2019), and where depression is concurrently associated with rejection sensitivity (Zimmer-Gembeck et al., 2016). The lack of within time associations between depression and self-oriented perfectionism at two time points is also supported by earlier research, where a longitudinal association exists between these variables, but concurrent relations are often not found (Curran & Hill, 2019; Smith et al., 2018; Smith et al., 2016).

With regards to the relation between perfectionism and depression, we found that only socially prescribed perfectionism had a direct relation with future depression, with socially prescribed perfectionism in Grade 11 leading to greater symptoms of depression in Grade 12. This finding coincides with previous research, which has indicated that there is a stronger relation between socially prescribed perfectionism and depression than other forms of perfectionism (Cox & Enns, 2003; Flett et al., 2011, Hewitt et al., 1996; O'Connor et al., 2010).

Self-oriented perfectionism initiated the cascade leading to rejection sensitivity from Grade 9 to Grade 10. Although self-oriented perfectionism, in which a person has unrealistically high standards for themselves that they strive to meet, is not driven by perceived pressure from an outside source as is the case for socially prescribed perfectionism, it may be that an individual who has high self-oriented perfectionism is trying to improve how others perceive them by demonstrating talent or ability across a number of areas. Therefore, they may be more sensitive to ambiguous situations of rejection, and be high in rejection sensitivity as a result.

Self-oriented perfectionism in Grade 11 was related to socially prescribed perfectionism in Grade 12. This pathway was only found across one time point toward the end of high school. This may be because this is a key year in development as adolescents are preparing for either post-secondary education or the workforce as they complete their final year of high school. It could be that as they focus more on post-secondary goals, those who have higher levels of self-oriented perfectionism in Grade 11 begin to project the source of their personal high standards and believe that important adults in their lives also expect perfection of them as they apply to college, university, or jobs outside of school. One study by Domocus and Damian (2018) demonstrated that self-oriented and socially prescribed perfectionism in adolescents can be influenced by perceived pressure and/or support by parents and teachers. There may be other factors not examined in our study, such as parenting practices, that may provide further explanation for this link between self-oriented perfectionism and future socially prescribed perfectionism.

We found a statistically significant indirect pathway from Grade 9 self-oriented perfectionism to Grade 10 rejection sensitivity to Grade 11 depression. This indirect pathway supports the Social Disconnection Model, which proposes a mechanism for the link between

perfectionism and negative mental health outcomes, wherein social disconnection is the mediating variable connecting the two (Hewitt et al., 2006). Rejection sensitivity can be considered a form of social disconnection. Adolescents who are high in rejection sensitivity tend to view social interactions through a more negative lens, as they are prepared to interpret ambiguous situations as proof of rejection by peers (Downey et al., 1998; Zimmer-Gembeck et al., 2016). This constant readiness to anticipate rejection by others creates distance and disconnection between the adolescent and his or her peers. The internal drive for perfection of someone high in self-oriented perfectionism is associated with high standards for themselves, the avoidance of failure, and being critical of one's own behaviour (Flett & Hewitt, 2002). In social situations, these traits may lead to a negative feedback loop where the adolescent thinks back on his or her own behaviour and reactions in a highly critical way. Reactions and behaviour that do not meet the adolescent's high self standards may lead to the belief that peers reject them, making them highly sensitive to rejection. In turn, this can lead to future symptoms of depression as they do not meet unrealistic personal or interpersonal standards.

Interestingly, and contrary to previous findings in the literature, we did not find any support for the Social Disconnection Model with regard to socially prescribed perfectionism, nor was socially prescribed perfectionism associated with rejection sensitivity at any time point. It could be that, although rejection sensitivity can be considered a form of social disconnection, it may not be a form that is related specifically to socially prescribed perfectionism. Very few researchers have looked at rejection sensitivity as it relates to perfectionism, and it may be a variable that is more closely related to self-oriented perfectionism.

Depression led to rejection sensitivity from Grade 9 to Grade 10 and from Grade 11 to Grade 12. Individuals who are depressed are more likely to rely on negative cognitive schemas

when confronted with everyday situations (Beck, 1976; Clark, Beck, & Alford, 1999), including peer interactions where real or perceived rejection may be experienced. As ambiguous situations are more commonly recalled as negative, those who have higher levels of depressive symptoms may be more likely to develop rejection sensitivity as a result, as has been demonstrated in previous research (e.g., Zimmer-Gembeck et al., 2016). We also found that rejection sensitivity predicted depression from Grade 10 to Grade 11 and from Grade 11 to Grade 12. As both directions of the relation between depression and rejection sensitivity were found, it follows that rejection sensitivity and depression have a bidirectional relation across time. Indeed, we found a statistically significant indirect pathway from Grade 9 depression to Grade 10 rejection sensitivity to Grade 11 depression. This significant indirect pathway provides evidence that there is a reciprocal relation between depression and rejection sensitivity across adolescence. This pathway has also been found in a previous study by Marston, Hare, and Allen (2010). In this longitudinal study, a reciprocal relation was found between rejection sensitivity and internalizing problems, including depression, in adolescents aged 16 to 18. Our study provides further evidence that depression and rejection sensitivity contribute to one another across development, especially in mid to late adolescence.

Limitations

An important strength of our study is the use of integrated cascade modelling across four years of late adolescence, which builds on results from previous studies which used cross-sectional data. Although our use of longitudinal data provides stronger evidence of the direction of the relations between perfectionism, depression, and rejection sensitivity, it is still not able to prove causality. Shared-method variance is also a possible limitation of this study. All measures used in this study were self-reports, which may have inflated the results. Another potential

limitation involves the measure we used for rejection sensitivity (i.e., BFNE-II). This measure, which examines the social aspects of fear of negative evaluation, is also a feature of social anxiety. Although rejection sensitivity and social anxiety have common features, it may be beneficial for future researchers to replicate these findings using a different measure of rejection sensitivity. Finally, although the parental education and household income of our sample was representative of the southern Ontario area at the first time point of the McMaster Teen dataset, after attrition, this may not accurately represent the general Canadian or North American population. Based on these limitations, future studies could provide stronger evidence of the directionality of our findings by aiming to replicate these studies by using multiple informants and including samples from other geographical areas which offer a wider range of socioeconomic backgrounds to be representative of the general population.

Conclusion

Perfectionism has become more prevalent across the general population, and with studies demonstrating the relation between perfectionism and depression, understanding this link is important in ensuring efficient monitoring and effective treatment. Longitudinal studies that expand understanding of the development of depression over time are especially important. Our study expands the literature on the link between perfectionism and depression across adolescence, with the addition of the role of rejection sensitivity in this relation. Using developmental cascade modelling, we found that, while socially prescribed perfectionism has a direct link with depression, rejection sensitivity plays a mediating role in the link between self-oriented perfectionism and depression. Additionally, we found that rejection sensitivity also plays a role in the persistence of depressive symptoms across adolescence, with depressive

symptoms predicting rejection sensitivity, but the two measures contributing to each other at future time points across development.

These findings are important as they demonstrate that the type of perfectionism an adolescent may possess can impact the way they may develop depression in the future. Both types of perfectionism are linked to future depression, whether directly or indirectly through rejection sensitivity. Understanding this, researchers, therapists, and policy makers may improve the development and administration of treatment for adolescent depression by also treating symptoms of perfectionism, especially earlier in adolescence. Acknowledging that there are a wide range of variables which predict future symptoms of depression can impact how an individual is treated and may lower the chance of developing depression.

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Table 1. Descriptive Statistics

	DEP9	DEP10	DEP11	DEP12	SOP9	SOP10	SOP11	SOP12	SPP9	SPP10	SPP11	SPP12	RS10	RS11	RS12
DEP9	1														
DEP10	.64*	1													
DEP11	.52*	.65*	1												
DEP12	.47*	.51*	.59*	1											
SOP9	.12*	.08	.04	.08	1										
SOP10	.02	.11*	.05	.09	.69*	1									
SOP11	.01	.10*	.09	.11*	.66*	.75*	1								
SOP12	.07	.15*	.11*	.16*	.56*	.67*	.81*	1							
SPP9	.34*	.26*	.23*	.28*	.49*	.35*	.35*	.32*	1						
SPP10	.18*	.37*	.28*	.35*	.37*	.50*	.44*	.40*	.61*	1					
SPP11	.19*	.26*	.36*	.33*	.38*	.40*	.54*	.45*	.57*	.71*	1				
SPP12	.17*	.25*	.24*	.42*	.37*	.45*	.49*	.55*	.55*	.65*	.70*	1			
RS10	.31*	.49*	.39*	.40*	.24*	.34*	.28*	.25*	.23*	.35*	.29*	.30*	1		
RS11	.25*	.34*	.50*	.41*	.15*	.21*	.32*	.27*	.18*	.27*	.33*	.26*	.63*	1	
RS12	.29*	.36*	.41*	.51*	.13*	.13*	.24*	.33*	.19*	.22*	.26*	.36*	.52*	.64*	1
M	4.44	5.17	5.09	5.21	24.27	24.84	24.94	24.63	13.90	15.25	14.87	14.66	2.64	2.61	2.61
SD	5.69	6.02	5.67	5.41	9.79	9.99	10.67	9.82	8.84	9.19	9.14	8.97	1.08	1.06	1.07

Note: DEP = depression; SOP = self-oriented perfectionism; SPP = socially prescribed perfectionism; RS = rejection sensitivity
*Significant $p<.05$

Table 2. Model Fit Statistics

	χ2	df	c	*p*	RMSEA (90% CI)	CFI	AIC	cd	vs.	Δχ2	*p*	Δdf
Model 1: within-time covariances	2111.684	84	1.225	<.001	.211(.203,.218)	.422	-.136	-	-	-	-	-
Model 2: within-time covariances and one-year stability	291.212	73	1.134	<.001	.074(.065, .083)	.938	.859	1.829	2 vs 1	1233.839	<.001	11
Model 3: within-time covariances, one- and two-year stability	191.322	66	1.111	<.001	.059(.049, .069)	.964	.911	1.351	3 vs 2	87.112	<.001	7
Model 4: within-time covariances, and one- and two-year stability paths, cross-lagged paths	60.926	33	1.089	.002	.039(.023, .055)	.992	.960	1.133	4 vs 3	129.047	<.001	33
Model 5: trimmed covariates	118.970	85	1.033	.009	.027(.014,.038)	.990	.981	0.998	4 vs 5	56.692	.304	52

Table 3. Parameter Estimates for Indirect Effects

Pathway	Estimate	95% CI
G9 Depression to G10 Rejection Sensitivity to G11 Depression to G12 Rejection Sensitivity	0.003	-0.001 – 0.007
G9 Depression to G10 Rejection Sensitivity to G11 Depression	**0.031**	**0.005 – 0.057**
G10 Rejection Sensitivity to G11 Depression to G12 Rejection Sensitivity	0.012	-0.004 – 0.027
G9 Self-Oriented Perfectionism to G10 Rejection Sensitivity to G11 Depression to G12 Rejection Sensitivity	0.002	-0.001 – 0.005
G9 Self-Oriented Perfectionism to G10 Rejection Sensitivity to G11 Depression	**0.023**	**0.003 – 0.043**
G9 Socially Prescribed Perfectionism to G10 Rejection Sensitivity to G11 Depression to G12 Rejection Sensitivity	0.001	-0.001 – 0.003
G9 Socially Prescribed Perfectionism to G10 Rejection Sensitivity to G11 Depression	0.008	-0.008 – 0.025

Note: G=Grade; Significant indirect effects are indicated in bold

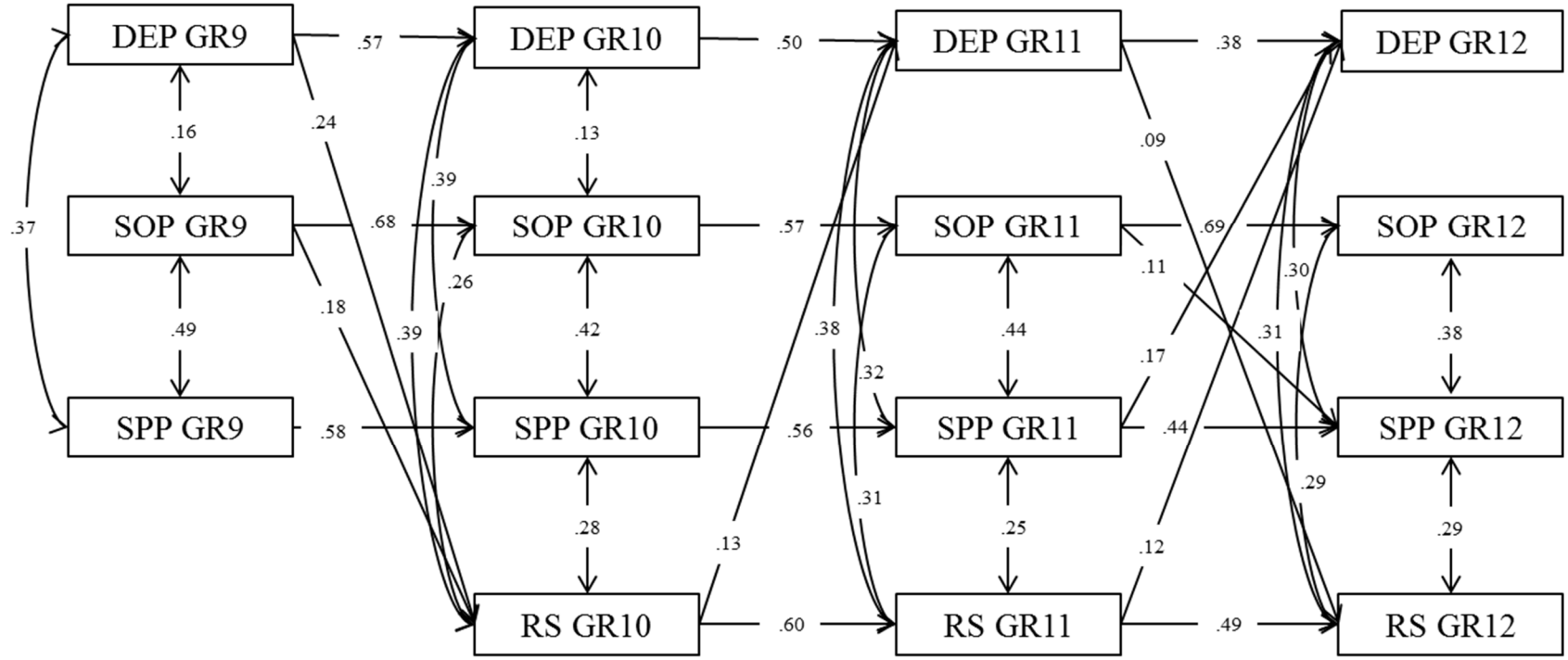

Figure 1: Cascade Model of Self-Oriented Perfectionism, Socially Prescribed Perfectionism, Depression, and Rejection Sensitivity. SOP = self-oriented perfectionism; SPP = socially prescribed perfectionism; DEP = depression; RS = rejection sensitivity. Parameter estimates in the model are significant at $p<.05$. All non-significant paths, two-lag paths, and those involving significant (untrimmed) covariates are included in the model but not shown for ease of interpretation.

Study 3: Perfectionism, Depression, and Rejection Sensitivity in Emerging Adulthood

Perfectionism, Rejection Sensitivity, and Depression in Emerging Adulthood

Christina M. L. Beeson

Abstract

The relation between perfectionism (socially prescribed perfectionism, self-oriented perfectionism, and other-oriented perfectionism), rejection sensitivity, and depression was examined in a young adult sample using a moderation regression analysis. Young adults ($N = 383$; $M_{age} = 19.41$) completed questionnaires in their second year post high school. Rejection sensitivity and socially prescribed perfectionism were positively related to depression and other-oriented perfectionism was negatively related to depression. Self-oriented perfectionism did not contribute significantly to depression. Contrary to the initial prediction, rejection sensitivity did not moderate the relation between perfectionism and depression. Overall, we found that types of perfectionism may have a differential influence on depressive symptoms in early adulthood.

Perfectionism, Rejection Sensitivity, and Depression in Emerging Adulthood

A recent meta-analysis by Curran and Hill (2019) demonstrated that over the past 30 years, all types of perfectionism (i.e., socially prescribed, self-oriented, and other-oriented) have significantly increased among Canadian, American, and British university students. Vaillancourt and Haltigan (2017) also found evidence of an increase in socially prescribed perfectionism across adolescence. Levels of perfectionism are at an all time high and understanding the relation between types of perfectionism, interpersonal difficulties, and mental health problems is critical in order to develop effective treatments and interventions.

Perfectionism is a multidimensional personality construct characterized by the establishment of unattainably high standards, excessive avoidance of making mistakes, preoccupation with negative evaluation and judgement from others, as well as harsh criticism placed on the self and/or others (Hewitt & Flett, 1991). Although there are differing opinions on whether perfectionism can be adaptive, current research is generally conducted with the understanding that perfectionism is maladaptive, with higher levels being related to psychopathology (Flett & Hewitt, 2002). Psychological outcomes related to perfectionism can differ depending on the target of the perfectionistic behaviour. The multidimensional aspect of perfectionism creates the opportunity for perfectionistic tendencies to be directed from others toward the self (i.e., socially prescribed perfectionism), from the self toward the self (i.e., self-oriented perfectionism), or from the self toward others (i.e., other-oriented perfectionism) (Hewitt & Flett, 1991).

Individuals who are high in socially prescribed perfectionism believe that others demand perfection of them and feel like they cannot achieve the high standards expected of them, creating a sense of having to display outward perfection (Hewitt & Flett, 1991). Socially

prescribed perfectionism is linked to a number of negative mental health outcomes, such as depression, anxiety, and suicide (Cox, Clara, & Enns, 2009; Hewitt & Flett, 1991; Roxborough et al., 2012), even after controlling for known predictors such as neuroticism (Sherry & Hall, 2009). Socially prescribed perfectionism is also related to numerous physical health outcomes, including poor sleep and somatic manifestations (e.g., digestive problems; Molnar, Reker, Culp, Sadava, & DeCourville, 2006). Individuals who are high in socially prescribed perfectionism are also more likely to have interpersonal difficulties (Habke & Flynn, 2002).

Self-oriented perfectionism originates from within a person and includes unrealistic and unattainably high standards for oneself in which perfection is demanded (Hewitt & Flett, 1991). Researchers have found that although self-oriented perfectionism is linked to depression, the relation is weaker to mental health outcomes when compared to socially prescribed perfectionism (Asseraf & Vaillancourt, 2015; Cox & Enns, 2003; Flett et al., 2011, Hewitt et al., 1996; O'Connor et al., 2010).

Other-oriented perfectionism is when an individual demands perfection from others and is related to a host of interpersonal problems as others fail to live up to these expectations (Hewitt & Flett, 1991). Although socially prescribed perfectionism and self-oriented perfectionism are studied starting in childhood all the way up to and including adulthood, other-oriented perfectionism is only examined in adult populations, as there is no evidence that it emerges before then developmentally (Flett et al., 2016). Moreover, although other-oriented perfectionism has not been studied extensively to date, it is linked to psychopathy, narcissism, and social dominance (Stoeber, 2014). However, unlike socially prescribed perfectionism and self-oriented perfectionism, it has not been found to be positively related to depression (Asseraf & Vaillancourt, 2015; Cox & Enns, 2003; Flett et al., 2011, Hewitt et al., 1996; O'Connor et al.,

2010). Rather, there is evidence that other-oriented perfectionism has a negative relation with depression (Chen, Hewitt, & Flett, 2017).

Social Disconnection Model

The interpersonal difficulties perfectionists experience can lead to feelings of being socially disconnected from others (Sherry, Mackinnon, & Gautreau, 2016). To explain these interpersonal difficulties, Hewitt et al. (2006) developed the Social Disconnection Model, which proposes a mechanism for the link between perfectionism and negative mental health outcomes like depression, anxiety, and hostility, wherein social disconnection acts as the mediating variable. Although it originally was created to explain how socially-prescribed perfectionism is related to negative mental health outcomes, researchers have expanded the Social Disconnection Model to include the other forms of perfectionism (i.e., self-oriented perfectionism and other-oriented perfectionism), as these types of perfectionism are also linked to social disconnection and interpersonal problems (Sherry, Mackinnon, & Gautreau, 2016).

The social disconnection that perfectionists experience leads to a sense of isolation or perceived rejection by important others (Hewitt et al., 2006). The unrealistic expectations that perfectionists believe others have of them cannot be achieved, leading them to believe that they are being harshly judged or are disappointing others (Hewitt et al., 2006). Perfectionists are more likely to interpret ambiguous social interactions as negative and disapproving, resulting in feelings of rejection and exclusion by others (Sherry et al., 2013), whether true or not. This maladaptive way in which perfectionists experience social interactions is similar to the way that those high in rejection sensitivity approach connection with others. From this, it follows that different types of perfectionism and rejection sensitivity may share characteristics.

Rejection Sensitivity

Rejection sensitivity is the tendency for an individual to be more likely to anxiously or angrily expect and perceive rejection in both overt and ambiguous situations (Downey et al., 1998). Rejection sensitivity is believed to develop when the need to belong is not met and interpersonal interactions with family, friends, or important others result in rejection (Downey & Feldman, 1996; Feldman & Downey, 1994; Rosenbach & Renneberg, 2014). However, past experiences of rejection may not be required for individuals to have heightened rejection sensitivity; instead, in some studies, when past experiences of rejection were not measured, rejection sensitivity was predicted by higher levels of depressive symptoms (e.g., Zimmer-Gembeck et al., 2016). Those who are higher in rejection sensitivity tend to have stronger emotional reactions to real or perceived rejection (Downey et al., 1998; Zimmer-Gembeck et al., 2016), resulting in long lasting maladaptive cognitions and behaviour (Downey & Feldman, 1996; Downey et al., 1998).

Rejection sensitivity is linked to two distinct defensive reactions to real or perceived rejection (Downey, Bonica, & Rincón, 1999). One is the tendency to react anxiously, which is related to internalizing problems such as depression or social anxiety; alternatively, the individual will get angry, which has been linked to externalizing behaviour such as aggression (Downey et al., 1998). The way in which a person reacts is dependent on causal attributions; when others are blamed as the cause of rejection, the individual is more likely to respond in anger, whereas if the self is blamed, they are more likely to react anxiously which, of relevance to the current study, has been related to internalizing problems such as depression (Downey et al., 1998; Zimmer-Gembeck et al, 2016).

Depression

Although the twelve-month prevalence rate of clinical depression (i.e., major depressive disorder) in the United States is about 1 in 14 (American Psychiatric Association [APA], 2013), depressive symptoms can also occur at non-clinical levels in the general population, and is much more common, with a lifetime prevalence rate as high as 1 in 5 (Merikangas et al., 2010; Thapar, 2012). Researchers have found that depression is rare in childhood but increases through adolescence (American Psychiatric Association [APA], 2013), after which it is more stable over time (Rudolph et al., 2009; Vaillancourt & Haltigan, 2017). Young adults aged 18 to 29 are more likely to be depressed than older adults (Kessler et al., 2003), and due to the stability of depression over time, a common predictor of depression in young adults the presence of depression in adolescence (Kessler et al., 2005).

One way in which depression may be maintained over time is through negative cognitive biases, which initiate and allow the continuation of depression (e.g., Alloy et al., 2006; Beck, 1967; Clark, Beck, & Alford, 1999). Individuals who are vulnerable to developing depression pay attention to and process information in a way which focuses on more negative aspects of interactions, which leaves the individual more likely to notice and remember negative events, or to interpret events as negative (Beck, 1967; Clark, Beck, & Alford, 1999).

Depression has been consistently linked with socially prescribed and self-oriented perfectionism (Asseraf & Vaillancourt, 2015; Cox, Clara, & Enns, 2009; Cox & Enns, 2003; Flett et al., 2011; Hewitt & Flett, 1991; Hewitt et al., 1996; O'Connor et al., 2010; Roxborough et al., 2012), as well as to rejection sensitivity (Downey et al., 1998; Zimmer-Gembeck et al, 2016). To date, very few studies have looked at the relation between perfectionism, rejection

sensitivity, and depression together in one model. Flett, Besser, and Hewitt (2014) studied a community sample of 183 young adults from Israel. Using a cross-sectional design, they found that participants who were high in both socially prescribed perfectionism and rejection sensitivity were more vulnerable to experiencing symptoms of depression, whereas those low in both socially prescribed perfectionism and rejection sensitivity were not. This study provided novel information in that it was the first to look at the role rejection sensitivity may have in the link between perfectionism and depression. Another recent study by Magson et al. (2019) looked at the relation between perfectionism, rejection sensitivity, and depression using the framework of the Social Disconnection Model. Also using a cross-sectional design, in a sample of 510 pre-adolescents from Australia, they found that both self-oriented perfectionism and socially prescribed perfectionism were related to higher levels of interpersonal difficulty, including rejection sensitivity, as well as to higher levels of depression and other mental health outcomes.

Present Study

In the present study, we aimed to test the replicability of previous findings (Flett, Besser, & Hewitt, 2014; Magson et al., 2019) by examining the relation between perfectionism, rejection sensitivity, and depression in a Canadian young adult sample. Previous studies looking at these variables either excluded other-oriented perfectionism, as they were conducted on an adolescent sample and other-oriented perfectionism has not been shown to emerge before adulthood, or were conducted on a unique sample that may not be generalizable to all populations (i.e., Israeli young adults). In order to test replicability in this area, we included all three forms of perfectionism (i.e., self-oriented perfectionism, socially prescribed perfectionism, and other-oriented perfectionism) to explain the development of depression symptoms in young Canadian adults. We also included rejection sensitivity as recent studies have found a relation

between rejection sensitivity and depression and tested it as a moderator between perfectionism and depression.

Previous studies have found that socially prescribed perfectionism (Cox, Clara, & Enns, 2009; Hewitt & Flett, 1991; Roxborough et al., 2012) and, to a lesser extent, self-oriented perfectionism, are related to increases in depressive symptoms (Asseraf & Vaillancourt, 2015; Cox & Enns, 2003; Flett et al., 2011, Hewitt et al., 1996; O'Connor et al., 2010). Therefore, we predicted that these two forms of perfectionism would have a positive relation with depression in our analyses. Prior studies have not found a positive relation between other-oriented perfectionism and depression; however, a negative association between these two variables has been found (Chen, Hewitt, & Flett, 2017). We predicted that other-oriented perfectionism would have a negative relation with depression. Finally, a number of researchers have found that rejection sensitivity and depression are related to one another (Chango et al., 2012; London et al., 2007; Marston, Hare, & Allen, 2010; Zimmer-Gembeck at al., 2016). We therefore expected that rejection sensitivity would also explain some of the variance in depression.

We also tested the role of rejection sensitivity as a moderator between perfectionism and rejection sensitivity. In Flett, Besser, and Hewitt (2014), rejection sensitivity was found to moderate the relation between socially prescribed perfectionism and depression, where high levels of both socially prescribed perfectionism and rejection sensitivity were related to higher levels of depression, but low levels of rejection sensitivity were protective against depression. We therefore predicted that the relation between socially prescribed perfectionism and depression would be strongest at high levels of rejection sensitivity. Flett, Besser, and Hewitt (2014) did not find that rejection sensitivity moderated the relation between self-oriented or other-oriented perfectionism and depression; we therefore did not have specific predictions for

the role of rejection sensitivity as a moderator between these types of perfectionism and depression, and we examined the role in an exploratory nature.

We controlled for biological sex and other types of perfectionism in our analyses. Previous studies have shown that girls and women are more likely to display depressive symptoms than boys and men (e.g., APA, 2013; Hankin et al., 1998; Salk et al., 2016; Vaillancourt & Haltigan, 2017), and there have been mixed findings with regard to biological sex and rejection sensitivity, with some researchers finding no sex differences in rejection sensitivity (Bondu & Richter, 2016; Ibrahim et al., 2015; Nowland, Talbot, & Qualter, 2018), and others finding that women are more likely to report rejection sensitivity than are men (Erozkan, 2009).

Method

Participants and Procedure

Participants were drawn from the McMaster Teen Study, an on-going longitudinal study designed to examine the relations between peer victimization, mental health, and academic achievement using a multi-method, multi-informant approach. In the spring of 2008, participants were recruited from 51 randomly selected public primary schools located in a large Southern Ontario Public School Board. From the recruitment process, 875 participants agreed to take part in the study in 2008, and 383 (61% girls) participated in 2018 (i.e., the second year post high school), the time frame used in this study. Participants were compensated for their time with gift cards for completed questionnaires and interviews.

In 2018, the tenth consecutive year of McMaster Teen study, participants were young adults, and many of the measures used in prior years were no longer appropriate based on their age. This was the first year that two of our variables of interest, perfectionism and rejection sensitivity, had been measured with the scales described in the Measures section. As we did not

have continuity in these measures from previous years, we used a cross-sectional sample of the McMaster Teen Study dataset.

Participants used in this study were young adults (M_{age} = 19.41), and this was the second year post high school that the longitudinal project took place. Participants who provided consent were contacted to complete surveys either online or using paper and pencil versions. Participants were also contacted to complete a telephone interview conducted by trained counselling psychology graduate students. Compensation was provided for each component of the study.

Measures

Perfectionism. Perfectionism was measured using the Multidimensional Perfectionism Scale-short form (MPS-15), which were self-reported by the young adult (Hewitt, Flett, & Turnbull-Donovan, 1991). The MPS assesses self-oriented perfectionism (e.g., "One of my goals is to be perfect in everything I do."), socially prescribed perfectionism (e.g., "My family expects me to be perfect."), and other-oriented perfectionism (e.g., "Everything that others do must be of top-notch quality."). This scale has 15 items, 5 for each form of perfectionism, which are rated on a 7-point Likert-type scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*. Scores were averaged to create a total score and higher scores indicate higher levels of perfectionism. The internal consistency for the MPS for the McMaster Teen Study was good (α = .91 for self-oriented perfectionism, α = .86 for socially prescribed perfectionism, and α = .83 for other-oriented perfectionism).

Rejection Sensitivity. Rejection sensitivity was measured using the Rejection Sensitivity Questionnaire – Adult version (RSQ) through self-reports (Berenson et al., 2009; Downey & Feldman, 1996). This scale is made up of 9 items in the style of situational vignettes (e.g., "You ask your parents or another family member for a loan to help you through a difficult financial

time."). Each vignette is split into two parts, one assessing how the participant would feel in that situation (e.g., "How concerned or anxious would you be over whether or not your family would want to help you?"), which is rated on a 6-point Likert scale with 1 = *very unconcerned* and 6 = *very concerned* and were averaged to create a total score, where higher values indicate higher levels of rejection sensitivity. The other half of the item assesses how the participant perceives the person in question would react (e.g., "I would expect that they would agree to help as much as they can."), which is also rated on a 6-point Likert scale ranging from 1 = *very unlikely* to 6 = *very likely*. Rejection sensitivity was scored by multiplying the level of rejection concern (i.e., the response to the first part of the question) by the reverse of the level of acceptance expectancy (i.e., the response to the second part of the question). The mean of the resulting nine scores gives the overall rejection sensitivity score. The internal consistency of the RSQ for the McMaster Teen Study was good (α = .82).

Depression. Depressive symptoms were also measured using the college subscale (SRP-COL) of the self-reported Behavior Assessment System for Children – Second Edition (BASC-2; Reynolds & Kamphaus, 2004). The depression subscales assess common symptoms of depression such as loneliness, sadness, and hopelessness through 13 items. True or false (*0 = false, 2 = true*; example item, "Nothing is fun anymore") and 4-point Likert scale items (*0 = never, 1 = sometimes, 2 = often,* and *3 = almost always*; example item, "I feel sad") are included. Self-reported symptoms of depression were calculated by summing the scores of the items, allowing for up to 2 missing items in each total score and adding a correction factor for missing data (Reynolds & Kamphaus, 2004). Higher calculated sums are equivalent to higher symptoms of depression. The internal consistency of the SRP-COL for the McMaster Teen Study was good (α = .91).

Analytic Plan

Analyses were performed using SPSS version 25. Three moderation regression analyses were conducted to examine the moderating role of rejection sensitivity in the association between three types of perfectionism (i.e., self-oriented perfectionism, socially prescribed perfectionism, or other-oriented perfectionism) and depression symptoms. The association between perfectionism (i.e., self-oriented perfectionism, socially prescribed perfectionism, or other-oriented perfectionism) and depression, along with the relation between the moderator (i.e., rejection sensitivity) and depression, and the interaction terms of perfectionism and rejection sensitivity were entered into the model. A moderation effect was detected if the interaction term was statistically significant in the model, indicated by a significant R-square change.

Each type of perfectionism was examined in a separate regression analysis because we wanted to control for the over lap between the three forms of perfectionism. Control variables for our analyses consisted of biological sex and the two types of perfectionism not specifically being examined in the regression. The predictor variables were mean centred. Control variables were entered into the first step of each regression model, including the other two types of perfectionism not being tested. The specific type of perfectionism being tested and rejection sensitivity were entered into the second step of each model. The interaction between perfectionism and rejection sensitivity was entered in the third and final step of each model. For example, when looking at the association between self-oriented perfectionism and depression, in Step 1 we entered biological sex, socially prescribed perfectionism, and other-oriented perfectionism; in Step 2 we entered self-oriented perfectionism and rejection sensitivity; and in

Step 3, we entered the interaction term between self-oriented perfectionism and rejection sensitivity.

Results

Little's Missing Completely at Random test of study variables was conducted in SPSS to determine if variables of interest in our study (i.e., self-oriented perfectionism, socially prescribed perfectionism, other-oriented perfectionism, rejection sensitivity, depression, and the control variable, biological sex) were missing completely at random. The analysis was not significant, meaning that the variables are missing completely at random, $\chi^2(13)=14.467$, $p=.342$; therefore, no follow up analyses were conducted.

Data were tested for assumptions of normality, which were confirmed. All values of skewness and kurtosis were under the acceptable range of 3 for skewness and 10 for kurtosis (Kline, 2011). Correlations, means, and standard deviations of all the study variables can be found in Table 1. Socially prescribed perfectionism, rejection sensitivity, and depression were all moderately significantly correlated with one another. Self-oriented perfectionism, socially prescribed perfectionism, and other-oriented perfectionism were all highly correlated with one another ($r > .60$).

For each type of perfectionism, the overall model accounted for 33.9% of the variance in the outcome of depression ($R^2 = 0.34$, $p < 0.001$). None of the three interaction terms of perfectionism and rejection sensitivity were statistically significant (self-oriented perfectionism x rejection sensitivity, $b = .009$, $p = 0.754$; socially prescribed perfectionism x rejection sensitivity, $b = 0.008$, $p = 0.823$; other-oriented perfectionism x rejection sensitivity, $b = -0.008$, $p = 0.834$). The association of rejection sensitivity to depression was statistically significant ($b = 0.59$, $p < 0.001$), as was the association between socially prescribed perfectionism and depression ($b =$

1.23, $p < 0.001$). Other-oriented perfectionism was also associated with depression but in this case, the relation was negative ($b = -0.72$, $p = 0.011$). The beta coefficients and results of the final regression models can be found in Tables 2-4.

Discussion

Our purpose in conducting this study was to examine the relation between perfectionism, rejection sensitivity, and depression in a young adult sample. To do this, three moderation regression analyses were performed to examine the moderating role of rejection sensitivity in the association between three types of perfectionism (i.e., self-oriented perfectionism, socially prescribed perfectionism, or other-oriented perfectionism) and depression symptoms.

Direct Effects

We found that rejection sensitivity alone explained the most variance in depression. This was expected, as a number of studies have found that rejection sensitivity and depression are related (Chango et al., 2012; London et al., 2007; Marston, Hare, & Allen, 2010; Zimmer-Gembeck at al., 2016). Rejection sensitivity causes individuals to expect and perceive rejection when confronted with social situations where rejection is possible, leading to maladaptive coping mechanisms (e.g., social withdrawal or anger) and the perception that rejection is outside of their control (Downey et al., 1998). Perceived control is a protective factor against depression (Ross & Mirowsky, 1989) and feeling a lack of perceived control with regard to rejection may contribute to increased rates of depression in those with higher rejection sensitivity.

Socially prescribed perfectionism explained the next greatest amount of variance in depression in our model. This finding supports what many other researchers have found in previous studies, where socially prescribed perfectionism is related to a host of mental health

issues, including depression (Cox, Clara, & Enns, 2009; Hewitt & Flett, 1991; Roxborough et al., 2012). Those who score higher on measures of socially prescribed perfectionism believe that they are harshly and unfairly judged by other people who expect perfection from them, an expectation that they cannot possibly achieve (Hewitt & Flett, 1991). Similar to rejection sensitivity, this may create a feeling of decreased perceived control over their successes and outcomes, as no amount of effort can achieve perfection. As a result of this loss of perceived control (Ross & Mirowsky, 1989), socially prescribed perfectionism leads to increased depressive symptoms.

Finally, other-oriented perfectionism also explained a significant amount of variance in depression, although there was a negative relation between these variables. Previous studies have found that other-oriented perfectionism is not related to depression (Asseraf & Vaillancourt, 2015; Cox & Enns, 2003; Flett et al., 2011, Hewitt et al., 1996; O'Connor et al., 2010), but others have found that it is significantly negatively related to depression (Chen, Hewitt, & Flett, 2017), so our study provides further support for this negative relation. Other-oriented perfectionism has been linked with interpersonal problems (Hewitt & Flett, 1991), such as narcissism (Nealis et al., 2015; Stoeber, 2014). Similarly, narcissism has been found to have a negative relation with depression in adults (Shih et al., 2019). It is possible that, although other-oriented perfectionism seems to be a protective factor against depression, it does so via problematic personality traits such as narcissism. By demanding perfection of others, this could bolster self-enhancement, such as is the case in those high in narcissism (Morf & Rhodewalt, 2001). In future studies, researchers should examine the role of narcissism when examining these associations.

That self-oriented perfectionism did not predict a significant amount of variance in depression in our models is noteworthy in and of itself. Although many researchers have found that self-oriented perfectionism is related to depression, the relation is consistently weaker than that between socially prescribed perfectionism and depression (Asseraf & Vaillancourt, 2015; Cox & Enns, 2003; Flett et al., 2011; Hewitt et al., 1996; O'Connor et al., 2010). Further, results of meta-analytic studies provide evidence that self-oriented perfectionism is related to increased depression across time, an effect that is often lost in cross-sectional studies (Curran & Hill, 2019; Smith et al., 2018; Smith et al., 2016). As our study uses cross-sectional data, this could explain our finding that self-oriented perfectionism did not contribute to changes in depression scores.

Moderation Analyses

Contrary to our prediction, rejection sensitivity was not a significant moderator of the relation between any type of perfectionism and depression. Although this replicates what previous studies have found with regard to self-oriented and other-oriented perfectionism and depression, it differs with regard to socially prescribed perfectionism and depression (Flett, Besser, & Hewitt, 2014). The Flett et al. (2014) study was conducted on young adults (M_{age} = 24.23) in Israel, which differs culturally from North America. For example, Israel has more of a collectivistic culture, focusing on the benefit of the collective group, than does Canada, which is more individualistic and motivated by personal rewards (Earley, 1993; Oyserman, Coon, & Kemmelmeier, 2002). There is evidence that collectivistic cultures are more likely to report higher levels of socially prescribed perfectionism, whereas individualistic cultures are more likely to have higher levels of self-oriented perfectionism (Smith et al., 2017). Due to these differences in prevalent types of perfectionism, rejection sensitivity may moderate the relation between perfectionism and depression in some cultures but not others. That we did not find a

moderating effect of rejection sensitivity may reflect a cultural difference, but in future studies, researchers should aim to continue to replicate these findings across culturally differing samples in order to determine the role of rejection sensitivity as a moderator between perfectionism and depression.

Limitations

One major limitation of this study was that the data were correlational in nature. Due to this, causality and the direction of the relations between the variables cannot be assumed. Although depression was used as our outcome variable in the regression analysis, it is also possible that perfectionism or rejection sensitivity could be outcomes of higher levels of depression, or the variables could influence each other over time. For example, previous studies have found that depression and rejection sensitivity influence one another across adolescence (Marston, Hare, & Allen, 2010). Moreover, a common predictor of depression in young adults, the population we studied, is the presence of depression in adolescence (Kessler et al., 2005). Accordingly, in future studies, researchers should make use of longitudinal data in young adults to provide evidence of the true temporal relation between perfectionism, rejection sensitivity, and depression, while controlling for prior associations.

A second limitation of this study is that all our variables were measured using self-reports, which may have potentially inflated our findings due to shared-method variance.

Conclusion

As perfectionism has increased in young adults over the past three decades, and with studies demonstrating the relation between perfectionism and depression, it is important for researchers to look into this link in order to provide a sound scientific knowledge base upon which to build and implement treatment. Our study expands the literature on the link between

perfectionism and depression in early adulthood, with the addition of other-oriented perfectionism in a Canadian young adult sample, and the role of rejection sensitivity in this relation. Using a sample of young adults in their second year following high school, we found that, as predicted, rejection sensitivity and socially prescribed perfectionism were positively associated with depression. We also found that other-oriented perfectionism was negatively associated with depression, which was also expected based on previous studies. Finally, self-oriented perfectionism was excluded from the model as it did not explain a significant portion of the variance in depression. Rejection sensitivity also did not moderate the relation between different types of perfectionism and depression.

Our study supports the existing literature on rejection sensitivity and depression. Further, this study provides further evidence that different types of perfectionism may have a divergent influence on depressive symptoms in early adulthood. The type of perfectionism a person possesses may help to identify potential risks in the development or comorbidity of depression.

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Table 1. Descriptive Statistics

	DEP	RS	SOP	OOP	SPP	Sex
DEP	1					
RS	.54*	1				
SOP	.00	.01	1			
OOP	-.05	-.05	.65*	1		
SPP	.25*	.22*	.62*	.61*	1	
Sex	.15*	.09*	-.02	-.04	.05	1
M	5.81	9.21	4.40	3.53	3.70	.61
SD	6.15	4.74	1.50	1.31	1.44	.49

Note: DEP = depression; RS = rejection sensitivity; SOP = self-oriented perfectionism; OOP = other-oriented perfectionism; SPP = socially prescribed perfectionism; Sex = biological sex
* $p < 0.05$

Table 2: Regression Analysis Summary for Self-Oriented Perfectionism and Rejection Sensitivity Predicting Depression.

Variable	*B*	*SE B*	*β*	R^2	ΔR^2
Step 1				.15	.15**
Biological Sex	1.13	0.53	.09*		
SPP	1.23	0.26	.29**		
OOP	-.71	0.28	-.15*		
Step 2				.34	.19**
SOP	-.33	0.25	-.08		
RST	.59	0.06	.46**		
Step 3				.34	.00
SOP*RST	.01	0.03	.01		

Note: SPP = socially prescribed perfectionism; OOP = other-oriented perfectionism; SOP = self-oriented perfectionism; RST = rejection sensitivity. SOP and RST were centered at their means.

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

Table 2: Regression Analysis Summary for Socially Prescribed Perfectionism and Rejection Sensitivity Predicting Depression.

Variable	*B*	*SE B*	*β*	R^2	ΔR^2
Step 1				.03	.03*
Biological Sex	1.13	0.53	.09*		
SOP	-.32	0.25	-.08		
OOP	-.71	0.28	-.15*		
Step 2				.34	.31**
SPP	1.22	0.26	.29**		
RST	.59	0.06	.46**		
Step 3				.34	.00
SPP*RST	.01	0.03	.01		

Note: SOP = self-oriented perfectionism; OOP = other-oriented perfectionism; SPP = socially prescribed perfectionism; RST = rejection sensitivity. SPP and RST were centered at their means.

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

Table 4: Regression Analysis Summary for Other-Oriented Perfectionism and Rejection Sensitivity Predicting Depression.

Variable	*B*	*SE B*	*β*	R^2	ΔR^2
Step 1				.12	.12**
Biological Sex	1.14	0.53	.09*		
SOP	-.32	0.25	-.08		
SPP	1.23	0.26	.29**		
Step 2				.34	.22**
OOP	-.72	0.28	-.15*		
RST	.59	0.06	.46**		
Step 3				.34	.00
OOP*RST	-.01	0.04	-.01		

Note: SOP = self-oriented perfectionism; SPP = socially prescribed perfectionism; OOP = other-oriented perfectionism; RST = rejection sensitivity. OOP and RST were centered at their means.

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

General Discussion

Summary of Research Findings

Study 1:

The purpose of Study 1 was to examine the directionality of the relations between self-reported peer rejection, rejection sensitivity, depression, and aggression across adolescence. To do this, we built an integrated cascade model using rejection, rejection sensitivity, depression, and aggression across four years of adolescent development. Our study was the first to our knowledge to use an integrated cascade model to study these variables and their relation over time. Previous studies have provided mixed results with regard to the direction of the relation between many of these variables. Given these discrepant findings, it was difficult to predict the directionality of associations; we therefore examined the associations between rejection, rejection sensitivity, depression, and aggression in an exploratory nature. Support was found for the symptoms-driven model and social process models; respectively, rejection was preceded by either depression or aggression at different times across adolescence. Similarly, rejection sensitivity was also preceded by depression and/or aggression. Although depression initiated the cascade leading to rejection sensitivity, our model also supported a bidirectional relation across late adolescence as rejection sensitivity also predicted future depression. Overall, Study 1 provided support that internalizing (i.e., depression) and externalizing (i.e., aggression) problems lead to interpersonal difficulties (i.e., rejection) with peers and demonstrate the unique role of rejection sensitivity with regard to depression and aggression in the absence of actual peer rejection.

Study 2:

The purpose of Study 2 was to determine the directionality of the relations between two types of perfectionism, depression, and rejection sensitivity across late adolescence using developmental cascade modelling. To our knowledge, no researchers prior to this have used an integrated cascade model to study these variables and their relation over time. Existing studies have had contradictory results with regard to the direction of the relation between perfectionism and depression. Given these discrepant findings, it was difficult to predict the directionality of associations, and we therefore examined the associations between perfectionism, rejection sensitivity, and depression in an exploratory nature. We found that socially prescribed perfectionism had a direct relation to future depression. The Social Disconnection Model was supported as rejection sensitivity mediated the relation between self-oriented perfectionism and depression. Depression initiated the cascade leading to rejection sensitivity; however, our model also supported a bidirectional relation across late adolescence as rejection sensitivity also predicted future depression. Overall, Study 2 provided support that different forms of perfectionism are related directly or indirectly with depression, and rejection sensitivity plays a role in the development and maintenance of depression.

Study 3:

The purpose of Study 3 was to examine the relation between perfectionism, rejection sensitivity, and depression cross-sectionally in a Canadian young adult sample. To do this, three moderation regression analyses were conducted to examine the moderating role of rejection sensitivity in the association between three types of perfectionism (i.e., self-oriented perfectionism, socially prescribed perfectionism, or other-oriented perfectionism) and depression symptoms. Based on the existing literature, we predicted that self-oriented perfectionism and

socially prescribed perfectionism would have a positive relation with depression, but other-oriented perfectionism would have a negative relation with depression. We also expected that rejection sensitivity would have a positive relation with depression. Another aim of our study was to test the role of rejection sensitivity as a moderator between perfectionism and rejection sensitivity, predicting that the relation between socially prescribed perfectionism and depression would be strongest at high levels of rejection sensitivity. As previous studies have not found evidence of a moderating effect of rejection sensitivity on the relation between self-oriented or other-oriented perfectionism and depression, we did not have specific predictions for the role of rejection sensitivity as a moderator between these types of perfectionism and depression, and we examined the role in an exploratory nature. We found that rejection sensitivity and socially prescribed perfectionism were positively related to depression, and other-oriented perfectionism was negatively related to depression. Self-oriented perfectionism did not contribute significantly to depression. Rejection sensitivity was not a significant moderator in the relation between perfectionism and depression.

Integration of Findings and Implications

Collectively, the three studies of this dissertation examine issues arising when threats to interpersonal belonging present in adolescence and young adulthood. Of specific interest were how rejection sensitivity, as well as interpersonal (i.e., rejection) and intrapersonal (i.e., perfectionism) factors, which are all related to social disconnection, can explain depressive symptoms, as well as how depression may explain these variables, through developmental cascade models in Studies 1 and 2, and using a moderation regression analysis in Study 3.

In all three of our studies, we consistently found a significant and positive relation between rejection sensitivity and depression at every time point measured, both concurrently and

across time, in adolescents and young adults, and using two different scales to measure rejection sensitivity. This provides strong support for the role of rejection sensitivity as a predictor of depression, which has been found in prior studies (Chango et al., 2012; Downey et al., 1998; London et al., 2007; Zimmer-Gembeck & Nesdale, 2012; Zimmer-Gembeck et al., 2016). In addition, using cascade models in Study 1 and Study 2, we also found that depression had a significant and positive relation with future rejection sensitivity across multiple years in adolescence, which supports findings from Zimmer-Gembeck et al. (2016). In fact, Study 1 and Study 2, with evidence of the relation between rejection sensitivity and depression in both directions, provide support for there being a bidirectional relation between these variables across late adolescence, which Marston, Hare, and Allen (2010) have also found.

One possible explanation for this bidirectional relation between rejection sensitivity and depression across adolescence is through a combination of the diathesis-stress model of depression (Caspi et al., 2003) and the Rejection Sensitivity Model (Downey, Bonica, & Rincón, 1999; Downey & Feldman, 1996). Depressed individuals are more likely to have negative cognitions surrounding everyday experiences, which causes them to recall memories of these experiences in a negative way (Beck, 1976; Clark, Beck, & Alford, 1999), creating a mental framework of depressive cognitive schemas (Beck, 1970). This occurs for all types of life experiences, including interpersonal interactions. Therefore, when interacting with others, a depressed individual will be more likely to interpret the interaction in a negative way, leading to the belief that the relationship is or will be rejecting, thus increasing rejection sensitivity (Downey et al., 1998; Zimmer-Gembeck et al., 2016). In turn, as those who are high in rejection sensitivity are more likely to perceive and overreact to rejection or threats of rejection, (Downey et al., 1998; Zimmer-Gembeck et al., 2016), rejection sensitivity may lead to more consistent

negative social interactions which threaten belonging, and in turn, to increased future depression (Chango et al., 2012; London et al., 2007).

In Study 1, we also examined how rejection, an interpersonal factor known to be related separately to both depression (Dodge et al., 2003; Zimmer-Gembeck et al., 2009) and rejection sensitivity (Downey & Feldman, 1996; Feldman & Downey, 1994; Rubin, Coplan, & Bowker, 2009), would contribute developmentally across adolescence. In our model, although rejection was not related to future depression or rejection sensitivity, we did find that depression was a predictor of future peer rejection in adolescence, evidence of the symptoms-driven model and of the scar hypothesis, where depressed individuals have long-lasting effects in other areas of their lives, such as interpersonal relationships (Kochel, Ladd, & Rudolph, 2012; Krygsman & Vaillancourt, 2017; Nolen-Hoeksema, Girgus, & Seligman, 1992; Rohde, Lewinsohn, & Seeley, 1990; Vaillancourt et al., 2013). Adolescents who are depressed may struggle with social skills (Segrin, 2000), or may be less adept at handling negative social interactions and interpersonal challenges (Rudolph, 2009), creating situations where they are rejected by their peers as a result of these social deficits.

As we did not find that peer rejection predicted depression or rejection sensitivity, and because previous studies have also found that rejection sensitivity can develop in the absence of actual peer rejection (Zimmer-Gembeck et al., 2016), and can be independent from rejection, we proceeded with Study 2 and Study 3 by excluding peer rejection as a predictor.

In Study 2 and Study 3, we therefore solely focused on an intrapersonal factor, perfectionism, which is known to be related to depression (e.g., Asseraf & Vaillancourt, 2015; Cox & Enns, 2003; Flett et al., 2011, Hewitt et al., 1996; O'Connor et al., 2010) and, more recently, rejection sensitivity (Flett, Besser, & Hewitt, 2014; Magson et al., 2019). The relation

between perfectionism, rejection sensitivity, and depression is an understudied area, yet the two existing published studies demonstrate that rejection sensitivity does play a role in the relation between types of perfectionism and depression (Flett, Besser, & Hewitt, 2014; Magson et al., 2019). Study 2 and Study 3 had mixed findings with regard to the role of rejection sensitivity in the relation between perfectionism and depression. In Study 2, in a longitudinal sample of adolescents, there was evidence of a mediating role between self-oriented perfectionism and depression, whereas the link between socially prescribed perfectionism and depression was direct; however, in Study 3, although we did find evidence of a direct link between socially prescribed perfectionism and depression (as well as a direct, negative link between other-oriented perfectionism and depression), we did not find evidence of a moderating role of rejection sensitivity between any form of perfectionism and depression.

In the transition between late adolescence and early adulthood, the mental maturation individuals experience lead to more thoughtfulness and deliberate behaviour when it comes to interacting with others (Roberts, Caspi, & Moffitt, 2001). Although rejection sensitivity is stable when comparing levels among a group of individuals, there is evidence that rejection sensitivity decreases across time in late adolescence as a whole (Marston, Hare, & Allen, 2010). Early adulthood may be a time where rejection sensitivity begins to play a less pivotal role between perfectionism and depression because individuals are able to rely on more mature mental reflection and cognition when faced with interpersonal problems. As this is still a relatively new and understudied area in the literature, our contributions to knowledge in this area were important, and our findings warrant further investigation in future studies.

Overall, through the three studies conducted in this dissertation, we found that adolescence is a key developmental period where rejection sensitivity and depression are at play.

As adolescence is a time where belonging to a social group is of utmost importance (Harris, 1995) and adolescents worry about and try to avoid rejection by peers, it is also when levels of rejection sensitivity and depression increase (Marston, Hare, & Allen, 2010; Zimmer-Gembeck et al., 2016). It is consequently not surprising that there is a bidirectional relation between these two variables throughout this period. Depression seems to initiate the bidirectional relation, likely through depressive cognitive schemas that lay the framework for the expectation of negative social interactions as well as actual peer rejection. Therefore, interpersonal threats to belonging, such as rejection, may actually be driven by internalizing problems in adolescence. Intrapersonal factors that threaten belonging, such as perfectionism, play a different role. Perfectionism is a direct and indirect predictor of future depression across adolescence. However, whether perfectionism directly or indirectly influences depressive symptoms is dependent on the type of perfectionism. Externally motivated socially prescribed perfectionism has a direct link with depression in both late adolescence and early adulthood, whereas internally motivated self-oriented perfectionism is indirectly related to depression in adolescence through a mediating variable, rejection sensitivity. These findings suggest that rejection sensitivity plays a direct role in the development and maintenance of depression across adolescence and early adulthood, and it also may play a mediating role in the relation between internally motivated intrapersonal threats to belonging and depression (i.e., self-oriented perfectionism and depressive symptoms). However, it does not play a role in the relation between interpersonal threats to belonging (i.e., rejection) or externally motivated intrapersonal threats (i.e., socially prescribed perfectionism) and depression, which have a direct relation.

Limitations and Future Directions

There are some limitations to the current research that require discussion and which could be addressed in future studies. Although the use of the McMaster Teen Study dataset was a great strength of this dissertation due to the large number of participants and the ongoing longitudinal nature of the project, it is also one of the limitations of these studies for a few reasons. First, although the sample was consistent with the income and education level of the area from which it was drawn, the findings may not be generalizable to all Canadians or all North Americans. Second, although the longitudinal sample is quite large, for the purposes of some of the analyses we were interested in conducting, the sample was not large enough, and we would have been underpowered (Whisman & McClelland, 2005). For example, in Study 1 and Study 2, we were unable to examine biological sex as a moderator due to the complexity and number of variables in our cascade model, and we therefore compared the means of girls and boys on all variables instead. Finally, the fact that we used the McMaster Teen dataset for all three of our studies may have an impact on the generalizability of our findings. The sample may be unique and differ from the general population or from other subpopulations on our variables of interest.

Another potential limitation to our studies is regarding the scales used to measure rejection sensitivity. First, in Study 1 and Study 2, the measurement of rejection sensitivity in our sample only began in Grade 10, the second year of our time range, and we were therefore unable to determine its temporal precedence before this time point. Although we found that depression initiated the cascade in our model, if rejection sensitivity had been available in Grade 9, we may have seen a different pattern emerge. A second issue with the scales used to measure rejection sensitivity is that, for both the scale used in Study 1 and Study 2 (i.e., BFNE-II; Carleton et al.,

2006) and that used in Study 3 (i.e., RSQ; Berenson et al., 2009; Downey & Feldman, 1996), only anxious rejection sensitivity was specifically measured. Especially in Study 1, where we examined aggression in our model, the ability to assess both anxious and angry rejection sensitivity would have been beneficial and may have provided further information that we were unable to detect in our study, as other researchers have found differential behaviour depending on which type of rejection sensitivity is measured (Downey et al., 1998; Zimmer-Gembeck & Nesdale, 2012; Zimmer-Gembeck et al., 2016). A third potential issue with our measure of rejection sensitivity in Study 1 and Study 2 is that the items do not specify to whom they are referring. The items in the BFNE-II only refer to generic others (e.g., other people, someone) as opposed to specific others such as peers. Although we assumed in our studies that they were referring to peers, as we were interested in peer rejection, participants may not have necessarily interpreted the items in this way. However, the measures more often used to assess rejection sensitivity in the literature tend to touch upon a number of other individuals (e.g., peers, family, significant other), and not only peers, so although we may have assumed participants were referring to peers, rejection sensitivity is a more broad measure which touches on sensitivity to rejection among a number of social relationships. Finally, the measure we used for rejection sensitivity in Study 1 and Study 2 (i.e., BFNE-II) may be argued to be a component of social anxiety, which shares features with rejection sensitivity. This measure was used in the McMaster Teen Study over the Children's Rejection Sensitivity Questionnaire (CRSQ), which is used to measure rejection sensitivity in children, because it represented a more parsimonious measure of rejection sensitivity that had good psychometric properties (Carleton et al., 2006; Leary, 1983).

An additional limitation with regard to the measures and scales used throughout our three studies was that we did not formally test the measures using factor analysis. Although

alphas are reported for the measurements used in our studies, the use of factor analysis to assess invariance across time could have strengthened our conclusions. This important point notwithstanding, the measures used in the McMaster Teen Study dataset are all well-established, and were chosen based on their known psychometric strengths.

Although another strength of our first two studies was the use of developmental cascade models using a longitudinal dataset (Masten & Cicchetti, 2010), even if directionality is implied from our models, causal conclusions cannot be drawn and cascade models are not without weakness. For instance, some researchers have criticized cross-lagged panel models, such as cascade models, as representing a weighted blend of between- and within-person effects as opposed to actual within-person relationships over time, which may have an impact on their interpretation (Berry & Willoughby, 2017; Hamaker et al., 2015). Researchers should aim to replicate the findings from these first two studies using other analytical methods which distinguish between- and within-person effects, such as random intercept cross-lagged panel models, in order to provide stronger evidence of the directionality of our findings. With regard to Study 3, as is the case with all cross-sectional data, which our third study uses, causality and the direction of the relations between the variables cannot be assumed.

A final limitation of this study is that all the variables used in all three of our studies were measured using self-reports, which may have potentially inflated our findings due to shared-method variance. In cases where the effect sizes were smaller, inflated findings due to shared-method variance may potentially be more problematic. For instance, in one meta-analysis examining cross-sectional studies of peer victimization and psychosocial maladjustment, Hawker and Boulton (2000) found that mean effect sizes from studies with shared-method variance were, on average, 0.11 higher (0.04 to 0.18) higher than the comparable mean effect sizes without

shared-method variance. Reported associations that are within this range in Study 3, which looked at cross-sectional data, should be carefully interpreted.

In Study 1 and Study 2, which used longitudinal data, although they also may have inflated findings due to shared-method variance, in these studies, small standardized betas should not necessarily be interpreted as non-significant. In Adachi and Willoughby (2015), the phenomenon of small effect sizes in longitudinal data, especially data which examine the stability of measures over time, is discussed. In these types of datasets, small effect sizes should not be interpreted as not being meaningful as they are measuring what the change in the variable is over and above the contribution of past values of that measure (i.e., stability and covariance).

With these limitations in mind, researchers could provide stronger evidence of the directionality of our findings by aiming to replicate these studies by using multiple informants and including large samples from differing geographical areas which offer a wider range of socioeconomic and cultural backgrounds in order to be more representative of the general population. The ideal future study would make use of a large multi-informant dataset which measures both anxious and angry rejection sensitivity from earlier points in development to aim to replicate and provide stronger evidence for the results found in our studies.

As the McMaster Teen Study is still ongoing and data are still being collected annually, another future study could make use of the young adult sample as they progress through early adulthood, who will have provided more time points using the new measures that were used in our Study 3. In so doing, it could provide stronger evidence of our findings through cascade modelling with longitudinal data, and would provide further longitudinal information on perfectionism, rejection sensitivity, and depression, which is still a new area of study.

Conclusion

This dissertation furthers our understanding of the role of rejection sensitivity, a defense mechanism against threats to the need to belong, in relation to depression and interpersonal (i.e., rejection) and intrapersonal (i.e., perfectionism) factors that serve as a threat to interpersonal connection and belonging by making use of developmental cascade models, as well as through replication of previous findings in a new sample. Results from our first and second study demonstrate the bidirectional relation of rejection sensitivity and depression in the absence of prior rejection through significant indirect effects, as well as the mediating role of rejection sensitivity in the relation between self-oriented perfectionism and depression. Finally, results from our third study provided some support for previous studies in the direct relation between rejection sensitivity, socially prescribed, and other-oriented perfectionism with depression, although a moderating effect was not detected. Overall, rejection sensitivity plays a significant role in the development and maintenance of depression in the absence of actual rejection as well as in conjunction with specific types of perfectionism.

Throughout all three studies, the variables used are all based on faulty perceptions of the world based on an individual's thoughts, interactions, expectations, and experiences, which all contribute to a working model of the world. Whether examining rejection sensitivity, depression, rejection, or perfectionism, even though they are all distinct constructs, they all reflect a misinterpretation of the world based on personal beliefs or sensitivities which can stem from past experiences or genetic predispositions. How a person misinterprets the world or misreads interactions with others feed into each other and may contribute to the development of depression or depressive symptoms. Understanding that these constructs are all representative of a person's perceived reality has implications for the clinical treatment of depression. By treating

erroneous cognitive patterns, such as the reactions and beliefs associated with rejection, rejection sensitivity, and perfectionism, it is possible that symptoms of depression can be lowered in adolescence as well.

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Appendix 1

Rejection Sensitivity – Brief Fear of Negative Evaluation Scale - II (BFNE-II)

1. I worry about what other people will think of me even when I know it doesn't make any difference.

Not at all characteristic of me	Slightly characteristic of me	Moderately characteristic of me	Very characteristic of me	Extremely characteristic of me
○	○	○	○	○

2. It bothers me when people form an unfavorable impression of me.

Not at all characteristic of me	Slightly characteristic of me	Moderately characteristic of me	Very characteristic of me	Extremely characteristic of me
○	○	○	○	○

3. I am frequently afraid of other people noticing my shortcomings.

Not at all characteristic of me	Slightly characteristic of me	Moderately characteristic of me	Very characteristic of me	Extremely characteristic of me
○	○	○	○	○

4. I worry about what kind of impression I make on people.

Not at all characteristic of me	Slightly characteristic of me	Moderately characteristic of me	Very characteristic of me	Extremely characteristic of me
○	○	○	○	○

5. I am afraid that others will not approve of me.

Not at all characteristic of me	Slightly characteristic of me	Moderately characteristic of me	Very characteristic of me	Extremely characteristic of me
○	○	○	○	○

6. I am afraid that other people will find fault with me.

Not at all characteristic of me	Slightly characteristic of me	Moderately characteristic of me	Very characteristic of me	Extremely characteristic of me
○	○	○	○	○

7. I am concerned about other people's opinions of me.

Not at all characteristic of me	Slightly characteristic of me	Moderately characteristic of me	Very characteristic of me	Extremely characteristic of me
○	○	○	○	○

8. When I am talking to someone, I worry about what they may be thinking about me.

Not at all characteristic of me	Slightly characteristic of me	Moderately characteristic of me	Very characteristic of me	Extremely characteristic of me
○	○	○	○	○

9. I am usually worried about what kind of impression I make.

Not at all characteristic of me	Slightly characteristic of me	Moderately characteristic of me	Very characteristic of me	Extremely characteristic of me
○	○	○	○	○

10. If I know someone is judging me, it tends to bother me.

Not at all characteristic of me	Slightly characteristic of me	Moderately characteristic of me	Very characteristic of me	Extremely characteristic of me
○	○	○	○	○

11. Sometimes I think I am too concerned with what other people think of me.

Not at all characteristic of me	Slightly characteristic of me	Moderately characteristic of me	Very characteristic of me	Extremely characteristic of me
○	○	○	○	○

12. I often worry that I will say or do wrong things.

Not at all characteristic of me	Slightly characteristic of me	Moderately characteristic of me	Very characteristic of me	Extremely characteristic of me
○	○	○	○	○

Aggression – Aggressive Behaviour Scale (ABS)

1. I'm the kind of person who often fights with others.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

2. When I'm hurt by someone, I often fight back.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

3. I often threaten others to get what I want.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

4. I'm the kind of person who tells my friends to stop liking someone.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

5. If others upset or hurt me, I often tell my friends to stop liking them.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

6. I often tell my friends to stop liking someone to get what I want.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

7. I'm the kind of person who hits, kicks, or punches others.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

8. When I'm threatened by someone, I often threaten back.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

9. I often hit, kick, or punch others to get what I want.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

10. I'm the kind of person who keeps others from being in my group of friends.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

11. If others have hurt me, I often keep them from being in my group of friends.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

12. I often keep others from being in my group of friends to get what I want.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

13. I'm the kind of person who says mean things to others.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

14. If others have angered me, I often hit, kick or punch them.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

15. To get what I want, I often say mean things to others.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

16. I'm the kind of person who ignores others or stops talking to them.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

17. When I am upset with others, I often ignore or stop talking to them.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

18. To get what I want, I often ignore or stop talking to others.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

19. I'm the kind of person who puts others down.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

20. If others make me mad or upset, I often hurt them.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

21. To get what I want, I often hurt others.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

22. I'm the kind of person who gossips or spreads rumors.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

23. When I am mad at others, I often gossip or spread rumors about them.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

24. To get what I want, I often gossip or spread rumors about others.

Not at all true	Sort of not true	Sort of true	Completely true
○	○	○	○

Perfectionism – Child and Adolescent Perfectionism Scale (CAPS)

The following questions are about how you feel about doing well all the time.

1. I try to be perfect in everything I do

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

2. I want to be the best at everything I do

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

3. My parents don't always expect me to be perfect in everything I do.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

4. I feel that I have to do my best all the time.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

5. There are people in my life who expect me to be perfect.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

6. I always try for the top score on a test.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

7. It really bothers me if I don't do my best all the time.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

8. My family expects me to be perfect.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

9. I don't always try to be the best.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

10. People expect more from me than I am able to give.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

11. I get mad at myself when I make a mistake

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

12. Other people think that I have failed if I do not do my very best all the time.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

13. Other people always expect me to be perfect.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

14. I get upset if there is even one mistake in my work.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

15. People around me expect me to be great at everything.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

16. When I do something, it has to be perfect.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

17. My teachers expect my work to be perfect.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

18. I do not have to be the best at everything I do

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

19. I am always expected to do better than others.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

20. Even when I pass, I feel that I have failed if I didn't get one of the highest marks in the class.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

21. I feel that people ask too much of me.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

22. I can't stand to be less than perfect.

False—Not at all true of me	Mostly False	Neither True Nor False	Mostly True	Very True of me
○	○	○	○	○

Rejection Sensitivity – Rejection Sensitivity Questionnaire – Adult Version (RSQ)

1. You ask your parents or another family member for a loan to help you through a difficult financial time.

a) How concerned or anxious would you be over whether or not your family would want to help you?	very unconcerned					very concerned
	1	2	3	4	5	6
b) I would expect that they would agree to help as much as they can.	very unlikely					very likely
	1	2	3	4	5	6

2. You approach a close friend to talk after doing or saying something that seriously upset him/her.

a) How concerned or anxious would you be over whether or not your friend would want to talk with you?	very unconcerned					very concerned
	1	2	3	4	5	6
b) I would expect that he/she would want to talk with me to try to work things out.	very unlikely					very likely
	1	2	3	4	5	6

3. You bring up the issue of sexual protection with your significant other and tell him/her how important you think it is.

a) How concerned or anxious would you be over his/her reaction?	very unconcerned					very concerned
	1	2	3	4	5	6
b) I would expect that he/she would be willing to discuss our possible options without getting defensive.	very unlikely					very likely
	1	2	3	4	5	6

4. You ask your supervisor for help with a problem you have been having at work.

a) How concerned or anxious would you be over whether or not the person would want to help you?	very unconcerned					very concerned
	1	2	3	4	5	6

b) I would expect that he/she would want to try to help me out.	very unlikely					very likely
	1	2	3	4	5	6

5. After a bitter argument, you call or approach your significant other because you want to make up.

a) How concerned or anxious would you be over whether or not your significant other would want to make up with you?	very unconcerned					very concerned
	1	2	3	4	5	6
b) I would expect that he/she would be at least as eager to make up as I would be.	very unlikely					very likely
	1	2	3	4	5	6

6. You ask your parents or other family members to come to an occasion important to you.

a) How concerned or anxious would you be over whether or not they would want to come?	very unconcerned					very concerned
	1	2	3	4	5	6
b) I would expect that they would want to come.	very unlikely					very likely
	1	2	3	4	5	6

7. At a party, you notice someone on the other side of the room that you'd like to get to know, and you approach him or her to try to start a conversation.

a) How concerned or anxious would you be over whether or not the person would want to talk with you?	very unconcerned					very concerned
	1	2	3	4	5	6
b) I would expect that he/she would want to talk with me.	very unlikely					very likely
	1	2	3	4	5	6

8. Lately you've been noticing some distance between yourself and your significant other, and you ask him/her if there is something wrong.

a) How concerned or anxious would you be over whether or not he/she still loves you and wants to be with you?	very unconcerned					very concerned
	1	2	3	4	5	6
b) I would expect that he/she will show sincere love and commitment to our relationship no matter what else may be going on.	very unlikely					very likely
	1	2	3	4	5	6

9. You call a friend when there is something on your mind that you feel you really need to talk about.

a) How concerned or anxious would you be over whether or not your friend would want to listen?

very unconcerned very concerned

1 2 3 4 5 6

b) I would expect that he/she would listen and support me.

very unlikely very likely

1 2 3 4 5 6

Perfectionism – Multidimensional Perfectionism Scale-short form (MPS-15)

	Strongly disagree			Neither agree nor disagree			Strongly agree
1. One of my goals is to be perfect in everything I do	1	2	3	4	5	6	7
2. Everything that others do must be of top-notch quality	1	2	3	4	5	6	7
3. The better I do, the better I am expected to do	1	2	3	4	5	6	7
4. I strive to be as perfect as I can be	1	2	3	4	5	6	7
5. It is very important that I am perfect in everything I attempt	1	2	3	4	5	6	7
6. I have high expectations for the people who are important to me	1	2	3	4	5	6	7
7. I demand nothing less than perfection of myself	1	2	3	4	5	6	7
8. I can't be bothered with people who won't strive to better themselves	1	2	3	4	5	6	7
9. Success means that I must work even harder to please others	1	2	3	4	5	6	7
10. If I ask someone to do something, I expect it to be done flawlessly	1	2	3	4	5	6	7
11. I cannot stand to see people close to me make mistakes	1	2	3	4	5	6	7
12. I must work to my full potential at all times	1	2	3	4	5	6	7
13. My family expects me to be perfect	1	2	3	4	5	6	7
14. People expect nothing less than perfection from me	1	2	3	4	5	6	7
15. People expect more from me than I am capable of giving	1	2	3	4	5	6	7