Do You See What I See? Exploring Transactional Influences of Parental and Child Perceptions

of Children's Anxiety Using an Actor-Partner Interdependence Framework

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Abstract

Do You See What I See? Exploring Transactional Influences of Parental and Child Perceptions

of Children's Anxiety Using an Actor-Partner Interdependence Framework

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Anxiety is the most common and earliest presenting of mental health problems and can have significant negative impacts on development across the lifespan, even at subclinical levels. Much research has explored the importance of the family system in children's emotion socialization, including their anxiety trajectories. However, little research has explored parental influences in ways that account for the dyadic and transactional nature of the family system.

The overall aim of this research was to investigate dyadic patterns of parent and child perceptions and emotion socialization behaviours on children's anxiety across development using Actor-Partner Interdependence Models. Data from Study 1 ($N = 180$) was drawn from the Concordia Longitudinal Research Project, an ongoing longitudinal, intergenerational study of children from disadvantaged neighbourhoods. Data from Study 2 ($N = 208$) was drawn from a three-wave community sample. Study 1 examined the dyadic influence of maternal and child perceptions of children's anxiety and their role as a possible mechanism for the intergenerational transmission of anxiety. Overall, results suggested that maternal perceptions of children's anxiety influenced children's later self-perceptions of their own anxiety, but not vice versa. Maternal perceptions were also shown to mediate the link between maternal anxiety in early childhood and children's self-reported anxiety in early adolescence, but only for mothers who

were observed to be less sensitive and structuring in their interactions with their children. Study 2 examined the dyadic influence of maternal and paternal perceptions of children's anxiety and responses to children's expression of anxiety. Overall, results suggested that mothers and fathers influence each other's negative socialization behaviours in different ways, with mothers' behaviours influenced more indirectly by paternal perceptions and fathers' behaviours influenced more directly by maternal behaviours.

The present studies build on previous work exploring parental perceptions of children's temperamental anxiety in early childhood and maternal and paternal emotion socialization strategies in response to anxiety. These findings highlight the importance of exploring key relationships in a child's environment when seeking to understand the importance of parenting on children's anxiety trajectories. This line of research has important implications for early prevention and intervention within the family system.

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I would like to thank my family for their overwhelming support over the last decade. You keep me happy and connected to what is important. You can stop asking me if I'm done school now. Special thanks to my "early environment". My mother, who taught me the importance of asking questions. My father, who taught me the power of answering a question with another question. And my sister, who taught me to empirically test my questions using household supplies. Thank you for keeping me curious.

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Lastly, to my precious son Maverick, who arrived just as this was being finished, thank you for making me a parent. You are my next great adventure.

Contribution of Authors

Alison Kirkpatrick was responsible for developing the research questions, designing the statistical models, performing and interpreting the statistical analyses, and writing and editing all chapters included in this dissertation. Dr. Lisa Serbin and Dr. Dale Stack, the student's research supervisors, provided commentary on the research as it progressed and Dr. Serbin edited the final draft of the dissertation.

Data from the first manuscript was a part of the Concordia Longitudinal Risk Project ("Concordia Project"), which began under the direction of Dr. Alex Schwartzman and Dr. Jane Ledingham in 1976. They were responsible for the original conceptualization and design of the study, as well as initial waves of data collection and analysis. The Concordia Project is now under the direction of Dr. Lisa Serbin and Dr. Dale Stack who have been integrally involved in the conceptualization, development, design, and collection of data for all intergenerational studies. The data utilized in the first manuscript comes from waves of data collection designed by Dr. Serbin and Dr. Stack.

Data from the second manuscript was part of a community-based study conducted by Dr. Rosemary Mills. The data was collected in collaboration with the Concordia Project under the direction of Dr. Serbin and Dr. Stack and a preschool-based study under the direction of Dr. Paul Hastings. Although Dr. Mills, Drs. Serbin and Stack, and Dr. Hastings each operated independently in the first wave of data collection, they collaboratively conceptualized, developed, and designed the second and third waves of data collection.

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Chapter 1: General Introduction

Parents are argued to be the most powerful influence in their children's socio-emotional development. Their situation within the immediate family system makes them uniquely positioned to serve as both important sources of risk and protection in a child's development of anxiety. Much of the current literature examining parental influences on children's anxiety trajectories has focused on parenting behaviours. Previous research has implicated both directional (e.g., specific parenting behaviours) and bidirectional links (e.g., elicitation of specific parental behaviour in response to children's expressed anxiety) in the development of anxiety symptomology (see Möller et al., 2016 for a review). However, current models have largely failed to account for the interdependent nature of the parent-child relationship across time, as well as dynamic relationships among family members within the family system (e.g., mothers and fathers) that can further influence children's development. Actor-partner interdependence models (APIMs) represent a promising statistical framework for exploring the dynamic relationship between parents and children while accounting for the nonindependence of dyadic data (Cook & Kenny, 2005).

The primary goal of this thesis was to examine the dyadic influence of mother, father, and child perceptions of children's anxiety from childhood to early adolescence. In Study 1, the dyadic influence of mother and child perceptions of children's anxiety and the moderating influence of maternal sensitivity were explored in an attempt to understand possible sources of intergenerational transmission of anxiety. To date, no studies have examined how parental perceptions of children's anxiety simultaneously shape and are shaped by children's perceptions of their own anxiety across childhood and adolescence. In Study 2, the dyadic influence of mother and father perceptions of children's anxiety and their parenting responses to children's expressed anxiety were explored in an effort to understand how the marital subsystem can contribute to children's anxiety and parents' emotion socialization strategies.

Anxiety in Childhood

Conceptualization

Anxiety is defined as an emotional response to perceived future danger and is composed of cognitive (e.g., negative thoughts, difficulties concentrating), somatic (e.g., nervousness, muscle tension, vigilance), and behavioural features (e.g., avoidance) (Byrne et al., 2018). It is conceptually distinct from fear, the emotional response to real or perceived imminent threat (American Psychiatric Association, 2013). Anxiety is apparent from infancy and responses range along a continuum, from mild to severe (Ollendick et al., 2014). Anxiety is not inherently pathological and is considered a part of normative development and an adaptive response; it prepares an individual to deal with the occurrence of the perceived threat (Ollendick et al., 2014).

However, anxiety is maladaptive when it is excessive, persists beyond what is developmentally typical or appropriate, and interferes with daily functioning (American Psychiatric Association, 2013). At this point, anxiety can be considered pathological and may result in a diagnosis by a medical or mental health professional. Although it is important to note that existing diagnostic systems differentiate between several distinct forms of anxiety disorders based on the types of objects or situations that induce anxious symptomology, most share the same clinical patterns of significant and excessive anxiety, physiological arousal, distress/impairment, and behavioural avoidance (American Psychiatric Association, 2013). To facilitate a more generalized interpretation of findings to non-clinical populations, the focus of the current dissertation is on more global forms of anxiety (i.e., general, non-specific worry).

Measurement

Lacking a clear biological indicator, anxiety is most often measured through the use of diagnostic interviews, observations, and self- and other-report symptom/behaviour inventories.

Although capable of providing a clear, comprehensive, and objective understanding of whether a child meets the criteria for an anxiety disorder, diagnostic interviews are often costly and time-consuming as they require administration by a clinician or trained researcher (Byrne et al., 2018) and are designed to provide clarity on diagnostic status (i.e., present or not), thereby limiting generalizations about children's experiences at normative and subclinical ranges. While observational measures provide a suitable alternative, providing objective reports of anxiety along a continuum (Möller et al., 2016), these tools are overwhelmingly used in infancy and preschool research and their utility and efficacy in samples of older children remain relatively unknown. Moreover, these tools rely on researchers making inferences about a child's level of anxiety during a single laboratory visit and may be more exemplary of their momentary responses to threat (i.e., state anxiety) than their overall anxious disposition (i.e., trait anxiety) (Möller et al., 2016). For these reasons, much research on anxiety in non-clinical populations in childhood and adolescence tends to focus on the use of symptom/behavioural inventories.

Symptom/behaviour inventories require informants to independently respond to a series of standard items assessing various aspects of anxiety (typically rated on a Likert scale) which are later scored to generate a summary score indicating their total level of anxiety. Symptom/behavioural inventories appear to be favoured within the literature, likely due to their low cost and ease of administration across multiple informants and settings without a required administrator (Simon & Bögels, 2009). Although they are susceptible to informant bias (e.g., bias due to dispositional factors, stress, and psychopathology), they tend to encourage informants to reflect on children's anxiety across time and context (i.e., trait anxiety) and may provide a more generalizable reflection of their anxiety than observational measures (Möller et al., 2016).

Prevalence, Course, and Clinical Implications of Anxiety

Anxiety is the most common and earliest presenting of all mental health problems among Canadian youth, with anxiety disorders in childhood having prevalence rates of 8-15% (Georgiades et al., 2019) and a median age of onset of 11 years (Kessler et al., 2005, 2007). Furthermore, more than half of Canadian youth report concerns with their level of anxiety, regardless of diagnostic status (Ipsos Public Affairs, 2017). Anxiety disorders have demonstrated moderate stability across development (e.g., Bosquet & Egeland, 2006; Gullone et al., 2001; Ialongo et al., 1995), with some children demonstrating stable-high symptoms, some demonstrating stable-low levels, and others experiencing fluctuations, increases, or decreases (Henry & Moffitt, 1991; Weems et al., 2002). Additionally, anxiety disorders demonstrate both broad homotypic continuity and heterotypic continuity across the lifespan (Woodward & Fergusson, 2001), suggesting a substantial degree of continuity of psychopathology that might not be fully captured by studies exploring strict heterotypic continuity (Weems, 2008).

Gender differences in prevalence rates are small in childhood and increase with age, with females showing a greater preponderance by mid-adolescence or early adulthood (Altemus et al., 2014; Copeland et al., 2014), though other studies have found no differences (Angold et al., 2002, 2012). Although females may be more likely to develop anxiety, gender was not found to moderate the association between anxiety and psychosocial functioning, suggesting that the negative impact of anxiety is independent of gender (Essau et al., 2014).

Children or adolescents who experience maladaptive levels of anxiety are at risk for a host of negative adjustment outcomes, including delayed development of emotion regulation skills, poor adjustment in school, concurrent and later psychopathology, and impairments in financial, interpersonal, and general health functioning (Copeland et al., 2014; Essau et al., 2018; Rapee et al., 2009). In addition, direct and indirect social costs for clinically anxious youth have

been suggested to be 20 times greater than those of non-clinically anxious youth (Bodden et al., 2008). Importantly, research has suggested that children and adolescents who experience clinically significant distress and impairment warranting psychological intervention but do not meet criteria for an anxiety disorder (i.e., "subthreshold" cases) can still be reliably differentiated from non-anxious controls in terms of their impairment, disability, and psychiatric comorbidity (Burstein et al., 2014). Consequently, understanding what mechanisms foster and exacerbate anxiety in childhood and adolescence is integral for informing etiological models and early intervention and prevention.

Determinants of Anxiety

Many individual biological risk factors for the development of anxiety have been proposed in the literature, including temperament (e.g., behavioural inhibition), differences in brain structure and functioning (e.g., amygdala hypersensitivity), physiological processes (e.g., hypothalamic-pituitary-adrenal (HPA) axis dysfunction), and cognitive processes (e.g., greater threat attribution) (Cabral & Patel, 2020; Schiele & Domschke, 2018). Of great relevance in the literature has been genetic heritability and the intergenerational transmission of anxiety.

Research has suggested that anxiety problems show significant familial aggregation, with children of anxious parents at much greater risk of developing anxiety (Lawrence et al., 2019). Risks appear to be elevated when both biological parents are affected (Li et al., 2008) and when parents experience earlier-onset, have multiple comorbid anxiety disorders, and experience more severe impairment (Schreier et al., 2008). However, results from twin studies have indicated these heritability estimates are modest, accounting for 30% of the variability in offspring anxiety (Gottschalk & Domschke, 2017). Consequently, the considerable remaining variance in children's anxiety has been attributed to nonshared environmental influences, with research

indicating direct effects for environmental, but not genetic, transmission of anxiety (Eley et al., 2015). Therefore, understanding early environmental influences on children's anxiety trajectories may be particularly important, especially in the context of intergenerational transmission.

Many environmental determinants have been proposed to influence the development of anxiety disorders, including the presence of childhood adversity and negative life events (e.g., abuse, neglect, exposure to violence, stressful life events, loss, separation), peer victimization, prenatal exposure to toxic substances, low socioeconomic status (SES), and lower parental education (see Cabral & Patel, 2020). However, of the many environmental mechanisms implicated, parental and familial factors appear to be the most widely explored. Many aspects of the family environment have been implicated in children's development of anxiety, including parental characteristics (e.g., inhibited or neurotic personality, anxious beliefs and perceptions, avoidant problem-solving), parental illness or disability, parental psychopathology (e.g., anxiety, depression), parenting style (e.g., authoritarian parenting), parenting practices and behaviours (e.g., overprotective, critical/rejecting, or lack of autonomy granting parenting, modelling of anxious/avoidant behaviour), and aspects of the parent-child relationship (e.g., insecure attachment, conflict) (see Cabral & Patel, 2020). Environmental factors rooted in the child's early development, like parental behaviours, parental modelling, and family functioning likely influence the intergenerational transmission of anxiety and merit considerable focus and attention.

Parenting, the Parent-Child Relationship, and Children's Anxiety

The family system represents the earliest and most continuous of all environmental systems within which a child grows and develops. Parent-child relationships, in particular, are uniquely situated to serve as both important sources of risk and protection in children's

emotional development, including their development of anxiety.

Parenting Styles and Parenting Behaviour Models

Early models of parental influence on children's anxiety trajectories explored the role of overly critical, rejecting, and punitive parenting behaviours characterized by increased hostility, disapproval, and withdrawal and decreased sensitivity and warmth (see McLeod et al., 2007). These parenting behaviours have been suggested to influence children's perceptions of their environment as hostile and threatening, increase negative emotionality, reduce their perceived sense of mastery, and lead to the development of a negative view of the self and greater feelings of anxiety (see Bögels & Brechman-Toussaint, 2006; Pinquart, 2017b). In contrast, when parents are sensitive and attentive to their child's needs, they are better able to help redirect and disengage attention away from anxiety-provoking stimuli to prevent anxious arousal from becoming overwhelming, fostering the development of an internalized locus of control and serving as a protective factor against the development of anxiety (Degnan et al., 2010; Warren & Simmens, 2005). However, the developmental outcomes of these parenting behaviours are not specific to children's development of anxiety and have been shown to predict increased risk for internalizing (e.g., depression) and externalizing problems more generally (Pinquart, 2017a, 2017b).

Subsequent models of parental influence sought to understand mechanisms more specific to the development of anxiety. Overcontrolling (i.e., excessive restriction of autonomy and attempts to manage behaviour), overprotective (i.e., overly cautious attempts to manage situations to limit exposure to novelty or anxiety-provoking situations), autonomy granting (i.e., encouraging child's independence), and challenging parenting behaviours (i.e., playful encouragement to go outside of one's comfort zone) feature most prominently in the literature

(Möller et al., 2016). Overcontrolling and overprotective behaviours are proposed to increase risk for the development of anxiety, as they restrict children from experiencing novel or ambiguous situations, teach a pattern of avoidant responding, increase children's threat perception, reduce their perceptions of control, and prevent opportunities for learning how to cope with unexpected and challenging situations (Möller et al., 2016). In contrast, autonomy-granting and challenging parenting behaviours have been proposed to reduce anxiety risk, as they are suggested to encourage exploration and risk-taking, to increase a child's perceived sense of control over events, and to increase a child's confidence in their ability to cope with threats and novelty (Möller et al., 2016). Although these behaviours have been shown to be associated with children's anxiety across numerous meta-analytic studies, their influence appears to be small to medium in size and research has suggested the importance of exploring smaller, more specific or proximal mechanisms of parenting behaviours when seeking to understand the role of the parent-child relationship in children's development of anxiety (McLeod et al., 2007; Möller et al., 2016; Price & Kiel, 2022; van der Bruggen et al., 2008)

Socialization Models

Parental socialization of emotion may be one mechanism highly relevant to the understanding of children's anxiety development within the context of parent-child relationships. Vicarious learning models, drawing from social learning theory (Bandura, 1977), have also suggested that children may learn anxious and avoidant behaviours and cognitions through observing the presence of these behaviours and cognitions in their parents. Direct conditioning, verbal transmission of threat and anxiety (i.e., parents highlighting or providing information about specific/generalized threat or directly communicating about their anxiety/fears), and parental modelling of threat and anxious behaviours (e.g., parental behavioural expression of

anxiety and avoidance) have all been implicated in children's development of anxiety (Fisak & Grills-Taquechel, 2007). These behaviours are proposed to contribute to anxiety risk as they increase children's threat perception, foster beliefs that the world is uncontrollable and to be avoided, and encourage maladaptive coping strategies by reinforcing the value of avoidant coping in anxiety-producing situations (Fisak & Grills-Taquechel, 2007).

Although most research in this area has focused on the intergenerational transmission of anxiety from parent to child through the transmission of parents' own anxious behaviours, cognitions, and biases, it is also likely that parents transmit information about children's own anxiety status. Children's anxiety has been suggested to have early, innate temperamental markers (e.g., behavioural inhibition) (Lahat et al., 2011) and parents have been suggested to parent anxious children differently, regardless of their own level of anxiety (Gouze et al., 2017; Hale et al., 2013). Parents have also been shown to interact differently with anxious children to whom they are not related (Hudson et al., 2009). Consequently, parental perceptions about their children's anxiety may be additional motivators of their parenting behaviours and interactions beyond their own experiences with anxiety. However, there is a relative dearth of research exploring how parental perceptions of children's anxiety influence children's perceptions and awareness of their own anxiety and how this may contribute to children's anxiety across development. The literature remains focused on exploring the associations between parental perceptions and children's observed temperament in infancy (e.g., Pauli-Pott et al., 2003) or the origins of parent-child reporting discrepancies rather than exploring systematic patterns of influence across children's development (e.g., Popp et al., 2017). Exploring the relationship between parent and child perceptions of children's anxiety across childhood represents the focus of Study 1 of this dissertation.

In a similar vein, emotion socialization models (e.g, Morris et al., 2007) have proposed that parents socialize and shape their children's emotional understanding, expression, communication, and regulation of emotion throughout development, and can consequently contribute to their development of anxiety more specifically. Although many avenues of socialization have been proposed (e.g., coaching, modelling, social referencing, emotional climate of the family), how a parent decides to respond to their children's emotions is especially important as their responses convey important messages about the nature and appropriateness of emotions, the situations and circumstances that elicit them, how they should react to the expression of emotions in others, and how they should manage their emotions (Eisenberg et al., 1998; O'Neal & Magai, 2005). Over time, emotion socialization strategies have important implications for emotional development, as they contribute to the consolidation of affective organization and become internalized into the child's self-concept, with maladaptive socialization strategies leading to moderate distortions of personality (e.g., subclinical anxiety) or more severe distortions typical of psychopathological functioning (e.g., anxiety disorders) (Malatesta-Magai, 1991; Malatesta & Wilson, 1988).

Parental responses to negative emotions like anxiety that are unsupportive in nature (e.g., those that punish, override/dismiss, neglect/ignore, and magnify the emotion) are particularly relevant to understanding the development of children's anxiety, over and above the role of supportive emotion strategies (Silk et al., 2011). Unsupportive parental responses are suggested to hinder the development of emotion regulation, as they teach children that the emotion is undesirable, threatening, or unacceptable, reinforce avoidance and suppression of emotion, and limit opportunities to better understand underlying emotional processes and to rehearse adaptive coping strategies (Denham et al., 2007; Miller-Slough et al., 2018; Perry et al., 2020). Indeed,

unsupportive responses to children's expression of anxiety are associated with a greater risk of internalizing problems, increased emotionality, and greater reliance on avoidant coping strategies (Eisenberg et al., 1996; Fabes et al., 2001; Perry et al., 2020).

However, much research has focused on exploring parental responses to children's emotions more globally by creating composites that collapse all negative emotions (e.g., anxiety, sadness, anger) and/or all unsupportive parental responses (e.g., punitive, overriding, neglectful, magnifying) into a single composite (Hurrell et al., 2015; Li et al., 2019; Miller-Slough et al., 2016; Seddon et al., 2020). The creation of a composite averaging responses and emotions may obfuscate rich emotion-specific information and limit our understanding of the mechanisms underlying children's development of anxiety. The functionalist theory of emotions (Barrett & Campos, 1987) and differential emotion theory (Ackerman et al., 1998) posit that the expression of a specific emotion carries a corresponding specific, interpersonal function and therefore elicits different parental responses. When studies have sought to examine discrete emotions, they have focused more predominantly on anger and sadness (e.g., Bao & Kato, 2020; Buckholdt et al., 2010, 2014) and much less is known about the role of parents in the socialization of children's anxiety.

In particular, the magnification of anxiety is relatively unexplored in the literature, despite the fact that anxious parents are more likely to engage in distressed ways that heighten their children's anxiety (Kiel et al., 2021), supporting environmental models of the transmission of anxiety. Magnification, although shown to have similar effects to other unsupportive responses (Silk et al., 2011), may also have unique associations with anxiety through the modelling of anxious behaviours and the validation of threat. Unlike other unsupportive responses that invalidate children's emotions through ignoring (neglecting),

downplaying/dismissing (overriding), or active discouragement (punishing), magnification may involve, in a maladaptive way, the validation of children's emotions. Magnification involves parents reflecting back and directly intensifying their children's emotions. Accordingly, parents are not only modelling emotional expressiveness, but they are potentially confirming that the threat the child perceives is real and worth worrying about.

Research exploring magnification responses remains limited, with existing studies focusing on responses to global negative emotions (e.g., McNeil & Zeman, 2021; Sharp et al., 2017; Silk et al., 2011), composites of sadness and anxiety (e.g., Hooper et al., 2018), or discrete emotions to the exclusion of anxiety (e.g., Buckholdt et al., 2010). Only a few studies to date have explored the magnification of anxiety more specifically (Garside & Klimes-Dougan, 2002; Klimes-Dougan et al., 2007; O'Neal & Magai, 2005), finding that mothers are more likely to magnify anxiety than fathers, that parents magnify their daughters' and sons' anxiety similarly, and that the magnification of children's anxiety is associated with internalizing problems. However, these studies are cross-sectional in nature, limited to adolescent or adult retrospective reports of parental emotional socialization, and focus on their contribution to internalizing problems or general psychological distress. Consequently, little is known about how parental magnification in response to children's expressed anxiety affects their anxiety trajectories more specifically across development. This represents the focus of Study 2 of this dissertation.

Exclusion of Fathers from Environmental Models of Children's Anxiety

Despite the longstanding history of acknowledging the importance of fathers in children's development, fathers have been largely ignored in research seeking to understand the intergenerational transmission of anxiety (Bögels & Phares, 2008; see Möller et al., 2016). This is problematic, as mothers and fathers have been suggested to play different roles in their

children's development of anxiety (see Bögels & Phares, 2008). For example, mothers are

suggested to be more likely to take on the role of caregiver and nurturer, permitting more

opportunities for providing comfort and coregulation of intense emotions in anxiety-provoking

situations. In contrast, fathers are more likely to take on the role of playmate and engage in play

characterized by spontaneity, unpredictability, and limit testing, permitting more opportunities

for encouraging autonomy, exploration, and flexibility and for facilitating the development of

confidence in approaching ambiguous, novel, and anxiety-provoking situations.

Given that mothers and fathers may take on different roles in their children's daily lives,

it naturally follows that their interactions with their children may differentially affect their

children's anxiety across development, with fathers' influence becoming stronger as children age

and become more independent (Verhoeven et al., 2012; Weijers et al., 2018). Indeed, research

has suggested, for example, that mothers and fathers socialize their children's emotions in

different ways (e.g., Baker et al., 2011; Brown et al., 2015; Hurrell et al., 2015) and that reduced

paternal autonomy-promoting parenting behaviours and paternal modelling or expression of

anxiety has a greater influence on children's anxiety than the same behaviours in mothers

(Bögels & Perotti, 2011; Burstein & Ginsburg, 2010; Majdandžić et al., 2014). Researchers have

hypothesized that this may be due to differences in emotional expressiveness between males and

females, with fathers being more likely to mask emotions than mothers (Dunsmore et al., 2009).

Consequently, children may have fewer opportunities to observe their fathers' expressions of

anxiety in daily life and may become more surprised and dysregulated by their presence.

Bidirectional Models

Developmental researchers and models of parental influence have long acknowledged the

bidirectional nature of parent-child relationships. Parental characteristics have been shown to

influence parenting behaviours and children's development, and children have been found to elicit specific responses from their parents. For example, research has suggested that anxious parents respond differently to their children than non-anxious parents. Anxious parents have been shown to engage in more anxiety-promoting parenting behaviours and to hold less certain or more negative perceptions about their children's skills and abilities to cope with distressing situations, likely as a result of their own threat sensitivity, belief that anxiety is harmful and to be avoided, and need to manage their own sense of distress in anxiety-provoking situations (see Emerson et al., 2019 and Jones et al., 2021). In turn, research has also suggested that parents respond differently to anxious children than to non-anxious children, with parents exhibiting more anxiety-promoting parenting behaviours and less sensitivity in their interactions with anxious children (e.g., Gouze et al., 2017; Hale et al., 2013), regardless of their own anxiety and even in response to children to whom they are not related (Hudson et al., 2009). Parents are also suggested to have more negative parental perceptions of their children's characteristics, abilities, and likelihood of success in distressing situations when their children are anxious (e.g., Micco & Ehrenreich, 2008; Orchard et al., 2015; Settipani & Kendall, 2017).

Moreover, bidirectional models argue for reciprocal bidirectional influences, such that the combination of both parental and child characteristics operating in tandem can exert strong influences over children's development. Indeed, research exploring parent and child characteristics simultaneously has found the interaction of parent and child anxiety to be predictive of more anxiety-promoting parenting behaviours (e.g., Hudson et al., 2008). Although bidirectional models add much to our understanding of children's development of anxiety, these models are often explored cross-sectionally and fail to account for the transactional nature of bidirectional effects. Consequently, they can paint an image of a static relationship between two

dyad members and often neglect the impact of larger family systems and the reciprocal, interdependent interaction of family members across time.

Interdependence theory (Kelley et al., 2003) and family systems theory (Cox & Paley, 2003) posit that family members are in constant interaction and therefore a member's thoughts, emotions, and behaviours are best conceptualized as a product of both independent and interactive influences. For example, a parent's perceptions of their child's anxiety and their associated parenting behaviours are likely driven by their child's behavioural expressions of anxiety, their own interpretations of the expressed behaviour (which are further influenced by parents' own characteristics and experiences), and the relationship the parent and child have formed that serves as the context within which these behaviours and perceptions play out. In turn, children's expression and experience of anxiety are likely products of their own, often genetically inherited characteristics, which are further shaped by aspects of their developmental environment, such as parental emotion socialization and parenting experiences, aspects of the parent-child relationship, and the broader family emotional climate. Consequently, parent-child data can never be assumed to be truly independent.

The unique relationships that exist within the larger family outside of the parent-child system (e.g., coparent, marital, sibling systems) also represent mutually regulated subsystems and can exert their influence on children's development in both direct and indirect ways. The spillover and crossover hypotheses (Erel & Burman, 1995) propose that each subsystem is reciprocally related to other subsystems such that functioning in one subsystem can have an impact on functioning in another subsystem. For example, one parent's experiences in the coparenting subsystem can affect the way they interact with their child (spillover effect) or the way that their partner interacts with their child (crossover effect). Indeed, research has suggested

the presence of paternal anxiety affects both fathers' and mothers' anxiety-relevant parenting behaviours (Bögels et al., 2008; Bögels & Perotti, 2011; Bögels & Phares, 2008). Specific patterns of coparenting behaviours (e.g., support, conflict, attachment) have also been shown to influence maternal and paternal behaviours in ways that affect children's risk for anxiety (e.g., Jia et al., 2012; Metz et al., 2018; Stuart Parrigon & Kerns, 2016). In light of current models of parenting behaviours demonstrating small to medium effect sizes noted earlier, when seeking to explore the etiological mechanisms underlying children's development of anxiety, research should look towards including relevant family dynamics as proximal mechanisms. This is the focus of Study 2.

Exploring the Parent-Child Relationship Through Actor-Partner Interdependence Models

Despite findings in the developmental literature suggesting the need to account for the interdependence of parent-child data, much of the previous research exploring the parent-child relationship has used statistical models that assume the independence of data. That is, they assume that the data from each individual is unrelated to the data from every other individual in the sample. This is problematic as exploring the environmental influences of children's anxiety necessitates acknowledging multiple individuals embedded within the child's social system. Parents and children are exposed to common influences within the family system and influence each other's thoughts, emotions, and behaviours, and therefore cannot be assumed to be independent. Treating interdependent dyadic data as individual independent data ("pseudo-unilaterality") and ignoring nonindependence is problematic as it biases standard error measurements and thus increases the likelihood of either a Type I or II error depending on the direction of the nonindependence and the type of independent variable (Kenny et al., 2006). Assessing parental influence on children's anxiety trajectories through exploration of dyadic

family interactions (parent-child in Study 1, mother-father in Study 2) represents the key methodological focus of both studies in this dissertation.

Actor-Partner Interdependence Models

More recently, researchers have begun to utilize statistical models that more fully account for their interdependent nature. Grounded in interpersonal and family systems theory, the Actor-Partner Interdependence Model (APIM) is a statistical model that treats the unique contributions of each member as nested within the dyad (Cook & Kenny, 2005). The model simultaneously estimates both actor-effects (i.e., individuals' influence on themselves, controlling for their partner's influence) and partner-effects (i.e., partner's influence on the individual, controlling for their own influence), which permits examination of how an individual's outcome is predicted by their own characteristics, their partner's characteristics, and the combination of the two. The presence of a significant partner-effect suggests interdependence, as an individual's outcome variable depends on the influence of their partner's independent variable.

APIMs can be analyzed either by structural equation modelling (SEM) or multilevel modelling (MLM), whose approaches vary based on whether dyad members are distinguishable from one another based on a given variable (e.g., heterosexual couples, parent and child) or not (e.g., same-sex couples) (see Ledermann & Kenny, 2017 for a review). In the MLM approach, individuals (level 1) are nested within dyads (level 2). For indistinguishable dyads, the effect of the actor variable and its partner variable on the outcome are estimated. For distinguishable dyads, two methods are available. Using the interaction APIM approach, the distinguishing variable is set to interact with both the actor and partner variables much like moderation to test whether actor and partner effects vary between dyad members. Using the two-intercept APIM approach, two indicator variables are created (one with value 1 for Member A and value 0 for

Member B, one with value 1 for Member B and value 0 for Member A) and multiplied separately with the actor and partner variables to provide separate estimates of the two intercepts, actor effects, and partner effects. The MLM approach is considered best suited for indistinguishable members and smaller sample sizes ($N < 80$) (Ledermann & Kenny, 2017).

In the SEM approach, a path model is estimated (see Figure 1), including estimates of the influence of an individual's independent variable on their outcome (actor path, "a"), the influence of a partner's independent variable on an individual outcome (partner path, "p"), possible compositional effects or the association between members' independent variables (c_1), and the residual nonindependence of members' outcome variables or the correlation between error terms for individuals' outcome variables (c_2). For indistinguishable dyads, equality constraints are placed on all parameters that come in pairs (i.e., variances, actor effects, partner effects, means, and intercepts) and the model fit statistic is adjusted. The SEM approach is considered best suited for distinguishable members and is preferable for a wider range of models (e.g., latent variables, multi-equation models like mediation, and nonstandard models), missingness, testing for dyadic patterns, and analyzing data from multiple independent groups (Ledermann & Kenny, 2017). Given interest in moderation and mediation, the frequent missingness involved in longitudinal studies, and sufficient sample sizes across studies, an SEM approach was used for this dissertation and will herein be the focus of discussion pertaining to methodology.

Four distinct relationship patterns are revealed through different combinations of actor and partner effects. In an actor-oriented model, where actor effects are present and partner effects are not, an individual's outcome is only predicted from their own independent variable (Kenny & Ledermann, 2010). In a partner-oriented model, where partner effects are present and actor

Figure 1

Basic Actor-Partner Interdependence Model
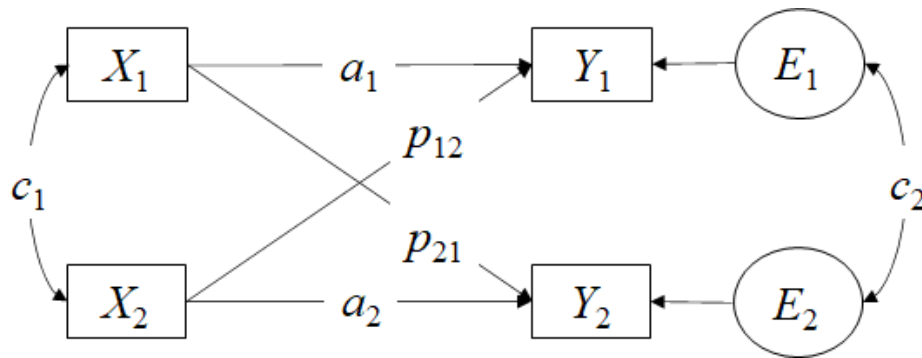
Note. Paths marked "a" represent actor effects, with the subscript "1" indicating the actor effect

for dyad member one and "2" indicating the actor effect for dyad member two. Paths marked "p"

indicate actor effects, with the subscript "21" indicating the partner effect for dyad member two

and "12" indicating the partner effect for dyad member one.

effects are not, a person's outcome is only predicted from their partner's independent variable (Kenny & Ledermann, 2010). In a couple-oriented pattern, where actor and partner effects are equal, a person's outcome is predicted as much by their own independent variable as by their partner's independent variable (Kenny & Ledermann, 2010). Lastly, in a social comparison model, where actor and partner effects are equal in magnitude but in opposite directions, a person's outcome is negatively predicted by their partner's independent variable and positively predicted by their own independent variable (or vice versa) (Kenny & Ledermann, 2010). These patterns can be identified by computing a ratio of the partner and actor effect through the creation of a phantom variable, *k* (Fitzpatrick et al., 2016).

APIM Studies Exploring Parent-Child Relationships and Children's Anxiety

Although APIMs have been proposed by statisticians for several decades and developmental research has long recognized the bidirectional influence of parent and child, surprisingly few studies have explored the joint influence of parent and child characteristics on children's development of anxiety. For example, exploration of PsychInfo, PsycArticles, PubMed, Web of Science, and ERIC using search terms designed to seek out APIM-based studies (APIM, actor-partner) exploring aspects of parenting (parent*, mother*, father*, matern*, patern*) and anxiety (anx*, fear*, worr*, inhibit*, shy*, internali*) produced 118 results, of which the majority did not explore parental influences on children's anxiety trajectories overtly, choosing instead to focus on aspects of the marital relationship among parents without specific reference to children, the transition to parenthood, parent or family outcomes other than anxiety (e.g., PTSD, trauma, eating disorder, substance abuse), and family functioning in specialized populations not easily generalized to a wider population (e.g., children with medical complexities or diseases). Only seven studies included children's anxiety as an outcome.

Findings from these studies suggest the presence of partner effects for both parents and children or from parent to child specifically. Woody and colleagues (2021) found parents' and children's negative facial affect in conflict discussion predicted their partner's social anxiety two years later, whereas Kaye and colleagues (2015) found that parent and child achievement-based goals in sporting contexts predicted their partner's increased somatic anxiety. In contrast, Kaye and colleagues (2015) found that parental performance-based goals in sporting contexts predicted worry in their children after controlling for children's own performance-based goals (but not vice versa), whereas Ruggieri and colleagues (2020) found that mothers' problematic Facebook use predicted their children's social anxiety concerning social media use after controlling for children's own problematic Facebook use (but not vice versa). Furthermore, some studies highlight indirect associations between parent characteristics and children's anxiety through additional familial mechanisms. Fitzgerald and colleagues (2021) found that parents' childhood experiences of abuse predicted their adolescents' anxiety through their adolescents' reports of relationship quality, whereas Gibler and colleagues (2018) found that paternal anxiety predicted child anxiety risk through lower maternal encouragement of independence. Two studies found the presence of actor effects, but not partner effects. Xu and colleagues (2020) found that paternal anxiety prospectively predicted children's anxiety, while maternal transmission off anxiety was mediated by their own psychological control. Hausman and colleagues (2020) found that children's post-hurricane anxiety was predicted by their pre-hurricane anxiety and not by mother's pre-hurricane depression.

While the majority of studies exploring dyadic interactions between mothers and fathers explored aspects of the marital relationship, six studies explored these interactions while accounting for parenting behaviours, though none included direct references to children's

anxiety. Findings from these studies suggest the presence of partner effects for both parents, from father to mother, and from mother to father. For example, two studies have suggested that aspects of the marital or coparenting relationship can spillover and undermine parent-child interactions in ways that could affect children's anxiety. Klausli and Tresch Owen (2011) found that mothers' and fathers' experiences of marital hostility predicted their partner's parenting sensitivity, even after controlling for their own marital behaviours. They additionally found that maternal marital withdrawal predicted paternal parental sensitivity, but not the same was not found for fathers (Klausli & Tresch Owen, 2011). In a study exploring the relationship between stepparents and biological parents, Ganong and colleagues (2020) found that stepparents' reports of their partner's restrictive gatekeeping with their stepchildren predicted biological parents' reports of the stepparent's affinity-seeking behaviour towards their stepchildren. Another study has also suggested that parenting behaviours between one parent and their child may spillover to affect their partner's relationship with their child, as Cai and colleagues (2021) found that mothers' harsh discipline predicted father-child affinity and conflict, though fathers' harsh discipline was not found to be related to the mother-child relationship.

However, other studies have found only the presence of actor effects and not partner effects from parent and coparenting characteristics to parenting behaviours. While Le and colleagues (2017) found actor and partner effects from parents' negative affect to parents' distress, they only found actor and not partner effects from parents' distress and stress to parents' harsh parenting. Brenning and colleagues (2017) found actor effects from parents' attachment anxiety to their own separation anxiety and partner effects from maternal attachment anxiety to paternal separation anxiety, but only found actor and no partner effects from parents' separation anxiety to their overprotective parenting behaviours. Lastly, in the only study exploring parental

emotion socialization, Lee and Brophy-Herb (2018) found actor effects from parent conflict to their unsupportive emotion socialization strategies, but only "trend-level" partner effects from parent conflict to unsupportive emotion socialization.

While these studies lend support to the fact that parents and children, as well as coparents, exert reciprocal influences on each other and children's anxiety, our understanding of the dynamic family systems underpinning children's anxiety trajectories remains limited. To date, no studies have reciprocally assessed the influence of parental perceptions of children's anxiety on children's perceptions of their own anxiety longitudinally using an APIM. Moreover, studies exploring the bidirectional influence of parental emotion socialization have focused on differentiating and understanding the source of distinctions between maternal and paternal strategies, treating socialization as an outcome variable or else exploring how parental strategies differentially affect children's social-emotional outcomes. No study to date has simultaneously assessed the influence of maternal and paternal perceptions of children's anxiety and their socialization strategies in response to children's expressed anxiety using an APIM. As such, this line of research can provide novel insights into how important family dynamics centred on the perception of children's anxiety and associated parenting behaviours may contribute to the development of children's anxiety across childhood and into early adolescence.

The Current Studies

The current studies sought to examine the transactional relations between parent and child perceptions of children's anxiety and socialization behaviours implicated in the development of children's anxiety. Study 1 sought to explore whether parent and child perceptions of children's anxiety influenced each other across development, including whether parental perceptions serve as a possible mechanism for the intergenerational transmission of

anxiety from parent to child and whether aspects of the parent-child relationship moderate the transmission of perception from parent to child. Study 2 sought to explore whether mother and father perceptions of children's anxiety and their anxiety-promoting emotion socialization strategies influence each other across their child's development.

Data

The data used in this dissertation comes from two existing archival studies that were developed and collected prior to the development of this thesis. Data from Study 1 comes from the Concordia Longitudinal Research Project ("Concordia Project"), an ongoing community-based longitudinal study. Original participants and their parents were recruited between 1976 and 1978 from low-income neighbourhoods in Montreal, Canada. A subsample of 1700 children identified based on peer ratings as being aggressive, withdrawn, both aggressive and withdrawn, and typical ("controls") were chosen to be intensively followed (see Schwartzman et al., 1985 for a more detailed review). In 1996-1997, a subsample of these 1700 participants were identified as having preschool-aged children and were invited to continue to participate in the study alongside their offspring. Parent-child dyads were sampled from this most-recent subsample, with children being the third generation of participants included in the study.

Data from Study 2 comes from a community-based longitudinal study based in Winnipeg, Manitoba. Families of young children born between June 1, 1999, and May 31, 2000, were recruited through letters sent out by a government agency responsible for administering health care (see Mills et al., 2007 for a more detailed review). Families participated in three waves of data collection, at which point the study was terminated.

Methodology

To address the previously identified gaps in the literature, APIMs were used to explore

longitudinal dyadic relations between parents and children on children's anxiety. Consequently, designs were longitudinal, multi-method (where available), and multisource in nature. In Study 1, data was collected from mothers and children utilizing both questionnaires and observational data. In Study 2, data was collected from mothers and fathers using questionnaire data. This is an important contribution to the existing literature as much of the previous research exploring parental influences on children's anxiety trajectories has failed to account for the interdependent nature of parent-child and family systems data. Each study utilized an SEM approach to APIMs. Study 1 modelled a moderated mediated APIM, whereas Study 2 modelled a bivariate APIM. All analyses were conducted in Mplus Version 8.0.

Hypothesized results. Overall, it was anticipated that results would demonstrate patterns of reciprocal family influence in relation to children's anxiety. In other words, actor and partner effects were expected, such that maternal, paternal, and child outcomes would be influenced by their own earlier characteristics and by those of their partners. Specifically, for Study 1, it was anticipated that maternal and child perceptions of children's anxiety in early adolescence would be predicted by their own and their partners' earlier perceptions. Extending this expectation for family patterns of influence through the inclusion of the coparenting system (i.e., mother and fathers), for Study 2, it was anticipated that maternal and paternal perceptions of children's anxiety would predict their own and their partners' subsequent reports of children's anxiety in childhood and early adolescence. It was also anticipated that maternal and paternal reports of emotion socialization behaviours would predict their own and their partners' subsequent reports of emotion socialization behaviours in childhood and early adolescence.

Across studies, it was also anticipated that parent characteristics and aspects of the parent-child relationship would interact with perceptions and behaviours in ways that could help

to explain children's development of anxiety. Specifically, in Study 1, it was expected that maternal perceptions of children's anxiety would act as a mechanism for the intergenerational transmission of anxiety from parent to child. In other words, parental perceptions of children's anxiety in middle childhood were expected to mediate the association between parent anxiety in early childhood and children's anxiety in early adolescence. The role of perceptions in mediating this association was thought to be expressed through aspects of parent-child interactions, such that observed maternal sensitivity was expected to moderate the association between parent perceptions of children's anxiety in childhood and children's perceptions of their own anxiety in early adolescence. In Study 2, it was expected that maternal and paternal perceptions and maternal and paternal emotion socialization behaviours would influence each other across children's development. In other words, parental perceptions of their children's anxiety were expected to influence their own and their partner's subsequent emotion socialization behaviours.

Chapter 2: Study 1

Do you see what I see? Exploring maternal and child perceptions of

children's anxiety longitudinally

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Currently under revision

Abstract

The goals of this study were to explore (1) the dyadic influence of mothers' and children's perceptions of children's anxiety symptoms across development; (2) whether maternal perceptions of children's anxiety serve as a mediator of the association between maternal anxiety and child anxiety; and (3) whether aspects of the parent-child relationship moderate the transmission of perception from parent and child (and vice versa). Participants were 180 mother-child dyads (96 female) assessed in preschool, middle childhood, and early adolescence. Children's anxiety was assessed by parent and child self-report questionnaires, maternal anxiety was assessed by parent self-report questionnaires, and maternal sensitivity/structuring was assessed from observed interaction tasks. Results from an actor-partner interdependence model suggest (1) maternal perceptions of children's anxiety in middle childhood influence children's self-perceptions in adolescence, but not vice versa; (2) maternal perceptions in middle childhood mediate the link between maternal anxiety in early childhood and child self-reported anxiety in adolescence; and (3) the mediation of this link is moderated by maternal sensitivity/structuring such that mothers who perceived more anxiety in their children *and* who were observed to show lower levels of sensitivity/structuring in middle childhood tended to have children who reported more anxiety in adolescence. Findings suggest that maternal awareness of children's anxiety and their consequent behavioural interactions with their child may be one mechanism through which anxiety risk is transferred from parent to child over time.

Keywords: anxiety; parents; children; APIM; sensitivity

Introduction

Anxiety is among the most common and earliest presenting of mental health problems for children and adolescents (Beesdo et al., 2009), with more than half (62%) of Canadian youth reporting concerns about their level of anxiety (Ipsos Public Affairs, 2017). Children or adolescents who experience anxiety are at risk for a host of adverse adjustment outcomes, including concurrent and later psychopathology and impairments in financial, interpersonal, educational, and health functioning (Copeland et al., 2014; Essau et al., 2018). Accordingly, understanding the mechanisms that foster and exacerbate anxiety in childhood and adolescence is integral for informing etiological models and for early intervention and prevention programming. As etiological models have suggested that environmental effects account for a greater proportion of variance in children's anxiety than genetic effects (Eley et al., 2015), exploring early environmental influences on children's anxiety may be particularly important when seeking to understand the intergenerational transmission of anxiety.

Parenting and Children's Anxiety

Parent-child relationships are uniquely situated to serve as important sources of both risk and protection, and much research has documented the powerful influence of the parent-child relationship on children's development of anxiety. Research has long implicated both direct and indirect influences in the development of children's anxiety, including critical, controlling, and protective parenting (see Möller et al., 2016) and parental modelling of anxious or avoidant behaviours, verbal transmission of threat, and direct conditioning experiences (see Fisak & Grills-Taquechel, 2007). With an extensive literature exploring these parenting behaviours, modern models have also explored parent and child characteristics driving these behaviours.

Parental anxiety has been suggested to contribute to children's anxiety beyond genetic

transmission by compromising their parenting (Jones et al., 2021). Anxious parents have been shown to experience more distress and perceive less control in response to their children's anxiety and, as a result, limit their child's exposure to anxiety-provoking situations to reduce their own distress (Casline et al., 2021; Kerns et al., 2017; Wheatcroft & Creswell, 2007). Parental anxiety has also been shown to compromise the parent-child relationship, with anxious parents demonstrating less sensitivity and warmth and more withdrawal and disengagement (Creswell et al., 2013; Woodruff-Borden et al., 2002). Anxious parents may be less sensitive to their children's needs and less likely to help redirect and disengage attention away from anxiety-provoking to prevent anxious arousal from becoming overwhelming, inhibiting the development of an internalized locus of control (Degnan et al., 2010). Indeed, research has suggested that parental sensitivity serves as a protective factor against the development of anxiety (Warren & Simmens, 2005).

Models of parental influence have also long acknowledged the bidirectionality of parent-child relationships and argued that children elicit specific responses from parents. Research has shown that parents respond differently to anxious children, exhibiting more anxiety-promoting parenting behaviours and less sensitivity in their interactions (e.g., Gouze et al., 2017; Hale et al., 2013), even in response to children to whom they are not related (Hudson et al., 2009). Bidirectional models have also allowed for the exploration of parent and child characteristics simultaneously, with research suggesting the interaction of parental anxiety and child anxiety to be predictive of more anxiety-promoting parenting behaviours (Hudson et al., 2008).

Parenting Perceptions and Children's Anxiety

Much research has examined *how* parents influence their children's anxiety through their behaviours; however, it is important to understand *why* parents choose to respond to their children in this way. Parents' perceptions of their children's expressed emotions and associated

behaviours may be particularly important motivators of the parenting choices they make, including their parenting style, discipline strategies, and communication and interaction styles (Bugental & Corpuz, 2019; Holden & Smith, 2019). Parents who perceive their child to be more anxious may view them as more sensitive, less prepared to succeed in distressing situations, and in need of more protection, or they may be intolerant to their child's experience of anxiety, seeking instead to avoid the expression of negative emotion through control or accommodation (Kortlander et al., 1997; Orchard et al., 2015; Settipani & Kendall, 2017).

Results from longitudinal research exploring parental perceptions of temperamental precursors of anxiety have demonstrated positive directional links from parental perceptions to children's later anxious temperament (e.g., Pauli-Pott et al., 2003), suggesting that parental perceptions not only influence children's anxiety but likely shape their anxiety trajectories by directly affecting their temperamental development. However, these studies often explore parental and observer reports bidirectionally across early development. Consequently, little is known about how parental perceptions of children's anxiety reciprocally influence and shape children's perceptions of their own anxiety across development, including into childhood and adolescence, when children's understanding of their internal emotional states becomes more developed.

Perceptions are argued to be a constructive, interpretative process (Gallagher, 2015) with parents' perceptions influencing both the behaviours they attend to and the behaviours they elicit from their children. From this perspective, parents' perceptions may shape children's perceptions through a dynamic process of acting and interpreting within the context of the parent-child relationship. This bidirectional process is best captured by Darley and Fazio's (1980) expectancy-confirmation theory, a social psychology theory that can be applied to the parent-

child relationship to better explore the bidirectional effects of parental and child perceptions on children's anxiety trajectories.

According to this theory, a child's behaviour (the "actor") does not automatically convey meaning but is given meaning through interpretation by the parent (the "perceiver"). Through repeated interactions, a parent develops a set of expectancies about their child and acts towards them in accordance with those expectancies. The child then interprets the meaning of their parents' actions and, based on these interpretations, responds to their parent's actions, re-entering the cyclical sequence of acting and processing. The child then interprets the meaning of their actions, in some cases inferring something new about themselves, resulting in modifications to their self-concept. Although both actor and perceiver can form expectancies and influence the other, perceivers are generally noted to have greater power to impose their interpretations of the situation and influence their partner (Darley & Fazio, 1980). In applying this theory to parent-child relationships, parents are more likely to assume the role of perceiver.

The available research exploring parent and child perceptions of children's anxiety in childhood and adolescence is not only limited but is largely focused on understanding and exploring report discrepancies utilizing cross-sectional data and/or analytic strategies that narrow the scope of analysis (e.g., difference scores, agreement statistics, running parent and child models separately) (e.g., Manassis et al., 2009; Popp et al., 2017; Van Der Toorn et al., 2010). These approaches limit the understanding of how parent and child perceptions mutually influence each other across a child's development and do not allow for inferences to be made about the directionality of influence. Focusing on discrepancies also emphasizes the idea that distortion results from subjective error (e.g., differences in context, biased observations due to personal characteristics), instead of acknowledging that these experiences may be themselves

subjective experiences with powerful, influential effects on children's development of anxiety. To date, it remains unclear how parents' perceptions of children's anxiety shape children's perceptions of their anxiety across development.

Actor-Partner Independence Models and Parent-Child Data

Drawing from Darley and Fazio's (1980) theory, parents' perceptions of their children's anxiety are likely products of the child's behavioural expressions of anxiety, parents' own interpretations of the expressed behaviour, and the parent-child relationship, which serves as the context within which these behaviours and perceptions play out (Bugental & Corpuz, 2019). In turn, children's interpretations of their internal states and the means through which they express them behaviourally are likely shaped in part by parental emotion socialization practices, such as communication around emotion, modelling of emotional expression, and parent responses to the expression of negative emotion (A. S. Morris et al., 2007). Consequently, parental and child perceptions of children's anxiety cannot be assumed to be independent and empirically studying these relations requires the use of statistical models that fully capture the transactional nature of the parent-child relationship across time, such as the actor-partner interdependence model (APIM). The APIM treats each member as nested within the dyad and allows for the simultaneous estimation of how an individual's outcome is predicted by their own (i.e., actor effects) and their partner's characteristics (i.e., partner effects) (Cook & Kenny, 2005).

The Current Study

The primary aim of this study was to explore whether maternal perceptions serve as a mechanism for the intergenerational transmission of anxiety from mother to child across childhood and into early adolescence. It was also of interest to examine whether the link between maternal perceptions and child perceptions of children's anxiety is influenced by parent-child

relational characteristics, namely maternal sensitivity. In other words, the goal was to examine whether maternal reports of children's anxiety mediate the link between maternal and child anxiety and whether this mediation was moderated by maternal sensitivity (see Figure 2). To date, no research has specifically examined the mutual influence of parent perceptions of children's anxiety on children's perceptions of their anxiety in this fashion.

Actor effects were hypothesized, such that (1) maternal perceptions of children's anxiety at earlier time points were expected to predict maternal perceptions at later time points, and (2) child self-perceptions of anxiety at an earlier timepoint were expected to predict child perceptions of anxiety at a later time point. Partner effects were also hypothesized, such that (1) maternal perceptions of children's anxiety at an earlier timepoint were expected to predict children's self-perceptions at a later timepoint and (2) child self-perceptions of their anxiety were expected to predict maternal perceptions at a later time point. As research has long documented discrepancies in mother-child reports of children's anxiety (Niditch & Varela, 2011), actor effects were expected to be larger than partner effects. However, given the exploratory nature of this study, no hypotheses were made concerning the magnitude of actor and partner effects between mother and child.

Finally, moderated mediation was hypothesized. Maternal perceptions of children's anxiety were expected to mediate the association between maternal anxiety and children's self-reports of anxiety, and the link between maternal reports and child self-reports was expected to vary depending on the levels of maternal sensitivity. Consistent with previous findings suggesting mothers report more anxiety in their children (Manassis et al., 2009) and have children who experience more anxiety themselves (Lawrence et al., 2019), mothers who experience more anxiety were expected to report more anxiety in their children. As maternal

Figure 2

Overall Distinguishable Dyad Model with Moderated Mediation
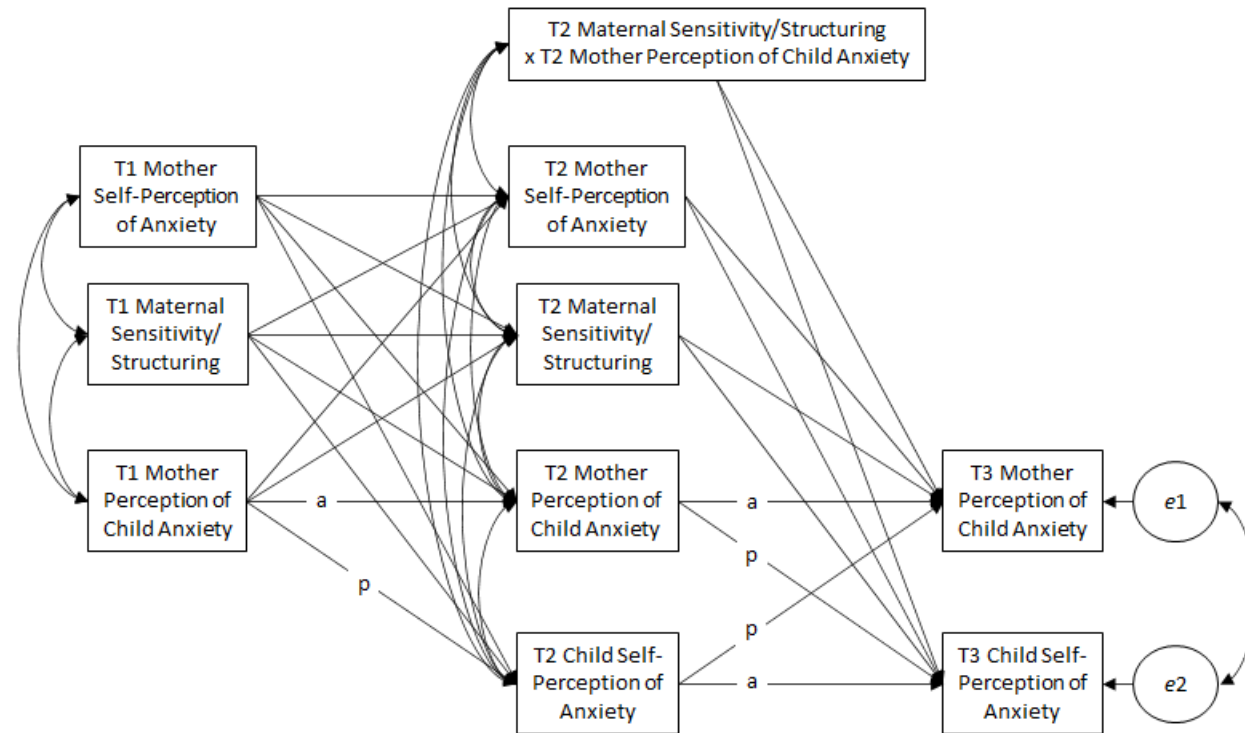
Note. Proposed distinguishable dyad actor-partner interdependence model with moderated mediation. Children were approximately 3.5, 10.5, and 13.25 years at T1, T2, and T3, respectively. Paths denoted *a* represent actor paths. Paths denoted *p* represent partner paths.

sensitivity has been shown to act as a protective factor against the development of anxiety (Warren & Simmens, 2005), mothers who report more anxiety in their children and who display more optimal levels of sensitivity in their interactions were expected to have children who reported lower levels of anxiety at a later time point. Conversely, mothers who report more anxiety in their children and who show lower levels of sensitivity in interactions with their children were expected to have children who reported higher levels of anxiety at a later time point.

Method

Participants

Participants in the current study were recruited from the Concordia Longitudinal Research Project, an ongoing community-based, longitudinal project that began in 1976 (see Schwartzman et al., 1985). In 1996-1997, a subsample of the study ($N = 180$) identified as having preschool-aged children were invited to continue to participate in the study alongside their offspring and screened at roughly three-year intervals (see Serbin et al., 1998).

The sample for this study includes 180 mothers and their children (96 female, 83 male). They were sampled across three waves of data collection: at preschool age ("T1"; $M = 3.54$ years, $SD = 1.56$), middle childhood ("T2"; $M = 10.46$ years, $SD = 1.00$), and early adolescence ("T3" $M = 13.19$ years, $SD = 1.29$). Dyads that participated were primarily of French-Canadian descent (95%) and spoke French in the home. At T1, mothers were approximately 30 years old ($M = 30.02$ years, $SD = 3.33$; ranging from 19 to 43 years) and had a high school degree (an equivalent of Grade 11 in the Quebec education system; $M = 11.77$ years, $SD = 2.39$ years, range 4 to 18 years of schooling). Approximately 77.2% of the dyads came from two-parent families, 16.1% lived with their mother alone, 1.7% lived with their mother and their mother's partner

(i.e., a step-parent), and 1.7% indicated shared custody. Median family income at T1 was $38 480 CAD ($M$ = $41 207, SD = $24 676.26), below the Quebec provincial median of $44, 755 at the time (Statistics Canada, 1997).

Procedure

Informed consent was obtained at each wave, and all procedures were approved by the university's Institutional Review Board. At T1 and T2, data was collected during home visits which involved a semi-structured interview, a mother-child interaction task, and the completion of questionnaires. At T1, mothers and children engaged in a 15-minute free-play interaction task involving a selection of standardized, age-appropriate toys (e.g., books, puzzles, doll, building blocks, tea set). At T2, mothers engaged in a 4-minute Jenga task where they cooperatively built a tower. All interactions were videorecorded (see Grunzeweig et al., 2009) and specific instructions are provided in the supplementary materials. Mothers were asked to rate how natural they believed their interaction had been with their child on a scale from 1 ("not at all natural") to 4 ("very natural). Mothers who reported their interaction as 2 or below (n = 1) participated in a second interaction task the following week. At T3, questionnaires were mailed to participants. At each wave, families were compensated $50 CAD for their time, and children received a small gift.

Measures

Mothers' Perceptions of Children's Anxiety

Maternal perceptions of children's anxiety was assessed using a French version of the Child Behavior Checklist (CBCL; Achenbach, 1991, 1992). At T1, mothers of children aged three years completed the CBCL/2-3, whereas mothers of children four years or older completed the CBCL/4-18. All mothers completed the CBCL/4-18 versions at T2 and T3. Only the raw

scores from the DSM-Oriented Anxiety Problems subscale were used for this study. The scale consists of six items measuring dependency, fearfulness, worry, and nervousness using a three-point scale from "rarely/never" (0) to "often" (2) (Achenbach et al., 2003). Although the DSM-oriented scales were developed for the subsequent update of the CBCL in 2001, they have been applied to previous versions of the CBCL, demonstrating acceptable internal consistency (α = .77) (Nakamura et al., 2009) and good test-retest reliability (.83 to .88) (Achenbach et al., 2003). The scale demonstrated acceptable internal consistency (α = .70 - .74) in the current sample. Mothers reported approximately 3.0% of children at T1, 10.5% of children at T2, and 8.1% of children at T3 to have clinically significant levels of anxiety.

Children's Perceptions of Their Own Anxiety Symptoms

Children's perceptions of their anxiety was assessed using a French version of the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978) at T2 and T3. The measure was not administered to children at T1, as the children were too young. The RCMAS is a self-report measure that assesses cognitive, behavioural, and affective symptoms of anxiety on a two-point scale ("yes" or "no"). The raw scores from the 28-item Total Anxiety scale were used for the analyses, with higher scores indicating greater anxiety. Overall, the scale has been shown to demonstrate good internal consistency (α =.87), test-retest reliability, and concurrent validity in a sample of French-Canadian children (Turgeon & Chartrand, 2003). The scale demonstrated good internal consistency in the current sample (α = .82 and .83). Approximately 6.3% of children at T2 and 9.5% of children at T3 reported clinically significant levels of anxiety.

Maternal Anxiety

Mothers reported on their perceptions of their own anxiety using a French translation of

the SCL-90-R (Derogatis, 1994) at T1 and T2. Reports were not collected at T3. The SCL-90-R is a self-report measure that assesses a variety of psychiatric symptomology on a 5-point Likert scale (1 = "not at all", 5 = "extremely"). For the current study, only raw scores from the Anxiety subscale were used for analyses, with higher scores indicating greater anxiety. The Anxiety subscale is composed of 10 items assessing cognitive, behavioural, and affective symptoms of anxiety. Internal consistency for the anxiety subscale in the French version has been demonstrated to be excellent ($\alpha = .90$) (Fortin et al., 1989). The scale demonstrated good internal consistency in the current sample ($\alpha = .82$). Approximately 5.9% of mothers reported clinically significant levels of anxiety.

Maternal Sensitivity/Structuring

Maternal sensitivity/structuring was assessed at T1 and T2 from recorded instances of mother-child joint play during home visits (free play at T1 and cooperative Jenga task at T2) using the second edition of the Emotional Availability Scales (Biringen et al., 1993), a global rating scale for evaluating the quality of observed caregiver-child interactions. The maternal sensitivity dimension quantifies the degree to which a mother is emotionally responsive toward their child (1 = "highly insensitive", 9 = "highly sensitive") by coding positive affect, appropriate parental responsiveness, parental acceptance, and awareness of timing, flexibility, variety and creativity in modes of play. Highly sensitive mothers display much genuine, authentic, and congruent interest, pleasure, and amusement in their children. In contrast, highly insensitive mothers display few areas of strength, often utilizing an active/harsh or passive/depressed/affectively flat style. The maternal structuring dimension quantifies the degree to which a mother guides and sets limits on their child's behaviour (1 = "non-optimal structuring", 5 = "optimal structuring") by coding for provision of cues, suggestions,

frameworks, rules, and regulations. Optimally structuring mothers allow children to lead and explore while providing a supportive frame and setting firm limits for discipline, whereas non-optimal structuring mothers set few limits and provide little structure for their children. Inter-rater reliability was obtained by having coders double-code 30% of the sample at T1 and 25% at T2. Intraclass reliability coefficients suggested highly satisfactory levels at T1 ($r = 0.82$-0.99) and T2 ($r = 0.87$-0.97). As the sensitivity and structuring scales were highly correlated ($r = .77$), a composite of the two scales was created.

Analytic Strategy

To fully understand the complex inter-association between mother and child perceptions of children's anxiety symptomology, a distinguishable APIM (Cook & Kenny, 2005) was used to help account for both "actor" effects (i.e., mother's/child's perceptions predicting their own later perceptions) and "partner" effects (i.e., mother's perceptions of child anxiety predicting children's later perceptions of their own anxiety and vice versa). Tests of distinguishability (Kenny et al., 2006) revealed that mothers and children were completely distinguishable from each other ($\Delta\chi^2(6) = 310.01$, p $< .001$), supporting the use of a distinguishable APIM.

To more fully understand how maternal characteristics and behaviours may influence the transmission of risk from parent to child, moderated mediation was explored. To examine the moderating effects of maternal sensitivity/structuring on the relation between maternal perceptions of children's anxiety and children's perceptions of their own anxiety, a specific interaction term was included in the APIM (maternal sensitivity/structuring at T2 * mother perceptions of children's anxiety at T2). Both variables involved in creating the interaction term were mean-centred. To capture the mediating effect of maternal perceptions, the indirect effect of maternal anxiety on children's self-perceptions of anxiety through maternal perceptions of

children's anxiety was specified to be estimated at different levels of the moderating variable.

All analyses were conducted using Mplus Version 8 (Muthén & Muthén, 2017).

Multigroup analysis by gender was not possible due to insufficient sample size (Ledermann & Kenny, 2017). As maternal education and family income have been shown to be negatively associated with maternal sensitivity (e.g., Neuhauser, 2016) and gender differences have been proposed in children's anxiety (e.g., Cohen et al., 2018), they were entered into the model as control variables. Additional non-significant paths with coefficients below 0.05 and/or that were not theoretically relevant were also trimmed from the fully saturated model.

Results

Preliminary Analyses

All key study variables demonstrated skew values less than |2.00|, suggesting adherence to normal distributions (George & Mallery, 2010). Fourteen univariate outliers exceeding z-values of |3.00| were identified across all predictor and outcome variables. They were corrected through winsorization, with outlier cases set to values equivalent to +/- 3.00 SD. Examination of the data using Mahalobis's Distance identified no multivariate outliers. Descriptive statistics for the sample, including means, standard deviations, and intercorrelations of all study variables are presented in Tables 1 and 2.

In the current study, missing data ranged from 0% to 42.6%, reflecting increasing missing data over time due to attrition. Approximately 95.5% of mothers participated in at least two of the three waves of data collection, whereas at least 76.1% of children completed at least one of the two waves of data collection plus the initial parent-child interaction at T1. Results from Little's MCAR test were not significant, $\chi^2(373) = 345.96$, $p = .84$. Therefore, all available observations were included in the analysis and missingness was handled using the Full-

Table 1

Study 1 Bivariate Correlations Between Study Variables

	1	2	3	4	5	6	7	8	9
1. T1 Maternal Anxiety	-								
2. T1 Maternal Sensitivity/Structuring	-.06	-							
3. T1 Mother Report Child Anxiety	.19**	-.13	-						
4. T2 Maternal Anxiety	.33***	.03	.21**	-					
5. T2 Maternal Sensitivity/Structuring	-.25***	.17*	-.19**	-.03	-				
6. T2 Mother Report Child Anxiety	.37***	.03	.23**	.24**	-.11	-			
7. T2 Child Self-Report of Anxiety	.12	-.12	.01	.17*	.002	.22**	-		
8. T3 Mother Report Child Anxiety	.33***	.01	.21**	.10	-.02	.58***	.19*	-	
9. T3 Child Self-Report Anxiety	.13	-.01	-.03	.19*	-.10	.31***	.40***	.30***	-
M	.46	.007	1.89	.37	.02	2.27	9.12	1.86	8.52
SD	.51	.92	1.60	.43	.86	2.14	5.65	1.99	5.40
Range	0-2.06	-2.8-1.39	0-6.90	0-1.87	-2.84-1.13	0-8.83	0-25	0-7.95	0-24

Note. Children were approximately 3.5, 10.5, and 13.25 years at T1, T2, and T3, respectively.
* $p < .05$, ** $p < .01$, ** $p < .001$, two-tailed.

Table 2

Bivariate Correlations Between Study Variables and Control Variables

	Child Sex	Child Age	Maternal Age	Mat Education	Family Income
T1 Maternal Anxiety	.10	-.02	.12	-.07	-.12
T1 Maternal Sensitivity/Structuring	-.13	-.10	.03	.09	.28***
T1 Mother Report Child Anxiety	.09	-.005	-.05	-.06	.05
T2 Maternal Anxiety	-.06	.03	-.01	-.16*	-.12
T2 Maternal Sensitivity/Structuring	-.19*	.07	-.13	.14	.19*
T2 Mother Report Child Anxiety	.12	-.08	.09	.04	.06
T2 Child Self-Report of Anxiety	-.32***	-.13	-.10	.009	-.08
T3 Mother Report Child Anxiety	-.003	-.09	-.03	-.03	.10
T3 Child Self-Report Anxiety	-.19*	-.02	.07	-.09	-.03

Note. Children were approximately 3.5, 10.5, and 13.25 years at T1, T2, and T3, respectively. Females were coded with a value of 0, whereas males were coded with a value of 1.

* $p < .05$, ** $p < .01$, ** $p < .001$, two-tailed.

Information Maximum Likelihood (FIML) approach in Mplus, a robust estimation method

appropriate for use when data is missing at random or completely at random (Little et al., 2014).

Paired samples t-tests utilizing standardized scores to attempt to equivocate maternal and

child reports of children's anxiety revealed that the two reports did not differ significantly from

each other at either T2, $t(106) = .007$, $p = .995$, or at T3, $t(101) = .25$, $p = .80$.

APIM Model

The final model displayed excellent model fit, $\chi^2(21) = 8.73$, $p = 0.99$, RMSEA = 0.00,

CFI = 1.00, SRMR = 0.03. Figure 3 provides a visual depiction of the model with standardized

coefficients. Compared to the fully saturated model, the fit for the final model did not

significantly worsen when non-significant paths were trimmed or when controls were added. The

model explained 41.8% ($p < .001$) of the variance in children's self-perceptions of anxiety at T3

and 40.6% ($p < .001$) of the variance in mothers' perceptions of children's anxiety at T3.

Examining individual paths revealed significant actor effects, suggesting stability across

time in both mother perceptions of children's anxiety ($\beta = 0.52$, $p < .001$, 95% CI [0.32, 0.72])

and in children's perceptions of their own anxiety ($\beta = 0.29$, $p = 0.03$, 95% CI [0.04, 0.54]) from

T2 to T3. Maternal perceptions of children's anxiety at T1 did not significantly predict their

perceptions at T2 ($\beta = 0.17$, $p = 0.057$, 95% CI [-0.005, 0.34]). A partner effect was found from

mother perceptions at T2 to child perceptions at T3 ($\beta = 0.28$, $p = 0.02$, 95% CI [0.04, 0.52]), but

not from child perceptions at T2 to mother perceptions at T3 ($\beta = 0.08$, 95% CI [-0.13, 0.28]) or

from mother perceptions at T1 to child perceptions at T2 ($\beta = -0.03$, 95% CI [-0.20, 0.15]).

Above and beyond other relations, mothers' perceptions of children's anxiety significantly

predicted children's later reports of their own anxiety.

To explore the mediating effects of maternal perceptions of children's anxiety on the link

Figure 3

Study 1 Model Results
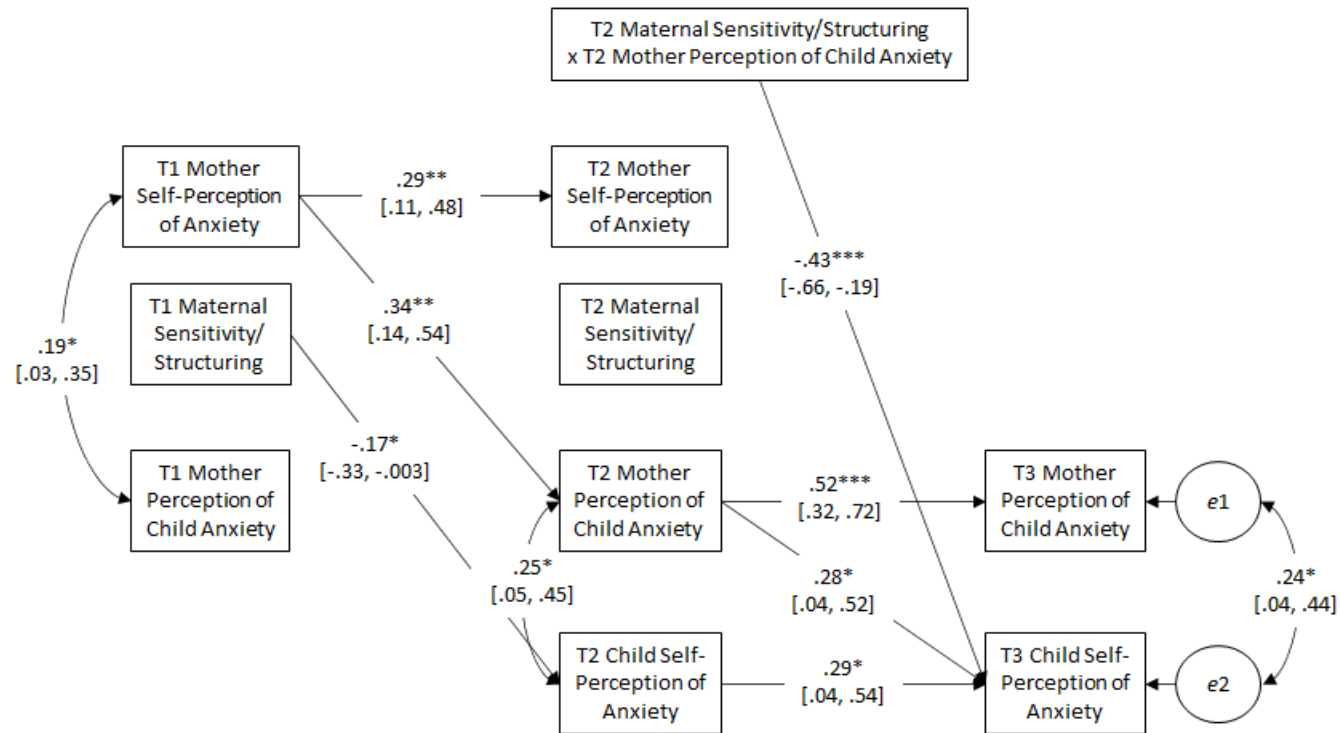
Note. Standardized coefficients for the moderated mediation of the association between maternal anxiety, maternal perceptions of children's anxiety, children's perceptions of their own anxiety, and maternal sensitivity/structuring. For each path, 95% confidence intervals are presented in square brackets. Children were approximately 3.5, 10.5, and 13.25 years at T1, T2, and T3, respectively.

* $p < .05$, ** $p < .01$, ** $p < .001$, two-tailed.

between maternal anxiety and child anxiety, indirect effects were examined. Maternal anxiety at T1 significantly predicted maternal perceptions of children's anxiety at T2 ($\beta = 0.34$, $p = 0.001$, 95% CI [0.14, 0.54]), such that mothers who experienced greater anxiety perceived more anxiety in their children approximately seven years later. In turn, maternal perceptions at T2 predicted children's self-perceptions at T3 ($\beta = 0.28$, $p = 0.02$, 95% CI [0.04, 0.52]), such that mothers who perceived more anxiety in their children had children who self-reported higher levels of anxiety approximately three years later. Mediation was observed and as the interaction of T2 maternal sensitivity/structuring and T2 maternal perceptions of children's anxiety was significant in predicting children's self-perceptions at T3 ($\beta = -0.43$, $p < 0.001$, 95% CI [-0.661, -0.190]), the indirect effect was explored at differing levels of maternal sensitivity/structuring. The indirect effect was significant at lower levels of maternal sensitivity/structuring (i.e., 1 SD below the mean; $b = 3.03$, $SE = 1.40$, $p = 0.03$, 95% CI [0.29, 5.76]), but not at mean ($b = 1.09$, $SE = 0.62$, $p = 0.08$, 95% CI [-0.14, 2.31]) or high levels of sensitivity/structuring (1 SD above the mean; $b = -0.86$, $SE = 0.76$, $p = .26$, 95% CI [-2.34, .64]). Exploration of the threshold revealed that the significance of the indirect effect was maintained up to 0.20 SD below the mean. In other words, the association between maternal anxiety and children's anxiety was explained, in part, through maternal perceptions of children's anxiety, but only for mothers who were inconsistently sensitive/structuring. As the interaction term predicting maternal perceptions at T3 was not significant ($\beta = 0.10$, 95% CI [-0.13, 0.33]), the moderating effect of sensitivity/structuring on the association between child perceptions at T2 and maternal perceptions at T3 was omitted from the final model.

Supplemental Analyses

As the parent (CBCL) and child measures (RCMAS) come from independently designed

measurement scales, supplemental analyses were run to increase the similarity and address concerns that the findings could be attributable to differences in measurement. Items that were similar or identical across items were retained based on face validity, whereas items that did not have an appropriate match across samples were dropped. The created 7-item composite correlated strongly with the full measures (r's ranging from 0.84 to 0.94) and demonstrated acceptable internal consistency (α's ranging from 0.71 to 0.75). Analyses were re-run, model fit remained acceptable ($\chi^2(21) = 18.59$, $p = 0.61$, RMSEA = .00, CFI = 1.00, SRMR = 0.06), and the pattern of results remained similar. Notably, the interaction term remained significant ($\beta = -0.60$, $p = 0.001$, 95% CI [-0.95, -0.26]) and probes of the interaction continued to suggest an indirect effect for low levels (-1 SD) of sensitivity/structuring ($b = 0.74$, $SE = 0.37$, $p = 0.048$, 95% CI [.007, 1.46]). A description of the items used to create the composite are included in the supplementary materials.

To address the possibility that children may have been reporting increases in anxiety due to increased maternal influence rather than personally experienced symptomology, bivariate correlations were explored between children's self-reported anxiety and other socio-emotional outcomes to determine whether awareness of symptomology was generalized across contexts and integrated into the self-concept. Child anxiety at T3 was found to significantly correlate with teacher perceptions of anxiety ($r = 0.24$, $p = .045$; using the Teacher Report Form) and self-perceptions of depression ($r = 0.52$, $p < .001$; using the Children's Depression Inventory), global self worth ($r = -0.53$, $p < .001$; using the Harter Self-Perception Profile for Children), and somatic problems ($r = 0.41$, $p < .001$) and social problems ($r = 0.38$, $p < .001$) (using the Youth Self Report) at T3.

Discussion

The present study aimed to explore the role of parent perceptions in the intergenerational transmission of anxiety from mother to child. For this purpose, an actor-partner interdependence model was specified to explore how parent and child reports of children's anxiety symptoms influence each other across childhood and early adolescence. To explore the mediating role of maternal perceptions, the indirect effect from maternal anxiety in early childhood (T1) to child perceptions of anxiety in early adolescence (T3) through maternal perceptions of child anxiety in middle childhood (T2) was estimated. To explore the moderating role of the parent-child relationship, an interaction term for maternal sensitivity/structuring and maternal perceptions of child anxiety at T2 was created to examine for possible moderated mediation. This is the first study to examine how maternal and child perceptions of children's anxiety influence each other across childhood using an APIM. Previous studies have largely explored parent and child reports to explain sources of discrepancy, neglecting the interdependent nature of their parent-child relationship and the fact that parent and child perceptions may influence each other across time.

Results from the APIM portion of the model revealed different dyadic patterns for mother and child. Both actor and partner effects were found for children's perceptions, such that children's perceptions of their anxiety in early adolescence were predicted by their own and their mother's earlier perceptions in middle childhood. In other words, when mothers perceived more anxiety in their children in middle childhood, children perceived more anxiety in themselves in early adolescence, even after controlling for children's own earlier perceptions. These findings are consistent with previous research suggesting maternal perceptions have a strong influence in predicting children's later behavioural expression (Pauli-Pott et al., 2003). Mothers' perceptions of their children's anxiety may shape how they interact with their children, either directly

through communicating and labelling of children's emotion states or indirectly through parenting behaviours.

In contrast, and contrary to expectations, only actor effects were found for mothers' perceptions, such that their reports of their children's anxiety in early adolescence were predicted only by their own earlier perceptions in childhood. Mothers' perceptions were not influenced by the earlier perceptions of their children. Although no studies to date have explored the effect of child perceptions on maternal perceptions of children's anxiety using an APIM, these findings are in contrast to research suggesting children's characteristics, such as their anxiety, elicit and shape the parenting they receive (e.g., Gouze et al., 2017). It is possible that parents form perceptions of their children early in their development and that these perceptions remain relatively fixed across childhood and resistant to outside influence after they have been formed. Indeed, the parental influence of perception on children's development has been documented as early as in infancy (Pauli-Pott et al., 2003).

An alternative explanation for the findings may be that children become more aware of the nuances of their symptomology as they develop and mature cognitively, effectively "catching up" with their parents' perceptions rather than being influenced by them. Results from previous studies that have found greater discrepancies between parent and child reports at earlier ages have argued that younger children may not be as reliable or valid in their reports of their symptoms due to a lack of cognitive sophistication (Grills & Ollendick, 2003). However, other lines of research have found no age trend or higher agreement between parent and child at younger ages (Achenbach et al., 1987; Choudhury et al., 2003; Engel et al., 1994), with some finding that it is often younger school-aged children, not parents, who report higher levels of anxiety (e.g., Niditch & Varela, 2011). Additionally, children's reports of their own anxiety have

been shown to be more predictive of their anxious behaviour than reports from their parents (DiBartolo & Grills, 2006), suggesting children may be valid informants of their own internal states. In the current sample, maternal and child reports did not significantly differ from each other at either T2 or T3.

Although results suggest that children are integrating their parents' perceptions of their anxiety into their developing perceptions of their own anxiety, whether this integration reflects introspection and processing of their true experiences into their self-concept remains unclear. It may be that children are integrating aspects of their parents' characteristics, such as maternal anxiety. Anxious mothers may attribute more anxiety to their children than is actually present (Manassis et al., 2009) and, as a result, parental influence on children's perceptions could represent alignment in perception without true integration. However, children's perceptions at T3 were also positively correlated with teacher perceptions of anxiety at T3 and other self-report measures of psychosocial maladjustment (depression, somatic problems, self-worth), suggesting true deficits in related domains of functioning.

In examining the mediating effect of maternal perceptions on the relation between maternal and child anxiety, a significant indirect effect was found for low levels of sensitivity/structuring, suggesting moderated mediation. Mothers who were more anxious when their children were in early childhood reported more anxiety in their children in middle childhood, and when they were observed to show lower levels of sensitivity/structuring, had children who self-reported more anxiety in early adolescence.

The finding that mothers who were more anxious when their children were preschool-aged perceived more anxiety in their children in middle childhood was consistent with existing findings in the literature (e.g., Manassis et al., 2009). As parents and children completed different

measures, determining whether parent reporting was biased by their personal characteristics is difficult. Anxious parents have been suggested to be biased in their reporting (e.g., Manassis et al., 2009), overreporting their child's level of anxiety because they are projecting or mistakenly identifying symptoms of their own anxiety (Moretti et al., 1985) or because they employ low thresholds because they are overly sensitive to or overwhelmed by their child (Brody & Forehand, 1986). In contrast, anxious parents have also been suggested to be no more biased in their reporting (e.g., Krain & Kendall, 2000) or to be more accurate in their reporting (e.g., Reuterskiöld et al., 2008). Moreover, anxiety is highly heritable (Lawrence et al., 2019), and children of anxious mothers may experience more anxiety and have this reflected in the observations made by their parents, even if maternal bias is present. Future research should explore these relations using similarly developed measures to allow for the exploration of parental influence at the symptom level.

The finding that observed maternal sensitivity/structuring moderates the transmission of parent perception to child perception represents a novel finding, as no study to date has explored the dyadic interplay of maternal and child perceptions of children's anxiety across development using an APIM. The finding that mothers with lower levels of sensitivity/structuring who perceived more anxiety in their children had children who themselves reported higher anxiety was consistent with predictions. However, the finding that mothers with higher levels of sensitivity/structuring did not influence this relation was unexpected.

Although maternal sensitivity has been touted to have a protective effect against the development of anxiety in the literature (Warren & Simmens, 2005), it has also been shown to play an important role in children's developing self-concept. Children of highly sensitive and supportive parents have been shown to be more accurate in describing themselves, likely because

highly sensitive parents permit children to act in ways that reflect their innate emotional

tendencies, encouraging free exploration and expression of emotion (Brown et al., 2009).

Children of highly sensitive parents may receive fewer messages about their anxiety or may have

messages tempered by an interaction style that places value on the exploration of one's identity,

resulting in a lesser parental influence on children's developing self-concept. In contrast, less

sensitive parents may not provide an environment that stimulates independent exploration of

one's self-concept, resulting in a greater reliance on the input and influence of others, such as the

parent. Less sensitive parents may also communicate a greater frequency of messages to their

children about their anxiety, or their interaction style may promote the integration of these

messages into their self-concept, as a lack of support in managing anxious arousal may make

references to their anxiety more salient. Understanding the mechanisms within which parents

communicate this awareness is a question for future research.

Limitations and Future Directions

Overall, results from the present study provided novel insights into the complex relations

between parent and child in the context of children's anxiety. Notwithstanding, some limitations

should be considered with an eye to future research. First, and most importantly, parent and child

perceptions of children's anxiety were measured using different assessment tools, the *CBCL* and

the *RCMAS*, respectively. While there is a child self-report measure matched to the CBCL, the

Youth Self-Report, it cannot be administered to children under 11, and therefore could not be

administered to our sample in the earlier waves. Although both measures tap into the same

overarching construct, they rely on differently worded items to assess anxiety and, in the case of

the RCMAS, provide a greater range of items to do so. Attempts to equivocate the two measures

provided a similar pattern of results; however, future studies exploring the influence of parent

perceptions on children's self-perceptions would benefit from utilizing similarly developed measures that allow for a more in-depth exploration of influence at a symptom level.

Second, the sample was composed predominantly of individuals of French-Canadian descent. As research has suggested that the relationship between parenting factors and children's anxiety may differ across cultural contexts (Mousavi et al., 2016), whether findings are generalizable across culturally diverse populations remains unclear. The present study also did not include fathers. Mothers and fathers have been suggested to play different roles in both emotion socialization and their children's development of anxiety (Brand & Klimes-Dougan, 2010; Verhoeven et al., 2012). Consequently, exploring the unique contributions of paternal perceptions and the father-child relationship within the context of the intergenerational transmission of anxiety from father to child may be particularly important.

Third, maternal sensitivity, although shown to be a protective factor in children's development of anxiety (Warren & Simmens, 2005), is not a parenting behaviour specific to anxiety and insensitivity has been linked to numerous other mental health problems (e.g., Easterbrooks et al., 2012). Future research should explore other facets of the parent-child relationship that may be more directly involved in the transmission of awareness of anxiety from parent to child, such as direct communication about emotion states or parental labelling of children's emotional and behavioural reactions to events. Additionally, although maternal sensitivity/structuring was objectively observed, it may differ in naturalistic, day-to-day settings where emotional and behavioural states may fluctuate.

Finally, the sample size for this study was too small to appropriately allow for the exploration of gender effects through multiple group analysis. Girls have been suggested to experience higher levels of anxiety (Cohen et al., 2018), which may offer more opportunities for

mothers to communicate and convey their awareness of their daughters' anxiety. Conversely, mothers have been suggested to be less accepting of the expression of anxiety in boys (Doey et al., 2013), and they may communicate more pointedly about their sons' anxiety. However, research exploring parent-child reporting discrepancies has found gender effects to be generally null or at best inconclusive (de Los Reyes & Kazdin, 2005), and research on emotion socialization has found mothers engage in similar amounts of discussion regarding the causes and consequences of emotion for daughters and sons (Suveg et al., 2008), suggesting the possibility that daughters and sons experience similar patterns of influence from their mothers. Future research should attempt to explore these relations separately by gender.

Conclusion

Results from the current study provide evidence to suggest that maternal perceptions of children's anxiety play a role in the intergenerational transmission of anxiety. How a parent perceives their children's anxiety may shape their parenting practices, such as emotion socialization, to exert an influence on children's growing awareness of their internal emotional states. This pattern of influence may be particularly true for anxious parents, whose anxious nature may make them more sensitive to their children's expression of anxiety and interfere with their ability to sensitively interact and structure their interactions with their children. Moreover, by using a dyadic statistical model like the APIM that permits the simultaneous analysis of both actor and partner effects, the current research was able to shed more light on the direction of influence. Findings from the current study suggest mother, but not child-driven effects, and continues to emphasize the importance of providing early intervention to target and mitigate the negative consequences associated with parental psychopathology to facilitate positive, sensitive, and supportive parent-child interactions. Last, these findings continue to highlight the

importance of the role of parents in children's anxiety trajectories across their development, including into early adolescence, a period where the influence of peer relationships becomes more prominent.

Chapter 3: Discussion of Study 1 and Rationale for Study 2

Results from Study 1 contributed to the current literature by expanding our understanding of the role of parental perceptions of children's anxiety in children's development of anxiety. More specifically, the study was the first study to examine parent and child reports of children's anxiety across development utilizing an actor-partner interdependence model. This methodology allowed for an exploration of transactional influences and revealed the novel finding that maternal perceptions of children's anxiety shape children's perceptions of their own anxiety, but not vice versa. The findings that maternal perceptions act as a mediator on the link between maternal anxiety and children's self-reported anxiety and that maternal insensitivity influences the transmission of parent perception to child perception also add to the understanding of the role of possible environmental mechanisms in the intergenerational transmission of anxiety.

A limitation of Study 1, and indeed, of much of the developmental literature, is the often exclusion of fathers from research designs due to convenience sampling. Although research has suggested that mothers may be more active emotion-socializing agents in their children's lives (Klimes-Dougan et al., 2007), mothers and fathers have each been shown to play unique roles in their children's development of anxiety (Bögels & Perotti, 2011; Bögels & Phares, 2008). Research has suggested that mothers and fathers may socialize and respond to their children's emotions, including their expression of anxiety, in different ways (Klimes-Dougan et al., 2007), and that fathers' reactions to their children's negative emotions uniquely predict children's emotional development above and beyond maternal socialization influences (McElwain et al., 2007).

However, much of the research that has explored maternal and paternal influences on children's anxiety trajectories has sought to understand and explain differences in patterns of

influence between mothers and fathers. Drawing from the larger marital and attachment literature, research in the past two decades has shifted to explore the importance of the larger family system. Family systems theory (Cox & Paley, 2003) and the spillover hypothesis (Erel & Burman, 1995) have supported the idea that all members of a family system are in constant interdependent interaction, with characteristics of one subsystem able to exert influences over another. Characteristics of the parent-parent subsystem have been shown to spillover into the parent-child subsystem, with aspects of the coparenting relationship, couple conflict, and attachment affecting parenting influences on children's anxiety (e.g., Jia et al., 2012; Metz et al., 2018; Stuart Parrigon & Kerns, 2016). However, much as there is a dearth of information on how parental perceptions of anxiety transactionally influence children's perceptions of their own anxiety, little is known about how maternal and paternal perceptions of their children's anxiety transactionally influence their anxiety-promoting parenting behaviours and what effects this could have on children's development of anxiety. For this reason, studying maternal and paternal perceptions and emotion socialization strategies utilizing a family systems theory framework and statistical methods that account for the interdependence of data may be valuable for understanding environmental influences on children's anxiety trajectories.

Study 2 was designed to address these gaps in the literature by extending our understanding of how aspects of the parent-parent subsystem (i.e., their perceptions and emotion socialization behaviours) transactionally influence each other across a child's development.

Chapter 4: Study 2

As I see or as I do? Exploring the transactional effects of maternal and paternal perceptions of children's anxiety and their associated emotion socialization behaviours

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Currently under revision

Abstract

This study aimed to explore the dyadic influence of maternal and paternal perceptions of children's anxiety and parents' emotion socialization behaviour across childhood. Participants were 206 mothers and fathers of preschool-aged children (91 females) recruited from a larger community-based longitudinal study and assessed when children were four, eight, and eleven years old. Anxiety was assessed using the Spence Children's Anxiety Scale, and parental tendencies to respond to children's anxiety with similar or more intense levels of anxiety (i.e., magnification) were assessed using the Responses to Child's Emotions Scale. Results from an actor-partner interdependence model analysis suggest (1) stability in maternal and paternal perceptions and behaviours across childhood; (2) paternal perceptions of children's anxiety at age four positively predict maternal and paternal magnifying behaviours at age eight; and (3) maternal magnifying behaviours at age eight positively predict fathers' magnifying behaviours at age eleven. Overall, results suggest that mothers and fathers may influence each other's responses to children's anxiety in different ways. Mothers appear to be influenced primarily by paternal perceptions of their children, whereas fathers appear to be influenced more directly by maternal behaviours.

Keywords: mothers; fathers; anxiety; magnification; APIM

Introduction

Anxiety is the most common mental health problem in childhood and adolescence (Beesdo et al., 2009), affecting more than half of youth (Ipsos Public Affairs, 2017). Even at subclinical levels, childhood anxiety is associated with adverse functioning across a wide range of domains (Comer et al., 2012). Consequently, studying the mechanisms that underlie the development of anxious symptomology in childhood may be important for early prevention and intervention.

Parental Reactions to Children's Emotions

The powerful and direct influence of contingency learning makes parental socialization strategies utilized in response to children's expression of emotion particularly salient in shaping children's emotional development, including their anxiety trajectories. How a parent chooses to respond to a child's emotion, whether through their emotional expressiveness, actions, or verbalizations, conveys both direct and implicit messages about the nature and appropriateness of the emotion, the situations and circumstances that elicit it, how to manage it, and how to react to the expression of the emotion in others (Eisenberg et al., 1998). Over time, these socialization experiences can contribute to the development and consolidation of affective organization and become internalized as part of the self, with some internalized components leading to moderate distortions that define personality (e.g., subclinical anxiety) and others leading to more severe distortions typical of psychopathological functioning (e.g., anxiety disorders) (Malatesta & Wilson, 1988).

Parents who view anxiety as uncomfortable, harmful, and to be avoided, may feel like they must prevent their children from experiencing or expressing the emotion. As a result, they may be more likely to reject, disapprove of, or shame their child's expression of anxiety (i.e.,

punitive affect socialization) or to dismiss, distract from, or devalue their children's expression of anxiety (i.e., overriding affect socialization), rather than respond in a way that promotes an acceptance of children's emotional expression and encourages them to experience and work through their anxiety (i.e., reward affect socialization) (Eisenberg et al., 1998; O'Neal & Magai, 2005). Parents who are distressed by their children's anxiety and experience difficulties regulating their own emotions may also respond by ignoring or being unavailable in response to their children's expression of anxiety (i.e., neglect affect socialization) as a means of avoidance or respond with their own expressions of anxiety (i.e., magnify affect socialization) (O'Neal & Magai, 2005; Root et al., 2015). These responses contribute to children's anxiety, as they communicate that the child's anxiety is undesirable, threatening, or unacceptable and reinforce avoidance and suppression of the emotion (Miller-Slough et al., 2018; Perry et al., 2020). Children may come to perceive their parents as unavailable to support them in their distress and may not feel secure enough to explore their anxiety and the circumstances surrounding it. This can heighten and extend their emotional arousal, limit opportunities to better understand underlying emotional processes and rehearse coping strategies, and ultimately increase maladaptive coping behaviours and emotional dysregulation (Denham et al., 2007). Indeed, the use of unsupportive socialization strategies has been linked with internalizing problems and avoidant coping behaviours (Eisenberg et al., 1996; Perry et al., 2020).

Within the existing literature, much attention has been focused on exploring unsupportive socialization responses to children's emotions wholly (Miller-Slough et al., 2016; Seddon et al., 2020), despite the fact that research has delineated discrete forms of emotion socialization (O'Neal & Magai, 2005). When studies have explored responses discretely, their focus has largely been on punishing, dismissing, or neglecting responses (e.g., Buckholdt et al., 2014;

Hastings, Grady, et al., 2019). Consequently, little is known about how parental magnification may contribute to children's anxiety. Given the documented importance of parental modelling in etiological models of anxiety (Fisak & Grills-Taquechel, 2007), exploring parental magnification responses may be an important line of research when seeking to expand our understanding of children's development of anxiety.

Magnifying responses appear to have similar impacts as other unsupportive responses (e.g., Silk et al., 2011); however, rather than encouraging avoidance by ignoring (neglecting), downplaying/dismissing (overriding), or actively discouraging (punishing) children's emotions, magnifying responses involve parents reflecting back and directly intensifying children's emotion. In other words, while neglect, punishment, and overriding responses may invalidate a child's emotional expression, magnification may validate a child's emotional expression, while still reinforcing negative patterns of emotion regulation. When parents magnify their children's anxiety, they not only model the intense emotion but heighten the emotional intensity of the parent-child interaction as parental expressions of anxiety may confirm that the threat the child perceives is real and worth worrying about. Similar to other unsupportive strategies, this heightened state of arousal may be overwhelming and make emotion regulation more difficult, limiting opportunities for learning and coping and contributing to greater psychological distress. Children may also come to learn that parental distress in response to their emotions signals their unavailability to provide support, encouraging suppression and further heightening dysregulation. Indeed, magnification of children's anxiety has been shown to be positively related to children's internalizing problems (e.g., Klimes-Dougan et al., 2001; O'Neal & Magai, 2005; Silk et al., 2011).

Parent Gender and Emotion Socialization

Although much of the literature has focused on the influence of maternal emotion socialization strategies (e.g., Kiel et al., 2021; Silk et al., 2011), research has suggested that mothers and fathers may play different roles in the socialization of their children's emotions (see Brand & Klimes-Dougan, 2010 and Kennedy Root & Rubin, 2010). Mothers have been suggested to be more active emotion socializing agents, as they have been shown to engage in more frequent and lengthier discussions about emotion, more frequently label and use emotion words, be more emotionally expressive, and utilize more supportive and fewer unsupportive socialization strategies with their children than fathers (Fivush et al., 2000; Nelson et al., 2009). Moreover, as research has suggested that mothers are more involved in parenting (Kotila et al., 2013) and that children are more likely to seek out their primary caregiver when distressed (Umemura et al., 2013), mothers are likely afforded more opportunities to socialize their children's anxiety. However, it is important to note that the literature is mixed, as other studies have found no differences or that patterns for fathers are similar to those of mothers (e.g., Baker et al., 2011; Di Giunta et al., 2020).

There is a relative dearth of literature exploring maternal and paternal reactions to children's expressed anxiety, despite the fact that expressing anxiety or worry is a common and frequent emotional response for typically developing children (Muris et al., 1998). The existing literature exploring parent gender differences in socialization has found that mothers tend to be more accepting of and concerned about children's internalizing emotions like fear and anxiety than fathers (Baker et al., 2011; Hurrell et al., 2015). Consequently, mothers have been shown to utilize more rewarding and magnifying strategies, whereas fathers tend to use more neglecting, overriding, or punitive strategies in response to these emotions (Brown et al., 2015; Garside & Klimes-Dougan, 2002; Hastings & De, 2008; Klimes-Dougan et al., 2007).

Evidence suggesting parental socialization strategies differ as a function of their child's gender remains inconclusive. Gendered beliefs about emotion have been argued to influence different parental expectations for emotional expression in boys and girls. For example, North American gender norms hold that internalizing emotions (e.g., anxiety, fear, sadness) are feminine, whereas externalizing emotions (e.g., anger) are masculine (Kennedy Root & Rubin, 2010), and therefore the expression of anxiety in boys is argued to be less socially accepted as it violates these norms (Doey et al., 2013). Consequently, they may be more likely to punish or encourage suppression of the expression of anxiety in boys (see Doey et al., 2013). This finding may be especially true for fathers, who have been hypothesized to hold more stereotyped gender expectations regarding emotion or whose lesser involvement in children's emotion socialization has been suggested to allow ingrained expectations about gender and emotion to remain relatively intact (Garside & Klimes-Dougan, 2002). While some research has suggested parents respond with more negative affect to their son's expressions of anxiety (Suveg et al., 2008), other studies have found that parents respond somewhat similarly to anxiety in their sons and daughters (e.g., Kennedy Root & Rubin, 2010; Klimes-Dougan et al., 2007), especially at higher levels of anxiety (Stevenson-Hinde & Glover, 1996). Although the exploration of parental magnification of child anxiety remains limited, no effects of child gender were found in a non-clinical sample (O'Neal & Magai, 2005).

Family Systems Theory and Socialization of Children's Anxiety

The bidirectional nature of the parent-child relationship has long been acknowledged in the developmental literature and children are suggested to actively shape much of their own socialization experiences (Davidov et al., 2015). Notably, in a study where parents interacted with anxious and non-anxious children to whom they were not related (Hudson et al., 2009),

interactions with anxious children were observed to include more parental negativity and overinvolvement. Anxious children also appear to receive less support in response to their negative emotions than non-anxious children (e.g., Hurrell et al., 2015). Anxious children, through the expression of more dysregulated emotion, may elicit more maladaptive parental socialization strategies. These maladaptive strategies may then further model maladaptive emotion regulation and coping strategies that can maintain or exacerbate children's anxiety over time (Hastings, Grady, et al., 2019; Hastings, Rubin, et al., 2019).

Building from efforts to explore the bidirectional relationship between parent and child, family systems theory (Cox & Paley, 2003) suggests that all members of a family system are in constant interaction, with each member's emotions and behaviours considered interdependent. Just as parent and child are considered mutually interrelated subsystems, so are coparent systems. The spillover hypothesis (Erel & Burman, 1995) further extends this understanding of interdependency, arguing that individuals' functioning in one subsystem (e.g., coparent system) can have important influences on individuals' functioning in another subsystem (e.g., parent-child system). Indeed, mothers and fathers arguably form a dynamic, interdependent system in the rearing of their children, influencing each other's parenting in ways that can have important implications for children's anxiety trajectories (Bögels et al., 2011).

However, the dynamic relationship between mother and father emotion socialization in children's development of anxiety remains relatively unexplored. Existing studies have largely focused on describing the causes and consequences of differential patterns of socialization between mothers and fathers in static ways, choosing to utilize cross-sectional designs focused on delineating the unique effects of each parent on children's outcomes (e.g., Baker et al., 2011; Hurrell et al., 2015) or utilize models that split maternal and paternal effects into separate models

or combine them into a single composite variable due to insufficient father data (e.g., Buckholdt et al., 2014; Hurrell et al., 2015). Although these studies add to the overall understanding of the importance of parental emotion socialization strategies, they do not fully address the possibility that mothers and fathers may influence each others' responses and their interactions with their children across their child's development.

Actor-partner interdependence models (APIMs; Cook & Kenny, 2005) may be particularly useful for exploring the interdependence between coparenting relationships and parent-child interactions. APIMs are statistical models that allow for the exploration of how an individual's characteristics relate to both their own interactions with their child (actor effects) and their partner's interactions with their child (partner effects). Exploration of partner effects may allow for the empirical exploration of spillover effects. For example, research exploring partner effects has found that family stress and parental emotion dysregulation "spillover" to influence parental socialization strategies (D. Li et al., 2019; Nelson et al., 2009). However, research remains limited and largely focused on exploring the interaction of parent characteristics in predicting parental socialization strategies. Consequently, how maternal and paternal socialization strategies may interact to influence each other across development is largely unknown.

Current Study

The primary aim of this study was to explore how maternal and paternal reactions to children's expressed anxiety influence each other across the course of childhood, from preschool age to early adolescence. It was also of interest to examine whether maternal and paternal perceptions of children's anxiety influence their own and their partner's reactions to children's expressed emotion. Within the context of understanding parental contributions to children's

anxiety, it was important to study discrete reactions to children's anxiety. A distress-based magnifying reaction was of interest, given it is closely associated with parental anxiety and overprotective parenting behaviours but remains relatively unexplored in the anxiety literature. To date, no research has examined the mutual influence of parental perceptions and socialization behaviours in this fashion across the course of childhood.

Exploring these associations longitudinally across childhood is particularly important, as the literature delineating the influence of socialization strategies at different developmental periods remains limited. Parental beliefs and responses to children's anxiety appear to differ across development, as parents have been shown to view children's expression of anxiety as more normative in preschool than in childhood, and consequently, appear to expect a greater capacity for regulation as children age (Hastings, Rubin, et al., 2019). However, results in the literature remain unclear; a decrease in parental awareness and acceptance of children's fear/anxiety was observed between the ages of 5 and 9 years, whereas an increase was observed between the ages of 9 and 11 years (Stettler & Katz, 2014). To date, little is known about how parents may differ in magnification behaviours across childhood.

Actor effects were hypothesized for both stability and within-individual influence paths. Given documented stability in parental socialization strategies (e.g., Miller-Slough & Dunsmore, 2019) and parental perceptions of children's anxiety across childhood (e.g., Grover et al., 2005), (1) parents' earlier reports of magnifying responses to their children's expressed anxiety and (2) parents' earlier perceptions of their children's anxiety were expected to predict their own reports at later time points. As children's anxiety was suggested to elicit more unsupportive socialization strategies (e.g., Hurrell et al., 2015), (3) parent perceptions of children's anxiety at an earlier time point were expected to predict their later magnification responses.

Partner effects were also hypothesized. As maternal and paternal reports of children's anxiety have been shown to be correlated (e.g., Jansen et al., 2017), (4) one parent's perception of their child's anxiety at an earlier time point was expected to predict their partner's later perception of their child's anxiety. Given that parental characteristics and behaviours have been shown to influence each other in the larger parenting literature (e.g., Bögels & Perotti, 2011), (5) one parent's magnifying response to their children's expressed anxiety at an earlier time point was expected to predict their partner's later magnifying response and (6) one parent's perceptions of their children's expressed anxiety at an earlier time point was expected to predict their partner's later magnification.

Given the exploratory nature of this study, no specific hypotheses were made comparing the magnitude of mother and father partner effects. Speculatively, maternal reports of children's anxiety have been shown to better correlate with children's self-reports (e.g., Jansen et al., 2017), perhaps because they spend more time with their children and are more likely to be sought out when children are distressed (Kotila et al., 2013; Umemura et al., 2013). Mothers may be more aware of their children's anxiety and thus more likely to influence their partner's awareness and subsequent behaviours. Additionally, given that they commonly spend more time with their children, they may also rely more strongly on their own perceptions to guide emotion-related parenting. Alternatively, one study found that maternal anxiety-promoting behaviours were positively influenced by paternal anxiety (Bögels & Perotti, 2011). It may be that when fathers express concern about their child's anxiety, it disrupts maternal tendencies to provide care and support (Bögels & Perotti, 2011) and spills over to influence mothers' parenting.

Although parents have been reported to be more concerned about the expression of anxiety in their sons (Doey et al., 2013), no effects of child's gender have been suggested in the

magnification of anxiety for non-clinical samples (O'Neal & Magai, 2005). For this reason, no specific hypotheses were made regarding the effects of children's gender.

Method

Participants

Participants were 206 English-speaking mother-father dyads from a larger community-based longitudinal study (see Mills et al., 2007). Of the 257 families who initially consented to participate in the larger study, 45 parents reported experiencing a relational separation at any wave in the study and could not be reliably assumed to be residing in the same home as their child. These cases were excluded, as dyadic influences between residing and non-residing parents and their influence on children's development are suggested to differ (Coates et al., 2019). Six co-residing families were further excluded because they had missing data on all key variables at each study wave.

Children (91 female, 115 male) were between 3.58 and 4.50 years of age ($M = 4.09$ years, $SD = 0.26$ years) during the initial wave of the study ("T1"), between the ages of 7.33 and 9.42 years of age ($M = 8.10$ years, $SD = 0.28$ years) during the second wave of the study ("T2"), and between the ages of 10.17 and 11.83 years ($M = 10.95$ years, $SD = 0.40$ years) during the third wave of the study ("T3"). Parents were predominantly married (89.3%) and had a postsecondary education (84.1% of mothers, 74.4% of fathers). At T1, approximately 17.2% of mothers and 11.2% of fathers reported being aged between 20 and 29, 63.5% of mothers and 60.9% of fathers reported being aged between 30 and 39, 19.2% of mothers and 22.8% of fathers reported being aged between 40 and 49, and 5.1% of fathers and no mothers reported being aged 50 and above. Exact parental ages are not available. Approximately 53.4% of the sample reported a household yearly income at or above the Manitoba provincial mean at the time ($59, 005 CAD) (Statistics

Canada, 2003), whereas 26.7% reported income slightly below the mean (i.e., $40 000 – 60 000) and 15.6% reported income substantially below the mean (i.e., less than $40 000). Parents largely identified as being European/White in descent (74.8% of mothers, 71.4% of fathers), with a minority reporting identifying as Indigenous (10.2% of mothers, 8.7% of fathers), Black (1.5% of both mothers and fathers), and Asian (2.4% of both mothers and fathers). They were predominantly the biological parents of the focal child (92.3%), with some participating fathers reporting they were stepfathers (3.4%) and some parents reporting being adoptive parents (1.9%). Approximately 11.2% of children were singletons, 46.6% had one sibling, and 37.5% of children had two or more siblings. Of children with siblings, 37.2% were the first-born child, 35.7% were the second-born child, and 23.1% were the third-born child or later.

Procedure

Families were initially recruited by a government agency responsible for administering health care. A randomly drawn subsample of 3500 families living in Winnipeg, Manitoba with children between the ages of three to four at the time of recruitment were sent a letter of invitation to participate in the study. Participants self-identified as interested in participating in the study, at which point they became known to the researchers. Additional information about the study was provided to obtain informed consent. Laboratory visits were conducted at each wave, where several parent and child characteristics were assessed. Parents reported on children's anxiety at T1, T2 and T3, and on their magnification responses at T2 and T3. All procedures were approved by the University's Institutional Review Board.

Measures

Parent Reports of Children's Anxiety

Parent preschool reports of children's anxiety symptomology (T1) were assessed using

the Spence Preschool Anxiety Scale (SPAS; Spence et al., 2001). The SPAS contains 28 items rated on a scale from 0 ("not at all true") to 4 ("very often true"). Parent childhood reports of children's anxiety symptomology (T2 and T3) were assessed using the Spence Children's Anxiety Scale (SCAS; Spence et al., 1997). The SCAS contains 38 items rated on a scale from 0 ("never") to 3 ("always"). Only the Generalized Anxiety Disorder/Overanxious Disorder subscale was used in analyses. In comparison to social anxiety, separation anxiety, and physical injury fears, the generalized anxiety disorder/overanxious disorder subscale assesses a more global form of anxiety (i.e., general, non-specific worry), potentially making the interpretation of findings more generalizable to a non-clinical population. The subscale was comprised of five items on the SPAS and six items on the SCAS. The SPAS has been shown to demonstrate good construct validity and reliability (Spence et al., 2001), and the SCAS has been shown to demonstrate acceptable internal consistency (α = .73-.77 for GAD subscale), test-retest reliability (α = .56-.66 for GAD subscale), and convergent and divergent validity (Spence, 1998; Spence et al., 2001). In the current sample, internal consistencies were acceptable to good (α's ranging from .75 to .87).

Parent Responses to Child Anxiety

Parent responses to children's expressed anxiety were assessed using the Responses to Child's Emotions Scale (RCE; adapted from O'Neal & Magai, 2005). The RCE asks parents to identify how they have responded to their children's specific emotional responses (anger, fear/anxiety, and sadness) in the last two months. For each emotion, parents rank fifteen brief descriptions of possible reactions on a 5-point Likert scale (1 = "Not at all typical to 5 = "Very typical"), with three items each tapping into one of five dimensions of emotion socialization strategies (reward, punishment, override, neglect, and magnify). For this study, only the

magnification of anxiety subscale ("I became worried or nervous", "I told my child that I felt scared too", "I got scared myself") was included in the analyses. Internal reliability of the five strategy subscale scores ranged from .66 to .94 (Magai & O'Neal, 1997), whereas test-retest reliability ranged from .49 to .86 (Klimes-Dougan et al., 2001). In the current sample, internal consistencies were acceptable at T2 and T3 (α = .76 and .77, respectively).

Demographic Information

Parents provided demographic information during laboratory visits, including their age, current level of education, occupation, and family income. Parents' reported occupation was used to calculate their occupational prestige using the Standard International Occupational Prestige Scale (Ganzeboom & Treiman, 1996). A prestige score is a weighted value assigned to common occupations based on results from factorial surveys assessing the social standing of fictional characters in vignettes standardized at a national level (Nock & Rossi, 1978, 1979). Occupations associated with a higher social status (e.g., doctors, lawyers, chief executive officers) are assigned higher scores, whereas occupations associated with a lower social status (e.g., domestic labourers, manufacturers, farmhands) are assigned lower scores. The score for the parent with the highest occupational prestige was included in the analyses. The mean level of occupational prestige for this sample was 52.69 (SD = 10.84), equivalent to the level of occupational prestige represented by a skilled clerical worker/business professional.

Analytic Strategy

The primary goal of this study was to examine the dyadic influence of mothers' and fathers' perceptions of children's anxiety on their magnifying responses to their children's expression of anxiety across childhood. To do so, a distinguishable APIM was used to help account for both "actor" and "partner" effects. Tests of distinguishability (Kenny et al., 2006)

revealed that mothers and fathers were completely distinguishable from each other in their reports of their children's anxiety ($\Delta\chi^2(6) = 21.403$, $p = .002$) and in their magnification responses to their children's anxiety ($\Delta\chi^2(6) = 12.80$, p = .046), supporting the use of a distinguishable APIM. Figure 4 depicts the fully saturated model. Actor effects correspond to paths *a* and *b* (within-individual stabilities) and paths *c* and *d* (within-individual influences). Partner effects (between-individual influences) correspond to paths *e*, *f*, *g*, and *h*. Within-individual correlations are denoted as *w* and *x*, and between-individual correlations are denoted as *y* and *z*. All analyses were conducted using Mplus Version 8 (Muthén & Muthén, 2017). Family SES, child age, and maternal and paternal education were entered into the model as control variables. Additional non-significant paths that were not theoretically relevant were trimmed from the fully saturated model.

Results

Preliminary Analyses

All key study variables demonstrated skew values less than |2.00|, suggesting adherence to normal distributions (George & Mallery, 2010). An examination of univariate outliers across all predictor and outcome variables exceeding values of |3.00| identified 26 outliers, which were corrected through winsorization. An examination of multivariate outliers using Mahalaobis's Distance revealed no cases with multivariate outliers. Descriptive statistics for the sample are presented in Table 3 and Table 4.

In the current study, missing data ranged from 0% to 49%, reflecting increasing missing data over time due to attrition. Of the 206 families who participated at T1, 140 (67.3%) completed key data roughly four years later at T2 and 111 (53.9%) completed key data roughly seven years later at T3. Results from Little's MCAR test were not significant, $\chi^2(317) = 355.33$,

Figure 4

Overall Distinguishable Dyad Model
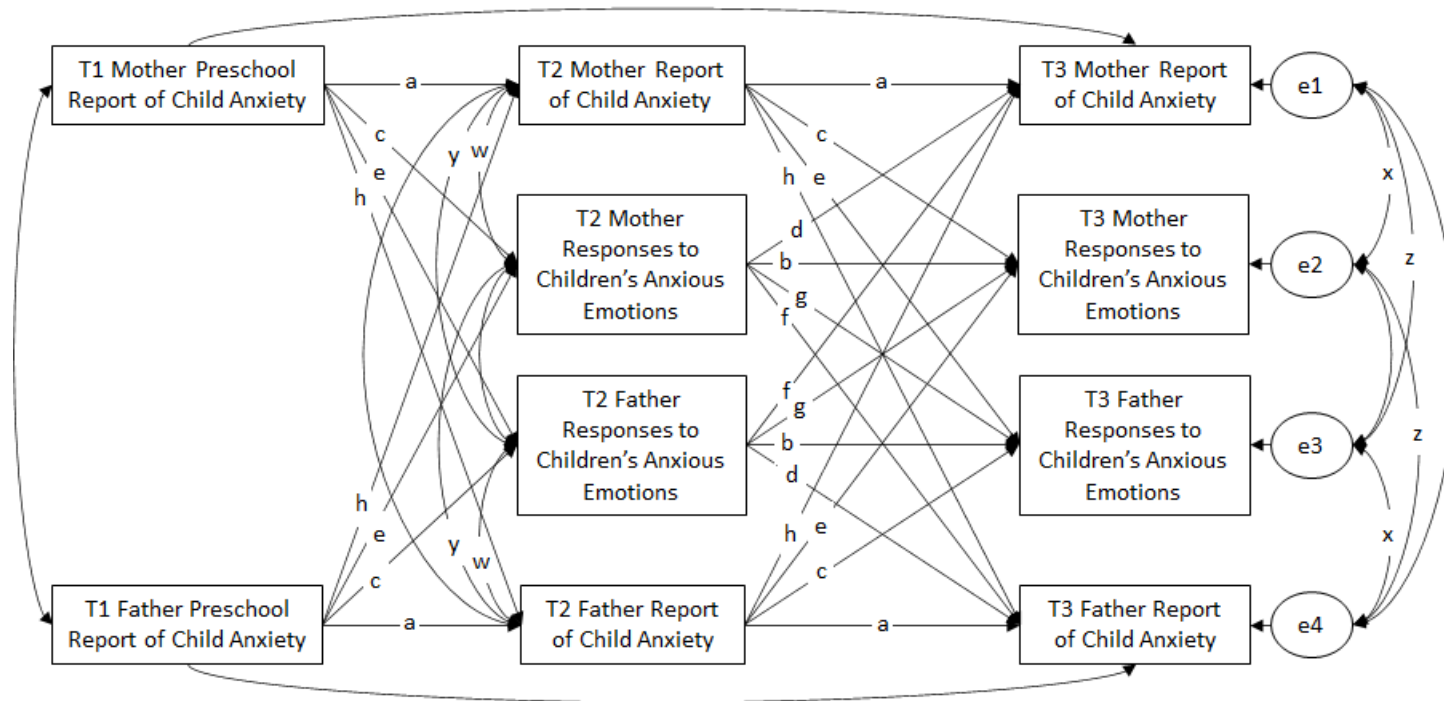
Note. The model includes stability paths (a and b), within-parent influence paths (c and d), between-parent influence paths (e, f, g, h), within-parent correlations (w and x), and between-parent correlations (y and z).

Table 3

Bivariate Correlations Between Study Variables

	1	2	3	4	5	6	7	8	9	10
1. T1 Child Anxiety – Mother	-									
2. T1 Child Anxiety – Father	.23***	-								
3. T2 Child Anxiety – Mother	.33***	.07	-							
4. T2 Child Anxiety – Father	.18**	.32***	.46***	-						
5. T2 Mother Magnification	.13+	.45***	.33***	.10	-					
6. T2 Father Magnification	.04	.27***	-.03	.20**	.02	-				
7. T3 Child Anxiety – Mother	.25***	.19**	.61***	.49***	.17*	.07	-			
8. T3 Child Anxiety – Father	.08	.26***	.44***	.57***	.09	.11	.60***	-		
9. T3 Mother Magnification	.007	.14*	.25***	.16*	.50***	-.005	.09	.08	-	
10. T3 Father Magnification	-.09	.27***	-.04	.12	.20**	.28***	.004	.06	.20**	-
M	1.71	1.27	2.98	2.81	1.53	1.40	2.80	2.51	1.42	1.46
SD	2.28	1.70	1.81	1.68	0.60	0.51	1.95	1.77	0.62	0.61
Range	0-8.62	0-7.43	0-8.73	0-7	1-3.35	1-3.23	0-9.32	0-7.86	1-3.37	1-3.29

Note. $+ p = .06$, $* p < .05$, $** p < .01$, $*** p < .001$

Table 4

Bivariate Correlations Between Study Variables and Control Variables

	Child Gender	Child Age	Maternal Education	Paternal Education	Family Income
T1 Child Anxiety – Mother	.13	-.10	.01	.08	.11
T1 Child Anxiety – Father	-.003	-.09	-.02	-.06	.04
T2 Child Anxiety – Mother	-.03	-.004	.14*	.11	.01
T2 Child Anxiety – Father	.001	-.06	.18*	.05	-.08
T2 Mother Magnification	-.10	-.03	.05	.01	.07
T2 Father Magnification	.13	-.02	.02	-.13	-.08
T3 Child Anxiety – Mother	-.15*	.14*	.09	.08	.02
T3 Child Anxiety – Father	-.10	.13	.17*	.07	.11
T3 Mother Magnification	-.03	.06	.04	-.09	-.02
T3 Father Magnification	-.009	-.10	-.19	-.26***	-.09

Note. Children were approximately 4, 8, and 11 years at T1, T2, and T3, respectively. Females were coded with a value of 0, whereas males were coded with a value of 1.

* $p < .05$, *** $p < .001$, two-tailed.

$p = .07$. Therefore, to reduce bias and loss of power, all available observations were included in the analysis and missingness was handled using the Full-Information Maximum Likelihood (FIML) approach in MPlus. FIML is a robust estimation method appropriate for use when data is missing at random or completely at random (Little et al., 2014).

As mean scores on key study variables were not found to significantly differ by child's gender and child's gender did not significantly interact with parent type (mother, father) in predicting any key study variables, to maintain sufficient power for APIM analyses given the current sample size (Ledermann & Kenny, 2017), multiple group analyses by child gender were not explored. Child gender was instead included as a control variable.

APIM Model

The model displayed excellent model fit, $\chi^2(43) = 33.06$, $p = .86$, RMSEA = .00, CFI = 1.00, SRMR = .04. Figure 5 provides a visual depiction of the model with standardized coefficients. Compared to the fully saturated model, the fit for the final model did not significantly worsen when non-significant paths were trimmed or when controls were added. Six paths from T1 to T3 variables were non-significant and trimmed from the final model. The paths from maternal and paternal anxiety at T1 to T3 were retained as their standardized coefficients exceeded 0.05, and they approached significance. The model explained 46.9% ($p < .001$) of the variance in maternal reports of children's anxiety at T3, 45.0% ($p < .001$) of the variance in paternal reports of children's anxiety at T3, 27.2% ($p = .005$) of the variance in maternal reports of magnification responses at T3, and 15.5% ($p = .04$) of the variance in paternal reports of magnification responses at T3.

Stability of Parental Reports of Children's Anxiety and Magnification Behaviours

Exploring stability paths revealed significant actor effects for parental reports of

Figure 5

Model Results
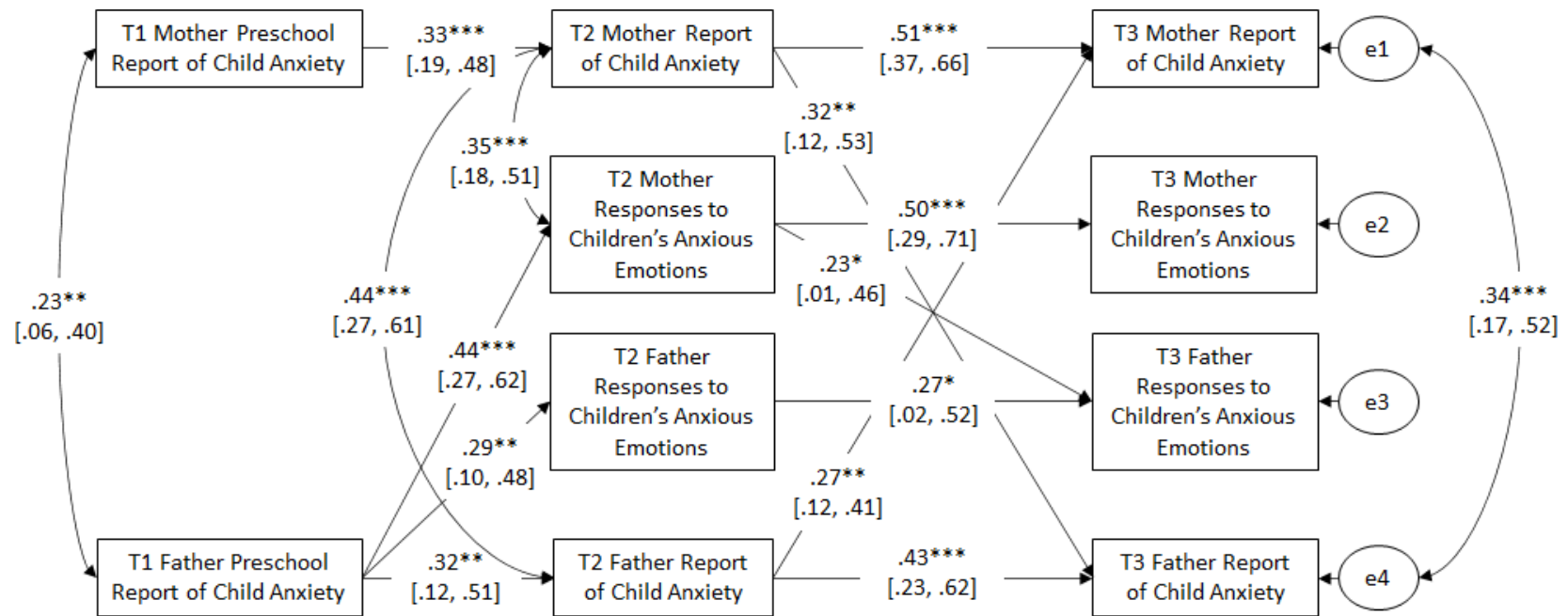
Note. Standardized coefficients for the actor-partner interdependence model exploring maternal and paternal perceptions of children's

anxiety and magnifying responses to children's expressions of anxiety. For each path, 95% confidence intervals are presented in

square brackets.

* *p* < .05, ** *p* < .01, ** *p* < .001, two-tailed.

children's anxiety (*a* paths), with earlier parental perceptions predicting their own later perceptions, as expected. Stability was suggested for mother reports of children's anxiety from T1 to T2 (β = .33, *p* < .001, 95% CI [.19, .48]) and from T2 to T3 (β = .51, *p* < .001, 95% CI [.37, .66]). Stability was also suggested for father reports of children's anxiety from T1 to T2 (β = .32, *p* = .002, 95% CI [.12, .51]) and from T2 to T3 (β = .43, *p* < .001, 95% CI [.23, .62]).

Exploring stability paths also revealed significant actor effects for parental reports of magnification responses (*b* paths), with earlier parental reports of magnification predicting their own later reports of magnification. Stability was suggested for mother reports (β = .50, *p* < .001, 95% CI [.29, .71]) and father reports (β = .27, *p* = .03, 95% CI [.02, .52]) of magnification from T2 to T3, as expected.

Parental Perceptions of Children's Anxiety Predicting Their Partners' Later Perceptions

Exploring between-parent influence paths revealed significant partner effects from one parent's earlier report of children's anxiety to their partner's later report of children's anxiety (*h* paths), as expected. Mothers' reports of children's anxiety at T2 significantly predicted fathers' reports of their children's anxiety at T3 (β = .32, *p* = .002, 95% CI [.12, .53]), even after controlling for fathers' own earlier reports. Fathers' reports of children's anxiety at T2 significantly predicted mothers' reports of their children's anxiety at T3 (β = .27, *p* < .001, 95% CI [.12, .41]), even after controlling for mothers' own earlier reports. However, contrary to expectations, partner effects were not observed from T1 to T2. Fathers' reports at T1 did not predict mothers' reports at T2 (β = .00, *p* = .998) and mothers' reports at T1 did not predict fathers' reports at T2 (β = .13, *p* = .11).

Parental Magnification Behaviours Predicting Their Partners' Later Magnification Behaviours

Exploring between-parent influence paths revealed one significant partner effect from parents' earlier report of magnification to their partners' later report of magnification (*g* paths). Consistent with expectations, mothers' reports of their magnifying responses at T2 significantly predicted fathers' later reports of magnification at T3 (β = .23, *p* = .04, 95% CI [.01, .46]), even after controlling for fathers' own earlier reports of magnification. In contrast to expectations, fathers' reports at T2 did not predict mothers' later reports at T3 (β = -.02, *p* = .84).

Parental Perceptions of Children's Anxiety Predicting Their Later Magnification Behaviours

Exploring within-parent influence paths revealed one significant actor effect from earlier parental reports of children's anxiety to later parental reports of magnification (*c* paths). Consistent with expectations, fathers' reports of children's anxiety at T1 predicted fathers' reports of magnification at T2 (β = .29, *p* = .003, 95% CI [.10, .48]). However, in contrast to expectations, the effect was not significant from T2 to T3 (β = .14, *p* = .19). Mothers' reports of their children's anxiety did not predict their magnification responses from T1 to T2 (β = .02, *p* = .77) or from T2 to T3 (β = .008, *p* = .95), in contrast to expectations.

Parental Magnification Responses Predicting Their Later Perceptions of Children's Anxiety

Exploring within-parent influence paths did not reveal any significant actor effects from earlier parental reports of magnification to later parental reports of children's anxiety (*d* paths). Neither mother (β = -.04, *p* = .63) nor father reports (β = .02, *p* = .87) of their magnification responses at T2 predicted their own reports of their children's anxiety at T3.

Parental Perceptions of Children's Anxiety Predicting Their Partners' Later Magnification Behaviours

Exploring between-parent influence paths revealed one significant partner effect from one parent's earlier report of children's anxiety to their partner's later report of magnification (*e*

paths). Consistent with hypotheses, fathers' reports of children's anxiety at T1 predicted

mothers' magnification responses at T2 (β = .44, p < .001, 95% CI [.27, .62]), even after

controlling for mothers' earlier perceptions and responses. However, in contrast to hypotheses,

mothers' reports at T1 did not predict fathers' reports of magnification at T2 (β = -.04, p = .67).

Neither mothers' (β = -.18, p = .08) nor fathers' reports of children's anxiety at T2 (β = .10, p =

.40) predicted their partner's reports of magnification at T3.

Parental Magnification Predicting Their Partner's Later Perceptions of Children's Anxiety

Exploring between-parent influence paths revealed no significant partner effects from a

parent's report of magnification to their partner's later report of children's anxiety (*f* paths).

Neither maternal (β = -.13, p = .21) nor paternal reports of magnification (β = .05, p = .52)

predicted their partner's reports of children's anxiety at T3.

Discussion

The aim of the present study was to explore the dyadic influence of maternal and paternal

perceptions of children's anxiety and maternal and paternal responses to children's expressions

of anxiety across childhood utilizing an actor-partner interdependence model. To date, no

research has examined how mother and father reactions to children's emotions may

transactionally influence each other across childhood.

Parental Perceptions of Children's Anxiety Across Development

Results from the bivariate APIM exploring the dyadic influence of parental perceptions

of children's anxiety revealed similar findings for both mothers and fathers. Parental reports of

children's anxiety from T1 to T2 revealed only actor effects, whereas from T2 to T3 revealed

both actor and partner effects. In other words, when one parent perceived more anxiety in their

child in middle childhood, their partner was more likely to perceive anxiety in their child in early

adolescence, even after controlling for their own earlier reports. In contrast, a parent's perception of their child's anxiety in middle childhood was determined only by their own earlier experiences and perceptions of their child in early childhood and not by those of their partner.

The finding that mothers and fathers influence each others' perceptions of their children's anxiety across middle childhood to early adolescence was consistent with our expectations and previous research suggesting that maternal and paternal reports of children's anxiety are correlated (Jansen et al., 2017). Contrary to expectations, partner influences were not detected from early to middle childhood. Children experience many age-typical fears in the preschool period (Phillips et al., 2019) and parents have been shown to respond more negatively to anxious behaviour in children than in preschoolers (Mills & Rubin, 1992; Rubin & Mills, 1992), suggesting that parents may perceive anxiety to be more developmentally normative in younger children and expect children to demonstrate a greater capacity for self-regulation as they age. Therefore, it may be that parents are less likely to discuss their concerns about their children's expressions of anxiety with their partner at younger ages. Furthermore, while many children grow out of the normative fears commonly observed in the preschool period (Phillips et al., 2019), research has supported the presence of a subset of children who continue to express frequent and/or increasing symptoms of anxiety (de Lijster et al., 2019; Morin et al., 2011). As these children age and their level of anxiety becomes more atypical for their developmental stage, parents may come to recognize their child's persistent pattern of anxiety and be more likely to voice their concerns to their partner. Parents may also come to develop a richer understanding of their children's anxious symptomology and have a greater repertoire of symptoms to draw from, which may further drive their concerns and encourage parental discussion about how to manage their children's behaviour.

Parental Magnifying Responses to Children's Anxiety

Results exploring the dyadic influence of parental magnifying responses to children's anxiety revealed different dyadic patterns for mothers and fathers; both actor and partner effects were observed for fathers, while only actor effects were observed for mothers. When a mother used more magnification in response to their child's anxiety in middle childhood, fathers were more likely to report they would use magnifying responses in early adolescence, even after controlling for their own earlier use of magnification. In contrast, a mother's use of magnification in early adolescence was only predicted by their own earlier use of magnification in middle childhood.

The finding that fathers' but not mothers' behaviours were influenced by the earlier behaviours of their partner represents novel and interesting findings. As mothers in this sample and within the larger literature are more likely to use magnification strategies in response to their children's anxiety (e.g., Brown et al., 2015), it may be that this tendency for mothers to utilize magnification strategies is present without influence from partners. In contrast, fathers were shown to be influenced by maternal strategies. As mothers have been suggested to be more involved in parenting, more active emotion socialization agents, and more concerned about their children's expression of anxiety (Klimes-Dougan et al., 2007), it may be that mothers communicate these concerns to their partners and model parenting responses for fathers to pick up on. In turn, in this context, it may be that fathers are more likely to defer to mothers about how to react to their children's emotions. To disentangle these maternal and paternal differences, future research should focus on exploring how parents communicate with each other about their children's anxiety and identifying how these messages may influence parent-child interactions in ways that may contribute to children's anxiety.

Parental Perceptions Influencing Parental Magnifying Responses

Results exploring the dyadic influence of parental perceptions on magnifying responses to children's anxiety revealed different dyadic patterns for mothers and fathers. Maternal reports of magnification responses in middle childhood were predicted by their partners' earlier perceptions of children's anxiety in early childhood but not by their own earlier perceptions. In other words, when fathers perceived more anxiety in their children at age four, mothers were more likely to report they would engage in magnification at age eight, regardless of mothers' perceptions of children's anxiety at age four. In contrast, paternal reports of magnification responses in middle childhood were predicted by their earlier perceptions of children's anxiety in early childhood but not by their partner's. In other words, when fathers perceived more anxiety in their children at age four, they were more likely to report they would engage in magnification at age eight, regardless of mothers' perceptions at age four.

The finding that mothers' socialization behaviours at age eight were influenced by fathers' perceptions of their children's anxiety at age four was consistent with the hypotheses. As maternal anxiety-promoting parenting behaviours have been shown to be shaped by paternal expressions of anxiety in parent-child interactions (Bögels & Perotti, 2011), it may be that fathers' awareness of their child's anxiety – communicated in some way to their spouse – similarly increases distress and concern in mothers and makes them more likely to report engaging in anxiety-promoting emotion socialization practices. However, the finding that mothers' *own* perceptions did not shape their later emotion socialization strategies contradicted expectations. Mothers have been found to be more likely to use magnification strategies overall (e.g., Brown et al., 2015), and it may be that this tendency holds true, regardless of whether they perceive their children to be more anxious.

The finding that fathers' socialization behaviours at age eight were influenced by their perceptions at age four was consistent with broader research suggesting that one's beliefs and perceptions shape their parenting behaviours (e.g., Bornstein et al., 2018). Contrary to expectations, maternal perceptions were not found to shape later paternal behaviours. Research has suggested mothers take on a more nurturing, supportive role that emphasizes the management of the child's internal world (Bögels & Perotti, 2011) and, consequently, are more anxious about their children's expression of anxiety (Baker et al., 2011; Hurrell et al., 2015). Indeed, in the current study, mothers reported more anxiety in their children in preschool and were more likely to report using magnification in response to their children's anxiety in middle childhood. In contrast, fathers have been reported to take on a more challenging, playful role that emphasizes exploration, exposure to novelty and ambiguity, and the encouragement of independence in interaction with the external world (Bögels & Perotti, 2011). It may be that mothers' concern about their child's anxiety, without action, is not enough to motivate fathers to become distressed enough about the situation to influence their interactions with their children. Fathers, in contrast to mothers, may also have higher levels of distress tolerance for their children's anxiety.

Limitations and Future Directions

Although results from the present study provided novel insights into the dyadic interaction of parental perceptions and parental responses to children's anxiety, some limitations should be considered with an eye to future research. First, the study used a sample of predominantly White, middle-class participants in heterosexual partnerships, which considerably limits the generalizability of the findings. Research has acknowledged the important role sociocultural factors play in the socialization of emotion, and parental responses to children's

expressed negative emotion have been shown to vary by characteristics such as ethnicity and socioeconomic status in both broad and nuanced ways (e.g., Brown et al., 2015; O'Neal & Magai, 2005). Consequently, exploring how dyadic patterns between parents may vary across diverse populations may be particularly valuable when seeking to understand the importance of parental socialization in the context of children's anxiety.

Second, the study did not include child self-reports of anxiety or perceptions of their parents' emotion socialization strategies. Previous research has found the associations between parental reactions and aspects of children's emotion regulation vary depending on whether parent or child self-reports were used (Hurrell et al., 2015), and parental reports are only modestly correlated with observations and children's self-reports of emotion socialization (Klimes-Dougan et al., 2007). Given that maternal and paternal socialization behaviours were for the most part not concurrently correlated with or predictive of later parental reports of children's anxiety and a fourth wave of data following the observed partner effect for paternal magnification was not collected, it remains unclear whether these dyadic patterns of influence between mother and father exert negative influences on children's anxiety trajectories. Future research would benefit from exploring triadic patterns between mother, father, and child or from including objective or other informant reports of children's anxiety and/or psychosocial adjustment outcomes.

Conclusion

In conclusion, the current study suggests that mothers and fathers dyadically influence each other's socialization strategies in unique ways. Mothers appear to be influenced more by their partners' perceptions of their children's anxiety than by their partners' socialization behaviours. In contrast, fathers appear to be influenced more by their partners' socialization behaviours than their partners' perceptions of their children's anxiety.

Together, these patterns suggest the importance of recognizing family dynamics in understanding children's development of anxiety. Sources of parental influence on children's anxiety trajectories are not static or solely products of the parent-child relational subsystem. Rather, parental influence may be generated from within the co-parental subsystem, influencing how a parent interacts with their child. Consequently, observations of interactions between each parent, separately, and their child cannot be assumed to be independent. While it remains to be seen how patterns of family influence contribute to children's internal working processes, including cognitive and physiological mechanisms known to be associated with children's anxiety, findings from this study argue for the need to utilize statistical methodology to account for the interdependence of family systems when seeking to understand and explore early environmental etiological models of anxiety. Moreover, prevention and intervention programming that seeks to address children's anxiety should extend to anxiety-promoting parenting behaviours in the larger family system.

Finally, families take many forms and may include other key members (e.g., siblings, stepparents, grandparents) who play an important role in a child's development, including the development of anxiety. Including larger family systems may be pertinent for developing comprehensive models of the ecological systems that shape children's development of anxiety. Future research should continue to explore these relationships more thoroughly across development in a manner that allows for the examination of triadic or more extended transactional relations with the aim of understanding how the interrelations among family members influence each child's developmental course.

Chapter 5: General Discussion

Given the wide prevalence and early onset of anxiety disorders (Georgiades et al., 2019; Kessler et al., 2005, 2007), it is unsurprising that much research has focused on seeking to identify and understand risk and protective factors to inform etiological models of anxiety. While results from family-risk and twin studies have supported genetic models of anxiety, heritability estimates remain modest and genetic factors account for only 30% of the variance in children's anxiety (Eley et al., 2015; Eley & Gregory, 2004). Consequently, exploring environmental influences of children's anxiety is particularly important when seeking to develop more informed and comprehensive models of etiological risk.

Parents represent important sources of influence on children's socio-emotional development, with immediate family systems representing the earliest and most consistent sources of both risk and protection in a child's development of anxiety. Many avenues of familial risk models have been explored, with the role of parental behaviours such as critical, rejecting, punitive, overprotective, and autonomy-granting parenting featuring most prominently (Möller et al., 2016). However, fewer studies have explored familial risk models while also seeking to understand the interdependent nature of family systems.

Therefore, the goal of the present study was to contribute to the existing discourse on environmental models of children's development of anxiety through the use of statistical models that allow for the exploration of how different relationships in the family subsystem may be involved in understanding parental influences on children's development of anxiety. The two studies included in this dissertation adopted an actor-partner interdependence model (APIM) approach to sufficiently capture the unique actor (i.e., how one's outcome is predicted by their own characteristics) and partner effects (i.e., how one's outcome is predicted by their partner's

characteristics) between parent and child and between mother and father in two community-based samples of children across early childhood through early adolescence.

Findings from these studies contribute to familial models by examining several key areas of interest, including (1) how parent and child perceptions of children's anxiety reciprocally influence each other across the child's development; (2) how parent perceptions of children's anxiety may contribute to the transmission of anxiety from parent to child and whether this transmission of awareness from parent to child is facilitated through aspects of the parent-child relationship; and (3) how parents perceptions of their children's anxiety and their emotion socialization strategies in response to their children's expression of anxiety reciprocally influence their coparents perceptions and strategies across their child's development.

Overall Contributions

Taken together, findings from this dissertation continue to highlight the importance of seeking to understand children's anxiety from a family systems perspective. Children's anxiety, much as their development more generally, does not develop within a vacuum and is best considered a product of numerous interdependent relationships within the larger family system. Patterns of influence may be more explicit and direct, such as parents exerting an influence on children's anxiety through their interactions with their children. Results from Study 1 indicate this possibility, with parental perceptions and behaviours driving children's self-perceptions of their own anxiety across development. Patterns of influence may also be more implicit and indirect, such as coparents exerting an influence on each other within the mother-father subsystem and spilling over to influence how a parent interacts with their child in the parent-child subsystem. Results from Study 2 indicate this possibility, with one parent's perceptions and emotion socialization behaviours influencing how their partner responds to their children's

displays of anxiety. The unique contributions of each study, as well as their larger strengths, limitations, clinical implications, and future directions will be addressed below.

Parent-Child Dyadic Influences of Perceptions of Children's Anxiety Across Development

Consistent with predictions, results from Study 1 suggested that maternal perceptions influence children's perceptions of their own anxiety over time, even after controlling for children's own earlier reports. Previous research has suggested that maternal perceptions are predictive of observational reports of children's temperament in infancy (Pauli-Pott et al., 2003). Consequently, it may be that mothers' perceptions of their children's anxiety shape the ways in which they interact with their children, either directly through communication and labelling of children's emotional states or indirectly through associated parenting behaviours selected to mitigate symptoms of anxiety or parents' own distress.

In contrast, children's perceptions were not found to predict maternal perceptions after controlling for mothers' own perceptions. This was in contradiction to previous findings from the larger literature that suggest children's characteristics elicit and shape the parenting they receive (Gouze et al., 2017). It may be that mothers form perceptions quite early into a child's development and that their perceptions remain fixed across childhood and resistant to outside influence after they have been formed. Indeed, research has shown that maternal perceptions exert an influence on children's development as early as infancy (Pauli-Pott et al., 2003).

No study to date has explored how parental and child reports of children's anxiety influence each other across development using an APIM approach. These findings represent a novel contribution to the literature as they extend existing research that recognizes the direction of influence of perceptions of children's anxiety flow from parent to child. A richer understanding of the source for this unidirectional influence remains to be explored, including

elucidating how this influence may play out across adolescence and emerging adulthood. Although much future research is warranted, findings from this dissertation argue for the importance of considering not only dyadic patterns of influence, but that discrepancies in reports between parent and child may themselves reflect important sources of influence in children's development and understanding of their own anxiety.

Parental Perceptions as Sources of Influence of Intergenerational Transmission of Anxiety

Findings from Study 1 also contributed to the existing literature by suggesting that maternal perceptions may not only serve to influence children's later perceptions of their own anxiety but may also serve as a possible mechanism for the intergenerational transmission of anxiety from parent to child. Maternal perceptions of children's anxiety in middle childhood were found to mediate the link between maternal anxiety in early childhood and children's self-perceptions in early adolescence at low levels of sensitivity.

The developmental literature currently supports the finding that more anxious mothers report more anxiety in their children (Manassis et al., 2009). While research has suggested that anxious mothers may be more biased in their reporting, either because they are projecting or mistakenly identifying symptoms of their own anxiety (Moretti et al., 1985) or because they employ low thresholds due to their own sensitivity and likelihood of becoming overwhelmed (Brody & Forehand, 1986), other studies have not found bias (Krain & Kendall, 2000) or have found them to be more accurate in their reporting (Reuterskiöld et al., 2008). Given that anxiety is highly heritable, it may simply be that children of anxious mothers experience more anxiety and that anxious mothers, cognizant of their own symptoms, are more likely to recognize the same characteristics in their own children, perhaps even before they do.

The finding that awareness is transmitted from parent to child only at lower levels of

sensitivity is also consistent with findings from the larger literature exploring the role of parental sensitivity in children's developing self-concept. Children of highly sensitive parents have been shown to be more accurate in their self-descriptions, as highly sensitive parents tend to permit their children to act in ways that reflect their innate emotional tendencies and encourage children to freely explore and express their emotions (Brown et al., 2009). The findings from the current study expand on this existing research by suggesting that parents of highly sensitive children experience a lesser parental influence on their developing self-concept, perhaps because they receive fewer messages about their anxiety or have these messages tempered by an interaction style that places value on the exploration of one's identity. In contrast, parents who are less sensitive may be less likely to provide an environment that stimulates independent expression of one's self-concept, and consequently, have children who are more reliant on the input and influence of others to develop their self-concept. Parents who are less sensitive may also communicate a greater frequency of messages to their children about their anxiety or may interact with them in a way that promotes the integration of those messages into their self-concept.

Results from Study 1 additionally represent a novel contribution to the literature, as they attempt to explain one possible mechanism that may facilitate and explain the unidirectional transfer of perception of child anxiety from parent to child across childhood. However, it is important to note that much of the current understanding of this finding remains speculative in the absence of specific measures targeted at assessing how this information is transmitted from parent to child in more concrete ways. While maternal sensitivity represents a framework within which parent-child interactions and communications play out, it is not sufficient in itself to explain and elucidate specific processes through which parents communicate to children about

their anxiety. Future research exploring specific emotion socialization practices is essential for continuing to understand the value of parental perceptions as mechanisms for the intergenerational transmission of anxiety.

Parental Dyadic Influences of Perceptions of Children's Anxiety Across Development

Consistent with predictions, results from Study 2 suggested that maternal and paternal perceptions of children's anxiety predicted each other from middle to late childhood. Although this is the first study to date to explore the transactional influence of maternal and paternal perceptions across childhood, findings are in line with previous research suggesting that mothers' and fathers' reports of children's anxiety are correlated (Jansen et al., 2017).

In contrast and contrary to expectations, maternal and paternal perceptions of children's anxiety were not found to influence each other from preschool to middle childhood. This finding speaks to the importance of exploring dyadic influences longitudinally, as patterns of influence may differ at different developmental stages. Indeed, drawing from the extant literature, parental responses have been shown to differ across childhood, with parents viewing anxiety more negatively in childhood than in preschoolers (Mills & Rubin, 1992; Rubin & Mills, 1992). It may be that parents see anxiety as more developmentally normative in younger children and be less likely to voice their concerns to their partners. Additionally, as children age, parents may develop a richer understanding of their children's behaviours and have a greater repertoire of symptoms to draw from, further reinforcing concerns and the likelihood that they will discuss or convey their awareness of their child's anxiety to the partner in some fashion.

No study to date has explored how maternal and paternal reports of children's anxiety influence each other across development using an APIM approach. These findings, in concert with findings from Study 1 exploring parent and child reports of children's anxiety, extend the

existing literature and continue to argue for including and examining sources of informant discrepancy as possible sources of interdependent influence in understanding the development of children's anxiety. Future research exploring children's anxiety should seek to include multiple informants within the family system when seeking to assess children's anxiety trajectories. Given the fact that maternal and paternal influence was found to differ across childhood, future research is also needed to explore patterns of parental influence across development more continuously, including further into adolescence and emerging adulthood.

Dyadic Co-Parental Influences of Perceptions and Behaviour Across Development

Attempting to build off of findings from Study 1 that suggested that parents exert an influence on their children through their perceptions of children's anxiety, Study 2 continued to explore parental perceptions and expanded to include an exploration of specific behaviours that may transmit this awareness. Moreover, given that the extant literature has largely neglected fathers in etiological models of familial influence despite some studies suggesting that mothers and fathers play unique roles in the socialization of their children's anxiety (e.g., Bögels & Perotti, 2011), Study 2 contributed to this literature by expanding on these gaps in the literature to elucidate how parental perceptions of children's anxiety simultaneously influence parental socialization behaviours within the coparenting system. Results revealed not only differential patterns of personal influence but differential patterns of dyadic influence between mothers and fathers, which may have important implications for children's anxiety trajectories.

Patterns of paternal influence suggested that mothers were influenced by fathers' earlier perceptions, but not by their behaviours. The finding that mothers are influenced by perceptions is consistent with previous research arguing that paternal expression of anxiety in parent-child interactions disrupts maternal tendencies to provide care and support, spilling over to influence

the utilization of maternal anxiety-promoting parenting behaviours (Bögels & Perotti, 2011). It may be that fathers' awareness of their children's anxiety, communicated in some way to their spouse similarly increases distress and concern in mothers and makes them more likely to engage in anxiety-promoting emotion socialization practices, such as the magnification of anxiety. The finding that mothers are not influenced by fathers' behaviours is also consistent with previous research suggesting that mothers are more concerned about their children's expression of anxiety (Klimes-Dougan et al., 2007) and are more likely to use magnification strategies (Brown et al., 2015). Consequently, it may be that mothers do not require the influence of their partner's actions directly; their awareness may be sufficient to raise concerns and motivate behaviours.

In contrast to paternal sources of influence, patterns of maternal influence suggested that fathers were influenced by mothers' earlier behaviours, but not by their perceptions. These results expand on findings from the existing literature speaking to the different roles that mothers and fathers play in the socialization of anxiety. Mothers are argued to be more active emotion socializers, to be more concerned with their children's anxiety, and to be more likely to utilize magnification strategies in response to children's anxiety (Klimes-Dougan et al., 2007), whereas fathers are shown to be less concerned by children's anxiety and to engage in more anxiety-reducing parenting behaviours (Bögels & Perotti, 2011). It may be that mothers' concerns about their child's level of anxiety, without action, are not enough to motivate fathers to become distressed enough about the situation to influence their interactions with their child. However, over time and as children's anxiety becomes less normative, mothers' modelling of specific parental responses may become more influential, and fathers' may defer to mothers about how to react to their children's anxiety.

There is a relative dearth of studies exploring maternal and paternal sources of influence

in this manner, with no studies having explored parental perceptions and socialization behaviours in response to children's anxiety utilizing an APIM approach. These findings, although preliminary, lend support to the argument that the coparenting system may have important implications for children's anxiety, with the effects of one partner's parent-child interaction having the capacity to spillover to affect their partner's parent-child interactions. Future research should continue to explore these findings more continuously across development and through the inclusion of triadic patterns of perceptions and behaviour, incorporating direct measures of children's perceptions of the parent-child interaction and self-perceptions of anxiety.

Strengths and Limitations

The current studies included in this dissertation demonstrated a number of strengths that increase its contribution to the current literature on the role of parents in children's anxiety trajectories. A major strength of the studies was the use of a longitudinal actor-partner interdependence model design. This design allowed for opportunities to explore not only temporal relations between study variables across longer periods of a child's development but also allowed for the exploration of these transactional relations simultaneously through the examination of actor and partner effects. As a result, previously unreported dyadic patterns of association between parent and child perceptions and between mother and father perceptions and behaviours were noted across childhood and early adolescence. These results extended findings from previous studies that utilized primarily cross-sectional designs or designs that pooled parental influences, ran parental influences in separate models, or explored the influence of perceptions and behaviours in a unidirectional fashion.

Another strength of the current studies was the inclusion of a community-based sample. Although clinical levels of anxiety pose specific, serious consequences for children's

development (Copeland et al., 2014; Essau et al., 2014), subclinical levels of anxiety have still been shown to pose challenges for children's development (Comer et al., 2012) and may serve as a precursor to the development of more severe symptomology in the presence of environmental factors known to exacerbate anxiety. Including a sample more representative of the population at large increases the generalizability of the findings to more normative developmental experiences.

However, there are also a number of limitations of the current studies. First, although APIMs allow for an examination of the dyadic patterns of influence in unique and novel ways, it examines mean trajectory comparisons rather than examining changes in individual trajectories. Moreover, despite the inclusion of longitudinal data, the design was not experimental in nature. In light of this, results are only suggestive of causality and determinations about causality and the direction of effects cannot be conclusively determined.

A second limitation of the current studies, as mentioned above, was the relatively small sample sizes that prevented the exploration of child gender effects. Research has suggested that girls experience higher levels of anxiety (Cohen et al., 2018), which may offer more opportunities for parents to respond to, communicate about, and express their awareness of their daughter's anxiety. In contrast, parents have been suggested to be less accepting of the expression of anxiety in boys (Doey et al., 2013), which may result in parents responding to and communicating more directly about their son's anxiety. However, research exploring the role of gender in emotion socialization remains inconclusive, with some studies reporting parents respond somewhat similarly to emotions in their sons and daughters (Eisenberg et al., 1996; Eisenberg & Fabes, 1994; Kennedy Root & Rubin, 2010; Klimes-Dougan et al., 2007; C. R. O'Neal & Magai, 2005), especially at higher levels of anxiety (Stevenson-Hinde & Glover, 1996). Research exploring parent-child reporting discrepancies has also found child gender

effects to be generally null or at best inconclusive (de Los Reyes & Kazdin, 2005). Future research would benefit from exploring whether these relations hold similarly when accounting for both child gender and the interaction of parent and child gender.

Finally, as discussed earlier, the current samples did not permit the exploration of triadic patterns of influence. Fathers were not able to be sampled in many of the waves of the Concordia Longitudinal Research Project, including the waves utilized for Study 1, due to challenges with recruitment and marital separation across time. Self-reports of children's anxiety were not consistently collected across the different waves of the community-based longitudinal sample in Study 2; notably, changes were made in measurement tools between waves, which affected the number of available data points for children's reports. As Study 1 suggested differential patterns of influence between parent and child and Study 2 suggested differential patterns of influence between mothers and fathers, the inclusion of all three familial members and their related subsystems will allow for simultaneous exploration of patterns of influence and provide a more nuanced understanding of the unique patterns of familial influence on children's anxiety trajectories.

Finally, the samples from the current studies were largely homogenous in terms of race and ethnicity. Although the Study 1 sample was recruited from a pool of individuals living in lower-risk neighbourhoods, the sample was overwhelmingly (i.e., 95%) White and of French-Canadian descent. The sample from Study 2 was recruited from a larger Canadian community but still was largely over-representative of White, middle-class heterosexual parents. Research has suggested that parenting behaviours and emotion socialization strategies utilized in response to children's anxiety vary as a result of sociocultural factors like culture, ethnicity, and socioeconomic status (Brown et al., 2015; Mousavi et al., 2016). Consequently, whether findings

are generalizable across more culturally diverse populations remains unclear. Exploring these findings in samples with more diverse demographic characteristics and across cultures may provide further insight into the complex, transactional influences of the parent-child and parent-parent subsystems on children's anxiety trajectories.

Implications for Intervention and Prevention

Results of the present work suggest that maternal anxiety can exert negative effects on a child's perceptions of their own anxiety through how they are communicating their awareness of their children's anxiety to their child in question. While much research has supported the importance of prevention and intervention strategies that seek to address how anxious parents communicate threat, broader-based interventions that address emotion socialization more widely, including helping anxious parents to reframe how they respond to their children's expressions of anxiety and how they communicate with their children about their anxiety may also be helpful. However, it is important to note that in the absence of variables exploring specifically how parents communicate and transmit their awareness of their children's anxiety to their children in the current study, these suggestions are speculative and remain an important future direction for research. Nevertheless, in the present work, parental perceptions were shown to be transmitted in the presence of unsupportive, insensitive parenting, suggesting the value of continuing to promote prevention and intervention strategies that foster increasing parental responsiveness and positive interactions between parent and child, especially for anxious mothers with anxious children.

Results from the present work also continue to support the importance of including fathers in intervention and prevention programming. Although mothers have been argued to be the more active emotion socialization agents in their children's lives, findings from Study 2

suggest that fathers' perceptions may be influential in their own way in how they shape maternal parenting behaviours shown to be associated with children's anxiety. In turn, mothers' behaviours may themselves shape fathers' behaviours, with the possibility for more additive negative emotion socialization behaviours exerting their influence over children's development of anxiety. These different patterns of influence between mothers and fathers and the presence of partner effects across both studies lend support to the argument that parent-child and mother-father influences are not only reciprocal but transactional in nature. Family data cannot be assumed to be independent, arguing for the need to utilize statistical methodology to account for the interdependence of family systems and for the inclusion of larger family systems in understanding, preventing, and intervening in the development of children's anxiety.

Conclusions and Directions for Future Research

The two research studies included in this dissertation provide an exploration of the transactional influences of parental anxiety, parental emotion socialization, parent-child interaction quality, and child and parental perceptions of children's anxiety as mechanisms for understanding the etiology of anxiety. In integrating mother, father, and child perspectives through the utilization of APIMs, the present studies demonstrate the importance of considering the dynamic relationship between familial systems in the child's home environment in understanding children's anxiety across childhood and adolescence. These findings help assert the position that environmental etiological models of anxiety are best understood through a family systems framework incorporating statistical models that account for the interdependence of family-based data, as well as point to additional avenues to improve environmental models of anxiety transmission.

First, this research highlights that environmental etiological models of anxiety are multi-

faceted, involving the influence of multiple individual, dyadic, and familial factors operating in tandem. To better account for variability in children's anxiety, familial models should operate from a family systems perspective and seek to include not only dyadic relationships between parents and children, but dyadic relations between coparents and, in the case of two-parent families, triadic relations between parents and children. Moreover, siblings remain especially neglected in the literature and likely offer significant contributions to the family's emotional climate and may serve themselves as sources of emotion socialization.

Second, and most importantly, the results from the present dissertation suggest that patterns of dyadic influence vary across development. Partner effects between parent and child and between mothers and fathers were detected at some developmental time points, but not at others. Limiting studies of dyadic influence to a single point in time or to single stages of development may paint a limited picture of how parents contribute to children's anxiety trajectories. Parental responses to children's emotions may vary with age as children develop more sophisticated cognitive and emotional skills (Mirabile et al., 2018). Moreover, children themselves become more independent in their understanding, regulation, and management of their emotions and begin to rely on other important socializing forces in their life, such as peer relationships (Klimes-Dougan et al., 2014). Longitudinal studies spanning children's development more continuously (e.g., across infancy, early childhood, middle childhood, early adolescence, adolescence, and emerging adulthood) provide the opportunity to identify how patterns of familial influence change across development and permit the identification of critical periods of familial risk and protective influence. These findings would have important implications not only for research but for intervention.

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Appendix A

Study 1 Supplementary Files

Instructions for Interaction Tasks

<u>Timepoint 1: Free Play</u>

« Maintenant, on aimerait vous voir jouer ensemble. Comme tu sais, on va enregistrer ça sur vidéo. Donc, pour être sure que vous restiez tous(tes) les deux bien en vue pendant qu'on filme, c'est très important que vous restiez assis(es) tous(tes) les deux sur le tapis qu'on a mis par terre. Moi, je vais quitter la pièce et je vais revenir vérifier la caméra une ou deux fois pour être bien sûr qu'elle fonctionne bien. Alors, la première chose qu'on aimerait que tu fasses est simplement de jouer avec (ENFANT) comme vous faites d'habitude pendant environ 15 minutes et essayez d'être le plus naturels possible. Vous pouvez prendre les jouets qu'on a mis sur le tapis si vous voulez, mais vous n'êtes pas obliges. Puis, quand to entendras l'alarme sonner, tu pourras arrêter de jouer. As-tu des questions? C'est très important aussi que to attendes mon signal avant de commencer à jouer, OK? »

<u>Timepoint 2: Jenga Task</u>

« Voici un jeu que vous aimerez sûrement. Jenga est un jeu coopératif. Chacun votre tour, vous enlèverez un bloc de cette tour de 18 étages et vous placerez sur la tour, perpendiculaire aux blocs de l'étage juste en dessous. Terminer toujours un étage de trois blocs avant de commencer l'étage plus haut. Vous devez travailler en équipe. Le but est de bâtir une tour aussi haute que possible jusqu'à ce qu'elle tombe. »

Items Retained in Created Composite

Items from the CBCL:

"Fears certain animals, situations, or places other than school"

"Too fearful or anxious"

"Fears he/she might think or do something bad"

"Nervous, highstrung, or tense"

"Nightmares"

"Self-conscious or easily embarrassed"

"Worries"

Items from the RCMAS:

"I am afraid of a lot of things"

"I worry about what is going to happen"

"I often worry about something bad happening to me"

"I am nervous"

"I have bad dreams"

"I worry about what other people will think of me"

"I worry a lot of the time"

Supplemental Table 1

Study 1 All APIM Direct Paths

Predictor	β	SE	p	Bootstrapping 95% CI Lower	Upper
Mother Actor Paths					
T1 Mother Report Child Anxiety → T2 Mother Report Child Anxiety	0.167	0.088	0.057	-0.005	0.340
T1 Mother Report Child Anxiety → T3 Mother Report Child Anxiety	0.083	0.105	0.427	-0.122	0.289
T2 Mother Report Child Anxiety → T3 Mother Report Child Anxiety	0.519	0.102	0.000	0.320	0.719
Child Actor Paths					
T2 Child Self Report Anxiety → T3 Child Self Report Anxiety	0.287	0.127	0.024	0.037	0.536
Mother Partner Paths					
T2 Child Self Report Anxiety → T3 Mother Report Child Anxiety	0.075	0.106	0.476	-0.132	0.282
Child Partner Paths					
T1 Mother Report Child Anxiety → T2 Child Self Report Anxiety	-0.025	0.088	0.778	-0.196	0.147
T1 Mother Report Child Anxiety → T3 Child Self Report Anxiety	-0.170	0.104	0.102	-0.375	0.034
T2 Mother Report Child Anxiety → T3 Child Self Report Anxiety	0.283	0.122	0.020	0.044	0.522

Supplementary Table 2

Study 1 All Moderation and Mediation Direct Paths

				Bootstrapping 95% CI	
Predictor	β	*SE*	*p*	Lower	Upper
T1 Mother Self Report Anxiety → T2 Mother Self Report Anxiety	0.294	0.096	0.002	0.107	0.481
T1 Mother Self Report Anxiety → T3 Child Self Report Anxiety	-0.033	0.076	0.668	-0.182	0.117
T1 Mother Self Report Anxiety → T3 Mother Report Child Anxiety	0.187	0.110	0.088	-0.028	0.403
T1 Mother Self Report Anxiety → T2 Mother Report of Child Anxiety	0.340	0.102	0.001	0.140	0.540
T1 Mother Self Report Anxiety → T2 Mother Sensitivity/Structuring	-0.183	0.116	0.115	-0.411	0.044
T1 Mother Self Report Anxiety → T2 Child Self Report Anxiety	0.152	0.084	0.070	-0.012	0.315
T1 Mother Sensitivity/Structuring → T2 Mother Report Child Anxiety	0.067	0.081	0.406	-0.091	0.225
T1 Mother Sensitivity/Structuring → T2 Mother Sensitivity/Structuring	0.079	0.100	0.428	-0.116	0.274
T1 Mother Sensitivity/Structuring → T2 Child Self Report Anxiety	-0.167	0.084	0.046	-0.331	0.003
T1 Mother Report Child Anxiety → T2 Mother Self Report Anxiety	0.106	0.108	0.324	-0.105	0.317
T1 Mother Report Child Anxiety → T2 Mother Sensitivity/Structuring	-0.142	0.088	0.107	-0.314	0.030
T2 Mother Sensitivity/Structuring → T3 Child Self Report Anxiety	-0.129	0.117	0.270	-0.359	0.100
T2 Mother Sensitivity/Structuring → T3 Mother Report Child Anxiety	0.061	0.082	0.461	-0.100	0.221
T2 Mother Self Report Anxiety → T3 Mother Report Child Anxiety	-0.114	0.094	0.229	-0.299	0.072
T2 Interaction Term → T3 Child Self Report Anxiety	-0.426	0.120	0.000	-0.661	-0.190

Supplementary Table 3

Study 1 All Control Variable Direct Paths

Predictor	β	SE	p	Bootstrapping 95% CI Lower	Upper
Child's Gender → T2 Mother Report of Child Anxiety	0.084	0.087	0.335	-0.087	0.256
Child's Gender → T2 Child Self Report Anxiety	-0.333	0.089	0.000	-0.508	-0.159
Child's Gender → T2 Mother Sensitivity/Structuring	-0.135	0.109	0.218	-0.349	0.080
Child's Gender → T2 Interaction Term	0.235	0.084	0.005	0.070	0.400
Child's Gender → T3 Mother Report Child Anxiety	-0.054	0.094	0.565	-0.239	0.131
Maternal Education → T2 Mother Self Report Anxiety	-0.136	0.081	0.092	-0.295	0.022
Maternal Education → T2 Interaction Term	-0.152	0.085	0.075	-0.319	0.015
Maternal Education → T3 Child Self Report Anxiety	-0.188	0.093	0.043	-0.369	-0.006
Maternal Education → T3 Mother Report Child Anxiety	-0.108	0.103	0.297	-0.310	0.095
Family Income → T2 Mother Sensitivity/Structuring	0.165	0.094	0.079	-0.019	0.349
Family Income → T3 Mother Report Child Anxiety	0.125	0.092	0.173	-0.055	0.305
Family Income → T3 Child Self Report Anxiety	0.065	0.090	0.472	-0.112	0.241

Supplementary Table 4

Study 1 All Model Covariances

Predictor	β	*SE*	*p*	Bootstrapping 95% CI	
				Lower	Upper
T1 Covariances					
T1 Mother Self Report Anxiety WITH T1 Mother Sensitivity/Structuring	-0.043	0.074	0.557	-0.187	0.101
T1 Mother Self Report Anxiety WITH Maternal Education	-0.070	0.082	0.391	-0.231	0.090
T1 Mother Self Report Anxiety WITH Family Income	-0.126	0.091	0.166	-0.305	0.052
T1 Mother Report Child Anxiety WITH T1 Mother Sensitivity/Structuring	-0.137	0.075	0.068	-0.284	0.010
T1 Mother Report Child Anxiety WITH T1 Mother Self Report Anxiety	0.191	0.080	0.017	0.034	0.347
T1 Mother Report Child Anxiety WITH Child's Gender	0.067	0.090	0.457	-0.110	0.244
T1 Mother Report Child Anxiety WITH Maternal Education	-0.100	0.068	0.139	-0.234	0.033
T1 Mother Sensitivity/Structuring WITH Child's Gender	-0.132	0.076	0.083	-0.281	0.017
T1 Mother Sensitivity/Structuring WITH Maternal Education	0.088	0.073	0.224	-0.054	0.231
T1 Mother Sensitivity/Structuring WITH Family Income	0.281	0.059	0.000	0.165	0.397
T2 Covariances					
T2 Mother Report Child Anxiety WITH T2 Mother Self Report Anxiety	0.126	0.096	0.190	-0.062	0.313
T2 Mother Report Child Anxiety WITH T2 Mother Sensitivity/Structuring	-0.003	0.114	0.982	-0.226	0.221
T2 Mother Report Child Anxiety WITH Interaction Term	0.015	0.154	0.920	-0.287	0.318
T2 Child Self Report Anxiety WITH T2 Mother Self Report Anxiety	0.125	0.092	0.177	-0.056	0.306
T2 Child Self Report Anxiety WITH T2 Mother Report Child Anxiety	0.253	0.102	0.013	0.053	0.454

Supplementary Table 4 (continued)

T2 Child Self Report Anxiety WITH T2 Mother Sensitivity/Structuring	0.005	0.125	0.968	-0.241	0.251
T2 Child Self Report Anxiety WITH Interaction Term	-0.060	0.155	0.698	-0.363	0.243
T2 Mother Self Report Anxiety WITH T2 Mother Sensitivity/Structuring	0.089	0.108	0.408	-0.122	0.300
T2 Mother Self Report Anxiety WITH Interaction Term	-0.199	0.128	0.119	-0.450	0.051
T2 Mother Sensitivity/Structuring WITH Interaction Term	-0.028	0.251	0.912	-0.520	0.465
T3 Covariances					
T3 Child Self Report Anxiety WITH T3 Mother Report Child Anxiety	0.239	0.103	0.020	0.038	0.439
Control Covariances					
Maternal Education WITH Family Income	0.468	0.059	0.000	0.352	0.584

Supplementary Table 5

Study 1 Indirect Effects

Predictor	b	SE	p	Bootstrapping 95% CI Lower	Upper
Low (-1 SD)	3.025	1.396	0.030	0.289	5.761
Medium (Mean)	1.085	0.624	0.082	-0.138	2.307
High (+1 SD)	-0.856	0.764	0.261	-2.347	0.635

Appendix B

Study 2 Supplementary Files

Supplementary Table 6

Study 2 All APIM Paths

				Bootstrapping 95% CI	
Predictor	β	*SE*	*p*	Lower	Upper
Mother Stability Paths (Actor Effects)					
T1 Mother Report of Child Anxiety → T2 Mother Report of Child Anxiety	0.332	0.074	0.000	0.187	0.476
T2 Mother Report of Child Anxiety → T3 Mother Report of Child Anxiety	0.514	0.074	0.000	0.369	0.659
T2 Mother Magnification → T3 Mother Magnification	0.500	0.108	0.000	0.289	0.711
Father Stability Paths (Actor Effects)					
T1 Father Report of Child Anxiety → T2 Father Report of Child Anxiety	0.315	0.101	0.002	0.118	0.512
T1 Father Report of Child Anxiety → T3 Father Report of Child Anxiety	0.168	0.133	0.204	-0.092	0.428
T2 Father Report of Child Anxiety → T3 Father Report of Child Anxiety	0.425	0.099	0.000	0.232	0.618
T2 Father Magnification → T3 Father Magnification	0.270	0.127	0.033	0.021	0.519
Mother Within-Parent Influence Paths					
T1 Mother Report of Child Anxiety → T2 Mother Magnification	0.023	0.078	0.768	-0.129	0.175
T2 Mother Report of Child Anxiety → T3 Mother Magnification	0.008	0.122	0.946	-0.231	0.247
T2 Mother Magnification → T3 Mother Report of Child Anxiety	-0.042	0.087	0.631	-0.213	0.129

Supplementary Table 6 (continued)

Father Within-Parent Influence Paths

T1 Father Report of Child Anxiety → T2 Father Magnification	0.291	0.097	0.003	0.100	0.481
T2 Father Report of Child Anxiety → T3 Father Magnification	0.135	0.104	0.194	-0.069	0.339
T2 Father Magnification → T3 Father Report of Child Anxiety	0.015	0.087	0.866	-0.156	0.185

Mother Between-Parent Influence Paths (Partner Effects)

T1 Father Report of Child Anxiety → T2 Mother Magnification	0.444	0.089	0.000	0.269	0.619
T2 Father Report of Child Anxiety → T3 Mother Magnification	0.099	0.119	0.403	-0.133	0.332
T2 Father Magnification → T3 Mother Report of Child Anxiety	0.046	0.071	0.515	-0.093	0.186
T2 Father Magnification → T3 Mother Magnification	-0.017	0.086	0.841	-0.185	-0.151
T1 Father Report of Child Anxiety → T2 Mother Report of Child Anxiety	0.000	0.097	0.998	-0.190	0.190
T2 Father Report of Child Anxiety → T3 Mother Report of Child Anxiety	0.266	0.074	0.000	0.121	0.411

Father Between-Parent Influence Paths (Partner Effects)

T1 Mother Report of Child Anxiety → T2 Father Magnification	-0.038	0.089	0.667	-0.212	0.136
T2 Mother Report of Child Anxiety → T3 Father Magnification	-0.177	0.102	0.084	-0.378	0.023
T2 Mother Magnification → T3 Father Report of Child Anxiety	-0.126	0.100	0.207	-0.322	0.070
T2 Mother Magnification → T3 Father Magnification	0.234	0.114	0.040	0.010	0.458
T1 Mother Report of Child Anxiety → T2 Father Report of Child Anxiety	0.129	0.082	0.114	-0.031	0.290
T2 Mother Report of Child Anxiety → T3 Father Report of Child Anxiety	0.324	0.106	0.002	0.116	0.532
T1 Mother Report of Child Anxiety → T3 Father Report of Child Anxiety	-0.150	0.088	0.088	-0.323	0.022

Supplementary Table 7

Study 2 All Control Variable Direct Paths

Predictor	β	SE	p	Bootstrapping 95% CI Lower	Upper
Child's Gender → T2 Father Magnification	0.123	0.082	0.133	-0.037	0.283
Child's Gender → T3 Mother Report of Child Anxiety	-0.115	0.069	0.095	-0.250	0.020
Child's Age → T3 Mother Report of Child Anxiety	0.150	0.066	0.024	0.020	0.280
Child's Age → T3 Father Report of Child Anxiety	0.155	0.089	0.082	-0.020	0.329
Maternal Education → T2 Father Report of Child Anxiety	0.165	0.081	0.042	0.006	0.324
Paternal Education → T2 Father Magnification	-0.103	0.095	0.279	-0.290	0.084
Family SES → T2 Father Report of Child Anxiety	-0.139	0.081	0.086	-0.298	0.020
Family SES → T3 Father Report of Child Anxiety	0.161	0.094	0.085	-0.022	0.345

Supplementary Table 8

Study 2 All Model Covariances

Predictor	β	SE	p	Bootstrapping 95% CI	
				Lower	Upper
T1 Covariances					
T1 Mother Report of Child Anxiety WITH T1 Father Report of Child Anxiety	0.230	0.086	0.007	0.062	0.398
T1 Mother Report of Child Anxiety WITH Child's Gender	0.138	0.066	0.037	0.008	0.268
T1 Mother Report of Child Anxiety WITH Child's Age	-0.106	0.067	0.110	-0.237	0.024
T1 Mother Report of Child Anxiety WITH Maternal Education	0.016	0.073	0.821	-0.126	0.159
T1 Mother Report of Child Anxiety WITH Paternal Education	0.095	0.067	0.156	-0.036	0.226
T1 Mother Report of Child Anxiety WITH Family SES	0.116	0.062	0.060	-0.005	0.237
T1 Father Report of Child Anxiety WITH Child's Gender	-0.008	0.072	0.906	-0.149	0.132
T1 Father Report of Child Anxiety WITH Child's Age	-0.083	0.078	0.291	-0.236	0.071
T1 Father Report of Child Anxiety WITH Maternal Education	-0.005	0.076	0.944	-0.154	0.144
T1 Father Report of Child Anxiety WITH Paternal Education	-0.052	0.067	0.440	-0.283	0.080
T1 Father Report of Child Anxiety WITH Family SES	0.036	0.085	0.669	-0.130	0.202
T2 Covariances					
T2 Mother Report of Child Anxiety WITH T2 Father Report of Child Anxiety	0.438	0.088	0.000	0.267	0.610
M2RCE WITH F2RCE	-0.101	0.095	0.289	-0.287	0.086
T2 Mother Report of Child Anxiety WITH T2 Mother Magnification	0.346	0.083	0.000	0.182	0.510
T2 Mother Report of Child Anxiety WITH T2 Father Magnification	-0.026	0.098	0.790	-0.219	0.167

Supplementary Table 8 (continued)

	0.111	0.094	0.234	-0.072	0.295
T2 Father Report of Child Anxiety WITH T2 Father Magnification					
T2 Father Report of Child Anxiety WITH T2 Mother Magnification	-0.066	0.089	0.460	-0.240	0.109
T3 Covariances					
T3 Mother Report of Child Anxiety WITH T3 Father Report of Child Anxiety	0.342	0.089	0.000	0.167	0.516
T3 Mother Magnification WITH T3 Father Magnification	0.107	0.093	0.250	-0.075	0.290
T3 Mother Report of Child Anxiety WITH T3 Mother Magnification	-0.109	0.100	0.275	-0.304	0.086
T3 Mother Report of Child Anxiety WITH T3 Father Magnification	-0.003	0.096	0.974	-0.192	0.185
T3 Father Report of Child Anxiety WITH T3 Father Magnification	0.024	0.094	0.799	-0.161	0.208
T3 Father Report of Child Anxiety WITH T3 Mother Magnification	-0.068	0.112	0.545	-0.287	0.151
Control Covariances					
Child's Gender WITH Maternal Education	-0.175	0.055	0.002	-0.28	-0.067
Child's Gender WITH Family SES	0.019	0.062	0.762	-0.103	0.140
Maternal Education WITH Paternal Education	0.606	0.045	0.000	0.518	0.695
Maternal Education WITH Family SES	0.397	0.060	0.000	0.280	0.514
Paternal Education WITH Family SES	0.485	0.057	0.000	0.373	0.598