LONGITUDINAL ASSOCIATIONS BETWEEN INDIRECT PEER VICTIMIZATION, FRIENDSHIP QUALITY, AND ANXIETY IN YOUNG ADULTHOOD

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Abstract

Friendships serve as vital sources of healthy social functioning in young adulthood, but these same relationships can also be a source of indirect peer victimization (IPV), involving covert forms of social maltreatment such as gossip and exclusion. In this thesis, I examined how IPV, poor friendship quality (PFQ), and anxiety influence one another over time. Using four annual waves from ages 22 to 26 (N= 443), a model building and cross-lagged panel approach was used to compare interpersonal-risk, symptoms-driven, and transactional models. Results indicated that the transactional model best fit the data. Indirect effects revealed support for interpersonal-risk driven pathways, such that IPV contributed to higher anxiety through deteriorating friendships, as well as greater IPV predicted subsequent heightened anxiety, which in turn predicted future victimization. Two additional, smaller indirect effects extended the sequence from IPV → PFQ → Anxiety to later IPV: PFQ predicted greater IPV through heightened anxiety, and IPV predicted later victimization through poorer friendship quality and heightened anxiety. Gender analyses showed some variation in auto-regressive and covariance paths, while multi-group comparisons revealed anxiety predicted poor friendship quality for men, and IPV showed stronger stability for women earlier in the study and for men at later time points, including over a two-lag span. Gender differences in indirect effects showed that the anxiety-mediated IPV loop was significant for women only. Results suggest that psychosocial distress in young adulthood is best conceptualized as a transactional system in which IPV, PFQ, and anxiety continually influence one another over time.

Keywords: Longitudinal, indirect peer victimization, friendship quality, anxiety symptoms, young adulthood, gender differences

Introduction

The development of social and emotional well-being across the lifespan is largely influenced by peer relationships like friendships, an enduring feature of daily living that contributes to emotional stability, psychological resilience, and protection against distress. Indirect peer victimization (also referred to as relational or social peer victimization; Archer & Coyne, 2005) is a particularly challenging source of relational distress within friendships that can negatively impact this development of social and emotional well-being. Defined as a form of maltreatment, targets of indirect peer victimization endure covert, manipulative, and destructive calculated tactics by the perpetrator, such as gossiping, being the subject of spiteful rumours, ostracism, and being given the silent treatment, to name a few (Vaillancourt, 2013; Vaillancourt & Krems, 2018). There is extensive research on indirect peer victimization among children and adolescents, but little is known about these experiences in adulthood. Exploring this phenomenon in young adulthood is crucial, as relationships, and particularly friendships, often either thrive or fail during this period of development (Arnett, 2000a; Dunbar, 2018).

Friendship quality can either buffer against or increase the risk of indirect peer victimization and related mental health problems like anxiety. Close friendships depicting intimate and positive social interactions predict adaptive and healthy adjustment into young adulthood (Demir & Özdemir, 2010; Demir et al., 2015; Friedlander et al., 2007; Weber et al., 2010). These positive relationships help satiate the human need for belonging, which has been shown to be fundamental for social and emotional functioning (Baumeister & Leary, 1995). In contrast, poor friendship quality can be associated with discord like indirect peer victimization, which has been found to be associated with internalizing problems like anxiety (Coyne et al., 2019; Crick & Nelson, 2002; Grotpeter & Crick, 1996; Leadbeater et al., 2014; Pickard et al., 2018). To date, most research on indirect peer victimization has focused on its links with psychosocial adjustment difficulties in childhood and adolescence. Far fewer studies have examined these associations in adulthood, and fewer still have considered their specific connection to anxiety. It is important to examine anxiety considering its significant relation with interpersonal dysfunction (Rudolph et al., 2016). Indeed, individuals can experience anxiety when there is an actual or perceived risk of temporary or permanent estrangement (e.g., increased tension and reduced emotional safety and communication) within their friendships, and indirect peer victimization can significantly influence this experience (Siegel et al., 2009).

Moreover, due to its hypervigilant nature, anxious behaviour can establish a self-fulfilling prophecy whereby individuals eventually suffer from thwarted friendships and become more vulnerable to indirect peer victimization (Biggs et al., 2012; Priest, 2013). Given the multi-directional pathways among indirect peer victimization, friendship quality, and anxiety in young adults, these associations were explored within one unified longitudinal model. The potential moderating role of gender was also examined, given established sex differences in the prevalence of anxiety (more women than men; Kessler et al., 2005; McLean et al., 2011) and the evidence showing women experience more indirect peer victimization than men (Vaillancourt & Brittain, 2024).

Literature Review

Friendships in Young Adulthood

Friendships satiate the fundamental need to belong in humans (Baumeister & Leary, 1995). This need is fulfilled when frequent engagement in intimate and positive social contact is prioritized among close relationships (1995). Having good quality friendships are especially vital for predicting healthy adjustment and positive well-being during the developmental period between adolescence and adulthood (i.e., generally falling between the ages of 18-25; Arnett, 2000a), known as emerging adulthood or early adulthood. During this time, individuals are typically exposed to various transitions and explorations in self and identity, personal growth and independence, ambiguous identification between age groups, consistent and unstable life changes, skill building, and optimism (i.e., distinctive features of emerging adulthood; Arnett, 2000a, 2004; Shanahan, 2000). Good quality friendships can provide support and predict success amidst these unique challenges, which can be achieved through numerous fundamental resources, including, but not limited to, emotional support, entertainment, mutual trust and security, positive encouragement, acceptance, and tangible resources of support (e.g., money; Friedlander et al., 2007). Good quality friendships also predict lower loneliness and distress levels and promote higher self-esteem, happiness, and cognitive skills (Demir et al., 2015; Weber et al., 2010). These findings support the abundance of empirical evidence suggesting the quality of friendships have a more positive impact on people's happiness and well-being than the number of friendships in one's social circle (Demir et al., 2007). This is especially evident in young adults as this number tends to reduce from that in adolescence in order to filter, prioritize, and maintain more meaningful relationships throughout their adult lives (Dunbar, 2018).

Although friendship is viewed as an essential piece of life satisfaction and well-being, it can also be a significant source of mental health distress, particularly when it takes the form of indirect peer victimization (Vaillancourt & Brittain, 2024). It is important to explore these experiences in young adulthood as individuals establish more intimate relationships within their social network and friendships can either strengthen, weaken, or dissolve during this stage in life (i.e., intimacy vs isolation; Erikson, 1950).

Age and Gender Differences of Indirect Peer Victimization

To examine predictors and patterns of indirect peer victimization in young adult friendships, it is important to first understand its developmental underpinnings. Aggressive behaviour begins as early as infancy, often taking the form of physical aggression (Tremblay, 2000). As children age and develop more advanced social-cognitive skills and language, they begin to use more intricate and strategic forms of aggression that rely on such skills (i.e., verbal, indirect; Björkqvist et al., 1992; Ingram, 2014). The complexity and subtlety of aggressive behaviour continue to develop over time. For example, aggressive behaviour can evolve from being direct and crude during early childhood (e.g., hitting, name calling, tattling on a peer in preschool; Ostrov et al., 2014) to covert and calculated during adolescence (e.g., excluding a peer from a party, neglecting to tag a peer in a social media post; Farrell & Vaillancourt, 2021; Vaillancourt et al., 2024). As aggressive behaviour becomes more indirect and nuanced, not only is it more of a challenge to detect and address, but it also becomes less reprimanded. As a result, targets of more covert forms of aggression often suffer from an intensified emotional toll in silence, inevitably creating emotional and interpersonal scars that last well into adulthood (Vaillancourt & Farrell, 2021; Huesmann et al., 2009).

Indirect aggression has been studied extensively in youth, but less so in adulthood. In a longitudinal study, Vaillancourt and Farrell (2021) found that indirect aggression peaks during adolescence and then stabilizes across adulthood. Still, indirect peer victimization remains a common experience among young adults (Vaillancourt & Brittain, 2024). One possible reason for the limited research on this topic in adulthood is that social networks become more fluid during this stage, offering greater opportunities to disengage from harmful relationships. Consequently, the stability and salience of peer networks that make indirect aggression prominent in youth may be diminished in adulthood. Nonetheless, examining patterns of

friendship quality and indirect peer victimization in adulthood remains essential to understanding how indirect aggression manifests later in life and to identifying effective points of intervention.

There are notable gender differences in the form that aggression takes. Boys and men use more direct means of aggressing than girls and women (e.g., verbal and physical; Archer, 2000, 2004; Baillargeon et al., 2007; Card et al., 2008; Hay, 2007). In contrast, girls and women use proportionately more indirect aggression than boys and men (Archer & Coyne, 2005; Benenson, 2013; Campbell, 2002; Crick & Grotpeter, 1995). Gender differences in the use of indirect aggression are driven in part by social-cognitive capacity, socialization of gender norms, and navigation of peer relationships. Björkqvist et al. (1992) have suggested that girls tend to develop emotional intelligence and social-cognitive skills faster than boys, allowing for them to use and become more attuned to more sophisticated aggressive strategies earlier in life. Regarding gender norms and peer relationships, boys are typically socialized to establish assertive, physically dominant, and stoic traits, equipping them for more direct forms of aggression (Archer, 2000, 2004; Card et al., 2008). Girls, in contrast, are more often socialized out of using direct forms of aggression and are influenced to foster politeness, empathy, and submissiveness while prioritizing more emotional and interpersonal closeness with peers compared to their male counterparts (Ostrov et al., 2023). The use of indirect forms of aggression therefore becomes a substantial strategy for girls and women to inflict harm and assert power within their peer groups without disrupting gender norms (Vaillancourt, 2013; Vaillancourt & Krems, 2018). These gender norms and differences extend into adulthood. For example, Vaillancourt and Farrell (2021) found that individuals, and particularly girls and women, exhibiting these increasing behavioural patterns of indirect aggression in adolescence were more likely to engage in the same patterns in adulthood.

Taken together, research findings illustrate the developmental progression of aggressive behaviour overtime from gender and developmental perspectives, with girls and women becoming more reliant on covert forms of aggression to remain socially sanctioned when navigating peer relationships and conflicts. Moreover, girls and women are more negatively impacted by indirect peer victimization than boys and men (Vaillancourt, 2013). These forms of aggression and victimization have been found to peak in late adolescence and early adulthood (Vaillancourt & Farrell, 2021). Given these trajectories, it is vital to explore the respective

impacts of indirect peer victimization on the quality of peer relationships, and specifically friendships, as individuals age into adulthood.

Temporal Precedence

Understanding how indirect peer victimization, friendship quality, and anxiety unfold over time requires careful consideration of temporal precedence. Although prior sections highlight the developmental progression of indirect aggression and its persistence into adulthood, less is known about the temporal ordering of these interrelated processes once individuals reach young adulthood. Specifically, it remains unclear whether poor-quality friendships set the stage for victimization, whether being victimized erodes friendship quality and increases anxiety, or whether anxiety itself heightens vulnerability to victimization and relational strain. Clarifying these temporal patterns is critical for identifying potential causal pathways and informing the design of targeted interventions.

Based on the existing empirical literature, the following longitudinal pathways are possible: (1) *Interpersonal risk-driven model* whereby indirect peer victimization predicts poor friendship quality, which in turn predicts later anxiety, or poor friendship quality predicts peer victimization by indirect aggression which then predicts later anxiety; (2) *Symptoms-driven model* whereby symptoms of anxiety predict either directional path between indirect peer victimization and poor friendship quality (i.e., anxiety to indirect peer victimization to poor friendship quality, or anxiety to poor friendship quality to indirect peer victimization); and (3) *Transactional model* demonstrating evidence for bidirectional paths among the variables. The three models are discussed below.

Interpersonal Risk-Driven Model

In support of the interpersonal risk-driven model, suggesting that an individual's social environment impacts their psychosocial well-being (Rudolph, 2008; Rudolph et al., 2016), indirect peer victimization has been widely linked to the breakdown of friendships, particularly in studies focused on youth (Andrews et al., 2018; Bouchard et al., 2018; Coyne et al., 2019; Dryburgh et al., 2025; Duncan & Owen-Smith, 2006; Kraft & Mayeux, 2018; Krems et al., 2021; Vaillancourt et al., 2007). However, much less is known about these experiences in adult friendships. Regardless of age, the very aspects that make these relationships meaningful, like trust, closeness, or emotional openness, can also leave people more exposed to subtle or indirect forms of harm. Some evidence suggests that the closeness of a relationship can increase a

person's exposure to relational aggression, especially when trust is compromised or misused (Andrews et al., 2021). Specifically, proximity paired with shared interests and experiences might allow for more convenient opportunities or reasons for a friend to be victimized by their close friends. For example, personal information or expressions of insecurity shared in confidence by one friend (i.e., the target) may be harmfully exaggerated, socially manipulated, or otherwise used to the other friend's advantage (i.e., the aggressor) in attempts to gain power and higher social status within the dyad, or among mutual friends (Andrews et al., 2021). This harmful treatment can evoke the need for emotional relief from trusted supporters; however, targets may seek this relief from their perpetrating friends who may not have their best interest in mind. This emotional dependence on potentially toxic friendships can result in further victimization from their friends and therefore frequent disappointment and dissatisfaction with their friendship quality.

Additionally, the lack of a secure foundation and recognizable positive regard within a friendship can predict upward and downward social comparisons, creating a competitive environment where indirect peer victimization can thrive. Upward social comparisons may occur when a target is potentially perceived to have more access to desirable social resources such as popularity among friends and physical attractiveness (Festinger, 1954; Humphrey & Vaillancourt, 2021). In these cases, these individuals might be seen as a threat by their friends and in turn become a target to the silent treatment, unfriendly glances, or noticing the perpetrator laughing with another friend when the target leaves the room. Conversely, downward social comparisons may occur when a target is potentially perceived to have reduced access to desirable social resources, such as general information within their social circle and access to social opportunities (e.g., invitations to social events). In these cases, the individuals might be perceived as less valuable or relevant within their friendships and may in turn experience pain of rejection and lack of belonging (Çelik et al., 2013). This is supported by the concept of lowered *perceived relational value*, whereby there is a lack of felt appreciation, interest, prioritization, and value from others within one's relationships, leaving them to feel discarded and undesirable (Leary & Acosta, 2018).

Altogether, friendship quality can become compromised due to indirect peer victimization. Furthermore, research by Dunbar (2018) suggests friendships are in jeopardy if there is less amicability, trust, emotional safety, and security within the dyad, and therefore

leaving those without the mental and physical health benefits of good quality friendships and more vulnerable to internalizing problems. Given the pivotal role that close friendships play in fostering a sense of belonging, emotional support and mental well-being, the impairments from indirect peer victimization can leave individuals vulnerable to internalized distress; specifically, anxiety (Leadbeater et al., 2014).

Anxiety is characterized by excessive worry, often accompanied by somatic symptoms (e.g., restlessness, accelerated breathing and heart rate, fatigue) and cognitive-behavioural disruptions (American Psychiatric Association [APA], 2022). Notably, anxiety and its associated disorders are among the most prevalent mental health conditions worldwide, with an estimated 4% of the global population being affected (Vos et al., 2017; World Health Organization, 2022). Longitudinal studies have shown how anxiety in youth can extend into young adulthood (Copeland et al., 2014; Essau et al., 2014; Pine et al., 1998; Wolbeek et al., 2011; Woodward & Fergusson, 2001), impacting 30% of young adults between the ages of 18-29 (Kessler et al., 2005). Research on gender differences show that women and girls report more experiences and a greater negative impact from anxiety compared to men and boys (McLean et al., 2011). According to interpersonal theories of anxiety (Rudolph et al., 2016), and in support of the interpersonal risk-driven model, an individual's mental health is fundamentally influenced by peer relationship trajectories and dynamics. The experience of indirect peer victimization is likely one notable precursor of anxiety in adult relationships.

Characterized by the aggressor's ability to conceal and deny their intent to harm, indirect peer victimization is more covert and is coupled with ambiguity, a feature that particularly enhances distress in targets and leads to emotional, cognitive, and behavioural responses related to anxiety (Archer & Coyne, 2005; Crick & Grotpeter, 1995). The inherent lack of control coupled with ambiguity and unpredictability from indirect peer victimization patterns can illicit feelings of helplessness as targets struggle to anticipate or prevent further harm (Peterson & Seligman, 1983). Taken from attributional style theories (Abramson et al., 1978; Seligman et al., 1979), for example, the lasting effects of anxiety from indirect peer victimization can inflict negative inferences and hostile attribution errors from social cues related to this form of maltreatment (e.g., facial expressions or withholding communication indicating tension or reduced closeness; Prinstein et al., 2005), which can ultimately contribute to debilitating patterns such as heightened emotional sensitivity to perceived or actual social threats (Downey &

Feldman, 1996; Rubin et al., 2009; Zimmer-Gembeck et al., 2014). Consequently, distinguishing the effects of indirect peer victimization from those of anxiety becomes complicated and this confusion can lead to maladaptive coping mechanisms, intensified feelings of isolation, and exacerbated anxiety symptoms such as rumination and hypervigilance (McLaughlin & Nolen-Hoeksema, 2011; Prinstein et al., 2005).

A lack of trust and stability experienced by an individual within a friendship due to indirect peer victimization can lead to anxiety and doubt in their friends' intentions and regard for them, given the perpetrator's covert strategies and underhanded ability to conceal any intent to harm (Björkqvist et al., 1992). The ambiguity can create perceptions of strain within the friendship and targets may feel less safe to confide in their friends for fear of future victimization or other social repercussions (Prinstein et al., 2001). Consequently, they may begin to feel a lack of mattering in their friendships which can lead to low self-regard (Krygsman et al., 2022). Concerningly, such internalized experiences can accumulate into negative core beliefs about oneself over time, ultimately fostering chronic and perpetual anxiety responses that negatively impact quality of life (Beck & Clark, 1997; Hoffman et al., 2008).

These findings support the interpersonal risk-driven model by demonstrating how relational disruptions can increase vulnerability to internalizing problems like anxiety. It is crucial to examine these patterns in friendships given that relational conflict is suggested to be a key risk factor and theoretical explanation to the onset of internalizing problems like anxiety (Rudolph et al., 2016), and stressors such as indirect peer victimization can negatively affect the way one perceives the dynamic of their current and future friendships. In a sense, relationship disturbances interact with relationship appraisals to increase stress and conflict in relationships which can in turn increase the risk for mental health problems. In other words, the more an individual is exposed to dysfunction in interpersonal relationships, the greater the risk for decreased mental health and challenges with emotional regulation in socialization, as the individual can start to develop internal, stable, or global attributions toward social feedback or challenges (Abramson et al., 1978; Rudolph, 2008; Seligman et al., 1979).

Symptoms-Driven Model

Although indirect peer victimization can be a catalyst for psychosocial disruptions, there is also research showing findings for the reverse, whereby anxiety precedes and contributes to poor friendship dynamics, ultimately reinforcing a self-perpetuating cycle of vulnerability to

relationship challenges like victimization. These findings are supported by symptoms-driven models of interpersonal functioning, suggesting that impaired cognition and behaviour resulting from internalizing problems like anxiety can influence individuals' interpretations and responses in relationships (Rudolph & Clark, 2001). Specifically, individuals harbouring anxiety symptoms are more likely to exhibit internalized thought patterns related to negative self-schemas and lowered self-esteem within relationship contexts (e.g., *"I am afraid I might do something bad"*; Lee & Hankin, 2009; Reynolds & Kamphaus, 2004; Segal, 1988; Sowislo & Orth, 2013). One notable concern for these individuals is the fear of rejection, which has been shown to intensify sensitivity to social cues that potentially imply relational threat (Downey & Feldman, 1996). In turn, this fear can lead to both direct and passive maladaptive coping mechanisms aimed to reduce immediate distress, prevent feared rejection and preserve interpersonal connection. Although the intention is to protect, the literature suggests that, ironically, these coping mechanisms can ultimately lead to social rejection and exclusion, predisposing targets to future victimization (Gazelle & Ladd, 2003).

Taken from theories of attachment (Bowlby, 1982), people are innately driven to rely on trusted individuals for security and emotional regulation when experiencing distress or threat to their own safety and survival. Those with insecure or anxious attachment patterns tend to crave higher levels of intimacy and reassurance from their relationships, often driven by fear of abandonment and rejection (Ainsworth, 1989; Nelis & Rae, 2009). This fear, along with negative self-appraisals stemming from anxiety, can result in overt and action-oriented behaviour directed towards potential or established friendships, such as clinginess, superfluous compliance, hypersensitivity to social feedback, excessive reassurance-seeking, and confirmation bias (i.e., seeking evidence that confirms pre-existing internal and external beliefs or expectations; Beesdo-Baum et al., 2012; Cramer & Tognetti, 2023; Oswald & Grosjean, 2004; Rector et al., 2011). Consequently, these actions may create tension within friendships, and these individuals may notice more withdrawal and disengagement from their respective peers as this behaviour may be deemed as over-bearing to some (Walden & Beran, 2010). These anxiety patterns may eventually become reinforced when attempting to prevent and cope with actual or perceived deteriorated friendship quality and existing or future victimization (McLaughlin & Nolen-Hoeksema, 2012; Siegel et al., 2009).

Conversely, anxious individuals may engage in more passive behaviour to mitigate relational distress or potential conflict, as the need to belong, when coupled with anxiety, can lead to avoidance of challenges related to indirect peer victimization within friendships (Biggs et al., 2012; Wesselmann & Williamson, 2013). For instance, individuals experiencing anxiety in friendships may refrain from engaging in various forms of socialization, such as attending social gatherings and responding to SMS messages, to manage anxiety symptoms and prevent the risks of being targeted for rejection (Benatov et al., 2020; Erwin et al., 2004). These attempts to avoid dissonance, however, have been suggested to result in the continuation and strengthening of victimization occurring within the friendship over time (Murray-Close et al., 2007). Moreover, self-isolation from a social network along with the stigma of mental health issues like anxiety can invite rumour spreading, gossiping, and further social exclusion in the future (Guimond et al., 2018; Link & Phelan, 2001; Rubin et al., 2009).

Individuals with anxiety are more likely to exhibit poorer social skills (Inderbitzen-Nolan et al., 2007; Segrin, 1999). When navigating conflict, they often lack the self-assurance needed to set boundaries and communicate assertively, making them more likely to hesitate or refrain from seeking help or defending themselves against indirect aggression and avoid confrontation all together, particularly when the aggressor is a friend (Alden & Taylor, 2004; Guttmann-Steinmetz & Crowell, 2006; Riggio et al., 1990; La Greca & Harrison, 2005). In which case, the aim may be to avoid provoking responses of retaliation or being negatively perceived, all while attempting to preserve a sense of relational stability and belonging. However, these patterns of avoidance may be conceptualized as the antithesis of improving social skills, such as conflict resolution and assertive communication, which may in fact aid in the reduction of anxiety experiences (Rosenberg, 2015; Alden & Taylor, 2011). In turn, conflict avoidance often limits opportunities to build trust and challenge internalized beliefs and expectations of friendship dynamics through the experience of affirming and receptive responses from friends that foster self-esteem and emotional support (Hodges et al., 1999). These interpersonal processes may ultimately contribute to perceived poor friendship quality.

Similarly, individuals who struggle with anxiety and sense of belonging might tolerate the harmful effects of indirect peer victimization from friends to maintain social connections and avoid loneliness and other emotionally distressful experiences (Almeida et al., 2021; Storch & Masia-Warner, 2004). This may take the form of consistently giving their friends the benefit of

the doubt, characterizing and accepting this behaviour as benign or typical (Bouchard et al., 2018; Wei & Jonson-Reid, 2011). Additionally, given the struggles with relational boundaries that anxious individuals often face, they may feel more fearful or hesitant to remove themselves from situations where they feel victimized and may instead endure maltreatment from friends out of fear of relational rupture or loss (Sarkova et al., 2013; Dixon & Overall, 2018). These forms of tolerance may lead to being perceived as easy to target without consequence, allowing continued victimization to occur as perpetrating friends' behaviour goes unimpeded, thereby reinforcing a power imbalance in which targets are manipulated, exploited, or otherwise taken advantage of (Grotpeter & Crick, 1996; Vucetic et al., 2021).

Anxiety-driven behaviour, demanding or withdrawn, may destabilize healthy, reciprocal friendship dynamics. Both direct and passive attempts to manage anxiety may inadvertently create relational strain and ultimately contribute to heightened risks of indirect peer victimization and reduced friendship quality.

Transactional Model

There is also evidence to support the transactional model, which theoretically posits that an individual's internal and environmental experiences reciprocally influence each other over time (Sameroff, 2009). For example, Siegel et al. (2009) found bidirectional relations between social anxiety and indirect peer victimization among adolescents in grades 10-12 over a 2-month period. Specifically, the authors found that indirect peer victimization significantly predicted increases in social anxiety for girls, and vice versa for both boys and girls. These findings support implications suggesting that those with anxious demeanours may be more susceptible to victimization from perpetrators that may view them as easy targets who are less likely to push back, ultimately furthering anxiety patterns among these targets.

Less is known about the temporal associations among anxiety and friendship strain. Still, meta-analytical research by Chen et al. (2024) analyzing peer relations and anxiety from adolescence to adulthood have found that individuals with higher social anxiety tend to face greater challenges with establishing and maintaining friendships, impaired peer reactions and reduced social support, and increased likelihood of loneliness and social withdrawal. The authors had also found support, albeit smaller effects, for the reverse direction, whereby friendship challenges predicted future social anxiety in family-related and general social relationships, including friendships. A lower effect size was found for friendship challenges as predictors of

social anxiety in school-related relationships, including friendships. Despite these findings, other studies have identified significant associations between poor friendship quality and elevated anxiety symptoms. For example, in their cross-sectional, correlational study, La Greca and Harrison (2005) found that adolescents with higher-quality friendships reported less social anxiety, while those who report more negative interactions with their close friends (e.g., conflict) were more likely to report feeling socially anxious. The variability in these findings highlights the need for further research into the potentially bidirectional relationship between friendship quality and anxiety.

Lastly, bi-directional relations have been found in research on friendship quality and peer victimization. For example, in cross-lagged panel study of Chinese adolescents, friendship quality was negatively associated with indirect peer victimization, while indirect peer victimization predicted lower friendship quality over a 6-month period (Cao et al., 2024). The implications of these findings suggest poor friendship quality increases vulnerability to victimization, which in turn further deteriorates friendship quality.

These findings offer support for the transactional model by illustrating how anxiety, friendship quality, and indirect peer victimization may reciprocally influence each other over time. However, the extant literature is not without limitations and gaps. For example, most of the current literature has only examined bi-directional associations between two variables at a time (e.g., friendship quality and indirect peer victimization). Longitudinal research is needed to examine the multifaceted ways in which all three variables can interact with one another over time. In addition, while these studies focus on social anxiety specifically, there is a need to explore anxiety more generally to assess for an all-encompassed range of anxiety experiences that may precede or follow fragmented peer experiences. Finally, the existing literature on transactional studies examining these variables has been well documented in adolescent populations but remain limited in young adulthood. It is important to expand this research across developmental stages to better understand how these dynamics may evolve or remain consistent over time.

Current Study

Research Objectives

Although several cross-sectional studies have examined the links between indirect peer victimization, friendship quality, and anxiety (e.g., Crawford & Manassis, 2011; Crick & Nelson,

2002; La Greca & Lopez, 1998), longitudinal research exploring these relations remains limited, especially among young adults. For my thesis, I sought to address this gap in knowledge. Specifically, I investigated the temporal ordering and potential bi-directional relations among indirect peer victimization, friendship quality, and anxiety in adults assessed annually from ages 22 to 26 using a cross-lagged panel model. The interpersonal risk-driven, symptoms-driven, and transactional pathways were examined within one unified model. I also examined the moderating role of gender when examining these associations. My goal was to identify the temporal priority between these variables.

Research Questions

The following research questions are addressed in my thesis:

1. What are the longitudinal relationships among indirect peer victimization, friendship quality, and anxiety in young adults?
    a. Does indirect peer victimization or poor friendship quality predict subsequent interpersonal difficulties and increased anxiety (interpersonal risk-driven model)?
    b. Does anxiety predict subsequent poor friendship quality and increased indirect peer victimization (symptoms-driven model)?
    c. Are there bidirectional effects among indirect peer victimization, friendship quality, and anxiety across time (transactional model)?
2. Does gender moderate the relations among indirect peer victimization, poor friendship quality, and anxiety in young adults?

Given that empirical evidence supports each of these theoretical pathways, no specific directional hypothesis was advanced regarding which would receive the strongest empirical support.

Contribution to Knowledge

The aim of my research was to highlight the importance of addressing peer dynamics and mental health while addressing significant gaps in knowledge. Specifically, I aimed to build on the existing knowledge by examining how indirect peer victimization, friendship quality and anxiety are related in young adulthood overtime. Exploring these links from a longitudinal perspective aimed to offer insight into the temporal priority of these experiences, allowing researchers and mental health practitioners to distinguish where and when to begin early interventions for mitigating psychosocial challenges. To my knowledge, no study to date had

tested and compared multiple models within a single analysis of these variables. Doing so in my thesis was intended to help facilitate future longitudinal and intervention research within diverse populations. Furthermore, my thesis addresses a gap in knowledge by exploring peer victimization in adulthood, emphasizing that social communities and environments where adult friendships are formed and maintained should not be overlooked in research on peer victimization, friendship quality, and mental health problems. In conducting this research, I ultimately sought to reduce stigma, validate the experiences and challenges of adults affected by victimization in their friendships, and contribute to highlighting the fundamental human need for belonging and psychological well-being.

Methods

Participants and Procedure

Data were drawn from the Canadian longitudinal study titled “McMaster Teen Study”, which was designed to examine a wide variety of variables within the realm of behaviour, relationships and mental health across time. Participants were originally recruited in 2008 (Grade 5) from 51 randomly selected schools within a large Ontario school board. Ethics approval was obtained annually from both the school board and the associated university. Participants completed the McMaster Teen study through either paper or online formats. Informed consent detailing the ethical procedures and the nature of the study was obtained from participants prior to data collection. Parents provided annual consent for participants until age 16 and participants provided their own annual consent afterwards. For their participation in the study, participants received compensation in the form of gift cards or e-transfers ranging from $10-100, depending on the year of participation.

For the current study, the focus was on young adults’ self-report measures of indirect peer victimization experiences, friendship quality, and anxiety symptoms. Data were taken from a sample of men and women assessed annually across four time points, beginning in 2019 (ages 22 to 26; data on age 25 were missing due to the COVID-19 pandemic). Demographic data, including biological sex and race/ethnicity, were included. Collection of data on friendship quality began at T13 (age 23); therefore, self-report measures of indirect peer victimization and anxiety were used from ages 22 to 26 (T12-T15), and self-report measures of friendship quality were used from ages 23 to 26 (T13-T15).

Measures

***Indirect Peer Victimization*:** The 35-item Indirect Aggression Scale Target Version (IAS-V; Forrest et al., 2005) was used to assess peer victimization by indirect aggression. The scale examined participants' experiences of indirect peer victimization in the context of social interactions and close interpersonal relationships in adulthood. Specifically, when asked "*How often have people done the following to you?*", sample items include "Talked about me behind my back" and "Purposefully left me out of activities." The IAS-V uses a 5-point Likert scale ranging from 1 = *never* to 5 = *always*. An indirect peer victimization composite score was created by averaging the 35 items with higher scores reflecting a higher degree of indirect peer victimization. Cronbach's α was excellent at all time points (Age 22 α = 0.97; Age 23 α = 0.97); Age 24 α = 0.98; Age 26 α = 0.97).

***Friendship Quality*:** Perceived quality of friendships was measured using a modified version of the Cambridge Friendship Questionnaire (CFQ; Goodyer et al., 1990), a self-report measure comprised of 5 items: (1) Are you happy with the number of friends you have? (2) Do your friends know what makes you happy or sad? (3) How often do you see your friends outside of school/work? (4) Do you talk to your friends about problems? (5) Overall, are you happy with your friends? Items 1, 3 and 5 on the scale used a 4-point Likert scale, ranging from 1 = very happy/all the time to 4 = unhappy/never, while items 2 and 4 used yes/no response options. Friendship quality scores were coded and summed to create one composite score, with higher scores reflecting poorer perceived friendship quality. Cronbach's α was good at all time points (Age 23 α = 0.70; Age 24 α = 0.72; Age 26 α = 0.72).

***Anxiety Symptoms*:** Self-reported symptoms of anxiety were measured using the anxiety subscale of the BASC-2, the self-report of personality college version (SRP-COL; ages 22-26; 14 items; Reynolds & Kamphaus, 2004). Items were rated as 2 = *true* or 0 = *false* for four items (e.g., "I worry about little things") and on a 4-point Likert-type scale of 0 = *never* to 3 = *almost always* for ten items (e.g., "I often worry about something bad happening to me"). Items were summed to form a single composite score. Two items were allowed to be missing in creating the sum scores. Cronbach's α was excellent at all time points (Age 22 α = .93; Age 23 α = .93; Age 24 α = .93; Age 26 α = .93).

Analytic plan

Preliminary analyses on descriptive statistics were conducted using SPSS 29. Path analysis was conducted using Mplus Version 8.0 (Muthén & Muthén, 2017), using full information maximum likelihood estimation (FIML) to address missing data, as well as maximum likelihood robust (MLR) estimation to obtain robust standard errors and fit indices. Model fit was evaluated using the comparative fit index (CFI; values ≥ 0.95 indicate good fit), root mean square error of approximation (RMSEA; values < 0.08 indicate adequate fit), and the chi-square (χ^2) test of significance, with consideration of its sensitivity to sample size (Browne & Cudeck, 1992; Hu & Bentler, 1999; Kline, 2011). For model comparisons, the Satorra-Bentler scaled chi-square difference test (Satorra & Bentler, 2001) was used for nested models, and the Akaike Information Criterion (AIC) was used for non-nested models (lower values indicate better fit, and a difference of > 10 indicating significant improvement in fit; Burnham & Anderson, 2002; Kline, 2011).

A model building approach was used, beginning with a base model (Model 1) including covariances among the three study variables (indirect peer victimization, friendship quality, anxiety) within each time point. The next model (Model 2) included auto-regressive paths between 1 and 2-year timepoints within each construct. Competing models were estimated by adding cross-lagged paths to the base model and were compared to determine the best-fitting model. Models included (Model 3) an interpersonal-risk model (i.e., paths from indirect peer victimization and friendship quality to anxiety), (Model 4) a symptoms-driven model (i.e., paths from anxiety to peer victimization and friendship quality), and (Model 5) a transactional model (bidirectional paths).

The Satorra-Bentler scaled chi-square difference test was used to compare nested models (i.e., Baseline to Model 2; Model 2 to each theoretical model, Model 3-Model 5; Model 3 interpersonal-risk model to Model 5 transactional model; M4 symptoms-driven model with Model 5 transactional model). The interpersonal-risk model and the symptoms-driven model were not nested and were compared using the AIC. If the improvement in model fit was not significant, the simpler model from the previous step was considered more parsimonious.

To examine whether the longitudinal associations among indirect peer victimization, friendship quality, and anxiety differed by gender, multi-group path analysis was conducted. Model 6 included all parameters in Model 5 (transactional model) which were freely estimated

across men and women to account for anticipated gender differences. Model 7 assessed gender invariance by constraining all auto-regressive paths, cross-lagged paths, and within-time associations to be equal across genders. A significant decrease in fit for Model 7 (constrained) compared to Model 6 (free across gender) would suggest that allowing parameters to vary by gender better fit the data. If evidence of gender non-invariance was detected, follow-up Satorra-Bentler scaled chi-square difference tests were conducted by systematically constraining each set of pathways (e.g. cross-lagged) and if the group was significant, then the individual paths were tested. In this context, all other paths were freely estimated. These models were compared to the unconstrained model (Model 6) to identify which specific associations differed significantly by gender. Possible indirect effects related to either interpersonal-risk, symptoms-driven, or both, were explored. Bias-corrected bootstrapping with 5000 bootstrap samples was used to examine indirect effects to account for non-normality.

Results

Descriptive Statistics

The analytic sample consisted of 443 participants (76.5% white; *n*= 339; 59.4% women; *n*= 263 and 40.6% men; *n*= 180). Descriptive statistics, including sample sizes, means, and standard deviations for each measure (indirect peer victimization, poor friendship quality, and anxiety) across all time points are displayed for the total sample, and for men and women in Table 1. Correlations among the study variables across all time points are displayed in Table 2. All variables were significantly and positively correlated within and across time.

Table 1. *Descriptive and Frequency Statistics*

Variable	Gender	*n*	Min	Max	*M*	*SD*
ANX						
Age 22	Women	230	1.00	37.00	17.47	8.74
	Men	153	0.00	36.00	11.76	8.26
	Total	383	0.00	37.00	15.19	8.99
Age 23	Women	231	0.00	37.00	17.45	8.67
	Men	142	0.00	34.00	11.74	7.85
	Total	373	0.00	37.00	15.28	8.80
Age 24	Women	225	1.00	37.00	18.16	8.38
	Men	144	0.00	36.00	12.44	8.60
	Total	369	0.00	37.00	15.93	8.91
Age 26	Women	225	1.00	36.00	17.69	8.29
	Men	133	0.00	33.00	12.20	8.18
	Total	358	0.00	36.00	15.65	8.65
PFQ						
Age 23	Women	228	0.00	11.00	2.73	2.16
	Men	142	0.00	11.00	2.96	2.59
	Total	370	0.00	11.00	2.82	2.33
Age 24	Women	224	0.00	11.00	3.09	2.31
	Men	143	0.00	11.00	2.97	2.35
	Total	367	0.00	11.00	3.04	2.32
Age 26	Women	225	0.00	11.00	2.80	2.21
	Men	131	0.00	11.00	2.87	2.39
	Total	356	0.00	11.00	2.82	2.28
IPV						
Age 22	Women	229	1.00	5.00	1.63	.59
	Men	153	1.00	3.49	1.45	.51
	Total	382	1.00	5.00	1.55	.56
Age 23	Women	230	1.00	4.77	1.60	.61
	Men	142	1.00	5.00	1.45	.59
	Total	372	1.00	5.00	1.55	.61
Age 24	Women	236	1.00	5.00	1.62	.65
	Men	149	1.00	3.34	1.40	.49
	Total	385	1.00	5.00	1.53	.60
Age 26	Women	225	1.00	3.86	1.61	.57
	Men	133	1.00	3.51	1.42	.50
	Total	358	1.00	3.86	1.54	.55

Note: ANX= anxiety; PFQ= poor friendship quality; IPV= indirect peer victimization.

Table 2. *Correlations Among All Study Variables*

Variables	1	2	3	4	5	6	7	8	9	10	11
1. AGE 22 ANX	-	.80**	.77**	.72**	.26**	.22**	.19**	.43**	.34**	.35**	.40**
2. AGE 23 ANX		-	.84**	.79**	.34**	.26**	.19**	.47**	.45**	.43**	.48**
3. AGE 24 ANX			-	.85**	.36**	.30**	.25**	.43**	.37**	.46**	.48**
4. AGE 26 ANX				-	.28**	.22**	.20**	.45**	.38**	.43**	.51**
5. AGE 23 PFQ					-	.54**	.39**	.30**	.25**	.23**	.26**
6. AGE 24 PFQ						-	.49**	.25**	.25**	.24**	.23**
7. AGE 26 PFQ							-	.24**	.18**	.20**	.23**
8. AGE 22 IPV								-	.71**	.67**	.65**
9. AGE 23 IPV									-	.72**	.62**
10. AGE 24 IPV										-	.73**
11. AGE 26 IPV											-

Note: ***p*< .01; ANX= anxiety; PFQ= poor friendship quality; IPV= indirect peer victimization.

Model Comparisons

Nested path models were compared to assess whether estimating additional paths improved model fit at each stage. Table 3 shows the fit indices for competing models and model comparisons. The baseline model (Model 1) was estimated with covariances and autoregressive paths freely estimated and cross-lagged paths were constrained to zero. This model demonstrated poor fit to the data. In the covariance and autoregressive-only model (Model 2), autoregressive paths were freed, but all cross-lagged paths remained constrained to zero. This model showed significant improvement over Model 1. The interpersonal risk model (Model 3) freed cross-lagged paths from poor friendship quality and indirect peer victimization to anxiety while constraining symptoms-driven paths to zero and demonstrated a better fit to the data compared to Model 2. The symptoms-driven model (Model 4) in which paths from anxiety to poor friendship quality and indirect peer victimization were freed and interpersonal risk paths were constrained to zero also showed significant improvement from Model 2. The interpersonal risk model (Model 3) was an improvement over the symptoms-driven model (Model 4) when comparing the AIC for non-nested models (ΔAIC= 14.07). Finally, the transactional model (Model 5) freed cross-lagged paths in both directions. This model demonstrated the best overall fit to the data compared to Model 2 and models containing only interpersonal-risk and symptoms-driven paths.

Lower AIC values and superior fit indices supported the transactional model as the most appropriate representation, consistent with bidirectional associations among anxiety, poor friendship quality, and indirect peer victimization. These results suggest that the transactional model was largely similar across men and women, with equivalent within-time associations and most structural effects consistent across groups, but with selected stability and cross-lagged paths differing by gender.

Table 3. *Model Comparison*

Model	CFI	RMSEA [90% CI]	AIC	χ^2	*df*	*p*	*cf*	comparison	Δ *df*	*cd*	*T*	*p*
1. Covariance only model: constrained auto-regressive and cross-lagged paths to 0	0.172	.253[.242-.265]	17811.455	1323.172	45	<.001	1.607					
2. Covariance and auto-regressive only model: constrained cross-lagged paths to 0	0.971	.072[.051-.092]	15714.312	93.870	44	<.001	1.093	1 vs. 2	1	24.2	84	.000
3. Interpersonal risk model: symptoms-driven paths constrained to 0	0.982	.053[.033-.073]	15784.610	49.328	22	<.001	1.073	2 vs. 3	22	1.1	45	.001
4. Symptoms-driven model: interpersonal risk paths constrained to 0	0.975	.058[.040-.076]	15798.677	64.793	26	<.001	1.157	2 vs. 4	18	1.0	28	.016
								3 vs. 5	6	0.2	22	.001
								4 vs. 5	10	0.4	42	.000
5. Transactional model including auto-regressive, covariance, and cross-lagged paths among ANX, PFQ, and IPV	0.993	.038[.000-.063]	15773.222	26.212	16	.051	1.127	2 vs. 5	28	1.1	68	.000

Note: ANX= Anxiety symptoms; PFQ= Poor friendship quality; IPV= Indirect peer victimization. Transactional model (Model 5) selected as the final cross-lagged panel model.

Cross-lagged Panel Model: Transactional Model

Auto-regressive paths. All one-lag ($p < .001$; see Figure 1) and two-lag auto-regressive paths of each construct (in text) were statistically significant (Anxiety from Age 22 to 24: $b = 0.255$, $\beta = .259$, $p < .001$; Age 23 to 26: $b = 0.242$, $\beta = .248$, $p < .001$; Poor friendship quality from Age 23 to 26: $b = 0.166$, $\beta = .168$, $p = .023$; Indirect peer victimization from Age 22 to 24: $b = 0.310$, $\beta = .302$, $p = .008$; Age 23 to 26: $b = 0.177$, $\beta = .190$, $p = .011$).

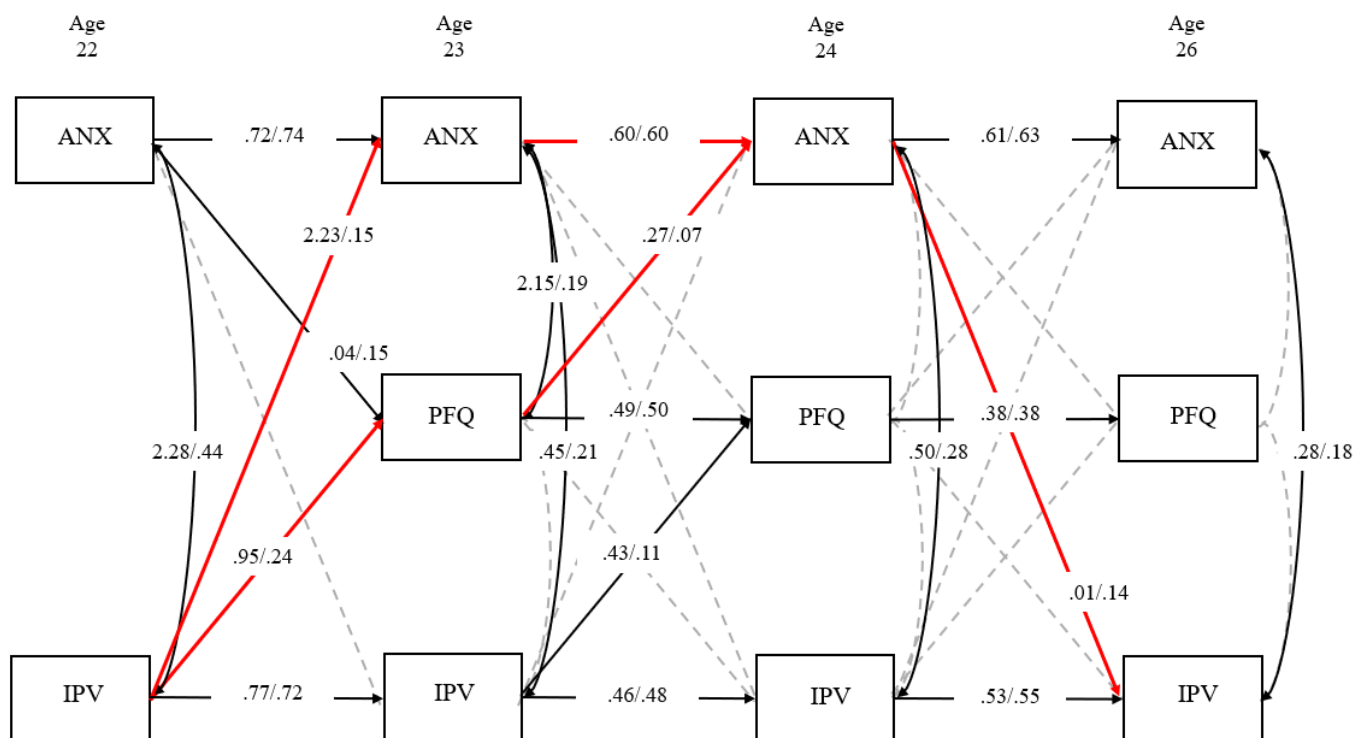
Cross-lagged paths. Cross-lagged effects (Figure 1) showed several significant bidirectional associations among anxiety, poor friendship quality, and indirect peer victimization. Anxiety at Age 22 significantly predicted poor friendship quality at Age 23 ($p = .008$), and poor friendship quality at Age 23 predicted increases in anxiety at Age 24 ($p = .019$). Anxiety also predicted increases in indirect peer victimization, whereby higher anxiety at Age 24 was associated with greater victimization at Age 26 ($p = .003$). From Age 22 to 23, indirect peer victimization predicted anxiety ($p < .001$) and poorer friendship quality ($p < .001$). Indirect peer victimization predicted poor friendship quality from Age 23 to Age 24 as well ($p = .037$).

Within-time associations. Results of the within-time covariances (Figure 1) showed significant positive relationships between anxiety and indirect peer victimization across all time points (Age 22: $p < .001$; Age 23: $p = .001$; Age 24: $p < .001$; Age 26: $p = .003$). Anxiety was also positively associated with poor friendship quality at Age 23 ($p = .003$), but these associations were not significant at other time points.

Indirect effects. Results of the indirect effects showed four out of five significant mediation pathways (Figure 1). First, indirect peer victimization at Age 22 positively predicted increases in poor friendship quality at Age 23, in turn predicting higher anxiety at Age 24 ($b = 0.258$, 95% bias-corrected CI [0.057, 0.596]). Second, indirect peer victimization at Age 22 indirectly predicted higher victimization at Age 26 through consecutive increases in anxiety at Age 23 and anxiety at Age 24 ($b = 0.012$, 95% bias-corrected CI [0.004, 0.028]). Two additional pathways extending from the first indirect effect reached statistical significance, albeit with relatively small effect sizes. Specifically, poor friendship quality at Age 23 predicted higher anxiety at Age 24, which in turn predicted greater indirect peer victimization at Age 26 ($b = 0.002$, 95% bias-corrected CI [0.001, 0.006]), and indirect peer victimization at Age 22 indirectly predicted later victimization at Age 26 through poorer friendship quality and heightened anxiety ($b = 0.002$, 95% bias-corrected CI [0.001, 0.007]). Finally, an additional indirect pathway from

anxiety at Age 22 predicting poorer friendship quality at Age 23, in turn predicting higher anxiety at Age 24 and increases in indirect peer victimization at Age 26 was tested, but was not statistically significant (*b*= 0, 95% bias-corrected CI [0.000, 0.000]).

Figure 1. *Cross-Lagged Panel Model of Anxiety, Poor Friendship Quality, and Indirect Peer Victimization*



Note: ANX= anxiety symptoms; PFQ= poor friendship quality; IPV= indirect peer victimization. Unstandardized/Standardized estimates are displayed for significant paths. Dotted grey paths were estimated but were not statistically significant. Two-lagged paths are in the model but not shown for simplicity. Significant indirect effects are shown in red. *CFI*= .993, *RMSEA*= .038[.000-.063], $\chi^2(16)$= 26.212, *p*= .051.

Gender Differences

Invariance analyses. Multigroup invariance tests were conducted to determine whether the transactional model functioned similarly across gender (see Table 4). In Model 6, parameters were allowed to vary freely across men and women, resulting in gender-specific path estimates and exhibited good fit to the data. In Model 7, all paths were constrained to be equal across men and women, testing whether the structural relationships operated equally across gender. Although this model demonstrated adequate fit, the Satorra-Bentler scaled chi-square difference test was

statistically significant, indicating that assuming full invariance did not adequately represent the data.

Stepwise invariance tests were conducted to identify the source of gender differences. In Model 8, constraining only covariances to be equal across gender did not significantly reduce model fit, suggesting that correlations among anxiety, poor friendship quality, and indirect peer victimization were comparable across groups. In contrast, constraining autoregressive paths (Model 9) significantly worsened model fit, indicating that some stability effects varied across gender. Finally, constraining cross-lagged paths (Model 10) as a block also significantly reduced fit, indicating some cross-lagged paths varied by gender. At the path level, four gender constraints were noninvariant. Specifically, the stability of indirect peer victimization from Age 23 to Age 24 (women > men) and from Age 24 to Age 26 (men > women), and the two-lagged path from Age 22 to Age 24 (men > women) differed significantly by gender. In addition, the cross-lagged effect from anxiety to poor friendship quality from Age 23 to Age 24 (men > women) differed significantly by gender. The freely estimated model (Model 6) was the best fitting model and selected as the final model. The magnitude of any sex differences was next explored.

Auto-regressive paths. One-lag stability was robust overall. For women, all one-lag paths for anxiety, poor friendship quality, and indirect peer victimization were significant ($p < .001$). For men, all one-lag paths were significant except indirect peer victimization from Age 23 to 24 ($p = .150$; Figure 2). Two-lag effects were also evident (in text), specifically anxiety from Age 22 to 24 (women: $b = 0.230$, $\beta = .242$, $p = .002$; men: $b = 0.293$, $\beta = .282$, $p < .001$) and Age 23 to 26 (women: $b = 0.210$, $\beta = .220$, $p = .001$; men: $b = 0.318$, $\beta = .308$, $p = .028$). The two-lag effect of poor friendship quality from ages 23 to 26 was significant for men ($b = 0.242$, $\beta = .262$, $p = .027$) but not for women. Indirect peer victimization showed two-lag stability for women from Age 23 to 26 ($b = 0.193$, $\beta = .203$, $p = .012$) and for men from Age 22 to 24 ($b = 0.473$, $\beta = .517$, $p < .001$); the complementary two-lag paths were nonsignificant (women, Age 22 to 24: $p = .242$; men, Age 23 to 26: $p = .142$).

Cross-lagged paths. For both women and men (Figure 2), anxiety at Age 22 predicted poorer friendship quality at Age 23 (women: $p = .036$; men: $p = .007$), and higher anxiety at Age 24 predicted greater indirect peer victimization at Age 26 (women: $p = .034$; men: $p = .032$). Among women, indirect peer victimization at Age 22 predicted increases in both anxiety ($p =$

.003) and poor friendship quality (*p*= .001) at Age 23. For men, anxiety continued to predict poorer friendship quality from Age 23 to 24 (*p*= .010). Poor friendship quality at Age 23 predicted higher anxiety at Age 24 (*p*= .036), and indirect peer victimization at Age 23 predicted poorer friendship quality at Age 24 (*p*= .001).

Within-time associations. For women (Figure 2), anxiety was positively associated with indirect peer victimization at each wave (Age 22: *p*< .001; Age 23: *p*< .001; Age 24: *p*= .001; Age 26: *p*= .022). For men, anxiety was positively associated with indirect peer victimization at Ages 22 (*p*< .001), 24 (*p*= .008), and 26 (*p*= .043), and with poor friendship quality at Age 23 (*p*= .003).

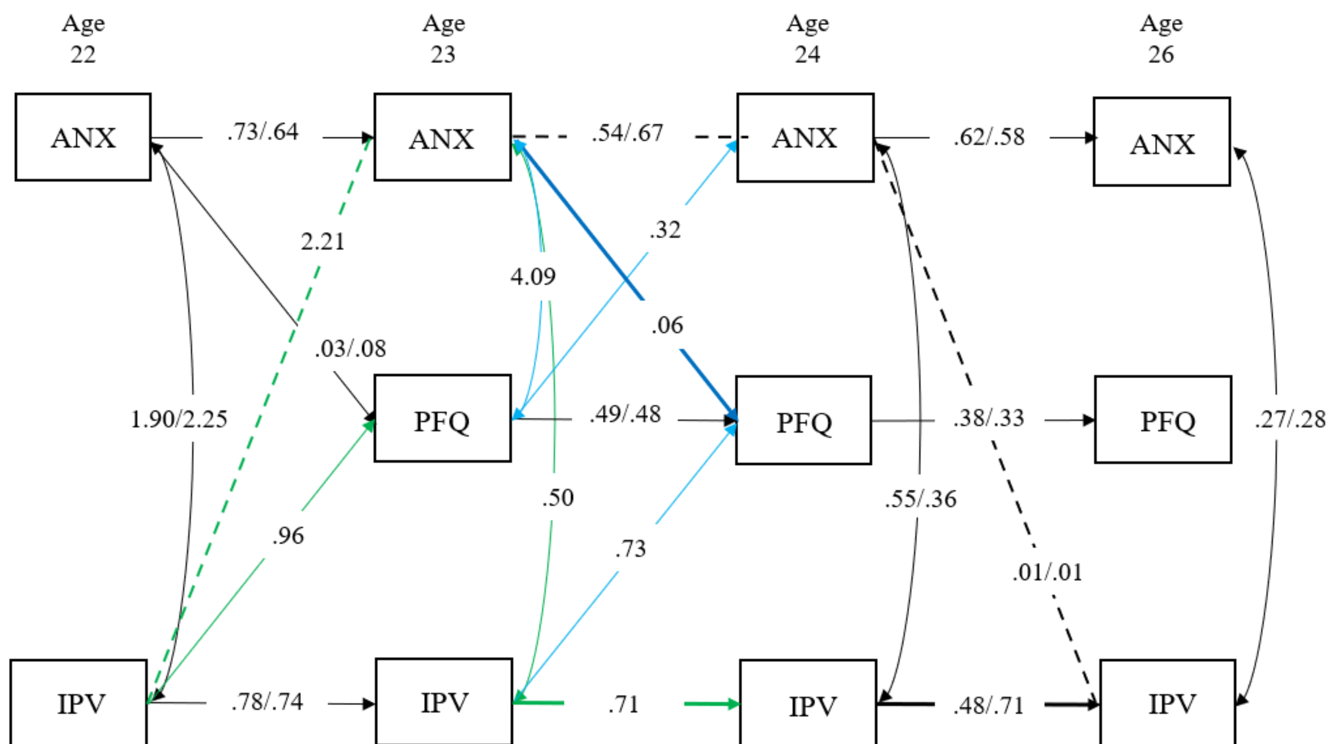
Indirect effects. Only one indirect pathway differed by gender. Specifically, the pathway showing indirect peer victimization at Age 22 indirectly predicting indirect peer victimization at Age 26 via sequential effects of anxiety at Age 23 and Age 24 was significant for women (*b*= 0.011, 95% CI [0.002, 0.032]; see Figure 2), but not significant for men. Based on cross-lagged evidence observed only among men, the indirect pathway from poor friendship quality at Age 23 through anxiety at Age 24 to indirect peer victimization at Age 26 was examined, but was not significant (*b*= 0.003, 95% CI [0, 0.009]).

Table 4. *Multi-Group Comparisons Across Gender*

Model	CFI	RMSEA [90% CI]	AIC	χ^2	*df*	*p*	*cf*	comparison	Δ df	cd	T	signifcance
6. Multi-group by men and women: freely estimated	0.986	.060[.033-.086]	15696.327	54.125	30	.005	1.047					
7. Multi-group by men and women: constrained across groups	0.966	.061[.044-.077]	15700.609	129.102	71	<.001	1.107	7 vs. 6	41	1.2	74.94	.000
8. Multi-group by men and women: constrained covariances	0.987	.049[.022-.072]	15685.831	64.360	42	.015	1.090	8 vs. 6	12	1.2	11.27	.085
9. Multi-group by men and women: constrained auto-regressive paths	0.971	.070[.050-.090]	15713.503	94.407	45	<.001	1.100	9 vs. 6	15	1.2	39.12	.000
9a. ANX (Age 24) to ANX (Age 26)	0.987	.056[.029-.081]	15693.312	55.989	33	.008	1.065	9a vs. 6	3	1.3	2.39	.187
9b. PFQ (Age 24) to PFQ (Age 26)	0.986	.056[.030-.081]	15693.328	56.304	33	.007	1.059	9b vs. 6	3	1.2	2.53	.179
9c. IPV (Age 24) to IPV (Age 26)	0.983	.063[.039-.087]	15697.589	62.369	33	.002	1.025	9c vs. 6	3	0.8	9.01	.013
9d. ANX (Age 23) to ANX (Age 24)	0.985	.059[.033-.083]	15694.911	58.474	33	.004	1.047	9d vs. 6	3	1.1	4.36	.094
9e. PFQ (Age 23) to PFQ (Age 24)	0.986	.057[.030-.081]	15693.254	56.406	33	.007	1.056	9e vs. 6	3	1.2	2.54	.178
9f. IPV (Age 23) to IPV (Age 24)	0.967	.088[.067-.110]	15722.278	89.863	33	<.001	0.986	9f vs. 6	3	0.4	84.32	.000
9g. ANX (Age 22) to ANX (Age 23)	0.985	.059[.033-.083]	15694.606	58.395	33	.004	1.043	9g vs. 6	3	1.0	4.23	.099
9h. IPV (Age 22) to IPV (Age 23)	0.986	.057[.031-.082]	15693.379	56.886	33	.006	1.050	9h vs. 6	3	1.1	2.83	.163
9i. ANX (Age 22) to ANX (Age 24)	0.986	.057[.030-.082]	15693.626	56.698	33	.006	1.057	9i vs. 6	3	1.2	2.83	.163
9j. IPV (Age 22) to IPV (Age 24)	0.979	.069[.046-.093]	15705.389	67.988	33	<.001	1.055	9j vs. 6	3	1.1	13.25	.002
9k. ANX (Age 23) to ANX (Age 26)	0.986	.057[.030-.081]	15694.126	56.492	33	.007	1.070	9k vs. 6	3	1.3	2.91	.159
9l. PFQ (Age 23) to PFQ (Age 26)	0.986	.058[.032-.082]	15694.423	57.528	33	.005	1.056	9l vs. 6	3	1.1	3.57	.127
9m. IPV (Age 23) to IPV (Age 26)	0.987	.055[.028-.080]	15693.290	55.265	33	.009	1.079	9m vs. 6	3	1.4	2.12	.201
10. Multi-group by men and women: constrained cross-lagged paths	0.983	.053[.030-.074]	15685.306	77.432	48	.005	1.054	10 vs. 6	18	1.1	23.42	.036
10a. PFQ (Age 24) to ANX (Age 26)	0.986	.058[.031-.082]	15694.178	57.226	33	.006	1.057	10a vs. 6	3	1.2	3.31	.139
10b. IPV (Age 24) to ANX (Age 26)	0.986	.058[.032-.082]	15693.619	57.525	33	.005	1.042	10b vs. 6	3	1.0	3.31	.139
10c. ANX (Age 24) to PFQ (Age 26)	0.985	.059[.033-.083]	15695.418	58.475	33	.004	1.056	10c vs. 6	3	1.1	4.44	.091
10d. IPV (Age 24) to PFQ (Age 26)	0.985	.060[.034-.084]	15695.007	59.142	33	.003	1.037	10d vs. 6	3	0.9	4.98	.074
10e. ANX (Age 24) to IPV (Age 26)	0.986	.057[.039-.081]	15693.244	56.385	33	.007	1.056	10e vs. 6	3	1.2	2.53	.179
10f. PFQ (Age 24) to IPV (Age 26)	0.986	.056[.029-.081]	15693.266	56.260	33	.007	1.059	10f vs. 6	3	1.2	2.48	.182
10g. PFQ (Age 23) to ANX (Age 24)	0.986	.058[.031-.082]	15693.550	57.309	33	.005	1.045	10g vs. 6	3	1.0	3.14	.147
10h. IPV (Age 23) to ANX (Age 24)	0.985	.059[.033-.083]	15694.896	58.171	33	.004	1.052	10h vs. 6	3	1.1	4.12	.103
10i. ANX (Age 23) to PFQ (Age 24)	0.983	.063[.039-.087]	15698.226	62.322	33	.002	1.036	10i vs. 6	3	0.9	8.52	.016
10j. IPV (Age 23) to PFQ (Age 24)	0.985	.059[.032-.083]	15694.497	58.101	33	.005	1.047	10j vs. 6	3	1.0	3.98	.109
10k. ANX (23) to IPV (Age 24)	0.985	.060[.034-.084]	15694.916	58.991	33	.004	1.038	10k vs. 6	3	1.0	4.82	.079
10l. PFQ (Age 23) to IPV (Age 24)	0.986	.057[.031-.082]	15693.409	56.921	33	.006	1.049	10l vs. 6	3	1.1	2.86	.161
10m. ANX (Age 22) to PFQ (Age 23)	0.985	.059[.033-.083]	15694.811	58.541	33	.004	1.044	10m vs. 6	3	1.0	4.39	.093
10n. IPV (Age 22) to PFQ (Age 23)	0.986	.057[.030-.082]	15693.236	56.855	33	.006	1.048	10n vs. 6	3	1.1	2.75	.167
10o. ANX (Age 22) to IPV (Age 23)	0.984	.060[.034-.084]	15695.707	59.440	33	.003	1.044	10o vs. 6	3	1.0	5.31	.065
10p. IPV (Age 22) to ANX (Age 23)	0.986	.057[.030-.081]	15693.232	56.355	33	.007	1.057	10p vs. 6	3	1.2	2.51	.180

Note: ANX= anxiety symptoms; PFQ= poor friendship quality; IPV= indirect peer victimization. Freely estimated model (Model 6) selected as the final model.

Figure 2. *Multi-Group Comparisons: Freely Estimated Across Gender*



Note: ANX= anxiety symptoms; PFQ= poor friendship quality; IPV= indirect peer victimization. Values represent unstandardized estimates (women/men). Significant stability and covariance paths are shown in green for women, blue for men, and black where effects were significant for both genders. Significant gender differences in path strength are bolded. The dotted lines illustrate the indirect path significant for women only; within this pathway, ANX23 →ANX24 and ANX24 → IPV26 were significant for both genders. *CFI*= .986, *RMSEA*= .060[.033-.086], $\chi^2(30)$= 54.125, *p*= .005.

Discussion

The aim of the present study was to examine the temporal ordering among indirect peer victimization, poor friendship quality, and anxiety symptoms in young adults from ages 22 to 26 using a cross-lagged design and comparative model-building approach. To date, most longitudinal research on peer victimization have primarily focused on youth, while studies on how these dynamics evolve or persist into adulthood remain limited. Existing studies have also tended to examine these constructs in isolation or among unidirectional associations, and to my knowledge, no prior research has directly compared competing longitudinal models encompassing these variables. Addressing these gaps, I tested whether interpersonal-risk, symptoms-driven, or transactional pathways best characterized the relations among these interpersonal and emotional systems in young adulthood.

Among the competing models, the transactional model provided the best fit to the data, indicating that indirect peer victimization, poor friendship quality, and anxiety function within a mutually reinforcing cycle that maintains and exacerbates maladaptive psychosocial patterns over time. These results are consistent with previous theories suggesting that both internal and external contexts are reciprocally influenced by one another over time (Sameroff, 2009). This interplay may reflect the notion that relational strain and internal distress co-develop within feedback systems, shaping how individuals navigate conflict and social hierarchies, monitor belonging and status, and detect cues of disconnection or exclusion within peer networks (Baumeister & Leary, 1995; Vaillancourt, 2013). Yet, the evidence for a transactional process rather than a unidirectional path suggests these coping patterns may become counterproductive when chronically activated, leading to persistent threat sensitivity, peer-related stress, and maladaptive behaviour or emotional responses.

Gender differences in descriptive measures of this thesis revealed higher mean levels of anxiety and indirect peer victimization for women, consistent with evidence from previous research showing that women tend to experience and are more impacted by anxiety and indirect forms of aggression than men (Archer & Coyne, 2005; Benenson, 2013; Campbell, 2002; Crick & Grotpeter, 1995; Kessler et al., 2005; McLean et al., 2011; Vaillancourt & Brittain, 2024).

Results of frequencies and covariances showed strong auto-regressive paths between each timepoint for anxiety, poor friendship quality, and indirect peer victimization. The robust stability observed here aligns with prior research exhibiting that anxiety symptoms show persistence

across developmental periods (Copeland et al., 2014; Woodward & Fergusson, 2001), perceptions of friendship quality remain moderately stable into adulthood (Demir & Özdemir, 2010, Weber et al., 2010), and indirect aggression endures beyond adolescence (Vaillancourt & Farrell, 2021). The stability found in the present study may also reflect the typical narrowing and deepening of social networks in early adulthood (Arnett, 2000a; Dunbar, 2018) coupled with the consolidation of psychosocial patterns at the individual level. This continuity may be reflective of the tendency for conserved interpersonal regulation and attunement, whereby individuals engage in familiar social and emotional patterns in attempt to augment predictability when navigating their environment (Bolis et al., 2023). When exposed to long-term interpersonal distress and persisted engagement in vigilance systems, however, such patterns can become dysregulated and may crystallize into characteristic traits rather than representing situational responses to transient distress (Kawamoto et al., 2015; Schwartz-Mette et al., 2021). Moreover, individuals' established psychosocial orientations in young adulthood may become increasingly embedded and less susceptible to fluctuation, thus prolonging the vicious cycle (Roberts & DelVecchio, 2000).

Three gender differences in the stability of indirect peer victimization were revealed. Specifically, stability was stronger for women than for men (non-significant for men) from ages 23 to 24, whereas the path from ages 24 to 26 was significant for both genders, but stronger for men. The two-lagged path from ages 22 to 24 also differed by gender (stronger for men than for women), suggesting nuanced developmental shifts in continuity across the transition to adulthood. The stability of indirect peer victimization among men from age 23 to age 24 was the only nonsignificant auto-regressive path. Notably, this wave occurred during the initial years of the COVID-19 pandemic. The finding that indirect peer victimization remained stable for women but not for men during this period of social isolation may point to women's greater attunement to subtle interpersonal processes. That is, despite limited in-person interactions during this time, women may have remained sensitive to cues of exclusion or relational strain conveyed through interactions via smartphones and social media (e.g., being ignored in group chats, observing others' online interactions, or perceiving subtle shifts in responsiveness or communicative tone; Vaillancourt et al., 2024). In contrast, men may be less perceptive of, or affected by, indirect forms of aggression in the absence of face-to-face interactions. These findings highlight that gendered differences in socialization and communication styles may shape how indirect peer

victimization persists in young adulthood, and particularly during periods of reduced social contact.

Consistent and robust positive within-time associations were found between indirect peer victimization and anxiety symptoms across all four waves, and anxiety symptoms were also related to poor friendship quality at age 23. These concurrent links indicate that anxiety and relational stress mutually reinforce one another, creating immediate feedback loops of negative interpersonal dynamics like heightened threat perception, social withdrawal, and tension within friendships. Individuals who experience victimization may become increasingly anxious and vigilant, while elevated anxiety can lead to maladaptive interpersonal behaviour, such as reassurance seeking, social withdrawal, or irritability, which may inadvertently elicit rejection or disengagement from peers (Cramer & Tognetti, 2023; McLaughlin & Nolen-Hoeksema, 2011; Siegel et al., 2009).

The indirect effects observed in the current study represent particularly key features of the overall transactional model of psychosocial maladaptation. In support of an interpersonal-risk process, early indirect peer victimization predicted later anxiety through poor friendship quality. This sequence indicates enduring harmful covert tactics (e.g., gossiping, social exclusion) from peers can erode emotional security and perceived safety and satisfaction in friendships; all of which are critical for sustaining friendships in young adulthood (Dunbar, 2018). As emphasized, high quality friendships are vital sources for emotional regulation, stress-buffering, identity exploration, and reassurance of belonging during early adulthood (Arnett, 2000a; Demir & Özdemir, 2010). When persistent barriers or harmful disruptions to receiving these forms of support befall, these individuals are consequently more likely to experience heightened vulnerability to anxious dispositions, hypervigilance to ambiguous social cues, and general internalized distress when navigating interpersonal environments (Prinstein et al., 2005; Rudolph et al., 2016; Zimmer-Gembeck et al., 2014). These dynamics are consistent with research showing indirect peer victimization in friendships associated with poor psychosocial adjustment (Crick & Nelson, 2002), and that relational disruptions predict increased susceptibility to internalizing difficulties like anxiety (Prinstein et al., 2001; Rudolph, 2008).

A smaller interpersonal-risk path also emerged from early victimization to later victimization through poorer friendship quality and increased anxiety, further underscoring the cyclical nature of these processes. These effects demonstrate that internal distress and relational

strain perpetuate one another, forming a feedback loop that reinforces maladaptive socioemotional functioning over time (Sameroff, 2009; Schwartz-Mette et al., 2021).

Another notable interpersonal-risk pathway observed in this study involved anxiety as a mediating process linking earlier and later experiences of indirect peer victimization. Although anxiety symptoms at age 24 directly predicted indirect peer victimization at age 26 for both men and women, the indirect cyclical pathway emerged as significant only among women. Specifically, women who reported higher anxiety two consecutive years following early indirect peer victimization were more likely to experience victimization two years later, indicating that anxiety may function not only as a ramification of peer maltreatment, but also as a risk factor that perpetuates further exposure to victimization. This cyclical relationship observed among women supports previous studies that have found women to be more attuned to cues of social threat and anxiety (Kessler et al., 2005; see review by Vaillancourt, 2013). Indeed, women tend to be more negatively impacted by threats of relational strife or exclusion and may develop heightened vigilance and sensitivity to such cues to effectively respond to social instability and sustain interpersonal well-being (McLaughlin & Nolen-Hoeksema, 2011; McLean et al., 2011; Prinstein et al., 2005). However, these learned coping patterns for mitigating repeated interpersonal conflict or perceived rejection can become maladaptive, creating a feedback loop of persistent social vigilance and relational insecurity that inadvertently predisposes individuals to further indirect forms of aggression (Biggs et al., 2012; Priest, 2013; Siegel et al., 2009). Given that women both primarily employ and are more negatively affected by indirect aggression, it is therefore unsurprising that this indirect pathway emerged more prominently within the sample of women compared to men.

Symptoms-driven paths were also observed within the transactional model. From ages 22 to 23, anxiety symptoms predicted poorer friendship quality for both men and women (stronger for men), and for men only from ages 23 to 24. This finding may speak to gender differences in expressions of anxiety and associated responses to stressors. Anxiety for men in particular may manifest in ways that prevent social connectedness, such as irritability, social withdrawal, or difficulty in or resistance to showing emotional vulnerability (McLean & Anderson, 2009). Such avoidance-based mechanisms to managing anxiety can strain actual or perceived friendship quality. This tendency is further compounded by societal gender norms that often place greater emphasis on traits fostering dominance, rigidity and independence, curtailing social acceptance

for emotional disclosure or relying on friends for emotional support (Archer, 2000, 2004; Card et al., 2008). Consequently, men experiencing anxiety may prioritize upholding these traits in adherence to gender norms over affiliative support seeking (Buhrmester & Prager, 1995; Rose et al., 2016), thereby inhibiting emotional intimacy and reducing satisfaction within friendships (La Greca & Harrison, 2005). In contrast, women may be more likely to seek closeness through trusted peers during periods of anxiety, which may buffer against declines in friendship quality (Rose & Rudolph, 2006). These findings highlight the importance of accounting for gender variation in social norms and forms of coping when exploring interpersonal challenges resulting from anxiety, particularly within contexts of stress and isolation, like the COVID-19 pandemic.

Although the indirect effect was modest, a complementary pathway was observed, showing that heightened anxiety symptoms mediated the effect of poor friendship quality to later experiences of indirect peer victimization. This finding further supports the transactional model by illustrating how relational strain and internalized distress may mutually reinforce one another, sustaining vulnerability to peer difficulties over time. Finally, the indirect pathway linking anxiety symptoms at age 22 to later indirect peer victimization at age 26 via poorer friendship quality and heightened anxiety did not reach significance. This may point to a transient process of particular socioemotional dynamics across the transition to adulthood.

Limitations and Future Directions

The present study has many strengths, including a longitudinal design and robust analytical approach with reliable measures and a large sample size. However, the study is not without limitations. First, data on friendship quality was not measured until age 23, resulting in missing data on this construct at the initial wave. Consequently, the temporal relationships between friendship quality and the other variables from baseline could not be fully captured. In addition, annual data between ages 24 and 26 was not collected due to the pandemic, therefore limiting the opportunity to track continuous developmental changes across young adulthood, as well as analyze any other nuanced patterns between these two years. Ensuring all variables are measured from the onset and across subsequent waves would strengthen future research in this area.

Second, although the present study included four time points, which is the minimum required to estimate more advanced longitudinal models such as the Autoregressive Latent Trajectory model with Structured Residuals (ALT-SR; Hamaker et al., 2015), the sample size and

model complexity limited the feasibility of applying this approach. The ALT-SR model simultaneously estimates random intercepts and slopes to disentangle within-person change from between-person differences, thereby offering stronger inferences about temporal dynamics. Future studies with larger samples and additional time points could extend this work using ALT-SR modeling to strengthen the precision of temporal estimates.

Third, psychosocial constructs like indirect peer victimization, friendship quality, and anxiety are contextual and dynamic, and may therefore fluctuate over shorter time periods than the annual assessments used in the present study. For instance, the specific circumstances surrounding the experiences of these constructs at age 22 may differ considerably from those at age 25. To better understand how associations among these variables evolve across young adulthood, future research could implement shorter time scales between assessments to identify more immediate patterns.

Fourth, because the study relied on self-reported data, it was unclear whether indirect peer victimization occurred within close friendships or stemmed from perpetrators outside the participants' social circles. Future research implementing peer-nomination methods would further help identify both the perpetrators and close friends of the participants, which could allow researchers to assess potential crossovers between these social networks and offer a more nuanced understanding of friendship dynamics in young adulthood.

Finally, data collection for the present study took place before and during the initial years of the COVID-19 pandemic. This global crisis led to substantial disruptions to daily life due to widespread lockdowns to limit in-person exchanges, inevitably influencing typical patterns of social interactions and mental health during this period (Vaillancourt & Brittain, 2024). Therefore, the extent to which these associations represent normative psychosocial development in young adulthood or pandemic-related influences remains uncertain. Future research should examine these associations during periods of typical social functioning to determine the generalizability of these findings.

Implications and Conclusion

Research on indirect peer victimization has been widely conducted in youth samples (Casper & Card, 2017), yet remains understudied in young adulthood, despite longitudinal evidence that this behaviour often persists beyond adolescence and stabilizes in adulthood (Vaillancourt & Farrell, 2021) and represents the most common form of aggression in adults

(Vaillancourt, 2013). Exploring interpersonal challenges across this developmental period is essential, as young adulthood is characterized by identity and independence exploration alongside the expansion and refinement of social networks. Indeed, individuals tend to have the greatest number of social contacts around age 25 (Bhattacharya et al., 2016). The stability observed across constructs in this study implies that early identification and interventions are crucial to disrupt maladaptive cycles before they become entrenched and persist over time. Findings from the interpersonal-risk pathways suggest that internalized challenges may stem from prior relational stress, emphasizing the importance of discerning early signs of maltreatment to better manage and mitigate its future impact. Additionally, normalizing re-evaluation and, when deemed necessary, distancing or termination of unhealthy friendships could reduce emotional distress and aid young adults in shifting towards better quality social networks (see Vaillancourt & Brittain, 2024). In conclusion, the findings of my thesis support transactional relations between indirect peer victimization, poor friendship quality and anxiety in young adulthood and speaks to the importance of espousing an integrative perspective when conceptualizing interpersonal relationships and mental health in emerging adulthood.

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