INDIRECT AGGRESSION AND VICTIMIZATION: INVESTIGATING INSTRUMENT PSYCHOMETRICS, GENDER DIFFERENCES, AND ITS RELATIONSHIP TO SOCIAL INFORMATION PROCESSING

Taylor Steeves

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INDIRECT AGGRESSION AND VICTIMIZATION: INVESTIGATING INSTRUMENT
PSYCHOMETRICS, GENDER DIFFERENCES, AND ITS RELATIONSHIP TO SOCIAL
INFORMATION PROCESSING

A Dissertation
Submitted to the School of Education

Duquesne University

In partial fulfillment of the requirements for
the degree of Doctor of Philosophy

By
Taylor A. Steeves

August 2023
INDIRECT AGGRESSION AND VICTIMIZATION: INVESTIGATING INSTRUMENT PSYCHOMETRICS, GENDER DIFFERENCES, AND ITS RELATIONSHIP TO SOCIAL INFORMATION PROCESSING

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ABSTRACT

INDIRECT AGGRESSION AND VICTIMIZATION: INVESTIGATING INSTRUMENT PSYCHOMETRICS, GENDER DIFFERENCES, AND ITS RELATIONSHIP TO SOCIAL INFORMATION PROCESSING

By
Taylor A. Steeves
August 2023

Dissertation supervised by Laura Crothers, D.Ed., NCSP.

The study of indirect bullying behaviors, relational aggression and social aggression, has been of theoretical importance and interest to researchers and psychologists within the last few decades. In this investigation, using a convenience sample of 451 late adolescents attending a private university in the mid-Atlantic U.S., I examined the factor structure of two measures of indirect bullying, the Young Adult Social Behavior Scale – Victim (YASB-V) and the Young Adult Social Behavior Scale – Perpetrator (YASB-P). Using confirmatory factor analysis (CFA), I found that the YASB-V comprised a four-factor model, differing from the model that had been identified in the YASB-P in previous studies. Furthermore, using CFA, the factor structure of the YASB-P was re-established akin to what has been described in prior research, although with a poor fit of the data, suggesting a better fit with a two-factor model. I also examined whether there were gender differences in the self-reporting of the indirect victimization on the YASB-V,
and I did not find meaningful differences. Finally, as researchers have speculated about a relationship between the social information processing model (SIP) and the perpetration of indirect bullying, I investigated whether the factor structure of the YASB-P was associated with the four Response Decisions (Assertiveness, Passiveness, Overt Aggression, and Relational Aggression) of SIP as measured by the Scenes for Social Information Processing Assessment (SSIPA). Each factor of the YASB-P was allowed to covary with the four response decisions. The interpersonal maturity factor of the YASB-P was meaningfully related to the four response decisions on the SSIPA, the social aggression factor was meaningfully related to the overt and relational aggression response decisions, while the relationally aggressive factor had no meaningful relations. This research is tied to the extant literature, and recommendations for future research is provided.
ACKNOWLEDGEMENT

I would like to gratefully acknowledge and express my gratitude to the following people who have supported me throughout my graduate training and completion of my dissertation.

First, I owe a great deal of thanks to my advisor and committee chair, Dr. Laura M. Crothers. Without your constant support these past five years, vast knowledge of everything “psychology”, enthusiasm for learning, and mentorship, I would not be the doctoral candidate I am today. You have always pushed me to be the best student and believed in my potential. I am forever grateful for the warmth and kindness you have shown me.

I would like to acknowledge and thank my committee members, Dr. Ara Schmitt, Dr. Jered Kolbert, and Dr. Jim Schreiber for their support, guidance, and contribution to my dissertation writing process. My committee provided me with encouragement, was willing to meet with me on short notice, and always expressed their enthusiasm for my learning. I would also like to thank Dr. Dustin Haraden for his expertise and valuable knowledge of statistics, as well as willingness to guide me through my analyses.

I would also like to thank my friends and family who have unconditionally supported me, allowed me to vent about my stresses for the past five years of study, and pushed me to try new things during my training. In particular, I would like to thank my mother, Terri Garity. Her never-ending support, encouragement, and constant love have sustained me throughout my life — you are truly remarkable.
Lastly, I would like to thank my cat, Nova, who has improved my quality of life these past eight years. I will always appreciate your attempt to help me write my dissertation — whether sitting on my lap while I type or attempting to sit on my keyboard to stop me from writing.
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CHAPTER I
INTRODUCTION

The empirical study of bullying among youth in schools gained international interest in the 1970s following the publication of Olweus’ book, *Aggression in the Schools: Bullies and Whipping Boys*, in 1978, in which he examined bullying behavior and the role of schools. Beginning in the 1990s, research on bullying emerged in North America following public concern over the tragic deaths of youth; particularly, the 1997 murder of Rina Virk and the Columbine massacre in 1998 (Cullen, 2009; Godfrey, 2005; Hymel & Swearer, 2015). In the scholarly attempts to understand school bullying and its underlying processes, researchers have increasingly studied developmental and theoretical perspectives that may contribute to bullying behaviors. In particular, the study of social information processing (SIP) theory (Crick & Dodge, 1994) has been an essential component of understanding the etiology of bullying behavior (Dodge & Rabiner, 2004).

Bullying can be described as an “intentional, repeated, negative (unpleasant or hurtful) behavior by one or more persons directed against a person who has difficulty defending himself or herself” (Olweus, 2005, p. 2). The key elements of bullying involve a physical, verbal, or psychological attack or intimidation, an actual or perceived power imbalance between the perpetrator(s) or victim(s), the intent to cause fear, and/or harm to the victim, repetition, and the achievement of the desired effects (Shetgiri, 2013). Of particular importance is the existence of a power imbalance between the bully and the victim (Aalsma & Brown, 2008). Early research focused on the direct, overt forms of bullying such as physical or verbal behaviors; however, researchers have identified the sizeable importance of the contributions of indirect forms of aggression such as social or relational behaviors to bullying behavior (Volk et al., 2017).
An element of maladaptive functioning in childhood, adolescence, and adulthood is involvement in aggressive behaviors (Crick et al., 1999; Murray-Close et al., 2010). The research evidence collected clearly suggests bullying or aggressive behaviors in children are both affected by and the result of various environmental, developmental, and social and cognitive processes. However, the theoretical interest in understanding bullying in late adolescence and early adulthood has been slower than expected (Lemerise & Arsenio, 2000). Therefore, analyses of the correlates or psychological sources of indirect aggression (e.g., relational or social aggression) must be pursued on several different levels.

**Significance of the Problem**

Few psychometrically-sound methods are currently available for investigating and advancing the understanding of relational aggression in late adolescence and early adulthood (Crick et al., 1999). Only recently have researchers begun to understand the importance of indirect aggression in youth, therefore leaving gaps in empirical findings related to relational and social aggression. Central to understanding indirect aggression in youth are the methods of measurement such as peer nominations, structured interviews, observations, and parent and teacher ratings. However, diagnostic assessment of indirect aggression, specifically relational aggression, is far more difficult to assess than other forms of aggression due to its covert nature (Crothers et al., 2009; Merrell et al., 2006).

A substantial body of research has provided evidence of relationally-aggressive behaviors in childhood and adolescence, but little work has examined these behaviors in late adolescence and early adulthood (ages 18-25; Crick et al., 1999). Similarly, despite recent advances in studying relational aggression, most research in examining bullying has focused on physical or verbal forms of aggression in child or adolescent samples (Crick et al., 1999). While additional
research with emerging adult samples is clearly warranted, one limitation of assessing relational aggression exists due to a lack of valid measures or instruments. Many of the measures assessing relational aggression (e.g., observations, peer nominations, self-reports, structured interviews, parent and teacher ratings) were developed for use with younger children and early adolescents.

While there are various diagnostic assessments designed to measure relational aggression in late adolescence and early adulthood, many are brief or are not unique assessments of relational aggression (Crothers et al., 2005; Crothers et al., 2009; Werner & Crick, 1999). Most assessments of relational aggression in adulthood are self-report methods that measure indirect, relational, and social aggression as a unitary construct despite emerging evidence that each group of behaviors is comprised of separate factors (Crothers et al., 2009; Fidazzo, 2021; Werner & Crick, 1999). Additionally, many of these instruments provide limited attention to gender differences in relational aggression in adulthood.

In some studies, researchers have found that girls exhibit greater levels of relational aggression than boys, while preliminary research with young adults suggests that there may be no gender differences in the perpetration of relational aggression. Owing to a need for further research, investigations of potential gender differences in late adolescence and early adulthood is of increasing importance (Bailey & Ostrov, 2008; Basow et al., 2007; Burton et al., 2007; Crick et al., 2007; Loudin et al., 2003; Murray-Close et al., 2010).

**Theoretical Basis for the Study**

The use of theory has been employed to explain, understand, or predict group phenomena such as bullying in children and youth. Researchers have consulted numerous theories to make sense of the complexities of bullying such as ecological systems theory, social learning theory, cognitive behavioral theory, attribution theory, and theories of human development. Particular to
developmental scholars, the study of distinctive social and cognitive information-processing patterns that have been implicated in the development and maintenance of aggression in children has garnered empirical support for the hypothesis of why children bully.

Currently, the SIP model is one of the most important social-cognitive theoretical frameworks for understanding the development of aggressive behavior in youth (Oribio de Castro, 2004). According to SIP theory, children’s behaviors are a function of their perceptions, interpretations, and decision-making abilities about social stimuli (Crick & Dodge, 1994; Crick & Dodge, 1986). Specifically, the SIP model proposes a series of sequential steps of processing, including encoding and interpretation of social cues, clarification of goals, response access or construction, response decision making, and behavioral enactment (Crick & Dodge, 1994; Crick & Dodge, 1986; Crick & Dodge, 1996). When children are skillful at processing each step, they enact competent behaviors in social situations, whereas if there is a deficiency at processing any step, children are likely to engage in deviant or aggressive social behaviors (Crick & Dodge, 1996).

The development of aggression is often related to the advancement of cognitive, verbal, and social skills as individuals age. Therefore, the cognitive and interpersonal maturity aspects of bullying are theoretically important to consider, given that social cognition is at the core of children’s social skills and their abilities to get along well with peers (Espelage et al., 2017; Sutton et al., 1999). Yet, the study of these SIP patterns in late adolescents and early adults has been limited. Although attempts have been made in studying indirect aggression in those ages 18-25, the body of empirical findings have been found using hypothetical self-referent situation interviews or questionnaires, most of which lack sound psychometric properties (Vagos et al., 2010).
Relevant Literature

The systematic study of relational aggression and other distinct, yet similar, constructs (e.g., indirect aggression and social aggression) has generated crucial findings regarding gender differences in relational aggression and the underlying psychological processes of relational aggression expressions (Werner & Crick, 1999). Numerous studies of childhood aggression have shown that females tend to engage in more relational aggressive behaviors than males. However, findings regarding gender differences in relational aggression for later adolescents and early adults (ages 18-25 years) have been inconsistent (Murray-Close et al., 2010).

As mentioned, as an empirically supported theory to explain the propensity to engage in bullying behavior is the SIP (Crick & Dodge, 1994), the Scenes for Social Information Processing in Adolescence (SSIPA; Vagos et al., 2010) was developed to evaluate adolescents’ social experiences applying the principal cognitive steps of the SIP model (Crick & Dodge, 1994; Vagos et al., 2010). Specifically, the SSIPA provides an evaluation of the four stages within social information processing:

- attribution of meaning (i.e., neutral attribution with four items and hostile attribution with five items);
- emotional reaction (i.e., anger with five items, sadness with four items, and shame with four items);
- evaluation of response based on moral valuation, self-efficacy, and expected personal and social outcomes (i.e., evaluation of an assertive, passive, relationally aggressive and openly aggressive response, each in response to relational or overt provocations, each in turn consisting of 15 items);
response decision/probability for an assertive (i.e., four items), passive (i.e., four items), relationally aggressive (i.e., five items) and overtly aggressive option (i.e., four items).

Additionally, the Young Adult Social Behavior Scale (YASB) was developed to measure self-reported relational and social aggression and behaviors of interpersonal maturity in adolescents and young adults (Crothers et al., 2009). The YASB measure is also comprised of two versions: the YASB Victim Scale (YASB-V) and the YASB Perpetrator Scale (YASB-P). For the purpose of this study, the psychometrics of the YASB-V will be explored, as well as the factor structure of the YASB-P in relation to SIP. These two instruments, which will measure a theoretical contribution to understanding indirect bullying behaviors through the SIP model, relational and social aggression as unique constructs, and gender differences in the reporting of indirect bullying behaviors among 18–25-year-olds, will be discussed in more detail in later sections of this paper.

Problem Statement

In comparison to direct aggression, there is a lack of empirical evidence regarding indirect aggression. Specifically, the study of indirect aggression, relational aggression, and social aggression as unique constructs in late adolescence and early adulthood has been limited. In this study, I will investigate the factor structure of the YASB-V as a means of validating the use of this measure, as well as the gender differences in reports of victimization of indirect bullying behaviors. I will also investigate the relationship between high perpetration scales on the YASB-P and the four response decision items for the SIP as measured by the SSIPA. As the SSIPA was developed in Portuguese, it is important to ascertain its usefulness in its English translation for both males and females in understanding their SIP behavior. Furthermore, while
there have been few investigations of the factor structure of the YASB-P, none have been
conducted on the YASB-V and examining the responses from each gender, separately.

Research Questions and Hypotheses

**Research Question 1.** What is the factor structure of the YASB-V?

*Hypothesis 1.* The factor structure will be consistent with that which has been reported
for the YASB-P in previous research.

**Research Question 2.** Does the factor structure of the YASB-P associate with the four
Response Decisions (Assertiveness, Passiveness, Overt Aggression, and Relational Aggression)
of SIP as measured by the SSIPA?

*Hypothesis 2.* Individuals with high perpetration scores in social and relational
aggression on the YASB-P will have higher relational aggression in their Response Decisions on
the SSIPA.

**Research Question 3.** Are there differences in males’ and females’ reporting of indirect
bullying behaviors on the YASB-V?

*Hypothesis 3.* Females will report greater victimization through indirect bullying
behaviors on the YASB-V.

**Summary**

In this chapter, I introduced the study of bullying and indirect aggression among children,
adolescents, and early adults. First, direct and indirect aggression or bullying behaviors were
described to provide clarification of the primary constructs under investigation. The significance
of the problem, identifying models that may predict the use of indirect bullying, such as the SIP,
and the need for further research in investigating indirect bullying in late adolescence and early
adulthood, was explained. This research investigation is proposed to help clarify the factor-
analytic structure of the YASB-V, determine whether gender differences exist in self-reporting of victimization of indirect aggression behaviors, and ascertain whether high perpetration scores on the YASB-P are associated with SIP aggressive response decisions. In the following chapter, the constructs and theories regarding direct and indirect aggression and school bullying will be described in the form of a comprehensive literature review.
CHAPTER II
BULLYING IN STUDENTS

Overview

Throughout the past several decades, there has been a great increase in research regarding bullying, and more specifically, bullying in schools (Guerin & Hennessy, 2002). One of the researchers credited with elevating the topic of bullying to international concern is Dan Olweus, a catalytic Norwegian researcher who studies bullying and peer victimization. In particular, there has been an international interest in school bullying since the landmark publication of Olweus’ book, *Aggression in the Schools: Bullies and Whipping Boys*, in 1978, in which he examined bullying behavior and the role of schools. In 2017, Volk and colleagues reviewed the number of publications on the database, *PsychInfo*, using the search term *bully* and found an increasing trend in the number of published articles. Their search resulted in over 5,000 new peer-reviewed publications over the period of the past six years (Volk et al., 2017).

Bullying can be defined as a subcategory of aggressive behavior, but of a particularly vicious kind, in which the behavior is directly repeatedly over time toward a victim who is unable to successfully defend himself or herself from the aggressive attacks (Farrington, 1993; Olweus, 1993; Smith & Morita, 1999). The bullying attacks are most often unprovoked by the victim and are intended to cause hurt through direct aggression (e.g., physical or verbal) or indirect aggression (e.g., social or relational; Björkqvist et al., 1992). Fundamentally, to define a behavior as bullying, there must be an existence of a power imbalance between the bully and the victim (Aalsma & Brown, 2008). As the phenomenon of bullying has piqued international attention, the issue of bullying definitions, language, terminology, and use must be carefully
considered for reporting accurate data statistics and interpretation of cross-national findings (Smith et al., 2002).

Bullying has been defined in a vast array of languages by researchers from countries spanning across the globe such as Scandinavia, the United States (U.S.), Australia, New Zealand, Italy, Spain, and Japan. As such, frequent differences in bullying definitions and terms have been noted in comparable studies examining bullying behaviors and experiences in school-aged children. Many of these studies gathered data by means of anonymous self-report questionnaires on students’ experiences of bullying and bullying victimization (Guerin & Hennessy, 2002). In order to illustrate these semantic dimensions and differences across the globe, Smorti and colleagues (2003) examined the use of the word, *bullying* (e.g., similarities and differences), in comparable studies, and found that there were significant differences amongst countries such as Italy, Spain, Portugal, England, and Japan. These researchers concluded that when any one individual attempts to translate “bullying” from English to other languages, there is no single word or definition that captures that exact, precise meaning (Hong & Espelage, 2012).

Despite these semantic challenges to bullying terminology, Farrington (1993) argues that a specific number of criteria are necessary to define behavior as bullying. These criteria include: (1) a wide range of overt or covert behaviors (e.g., physical, verbal, or psychological), (2) the intention to cause direct or indirect harm, (3) repetition over time, (4) the absence of provocation and, (5) the presence of an imbalance of power favoring the bully over the victim (Guerin & Hennessy, 2002). Similarly, Olweus (1993) proposed that the definition of bullying behaviors should include: (1) an aggressor who intends to cause harm to the victim, (2) aggressive behavior that is repeated across time, and (3) aggressive behavior that involves a power imbalance between the aggressor and the victim. Although there is no one universal agreement regarding
the definition of bullying, there does exist consensus that the major forms or categories of bullying behaviors are physical, verbal, and social or relational (Volk et al., 2017).

In 1973, Heinemann was one of the first researchers to define bullying as *mobbning*, a Norwegian term referring to group violence against a deviant individual that occurs and subsides suddenly (Smith et al., 2002). Later in 1978, Olweus, coined the term ‘bullying’ by extending the term *mobbning* to include systematic one-on-one attacks of a stronger child against a weaker child (e.g., power imbalance). His early studies of peer harassment and social exclusion in children led to the term, bullying, being widely used across countries and increasingly being referred to as *victimization* or *peer victimization* throughout American published works (Perry et al., 1988).

Throughout the 1970s, Olweus’ school bullying research emphasized bullying as direct physical and verbal forms of aggressive behaviors and gave little notice to indirect aggression as bullying behaviors. However, following research in Finland by Björkqvist and colleagues (1992), which recognized the sizable importance of indirect aggression as a category of bullying, Olweus revised his original definition to include forms of intimidation and psychological bullying (e.g., exclusion and spreading rumors; Olweus, 1999). Olweus (1994, p. 1173) stated that “bullying is thus characterized by the following three criteria: (1) it is aggressive behavior or intentional ‘harmdoing’ (2) which is carried out ‘repeatedly and over time’ (3) in an interpersonal relationship characterized by an imbalance of power.” This definition of bullying is now widely accepted by researchers across the globe.

Direct aggression is defined as any overt behavior carried out intentionally, such as verbal shouting or name-calling, and physical acts such as kicking, hitting, and pushing (Sijtsema et al., 2020). Indirect aggression can be described as a covert form of bullying such as gossiping...
and spreading rumors, or social exclusion in which the bully uses a third party to harm the victim in order to remain unidentifiable (Smith et al., 2002). Researchers have also identified and defined bullying behavior as including overt and covert acts of aggression. Overt bullying behaviors refer to acts of direct physical or verbal aggression (e.g., hitting, name calling), while covert bullying behaviors refer to acts of nonphysical aggression that cause harm through damage to relationships and social status such as gossiping or spreading rumors (Bradshaw et al., 2015). Of note, aggressive behavior is often defined as negative acts carried out with intention to harm another (Smith et al., 2002).

Bullying typically involves a conflict between two different personalities (e.g., the victim and the aggressor). Olweus identified a bully as someone who directly (e.g., pushing, shoving, hitting, kicking, or restraining another) or indirectly (e.g., teasing, taunting, threatening, calling names, or spreading a rumor) causes, or attempts to cause fear, discomfort, or injury upon another person or victim (Olweus, 1993). The relative defenselessness of the victim may be for several reasons: they may be outnumbered, smaller, physically less strong, younger, and/or less psychologically resilient (Smith & Brain, 2000). The existence of a power imbalance between the bully and the victim is fundamental to defining aggressive behaviors as bullying. Olweus warns, “it must be stressed that the term bullying is not (or should not be) used when two students of approximately the same strength (physical or psychological) are fighting or quarreling” (Olweus, 1994, p. 98).

Researchers have identified school bullying as social in nature. School bullying behaviors often take place in relatively permanent social groups where the victim has little possibility of avoiding their aggressor, and other peers or social group members (Björkqvist et al., 1982) often support the aggressor. Bullying involves an aggressor and victim; however, school bullying often
involves social groups. When bullying takes place in a school, most students know about it through direct or indirect exposure. As children witness the bullying or victimization of a peer by another on school grounds, their behavior can never be neutral (Garandeau & Cillessen, 2005). They may choose to take sides with the victim, actively join the bullying with the aggressor, or remain passive, which actively reinforces the aggressor by demonstrating that nothing will prohibit them from bullying the victim. Interestingly, O’Connell and colleagues (1999) found that when bullying occurs with peers present or as bystanders, the aggressor is more likely to continue attacking the victim.

**Prevalence of Bullying in the U.S.**

The prevalence estimates of school bullying or victimization, “having been bullied” or “being a victim,” refers to the proportion of school-aged children within a school who have been exposed to bullying/victimizing behavior by other peers with some frequency during a specific period of time (Solberg & Olweus, 2003). Findings from several studies suggest that students experience school bullying most commonly during their adolescent years. Specifically, bullying tends to increase throughout elementary years, peak during early adolescent middle school years, and decline somewhat during later adolescent high school years, suggesting that middle school is the setting with the highest prevalence (Barboza, 2009; Espelage et al., 2012; Gendron et al., 2011; Guerra et al., 2011; Menesini & Salmivalli, 2017; Nansel, 2001; NCES, 2017; Williams & Guerra, 2007). Data from the Global School-based Student Health Survey, in which 317,869 adolescents were surveyed between 2003 and 2015, revealed that the pooled prevalence of bullying victimization on one or more days in the past 30 days amongst adolescents aged 12-17 was 30.5% across country, regional, and global levels (Biswas et al., 2020).
Most studies find that verbal and relational bullying occurs most often, followed by physical bullying (U.S. Department of Education, 2018). According to Youth Truth Student Survey (2019) data, the most commonly reported type of bullying is verbal harassment, followed by social harassment, physical bullying, and cyberbullying. For adolescents in middle school (e.g., those who experience the most bullying), Bradshaw (2007) found that bullying and peer victimization experienced on school grounds occurs most commonly in the classroom (29.3%), followed by hallways (29%), lunchroom/cafeterias (23.4%), gymnasiums (19.5%), bathrooms (12.2%) and recess playgrounds (6.2%).

Nansel and colleagues published the first large-scale study of bullying prevalence in the U.S. in 2000. The authors surveyed more than 15,000 students in grades 6 through 10 and found that the prevalence of bullying involvement among teens and preteens was approximately 30% (Nansel et al., 2001). In particular, 13% reported being a bully, 11% reported being a victim of bullying, and 6% reported being both a bully and a victim. Bosworth and colleagues (1999) examined bullying behavior among 558 sixth-to-eighth grade students at a large middle school located in a major metropolis. They reported that 81% of the students surveyed identified being victimized by their peers, and 7.7% reported frequently bullying someone in their school. Similarly, in a study examining bullying prevalence among 4,263 middle school students in Maryland, 24.1% of students reported bullying a classmate or peer at least once during the past year, with 16.7% bullying one or two more times and 7.4% bullying three or more times during the past year (Haynie et al., 2001; Hong & Espelage, 2012).

**Prevalence of Bullying in Other Countries**

In a cross-national study of 113,000 students between the ages of 11 and 15, from 25 countries, involvement in bullying (being bullied or being the aggressor) varied from nine to
54% across countries (Nansel et al., 2008). Those who reported being victimized by bullying stated that they experienced poorer emotional adjustment and social relationships with classmates than bullies. Specifically, in all countries, victims overall showed poorer emotional adjustment than bullies, whereas bullies demonstrated poorer school adjustment than victims. In 2014, Modecki and colleagues reviewed the existing literature on adolescent school bullying across different contexts and reported that the mean prevalence of traditional bullying (e.g., physical, verbal, and relational) was 35%.

Olweus (1991) conducted a prevalence study with a sample of 130,000 Scandinavian children ages 7-16, finding that between 5% and 9% of schoolchildren reported being bullied on a regular basis during the school year. Furthermore, 15% of children from primary and junior high school reported regular interactions with peers as either bullies or victims, with 3% being bullied and 2% bullying others at least once per week (which corresponded with teacher reports, suggesting that these were accurate estimates of prevalence; Griffin & Gross, 2004). Most recently, the U.S. Department of Education (NCES, 2017) reported on data collected in 2015 and found a 21% prevalence rate of bullying among school-aged youth. The majority (66%) of students who experienced being bullied reported that it happened once or twice during the school year, followed by 19.3% who were bullied monthly, 9.6% weekly, and 4.2% who were bullied daily.

In the United Kingdom, a survey of 4,700 children ages 11-16 years yielded findings that 75% of children reported being the victim of physical bullying within the past school year while 7% of children reported being the aggressor or victim of more severe forms of bullying such as repeated verbal or physical bullying, or social exclusion (Glover et al., 2000). Comparably, a second United Kingdom study employing a sample of school-aged children ages 12-17 found
that 10% of the sample reported being bullied occasionally and 4% reported victimization on a weekly basis (Salmon et al., 1998). Australian research using a sample of 685 schoolchildren ages 6-16 years indicated that 1 in 10 children experienced victimization on a regular basis based upon self and teacher reports (Rigby & Slee, 1991).

**Prevalence Conclusions**

Prevalence rates of bullying and victimization has been the topic of debate in several countries. Carney and Merrell (2001) found that increasing prevalence rates for bullying appear to be similar across cultures and types of educational settings, though bullying behaviors appeared to be increasing in the U.S. (Hong & Espelage, 2012). Yet, Finkelhor and colleagues (2010) found prevalence rates to be decreasing in the U.S. with reports of physical bullying declining from 22% to 15% from 2003 to 2008. In a report by the World Health Organization (WHO) examining the prevalence of bullying and victimization in 43 countries, rates of victimization varied from 2-32% and rates of bullying varied from 1-36% across countries (Hymel & Swearer, 2015; WHO, 2012). The WHO further found an overall decline in rates of bullying in most countries over previous years, although the decline was small and often less than 10% (Hymel & Swearer, 2015). Other studies have noted that although traditional forms of bullying may be declining overall, a new form of bullying (e.g., cyberbullying) is on the rise (Jones et al., 2013).

**Gender Differences in Bullying**

Gender differences by roles, age, and type of aggressive behaviors have been a topic of continuing interest in school bullying research (Smith et al., 2019). Throughout history, decades of research exist supporting the findings that boys are more aggressive than girls. However, more recent research supports that consideration of the contextual factors and types of aggressive
behaviors influence conclusions regarding whether boys or girls engage in more bullying behaviors. Researchers have tried to explain gender differences in bullying by citing that learned behaviors consistent with gender norms or societal expectations suggest that gender patterns in aggression have been evident over time. Many studies suggest that boys have been socialized to use direct physical or verbal aggression while bullying, while girls have learned to use less overtly aggressive acts or to express their aggression indirectly (Björkqvist, 1994; Hellstrom & Beckman, 2019; Lagerspetz et al., 1988).

As a result, children may grow up using gender-stereotypical behaviors leading to different forms of bullying. Boys may see using physical aggression as a sign of masculinity, while girls may see gossiping or rumor spreading as a way to maintain insular friendships. Furthermore, while physical aggression among boys is more acceptable in the U.S. culture, physically-aggressive girls may be perceived as immature and as engaging in norm-breaking behaviors (Eliasson, 2007; Hellstrom et al., 2020). In 2019, Hellstrom et al. found that boys and girls had stereotypical perceptions of gender differences in bullying and that different expectations and needs to “fit the norms” were used in choosing their preferred method of bullying. For example, boys believed they were to be “masculine”, win every fight, and be good at sports. Girls reported they were to like fashion, wear makeup, and were not expected to get into fights. These expectations stem from the need to belong and being able to fit in with peers, which is often expressed differently among boys and girls. Other studies have reported that although bullying behaviors may differ between genders, males and females share a common understanding of the definition of bullying (Lagerspetz et al., 1988).

Gender differences in rates of bullying peers in schools appear to be rather consistent and substantial but less consistent when examining the role of gender and victimization (Smith et al.,
These differences and lack of evidence may be due to how indirect aggression is measured compared to direct aggression. In a meta-analytic review investigating predictors of three bully status groups (e.g., bullies, victims, and bully victims), Cook et al. (2010) found gender to be a significant, but weak predictor of being a bully ($r = 0.18$), followed by being both a bully and a victim ($r = .10$), and being a victim ($r = .06$). Although the strength of the gender effect depended on the specific group being assessed, the researchers noted that boys appeared to be more involved in bullying than girls across all three bully status groups. Furthermore, when examining the strongest individual predictors of victimization, the authors found that peer status ($r = -.35$) and social competence ($r = -.30$) had the largest effect size with respect to being a victim of bullying. Similarly, Sijtsema et al. (2020) found gender differences to be significantly stronger between status or social goals (e.g., power and dominance) and peer-reported direct aggression for boys compared to girls, indicating that boys may more overtly aim for power and respect from others by using direct bullying behaviors.

Boys are most often found to be likely to engage in perpetration of direct bullying than girls, but when social or relational aggression are included (the forms of bullying most often used by females that hurt others by disputing friendships or social status), the differences may wash out (Underwood & Rosen, 2011). Female bullying may still be associated with social power but may take form in more subtle ways. In a study examining gender differences in the conceptualization of bullying in children ages 8-18, girls in the study were more likely than boys to use social aggression as a form of bullying, suggesting that girls more strongly identify bullying as including social or relational aggression (Vaillancourt et al., 2008).
Indirect Aggression and Bullying

Definition

The study of indirect aggression began in the late 1980s (Archer & Coyne, 2005). Indirect aggression emphasizes the more covert types of bullying behavior such as social or relational aggression and is distinct from direct aggression such as physical or verbal attacks. Indirect aggression can be defined as “a kind of social manipulation in which the aggressor manipulates others to attack the victim, or, by other means, makes use of the social structure in order to harm the target person, without being personally involved in the attack” (Björkqvist et al., 1992, p. 52). This form of aggression is also referred to as social or relational aggression. Although indirect aggression, relational aggression, and social aggression are often used interchangeably, research suggests they each distinctively measure their own constructs with independent motivations (Crothers et al., 2009).

Unique to indirect aggression is the attempt to damage peer relationships in covert ways such as exclusion from a social group, rumor spreading, and talking about others behind their backs. Often, but not always, indirect aggression is non-observable and involves the cautious approach of the bully as they often avoid being identified as the aggressor. The perpetrator instigates others to act aggressively against a specified weaker victim in order to harm that victim. They may employ a third person to carry out the acts of aggression against the target person in order to remain completely anonymous or to pretend the attack was not aggressive at all (Archer & Coyne, 2005). For example, the aggressor may criticize a person’s clothes or looks to peers in the same social group while remaining anonymous, while other forms of indirect aggression such as ignoring a target person involve the awareness of the aggressor’s identity (Archer & Coyne, 2005; Björkqvist et al., 1992).
Many forms of indirect aggression exist, including gossiping, imitation behind a victim’s back, turning others against a target person, giving dirty looks, saying something hurtful that appears rational when questioned, or the use of anonymous notes (Archer & Coyne, 2005). The effects of indirect aggression are long lasting as they ultimately result in confusion for the victim or feelings of vulnerability. The confusion for the victim may manifest in them attempting to cover up the damage or deny what is happening to them (Owens et al., 1996). The cover-up or attempts to mask the pain eventually lead to feelings of psychological pain such as hurt, fear, loss of self-esteem, anxiety, or fear of future relationships with other peers. The pain may induce victims in attempting to join other social groups, retaliation, unsuccessful attempts to resolve the conflict, or the victim leaving their school altogether. In other instances, if a victim feels socially vulnerable, he or she may increase or decrease certain behaviors in order to repair social relationships or the friendship with the aggressor (Crothers et al., 2019).

**Prevalence**

Many studies of indirect aggression have used parent or teacher ratings, a common measure used throughout the history of developmental psychology (Archer & Coyne, 2005). According to the National Longitudinal Survey of Children and Youth (NLSCY), the most accurate reporting method to measure the occurrence of indirect aggression is the person who knows most about the child, often parents or guardians. However, this method of reporting poses limitations, as parents and/or teachers are less likely to know the exact details of their children’s social relations at school or within the community (Archer & Coyne, 2005; Vaillancourt et al., 2003). Other methods of study include self-report measures, in which participants are asked how often they engage in various acts of direct or indirect aggression with peers during the past year (Archer & Coyne, 2005; Crothers et al., 2009).
The prevalence of indirect aggression often coincides with a certain level of social intelligence due to its interpersonal style of attack. Björkqvist and colleagues (1992) studied the relationship among social intelligence, empathy, and indirect aggression strategies in students ages 11 and 15. They found that indirect aggression and social intelligence are positively correlated, confirming that 15-year-old girls demonstrated higher trends of indirect aggressive acts than 11-year-old girls. The prevalence of indirect aggression most often occurs during the adolescent years and studies suggest that girls use more indirect violence and that females are typically more indirectly aggressive than males (Vaillancourt, 2005). However, some studies also find few sex differences in the use of indirect aggressive strategies (Vaillancourt, 2005).

The occurrence of indirect aggression also relies on the goals of the behavior. For example, girls who are attention-seeking or seek to secure group inclusion and membership tend to engage in more indirect aggressive strategies to feel a sense of adequacy and importance amongst peers. In a cross-sectional study of 1,403 kindergarten children, parents’ ratings of their child experiencing relational aggression were 1.6% compared to 9.9% prevalence of physical aggression. Similarly, teacher ratings of students’ experiences with relational aggression were represented by a 6% prevalence rate as compared to a 10.9% of prevalence of physical aggression (Meysamie et al., 2013). The authors found no significant difference in the prevalence rates of aggressive behaviors except for relational aggression between parents’ and teachers’ ratings.

**Gender and Indirect Aggression**

In general, the differences in the use of indirect aggression documented between genders in the extant literature are mixed. Many studies have examined the effect of gender on indirect aggression and found females to engage in more indirect aggressive behaviors compared to
males. Specifically, during childhood and adolescence, girls appear to use indirectly aggressive behaviors instead of overt acts of aggression (Crothers et al., 2019). While studying female aggressive styles in adolescence, Björkvqvist et al. (1992) found adolescent girls to report indirect, manipulative methods, such as gossiping, exchanging friends, trying to win others to one’s side, excluding peers from social groups, and writing hurtful notes as typical forms of behavior when in conflict with others. Other findings have revealed that although girls tend to engage in more indirect aggressive strategies, they prefer direct aggression to indirect aggression just as boys do (Artz et al., 2008). Interestingly, a large-scale survey in the UK found both boys and girls reported indirect aggression as more stressful than any other form of bullying (Archer & Coyne, 2005).

Owens et al. (1996) found indirect aggression to be more typical of girls, but this only became evident during the teenage years. The authors found that when girls are aggressive toward peers, they tend to spread rumors, break confidences, and criticize others’ clothing, appearance, or personality more so than boys. Consistent with other forms of indirect harassment, females reported writing abusive messages on desks, writing letters and notes, and engaging in the use of prank phone calls. Research has tried to explain girls’ use of indirect aggression more frequently compared to boys as due to socialization processes, particularly due to childhood peer groups (Owens et al., 2000). Overall, researchers argue girls value close, intimate friendships more so than boys and are more concerned with activity and achievement instead of the physical dominance of others, suggesting that acts of indirect aggression are more used by girls.
Age and Indirect Aggression

Studies of indirect aggression have been noted in children as early as the preschool years, although in a less sophisticated manner than older children, by observing the frequency of aggressive acts towards other children (Archer & Coyne, 2005). Recent studies have found that children as young as two and half years of age display relational aggression, while those ages 3-5 can recognize relational aggression in one another (Casas et al., 2006; Goldstein et al., 2002). Crick et al. (1999) reported that aggressive acts seen in preschool children (e.g., verbal aggression) were precursors of indirect aggression and were observed in children as young as 4 years of age. In particular, Morine et al. (2011) found that both teachers and children identified relational aggression in three and four-year old preschoolers but rated four-year-old’s as significantly more relationally aggressive than the three-year-old preschoolers. Interestingly, the researchers found no gender differences in use of relational aggression, adding to the mixed research on sex differences in the use of relational aggression (Morine et al., 2011).

Several longitudinal studies have shown that older children engage in more indirect aggressive strategies than younger children, suggesting an increasing trajectory in indirect aggression between ages 8 and 11 (Björkqvist et al., 1992; Cairns et al., 1989; Osterman et al., 1998). The occurrence of indirect aggression being used by children as they age has been linked to several theories and hypotheses, many of which involve a social-cognitive-developmental model. One hypothesis is that based on the maturation of language and social-cognitive skills, children advance their perspective-taking abilities.

Consistent with the notion of the continuity of aggression, indirect aggression is a more sophisticated form of aggression that replaces physical acting out and becomes a verbal form of aggression (Vaillancourt et al., 2007). Children begin using indirect aggression around age eight
when their social skills become sufficiently developed to do so. Thus, the variations in indirect aggression according to age tend to be aligned with the development of more mature and sophisticated verbal and cognitive skills (Artz et al., 2008). Additionally, the motives behind indirect aggression are often related to social exclusion, a concept that younger children may not have the cognitive skills to understand. Indirect aggression is only possible when well-established social networks exist and a bully has the social skills necessary to manipulate relationships within those social networks (Archer & Coyne, 2005). Therefore, school-aged children’s use of indirect aggression increases with age as their social and psychological concerns become more prominent (Vaillancourt et al., 2007).

**Relational Aggression**

**Definition**

The concept of relational aggression was proposed in 1969 but was not scientifically studied until the last several decades (Bowie, 2007; Fleshbach, 1969). Relational aggression may be defined as the purposeful intent to inflict or harm a victim through a social relationship. Crick et al. (1999, p. 77) described relational aggression as “behaviors that harm others through damage (or the threat of damage) to relationships or feelings of acceptance, friendship, or group inclusion” (Archer & Coyne, 2005). Examples of relational aggression strategies include withholding friendship, exclusion from social activities, spreading rumors, or threatening to stop talking to a friend (Bowie, 2007). Although many forms of relational aggression are often covert, overtly relational acts exist such as when an aggressor gives a target person the “silent treatment” (Archer & Coyne, 2005). Relational aggression was first discovered during an observational study in which first-grade girls were found to be significantly more likely than boys to engage with an unfamiliar peer with social exclusion from the peer group (Fleshbach, 1969). This
sparked interest in the study of relational aggression specific to genders for researchers throughout the globe.

Relational aggression tends to be manipulative and subtle (e.g., use of anonymous notes, imitating the victim behind his/her back, social ostracism), and research suggests that this form of aggression can create or cause just as much harm as physical aggression (Crick & Grotpeter, 1996). Due to the subtle nature of relational aggression, it tends to go unnoticed by others or is overlooked by those not experiencing the aggressive acts. There is often no physical evidence of the behavior, and the consequences are often mislabeled as normal peer relationship developments and transitions (NASP, 2010).

**Prevalence**

Similar to indirect aggression, relational aggression requires the use of specific verbal, cognitive, and social developmental skills and ranges between a prevalence of 10-20% of all aggressive behaviors (McMorris et al., 2007). Rates of relational aggression peak during adolescent years for both males and females (Hemphill et al., 2010). In particular, for school-aged youth in high school, relational aggression and status are increasingly correlated, with a strong association for girls (Cillessen & Mayeux, 2004). Interestingly, studies have found youth going through puberty report experiencing a high frequency of relationally-aggressive acts from peers, suggesting that the adolescent increase in relational aggression may be related to timing of puberty (Hemphill et al., 2010). Other studies have examined individual factors related to the occurrence of relational aggression such as poor family management, home-school connection, and antisocial friends. For example, for children in grades three through nine, relational aggression positively correlates with perceptions of popularity (Krueger et al., 2001).
Relational aggression is distinguished by the aggressor’s want or intent to cause harm to the victim by sabotaging social relationships in peer social groups, ostracizing the victim from others, or excluding the victim from a peer social group. It is often done through interpersonal manipulation. Adolescent aggression is the most prevalent for individuals in their family structure, peer group, academic setting, or community (Mukhtar & Mahmood, 2018). Crothers et al. (2009) further defined relational aggression as a form of bullying behavior aimed at directly controlling another’s behavior.

**Gender and Relational Aggression**

Similar to indirect aggression, gender differences related to relational aggression are often characterized through learned social experiences. In 1995, Crick and Grotpeter defined and conceptualized the meaning of relational aggression based upon the concept that girls were more concerned with relationships and would therefore use methods to manipulate those relationships as forms of aggression (Bowie, 2007). While studying 491 third-through sixth-grade children, Crick and Grotpeter (1995) found that girls were significantly more relationally aggressive than boys and were more at risk for serious adjustment difficulties, such as reports of being rejected, loneliness, depression, and isolation relative to their non-relationally aggressive peers. Furthermore, the extant literature has found that preschool and school-aged girls most commonly engage in relationally aggressive behaviors and in some cases may have memory preferences for interactions that fit this schema (Giles & Heyman, 2005).

Lagerspetz et al. (1988) also found that middle-school-aged girls were more typically involved with the use of relational aggression strategies compared to boys. Girls were significantly more likely to use relational aggression when angry, such as persuading a peer group not to be friends with the target victim (Bowie, 2017). However, when relational and overt
aggression are measured simultaneously among genders, levels of aggression are more or less equal between the genders (Crick & Grotpeter, 2000; Crick & Rose, 2000).

Many studies of relational aggression use peer nominations, in which subjects are required to nominate three students or peers they believe have acted in aggressive ways (Archer & Coyne, 2005; Crick & Grotpeter, 1995). The use of peer nominations potentially provides more sensitive and accurate information, through which subjects provide information regarding who (e.g., boys vs. girls) is being aggressive (Björkqvist, 2001). Even so, the use of peer nominations poses limitations where those who engage in quieter, and maybe more manipulative, aggressive acts are not rated as doing so (Archer & Coyne, 2005).

**Age and Relational Aggression**

Relational aggression has been noted to exist in individuals as early as three years of age (Ostrov et al., 2004). Research suggests that relational aggression is expressed more commonly as boys and girls age through different developmental periods, with girls increasingly using relational aggressive strategies as they enter middle school (Zimmer-Gembeck, 2005). Cairns et al. (1989) found that as physical aggressive acts decreased during late childhood/early adolescence, acts of relational aggression increased during early adolescence or around ages 11 and 12. Werner and Nixon (2005) explained that relational aggression becomes more sophisticated and more covert as children age. Similar to indirect aggression, this is most likely due to the increase in cognitive, verbal, and social skills as children develop. Relational aggression is common during preschool, elementary, middle-school, and high-school years, but during middle to late childhood, relational aggression may increase in frequency among both aggressors and victims (Björkqvist, 1994; Crick et al., 1999).
With regard to the vast array of types of relational aggression, the different aggressive acts used against a target person become more sophisticated and manipulative as individuals cognitively develop. According to Archer and Coyne (2005), early childhood forms of relational aggression may include threatening to end a friendship, choosing not to invite a target person to their party if they do not want to, or refusing to listen to someone they are mad at by covering their ears. Middle child/pre-adolescent forms of relational aggression may include gossiping, ignoring, social exclusion, embarrassing the target person in public, writing and sharing mean-spirited anonymous notes, or creating group huddles to make fun of the target person. And finally, adult forms of relational aggression may include saying something hurtful about a target person that appears rational when questioned, judging others’ work in an unjust manner, or openly dismissing the opinion of other peers (Archer & Coyne, 2005).

**Social Aggression**

**Definition**

Social aggression consists of actions or behaviors directed at damaging another’s self-esteem, social status, or both, and may include the use of directed facial expressions toward a target person, cruel gossiping, or the manipulation of friendships (Galen & Underwood, 1997). Galen and Underwood (1997) argued that social aggression focuses on covert rather than overt behaviors and encompasses both indirect and relational aggression measures (e.g., harmful nonverbal behaviors, rolling the eyes, giving dirty looks). These forms of aggressive acts are focused more on making the victim feel bad about themselves. Interestingly, in their estimation, Galen and Underwood (1997) contend that the use of socially-aggressive acts are aimed at damaging a target person’s self-esteem and do not focus on damaging their social relationships.
Social and relational aggression are occasionally viewed in a similar manner but are clear, distinct entities. Relational aggression encompasses only covert forms of aggressive behaviors while social aggression includes both covert and overt forms of aggressive behaviors. Social aggression also includes both verbal and nonverbal acts of aggression. Verbal acts include insulting, name-calling, teasing, or sarcastic remarks, while nonverbal acts include a mean/disgusted face, laughing, finger pointing, staring, or sticking out a tongue (Martins & Wilson, 2012). However, researchers typically do not include acts of verbal aggression (e.g., insults) as a form of social aggression (Crick et al., 1999).

Social aggression is likely more sophisticated than relational aggression, as it requires the use of understanding social dynamics and roles in order to achieve one’s own goals through the use of manipulation (Crothers et al., 2019). As aforementioned, bullying behaviors often involve a dyad but typically include more than two students when occurring at school. Researchers suggest that social aggression may include both non-confrontational aggression in a larger peer group setting or a direct relational manipulation in a dyad with a power imbalance. Therefore, social aggression uniquely applies to both dyadic relationships as a form of manipulative bullying behavior and group relationships as a form of manipulating another’s social position as bullying behaviors (Archer & Coyne, 2005).

**Prevalence**

Social acts of aggression require the knowledge of social dynamics amongst peers or social groups in order to carry out targeted and harmful manipulation against a victim (Crothers et al., 2019). Research has shown that gossip is the most common form of social aggression used (Galinsky & Salmond, 2002). In a study of 1,001 nationally represented students from grades five through 12, 66% reported being teased or gossiped about at least once during the past month.
and 25% reported experiencing being gossiped about five times or more in the past year (Galinsky & Salmond, 2002).

**Gender and Social Aggression**

Similar to relational aggression, research suggests girls tend to use socially-aggressive tactics more often than boys (Galen & Underwood, 1997). However, a meta-analysis of the magnitude of these gender differences specific to childhood and adolescence ranged from small to medium due to the varying methods of assessing aggression (Card et al., 2008). One explanation for evidence supporting that females are more socially-aggressive than males are due to adult expectations for gender-stereotypic behaviors that result in parents and teachers perceiving that girls are more indirectly aggressive than boys. Specifically, parent and teacher reports yield greater gender differences in social aggression in favor of girls, whereas self-reports yield a slightly lower magnitude of these gender differences (Card et al., 2008). Overall, although gender differences in social aggression may be small, there is empirical evidence supporting that social aggression is enacted more so by females than males.

**Age and Social Aggression**

Many researchers support the idea of social aggression being used by both boys and girls as part of an age-related, developmental progression (Zimmer-Gembeck et al., 2005). As gender differences suggest that girls engage in more socially-aggressive acts as compared to boys, this pattern of results has also been found for older children (Crick & Grotpeter, 1995). According to Archer and Coyne (2005), social aggression is only possible once an aggressor understands and maintains the necessary social skills to comprehend and manipulate relations in a social group. The associations of social aggression and age are linked to children using developmentally-appropriate and normative forms of aggression. This suggests that as children and adolescents
age, the use of social aggression parallels the development of greater verbal abilities and social sophistication (Card et al., 2008).

**Interpersonal Maturity**

**Definition**

Perspectives of maturity have been benchmarked by several factors, such as puberty, changing societal needs, brain development, and behavioral changes (Johnson et al., 2010). Understanding the nature of bullying and its developmental processes is of considerable theoretical and scientific importance (Arsenio & Lemerise, 2002). This has prompted interest in linking the development and interpersonal maturity of individuals to acts of aggression. Interpersonal maturity is a dimension of personality and describes the psychological development of a person. Greenberger and Sorensen (1974) conceptualized a psychosocial model of maturity and included three factors that impact an individual’s functioning in society: (1) individual adequacies, (2) interpersonal adequacies, and (3) social adequacies. Individual adequacy relates to an individual’s ability to function effectively on their own, interpersonal adequacy relates to an individual’s ability to function and interact effectively with others, and social adequacy relates to an individual’s ability to effectively contribute to social group cohesion and solidarity (Adams et al., 1978).

**Gender and Interpersonal Maturity**

Research findings in gender differences among bullying behaviors have shown that females are better at peaceful interpersonal conflict resolution than males (Björkqvist et al., 2000; Osterman et al., 1997). According to Cohn (1991), females mature faster than males and therefore are more socially competent at earlier ages. These socially-competent skills are used for the purpose of both aggressive behaviors and resolution of conflicts with others. Social
competence or social intelligence refers to the ability that allows children to understand the goals, needs, and intentions of others in social situations and use that knowledge to select an appropriate behavior for the purposes of achieving desired social goals (Carreras et al., 2014).

**Age and Interpersonal Maturity**

The development of aggression is often related to the advancement of cognitive, verbal, and social skills as individuals age. With increasing age, the styles of bullying become more focused on the motivations behind the aggressive acts. Acts of aggression typically occur during childhood, but the advancement and sophistication of those acts change as individuals age and develop. Presently, neuroimaging studies have yet to distinguish a chronological cutoff point for behavioral or cognitive maturity (Johnson et al., 2010). Yet, research suggests older adults typically report higher levels of satisfaction with their social relationships than younger adults (Luong et al., 2011).

Older adults report greater satisfaction and positive emotions and fewer negative experiences in their social interactions within their social networks (Charles & Piazza, 2007), whereas younger adults report experiencing more interpersonal tensions within their social networks (Birditt & Fingerman, 2003; Luong et al., 2011). Similarly, reports of interpersonal conflicts decline with age, with older adults experiencing fewer problematic and ambivalent relationships than do younger adults (Fingerman et al., 2004; Luong et al., 2011). For example, Blanchard-Fields and colleagues (2007) found that older adults are more problem focused in solving difficulties than young adults and use more avoidant-denial strategies when solving interpersonal problems. Additionally, they found that older adults were also more effective than young adults when solving everyday problems; in particular, for interpersonal problems (Blanchard-Fields et al., 2007).
The cognitive and interpersonal maturity aspects of bullying is theoretically important to consider, given that social cognition is at the core of children’s social skills and their abilities to get along well with peers (Espelage et al., 2017; Sutton et al., 1999). In an attempt to understand aggression among youth in schools, numerous explanations, such as SIP theory or Theory of Mind, have been posited as different assumptions for why individuals engage in bullying behaviors. Developmental scholars alike have examined a vast array of theoretical frameworks to better understand the characteristics and implications of bullying and victimization and have attempted to advance the field by integrating traditional theories together. These models and core theories as explanations for human development in relation to children’s aggressions and moral transgressions continue to emerge as relevant areas of study today.

**Models for Explaining Bullying**

*Evolutionary Psychology Perspective*

Some researchers believe that bullying can be understood through the lens of evolutionary psychology theory. Evolutionary psychology theory is rooted in concepts from Darwin’s evolution theory and explains that humans engage in aggressive behaviors to increase their ability to survive and reproduce (Koh & Wong, 2015). Proponents of evolutionary psychology theory argue that bullying is an adaptive behavior learned by humans in order to gain better sexual opportunities and physical protection, and promote mental health (Koh & Wong, 2015). The two processes posited by evolutionary psychology theorists are natural selection and sexual selection. Natural selection is based on “survival of the fittest” and encompasses three components: (1) advantageous variation, (2) heritability, and (3) offspring.

Advantageous variation refers to the natural variation of some physical, mental, or behavioral characteristics in individuals that aid survival (Bjorklund & Pellegrini, 2000; Koh &
In regard to youth bullying, males who are seen as aggressors often gain reputations of being tough and therefore may earn protection from being attacked by other aggressors. Researchers suggest other advantages of being an aggressor include suffering from fewer physical health problems such as headaches, sore throats, and colds (Fekkes et al., 2004), whereas youth who are being bullied experience an increased likelihood of depression and psychosomatic symptoms (Fekkes et al., 2004).

Heritability refers to the notion that bullying behaviors or traits have a heritable component and can be passed through inherited genes. In twin studies, researchers have examined the genetic and environmental influence on the stability of aggressive behaviors and estimated that genetic influence accounts for 65% of the variability of aggressive behaviors (Ball et al., 2008; van Beijsterveldt et al., 2003). The third component of natural selection is the concept of offspring, in which bullies may have better “fitness” than non-bullies in terms of increased sexual opportunities, thus leading to more opportunities to reproduce than non-bullies (Koh & Wong, 2015).

The opposing second process underlying evolutionary psychology theory is sexual selection. Sexual selection emphasizes the selection of traits based on survival advantages, and implies that men and women have evolved to seek out certain characteristics, such as athleticism in the opposite sex, which promote better mating opportunities (Buss, 2004). Evolutionary psychologists reason that youth bullying was developed in order to elevate social status and gain more desirable mates (Volk et al., 2012). In other words, domination for social status to increase one’s sexual access contributes to greater changes of survival or reproduction (Koh & Wong, 2015). As such, the evolutionary psychology theorists hypothesize a strong relationship between
establishing a social hierarchy and gaining sexual opportunities exists through evolved adolescent bullying behaviors.

**Social/Ecological Model**

Those espousing the social-ecological framework attempt to explore factors in an individual’s environment that foster or inhibit bullying behaviors (Merrin et al., 2018). In this model, theorists propose that behaviors of an individual are influenced by various contextual factors of the social environment in which they are embedded (Bronfenbrenner, 1979). The bullying behaviors are guided by different individual, family, peer-group, school, and community level factors that an individual may experience (Espelage, 2014). Researchers posit that the social-ecological correlates of bullying and victimization are due primarily to family, school, and community interactions.

Individual level correlates of bullying include age, sex, and race/ethnicity. Although there is a growing literature base that supports bullying differences among age and sex, there is little evidence to suggest that there are bullying differences among race/ethnicities. However, children and adolescents of racial and ethnic minorities report experiencing more racist name calling than those from ethnic majorities (Monks et al., 2008). Studies exploring individual level differences have found that adolescents who engage in more antisocial and delinquent activities are more at risk for bullying perpetration behaviors (Merrin et al., 2018; Radliff et al., 2012). According to Carlyle and Steinman (2007), when adolescents use alcohol or drugs, they may experience impaired thoughts leading to higher levels of engagement in misbehaviors, such as bullying perpetration. Similarly, Radliff and colleagues (2012) found that adolescent youth involved in bullying were more likely than students not involved in bullying to use substances, with bully-victims reporting the greatest levels of substance use.
Family environments and family characteristics continue to play a role in understanding behaviors of those who bully and those who do not. The influence of family environment, family involvement, and parenting behaviors can explain bullying behaviors through different theories such as attachment theory, social learning theory, and family systems theory (Holt et al., 2008; Merrin et al., 2018). Research suggests adolescents who bully may come from family environments lacking warmth that are abusive, conflictual, or dysfunctional versus those who do not bully may come from homes with high levels of parental support or involvement (Baldry, 2003; Espelage et al., 2014; Holt & Espelage, 2007; Low & Espelage, 2013; Wang et al., 2009).

The impact of school contextual factors on bullying behaviors do not include size of school, class size, or rural verses urban school setting, but refer to the school ethos, attitudes of teachers when bullying occurs, degree of supervision of students, and effectiveness of school policies (Galloway & Roland, 2004; Monks et al., 2009). Students who feel connected to their school and perceive their school as safe are less likely to be involved in bullying behaviors (Merrin et al., 2018). Conversely, students who feel that their school is disorganized, report low school connectedness, and perceive their school as high-risk are more likely to experience elevated rates of bullying perpetration (Merrin et al., 2018). Morrison and colleagues (1994) found that students’ ability to achieve in the school setting may be negatively influenced by high-risk school environments, including higher rates of bullying. On the contrary, students who believe their teachers are supportive and receive effective school-wide bullying prevention and intervention efforts are less likely to experience bullying behaviors.

**Crick and Dodge’s Social Information Processing (SIP) Model**

One of the most important developmental and theoretical frameworks for understanding school bullying was proposed by Crick and Dodge (1994) using a SIP perspective. The SIP
model is one of the most widely known frameworks for understanding aggression, prosocial behaviors, and negative social adjustment among children and adolescents (Santone et al., 2020). The SIP model proposes that in order for children and adolescents to respond appropriately to social situations, they must first process social information in an orderly fashion (de Castro, 2004). Children and adolescents’ beliefs and conceptions of social situations and the people involved in those social situations influence how they process social information and then how they react in those social situations (Thornberg et al., 2012).

The original SIP model was composed of five sequential cognitive processes that were thought to influence children’s behavioral responses (Crick & Dodge, 1994). Following evidence suggesting that reactive and proactive aggression were uniquely related to different steps in the SIP model (and thus should be studied independently), Dodge (1991) reformulated the SIP model to include six cognitive processing steps reflecting how children understand social information and interactions. When confronted with social cues, individuals progress through the six cognitive processes to inform a behavioral response (Santone et al., 2020). The six steps of the SIP model include: (1) encoding of social cues, (2) interpretations of social cues, (3) clarification of goals, (4) response construction, (5) response decision, and (6) enactment of behavioral response. Deficits at each of these steps have been found to be related to aggressive behaviors.

**SIP Theory**

Early SIP theories traced the development of aggressive behaviors from early frustration and drive models to social learning models (Bandura, 1973; Eron, 1994). SIP theorists argue that children engage in a series of sequential processes when faced with a social situation. Owing to research findings in the late 1980’s and early 1990’s showing significant differences in social
cognitions between aggressive and nonaggressive children, Crick and Dodge (1994) proposed the SIP model to understand how children cognitively process social problem situations (Boxer & Dubrow, 2002).

The six-step SIP model has been heavily studied over the past several decades and researchers from different fields have acknowledged its importance to understanding social-cognitive information-processing mechanisms related to bullying and bullying behavior patterns. In this model, behavioral responses are viewed as a product of a sequence of the social-cognitive information processing steps (Possel et al., 2018). The six cognitive processing steps (e.g., encoding of social cues, interpretations, clarification of goals, response construct, response decision, and enactment of behavioral response) can be seen as a repeating, conscious, or unconscious process in social interactions (Possel et al., 2018). Skillful processing at each step is believed to contribute to a competent performance within a social situation, whereas biased or deficient processing at any step is believed to lead to deviant social behavior (e.g., aggression; Crick & Dodge, 1996).

A substantial body of empirical evidence has found that children develop social-cognitive patterns that are correlated with individual differences and experiences of social maladjustment, more particularly with aggressive behavior patterns (Coie & Dodge, 1998). Although some theorists describe social cognition as unidimensional, the SIP model articulates social cognition as a complete set of distinct mental steps that children proceed through when confronted with a problematic social stimulus. It is proposed that at each of the six steps of the SIP model, individuals develop stable patterns or styles of processing, which then act as acquired personality-like characteristics to guide future social behaviors (Dodge et al., 2002).
**Encoding of Social Cues**

The first step of the SIP model is the encoding of social cues, in which relevant aspects of social stimuli are detected by a selective perception. When confronted with a problematic social situation, some, but not all situational cues are sensed, perceived, and placed into working memory (Dodge et al., 2002). In order to manage and make sense of the social input, individuals learn to selectively attenuate to the features in their environment that are deemed most relevant, which are then encoded into short-term memory (Possel et al., 2018). A key component of this step is the idea that children develop internally-consistent patterns while encoding that characterize their later behavioral responses and take on features of an acquired personality characteristic (Zelli et al., 1999). Both deficits and hypervigilance to relevant social cues have been correlated with aggressive behavior (Dodge & Newman, 1981). Nonaggressive children are more effective at encoding relevant social cues about contexts and emotions while aggressive children encode fewer relevant social cues and more hostile cues (Santone et al., 2020; van Nieuwenhuijzen et al., 2015). Failure to encode relevant social cues, such as a child’s facial cue or verbalization, will increase the likelihood of misinterpreting a peer’s intention.

**Interpretations**

The second step of the SIP model involves interpreting the social cues, which are encoded, and assigning them meaning. During this process, interpretation of social cues often involves interpretation of others’ intentions and attributions about the cause of the social situation (Crick & Dodge, 1996). Children use intent attributions to interpret both internal and external stimuli in order to make sense of an interpersonal situation. For example, children who misinterpret social cues may experience deficits or biases related to inaccurate problem-solving.
Relatedly, aggressive children may attribute hostile intent to the interpretation of a social cue from a peer more so than non-aggressive children do (Crain et al., 2005).

**Clarification of Goals**

The third step of the SIP model involves clarification of goals, in which an appropriate interaction goal needs to be specified. At this stage, children select a social goal based on the social situation in order to achieve a desired outcome (Santone et al., 2020). Additionally, during this stage, if a child is emotionally aroused, they are likely to experience deficits during this process related to appropriate goal identification. These deficits may lead to inaccurate goal selection based on misinterpretation of social cues or hostile attribution biases (Santone et al., 2020). Those who experience deficits are often perceived negatively by their peers, leading to experiencing rejection or bullying behaviors. Patterns of goal setting related to revenge goals have been found to predict aggressive tendencies (Erdley & Asher, 1996).

**Response Construct**

The fourth step of the SIP model involves the generation of possible responses for the identified goals. During this stage, behavioral responses are selected from long-term memory, through processes of associate networks, schemas, and other access rules (Crick & Dodge, 1996). While some behavioral responses occur automatically, individuals can elect or enable potential verbal or physical behavioral responses based on the demands of the situation during this stage (Possel et al., 2018).

**Response Decision**

The fifth step of the SIP model involves evaluating and selecting whether an accessed response is acceptable based on the social situation. Individuals may evaluate their selected
behavioral response based on interpersonal and instructional outcomes (Crick & Dodge, 1996). If children experience a deficit at this stage, aggressive behavioral responses are elevated.

**Enactment of Behavioral Response**

The final step of the SIP model involves children performing a selected behavioral response based upon the previous two processes (Santone et al., 2020). During this stage, individuals use protocols or scripts to transform their selected behavioral response into behavioral performance. Nonaggressive children with competent responses are selected based on their evaluations of the positive and negative outcomes, whereas aggressive children more likely fail to evaluate the consequences of their aggressive behaviors and place more emphasis on short-term, selfish gains (Dodge & Goodwin, 2013; Slaby & Guerra, 1988). Although the steps are presented and discussed separately, the stages of the SIP model are processed simultaneously. This theory and empirical framework suggests that deficits in social and cognitive-information processing at individual stages guide the understanding of anti-social and bully behaviors (Dodge & Goodwin, 2013).

**Age and Social Information Processing Theory**

As aforementioned, the SIP model hypothesizes that deviant behaviors (e.g., aggression) occur due to deficits or bias in one or more of the six steps of the model. During childhood, common social challenges include initiating friendships, acquiring objects, or seeking attention from peers (Rubin & Krasnor, 1986). According to the SIP model, children approach social challenges or social interactions with a set of biologically-limited capabilities and memories based on learned experiences, which contribute to the six steps (Crick & Dodge, 1994). Thus, younger children who have limited experience in social situations tend to have less varied
knowledge of mental structures to draw upon when processing information in social interactions (McGee et al., 2009).

These social knowledge structures begin forming early in a child’s life and can be negatively biased if the child views the world as unsafe. For example, children who have been maltreated exhibit hostile encoding patterns, hostile attribution errors, and aggressive verbal and non-verbal problem-solving techniques more so than children who have not been maltreated (Dodge et al., 1990). Further, Weiss and colleagues (1992) found children who experienced higher levels of harsh discipline had an increased tendency to generate aggressive responses towards peers. These deficits in SIP from early childhood experiences have significant implications for later social adaptation and behavioral adjustment (Burks et al., 1999). Other developmental differences in processing patterns suggest that as children age, they acquire increased processing skills such as the evaluation of their responses and enactment of behavioral responses.

**Gender and SIP Theory**

Researchers, in using the SIP model, hypothesize that aggressive males are more likely than nonaggressive males to attribute a hostile intention to the peer instigating a behavior (Dodge, 1980). However, much of the research that has been conducted has tended to use largely male samples. Aggressive males are also more likely than nonaggressive males to continue to expect hostility from the peer with ambiguous intent. However, when the intentions of another peer clearly defined, aggressive males as young as seven years of age are able to alter their retaliatory behavioral response according to the defined intention as appropriately as nonaggressive males (Dodge, 1980). Price and Glad (2003) found that males who experienced maltreatment were more likely to exhibit hostile attributional tendencies than those who did not
experience maltreatment. However, other research studies have found no sex differences to exist in processing patterns (Weiss et al., 1992).

**Attribution of Intent**

A large body of research has consistently shown that aggressive children and adolescents perceive, interpret, and make decisions on social cues in ways that increase the likelihood of engaging in aggressive responses (Dodge & Crick, 1990). Similarly, aggressive children and adolescents tend to attribute others’ intentions as benign or hostile, especially so when the intentions of others are more unclear and ambiguous (van den Berg & Lansu, 2020). This phenomenon is also known as hostile attribution bias (HAB). Orobio de Castro et al. (2020) conducted a meta-analysis and found that attribution of intent and aggressive behaviors are clearly and distinctly related.

**Emotion Intensity**

A critical aspect to understanding how children process social information is linked to the influence of ongoing emotions and their intensity. According to Hoffman (1981), thinking about people differs from thinking about things, and is likely associated to the emotional valence we assign to interpersonal interactions. Thus, when children are experiencing peer provocation situations (e.g., being excluded from play or teased in front of others), they are more likely to experience higher levels of emotional arousal or intensity (Lemerise & Arsenio, 2000). Crick and Dodge (1994) suggest that emotions are important influences during SIP and the integration of emotion and SIP are important sources of information for understanding aggression. They posit that emotions can energize particular steps of the model and assert that goal selection or attainment can alter based on mood or emotion (Lemerise & Arsenio, 2000).
Emotions such as feeling angry, happy, or frustrated may cue different behavioral responses in the SIP model. When those emotions are experienced at higher intensities, children who cannot self-regulate may be too overwhelmed or self-focused to generate acceptable responses (Lemerise & Arsenio, 2000). Such children are more likely to experience preemptive processing, which results in a response that is unlikely to further social interaction with peers (Crick & Dodge, 1994). For children who are more skilled at emotional regulation, they may be more likely to consider a social situation from varying perspectives and respond in a more competent manner.

**Response Evaluation**

Response evaluation refers to the decision-making task for children once they have generated all possible responses to a particular social situation (Dodge & Crick, 1996). During this phase, children must evaluate their responses based on three criteria: (1) the quality of each generated response, (2) the type of outcome likely to ensue, and (3) the degree of confidence that they feel about their ability to perform each response (Dodge & Crick, 1996). The first criterion involves children’s own assessments of their generated responses or social behaviors pertaining to the specific social situation. The second criterion refers to children’s evaluations of what is going to occur in the social situation based on the enactment of the social behavior. The third criterion involves children’s self-belief that they can successfully enact social behaviors to achieve the desired outcomes of the social situation. Many research findings suggest that aggressive children experience problematic deficits during the processing of all three criteria (Dodge & Crick, 1996).
**Relevant Theory**

SIP theory is linked to several other relevant theories. For example, theories of cognitive mediators of behavior, theories of development, and social learning theories approach aggressive behaviors in a similar manner. Other theories, such as domain theory, focus exclusively on the underlying latent structures of SIP. In addition to the concern of the SIP model on harm and victimization of children, the theory of moral development attempts to explain children’s aggression through the connection of their social cognitions and related behaviors (Arsenio & Lemerise, 2004).

**Gaps in the Literature**

Research about SIP mechanisms and the SIP model proposed by Crick and Dodge (1994) have often focused on children and adolescents. Less research has been devoted to studying aggression in late adolescents and early adulthood. Given the developmental changes that occur during early and late adolescent years, there is a need to examine how SIP occurs during the later years of adolescence. Furthermore, because adolescents’ social relationships become more emotionally close and intimate, and their social status may become more refined, there should be greater significance on longitudinal effects of the SIP model. Other findings regarding the SIP model have failed to examine how social cognition predicts aggressive behaviors specific to relational aggression in both males and females (Crick, 1995; Crick et al., 2002; Crick & Werner, 1998). Currently, little is known about the measures used to examine the validity and application of the SIP model.

**Measuring Aggression in Adolescents**

The assessment of aggression in adolescents has been accomplished using various methods, such as self-report measures, teacher and parent rating scales, peer nominations,
observational methods, and hypothetical vignettes. Given the seriousness of aggression, particularly relational aggression, methods for appropriate assessment of aggression in adolescents continues to attract increasing support. In 2005, Archer and Coyne conducted a systematic review of various approaches to measuring aggression in children and adolescents.

Observational methods were found to be more employed in studies with preschool children due to the association between free-play and aggressive behaviors in younger-aged children. However, observational methods are limited by the covert nature of the observer, thus making it a less reliable and practical measurement method for older children and adolescents. Teacher and parent rating scales can be informative and practical with their ease of use; however, ratings of relational aggression may be influenced by gender stereotypes biases, namely the personal belief that girls engage in more covert, relational aggression and boys engage in more covert, physical aggression (Voulgaridou & Kokkinos, 2015).

A common measuring method of aggression and victimization in adolescents includes peer nominations, where students are asked to evaluate classmates on both indirect and relational aggression behaviors (Crick et al., 1999; Crothers & Levinson, 2004, Voulgaridou & Kokkinos, 2015). These methods are common measurements of relational aggression and victimization because the behaviors of interest are using information from direct sources (e.g., adolescents themselves) rather than teachers or parents. Peer nominations have generally favorable psychometric properties but may be limited for use with younger children who may not be able to reliably understand what the assessment is asking of them (Voulgarido & Kokkinos, 2015).

Research suggests that self-report measures of assessing aggression and being the victim of bullying behaviors are not reliable for measuring relational aggression due to aggressors denying their actions and victims hiding being bullied (Archer & Coyne, 2005). Self-report
measures of aggression may pose a risk for demand characteristics and social desirability biases (Bailey & Ostrov, 2008). Yet, other studies find self-report measures are reliable for older children who may be more inclined to accurately report experiences of bullying behaviors, both being the perpetrator or the victim (Marsee et al., 2011). As each diagnostic method of measuring aggression uniquely contributes to understanding bullying behaviors, the use of multi-source, multi-methods for assessing relational aggression and victimization are recommended (Archer & Coyne, 2005; Crothers et al., 2009).

**Gender Differences**

In childhood, gender differences in aggression are often but not always documented, with girls exhibiting greater levels of relational aggression and boys exhibiting greater levels of physical aggression. Researchers utilizing teacher and peer-rating scales and report methods have generally found gender differences in relational and physical aggression in preschoolers. However, assessments of gender differences in aggression for adolescents and adults are more limited, with cross-sex interactions becoming increasingly common (Maccoby, 1990). Based on the previous developmental literature, research suggests that as individuals age, men self-report higher levels of physical aggression than women, and women self-report higher levels of relational aggression than men (Crick & Grotpeter, 1995; Hawley, 2003; Little et al., 2003).

However, although a more recent study found that men ages 18-25 self-reported higher levels of physical aggression than women, no gender differences were found for self-reported levels of relational aggression (Bailey & Ostrov, 2008). These findings are consistent with emerging literature suggesting no gender differences exist with use of relational aggression. Further adding to newer hypotheses of no gender differences in relational aggression in adulthood, Murray-Close et al. (2010) found that as males and females did not differ in their
overall use of relational aggression, and as both genders increasingly interact with one another, males may learn how to effectively employ relationally-aggressive strategies from female friends and romantic partners. Although research exists regarding the perpetration of indirect bullying behaviors, limited studies investigate the gender differences in victimization measures.

When investigating assessments of gender differences in aggression for children, McEvoy and colleagues (2003) suggest that using observational techniques to study relational aggression opposed to rating scales and peer nomination measures may be a more reliable and valid measurement for females than for males. This may be due to the fact that young girls often play in gender-segregated female groups and may be at an increased risk for experiencing relational victimization from their peers (Maccoby, 1990). Additionally, observational evidence of aggression in young children’s behavior has been repeatedly recognized by researchers due to the limitations of teacher and peer informants. Collectively, observational methods offer reliable and valid approaches to investigating both aggression and associated social behaviors (e.g., peers, play style) in natural settings (e.g., classrooms, playground) for children and school-aged youth.

**Purpose of the Current Study**

The purpose of this study was to examine the factor analytic structure of the YASB-V, and whether gender differences exist in the self-reported experience of victimization through relational and/or social aggression. This study was further intended to provide support for relational and social aggressions as separate, distinct entities of bullying behaviors through the validation of the original CFA conducted on the YASB-P. Additionally, as a means of providing more information to the extant literature base, this study also examined whether the use of forms of indirect bullying in a late adolescent sample using the YASB-P are associated with SIP
response decision styles (e.g., assertiveness, passiveness, overt aggression, and relational aggression) as measured by the SSIPA.

**Summary**

In this chapter, the definitions, constructs, prevalence rates, and gender differences related to direct and indirect bullying behaviors were described. In this chapter, I outlined the distinct forms of aggression, how they are measured, and the SIP theories related to aggressive tendencies. In particular, I described the SIP model proposed by Crick and Dodge (1994) as a relevant comprehensive framework that examines deficits exhibited by aggressive children and youth.

In the next chapter, I will focus on the methodology related to measuring relational and social aggression among adolescents. Specifically, I will provide information regarding the participants for the current study, the measurement tools that were used to collect the data, the data collection procedures, and the methods of data analysis. The primary aims of this research was to determine the underlying factor structure of one instrument measuring relational and social aggression reports of indirect bullying behaviors (e.g., victimization) by gender. My other research question was to investigate whether high perpetration of indirect bullying behaviors predict SIP response decision styles. These research questions will be expanded upon in the following chapter.
CHAPTER III

METHODS

The purpose of this quantitative study was to achieve multiple aims, including the following:

1) to investigate the factor analytic structure of the YASB-V
2) provide support for relational and social aggression as separate, distinct entities of indirect bullying behaviors in the YASB-P
3) examine gender differences in self-report measure of the victimization of indirect bullying in the YASB-V
4) ascertain whether the use of forms of indirect aggression as measured through the YASB-P are associated with SIP response decision styles in a late adolescent sample.

In the following sections, I describe the procedures for the recruitment of participants, the measures and procedures used for data collection, the psychometric properties of these measures, the research methodology, the limitations of the study, and the methods of data analysis.

Research Questions

Research Question 1. What is the factor structure of the YASB-V?

Hypothesis 1. The factor structure will be consistent with that which has been reported for the YASB-P in previous research.

Research Question 2. Does the factor structure of the YASB-P associate with the four Response Decisions (Assertiveness, Passiveness, Overt Aggression, and Relational Aggression) of SIP as measured by the SSIPA?
**Hypothesis 2.** Individuals with high perpetration scores in social and relational aggression on the YASB-P will have higher relational aggression in their Response Decisions on the SSIPA.

**Research Question 3.** Are there differences in males’ and females’ reporting of indirect bullying behaviors on the YASB-V?

**Hypothesis 3.** Females will report greater victimization through indirect bullying behaviors on the YASB-V.

**Participants**

Participants for this study were sought from a mid-sized private university located in a city in the mid-Atlantic U.S. Participants in the current study consisted of a convenience sample of 451 late adolescents who attended the participating university. A table with the description of the demographic information regarding this sample of students will be presented in the next chapter. Because students who would not be considered late adolescents could not directly be prohibited from completing the surveys via flyers that contained QR codes, a total .6% sample of students with ages outside the 18-25 years’ age range responded. These responses were excluded from the analysis (n = 4). Additionally, as the purpose of the research study is to examine gender differences among reports of indirect bullying behaviors, those who selected their gender as transgender female, transgender male, and prefer not to respond, were subsequently excluded from the analysis (n = 12).

**Measures**

Increased awareness of the effects and use of indirect aggression among youth has led researchers to evaluate the prevalence of bullying and peer victimization (Sawyer et al., 2008). Specifically, there is evidence that, although similar, relational and social aggression are distinct,
unique forms of aggression (Crothers et al., 2009). Despite a growing consensus regarding the scientific need for understanding these forms of aggression, the assessment methods used to examine bullying have come under question. In particular, self-report measures of victimization (e.g., the most commonly used method for assessing the prevalence of bullying and peer victimization) have been criticized due to limited information regarding their reliability and validity (Crothers et al., 2009; Sawyer et al., 2008).

Furthermore, although several methods or instruments designed to measure indirect aggression exist, few self-report measures can be used for adolescents (Crothers et al., 2005), as most are limited to preschool or elementary age children, are brief, and do not uniquely assess relational aggression (Crothers et al., 2009). With regard to gender differences in bullying and victimization, there are relatively few studies exploring gender variations in self-reports of involvement in indirect aggression. The aforementioned discrepancies in students’ self-reports of involvement in bullying suggest a noticeable lack of empirically-validated instruments designed for use in measuring indirect aggression. Further, few instruments measuring SIP patterns in adolescents exist. In 1980, Dodge introduced the instrument, Home Interview With Child, for measurement of SIP in children, specifically designed to assess hostile attributions. SIP patterns were assessed during semi-structured home-visits and interviews with children’s mothers or caregivers.

Additional instruments investigating SIP in children often depict hypothetical vignettes such as the Social Problem-Solving Scale (Dodge et al., 1990) and Things That Happen to Me (Crick & Dodge, 1996). Although these instruments support convergent, discriminant, and construct validities of SIP patterns in children, psychometric support for adolescents’ SIP patterns are lacking (Dodge et al., 2002). After an extensive review of the existing literature,
however, three instruments were selected for use in this study. The instruments are described in
detail below.

**Young Adult Social Behavior Perpetration Scale (YASB-P)**

The YASB-V and YASB-P instruments were developed by Crothers et al. (2009) for the
purpose of measuring self-reported relational and social aggression in adolescents and young
adults, as well as behaviors reflecting interpersonal maturity. Both the YASB-V and YASB-P
each consist of 14 items measured through a 5-point Likert-type scale ranging from *Never* to
*Always*. The YASB-V and YASB-P were created as an alternative measure to the existing
measures of relational aggression, which may not uniquely measure direct relational and social
aggression as separate forms of indirect bullying (Crothers et al., 2009). Although the
psychometrics of the YASB-P have been explored in previous research, the psychometrics of the
YASB-V have yet to be examined.

For the YASB-P measure, direct relationally-aggressive behaviors include: not talking to
or hanging around with someone, deliberately ignoring someone, threatening to withdraw
emotional support or friendship, and excluding someone from a group by informing him or her
that he or she is not welcome. If a participant endorses many of these behaviors, then that
individual is considered to demonstrate relational aggression as measured by the relational
aggression factor. Direct socially-aggressive behaviors include: gossiping, social exclusion,
isolation, alienation, writing notes or talking about someone, and stealing friends or romantic
partners. If participants endorse many of these items, they are considered to demonstrate
socially-aggressive behaviors. Finally, the interpersonal maturity factor includes prosocial
behaviors that are used in friendships, such as assertively managing conflict (Crothers et al.,
The items from the YASB-P representing relational and social aggression and interpersonal maturity are depicted in Table 1.

YASB Reliability and Validity. A confirmatory factor analysis (CFA) was used to examine the theoretical factor structure of the YASB-P, which is a rigorous analysis due to the statistical provision of both construct and discriminative validity and opportunities to test alternative models (Crothers et al., 2009; Kline, 2005). Crothers and colleagues (2009) theorized three alternative latent construct models measuring factors of indirect, relational, and social aggression for the YASB-P. Model A measured three constructs—social aggression, relational aggression, and interpersonal maturity, Model B measured three constructs—active relational aggression, passive relational aggression, and prosocial behavior, and Model C measured two constructs—relational aggression and assertive conflict.

Model fit indices found that Model A, representing the three factors of social aggression, relational aggression, and interpersonal maturity, was the best of the three alternative models (AIC = 164.39). Models B (AIC = 178.78) and C (AIC = 268.96) demonstrated overlap in the conceptualization of prosocial behavior and assertive conflict, which reflect an identical grouping of items (Crothers et al., 2009). Other fit indices suggested that Model A was a good fit to the data (Chi-square = 96.39, df = 71, CFI = .98, TLI = .97, RMSEA = .023; .009, .034), with values between the latent constructs relating to each other but not too strongly, providing statistical evidence for the theoretical argument of uniqueness between relational aggression, social aggression, and interpersonal maturity.

In order to investigate the convergent and divergent construct validity of the YASB-P, data were compared to a measure of hyperfemininity, the Hyperfemininity Inventory, measuring extreme adherence to a traditional feminine gender role (Murnen & Byrne, 1991). Correlation
Table 1  
**YASB-P Items**

<table>
<thead>
<tr>
<th>Relational Aggression</th>
<th>Social Aggression</th>
<th>Interpersonal Maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td>When I am angry with someone, that person is often the last to know. I will talk to</td>
<td>I contribute to the rumor mill at school/work or with my friends and family.</td>
<td>I deal with interpersonal conflict in an honest, straightforward answer.</td>
</tr>
<tr>
<td>others first.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>When I am frustrated with my partner/colleague/friend, I give that person the silent</td>
<td>I break a friend’s confidentiality to have a good story to tell.</td>
<td>I honor my friends’ need for secrets of confidentiality.</td>
</tr>
<tr>
<td>treatment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I criticize people who are close to me.</td>
<td>I confront people in public to achieve maximum damage.</td>
<td>I respect my friends’ opinions, even when they are quite different from my own.</td>
</tr>
<tr>
<td>I intentionally exclude others from activities to make a point with them.</td>
<td>I have attempted to “steal” a rival’s friend.</td>
<td>Working through conflicts with friends’ makes our friendship stronger.</td>
</tr>
<tr>
<td>When I am angry with a friend, I have threatened to sever the relationship in hopes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>that the person will comply with my wishes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>When I do not like someone’s personality, I derive a certain degree of pleasure when</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a friend listens to my assessment of the person’s personality.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Crothers et al. (2009)*
results revealed that lower relational and social aggression scores were associated with higher levels of femininity, while higher levels of femininity were also associated with less interpersonal maturity (Crothers et al., 2009).

**Scoring.** Raw scale scores for relational aggression and social aggression were obtained by summing the response values for all items within each factor of the scale. Lower scores on the scales indicate a greater use of relational aggression, social aggression and interpersonal maturity.

**Young Adult Social Behavior Victim Scale (YASB-V)**

Aforementioned above, the psychometrics of the YASB-V have yet to be examined and thus, will be explored in detail for this study. Based upon the similarities between the two measures, I hypothesize that the factor structure of the YASB-V will be the same for the YASB-P. Therefore, on the YASB-V, being a victim of direct relationally-aggressive behaviors includes: being a victim of others’ gossiping about you when they are angry with you, being excluded, ignored, or criticized by a friend or classmate and being threatened by a friend that they will end their relationship with you in hopes of your compliance.

If a participant endorses many of these behaviors, they are considered to be a victim of relational aggression as measured by the relational aggression factor. Being a victim of direct socially-aggressive behaviors include: having someone tell a rumor about you, having someone tell your secrets to others, being confronted by others in public, and having a rival attempt to “steal” one of your friends. If participants endorse many of these behaviors, they are considered to be victims of socially-aggressive behaviors. Finally, the interpersonal maturity factor includes prosocial behaviors that are used in friendships, such as managing and handling conflict with
others in an appropriate way (Crothers et al., 2009). The items from the YASB-V representing relational aggression, social aggression, and interpersonal maturity are depicted in Table 2.
Table 2

*YASB-V Items*

<table>
<thead>
<tr>
<th>Relational Aggression</th>
<th>Social Aggression</th>
<th>Interpersonal Maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td>When a friend/classmate/sibling is angry with me, I am often the last to know. He or she will talk with others first.</td>
<td>My friends/classmates/siblings tell rumors about me at school or home.</td>
<td>Others talk to me in an honest, straightforward manner when we are having an interpersonal problem.</td>
</tr>
<tr>
<td>When a friend/classmate/sibling is frustrated or irritated with me, he/she will stop talking to me.</td>
<td>A friend may tell my secrets to others just to have a good story to tell.</td>
<td>My friends/classmates/siblings honor my needs for secrets or confidentiality.</td>
</tr>
<tr>
<td>People who are close to me criticize me.</td>
<td>My friends/classmates/siblings confront me in public to achieve maximum damage.</td>
<td>My friends believe that working through conflicts makes our friendship stronger.</td>
</tr>
<tr>
<td>My friends intentionally exclude me from activities to make a point with me.</td>
<td>A rival has attempted to “steal” one of my friends.</td>
<td>My friends respect my opinions, even when they are quite different from their own.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When a friend is angry with me, he/she has threatened to end the relationship in hopes that I will comply with his/her wishes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>When a friend/classmate/sibling doesn't like my personality, he or she derives a certain degree of pleasure when someone else listens to and agrees with his/her assessment of my personality.</td>
<td>Crothers et al. (2009)</td>
<td></td>
</tr>
</tbody>
</table>
Scenes for Social Information Processing in Adolescence (SSIPA)

The SSIPA is a self-report measure designed to assess how adolescents rationally and emotionnally process social information when faced with customary, hypothetical, and ambiguous social situations (Vagos et al., 2016). The authors developed the instrument based on the SIP model proposed by Crick and Dodge in 1994 to further support the study of adjusted social behaviors. According to Vagos et al. (2016), robust findings have associated the SIP steps to aggressive behavior using hypothetical self-referent situation interviews or questionnaires, albeit most of which lack sound psychometric properties. Furthermore, different steps of SIP are often evaluated using separate instruments, making the validity of the results harder to interpret. Therefore, the SSIPA was developed to specifically evaluate adolescents’ social experiences and their SIP, and presently is the only existing measure designed to directly assess adolescents’ input regarding their own social experiences as the premise of the measure.

The SSIPA consists of six hypotheticals, ambiguous provocative social scenes, with each containing seven Likert-type items intended to assess four dimensions of SIP (e.g., attribution of intent, emotion intensity, response evaluation, and response decision; Crick & Dodge, 1994; Fontaine & Dodge, 2006). Respondents are asked to imagine that the event is happening to them and to rate their:

1) likelihood of attributing a neutral and hostile intent to others
   the intensity of experiencing anger, sadness, and shame in that situation
2) the evaluation of assertive, passive, overtly aggressive, and relationally-aggressive behavior options according to self-efficacy, personal and social goals, and moral/social value
3) the likelihood of choosing such behavior options for each scene (Vagos et al., 2016).
The 17 items from the six scenes of the SSIPA representing response decision are represented in Table 3.
### Table 3

**SSIPA Subscale Items**

<table>
<thead>
<tr>
<th><strong>Response Decision</strong></th>
<th><strong>Relational Aggression</strong></th>
<th><strong>Overt Aggression</strong></th>
<th><strong>Assertiveness</strong></th>
<th><strong>Passiveness</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>When no one was watching, I would complain to my teacher or coach.</td>
<td>Tell them: You’d better pick me next time or else…</td>
<td>Ask why I hadn’t been picked because I really wanted to play.</td>
<td>Walk away quietly so that no one would notice I hadn’t been chosen.</td>
<td></td>
</tr>
<tr>
<td>When my colleague wasn’t watching, I would badmouth that colleague so that no one would be friends with him/her.</td>
<td>Demanded that he/she would pick up my things and if he/she didn’t, I would hit him/her or call him/her bad names.</td>
<td>Ask my colleague why he/she has smashed into my table and calmly tell him/her to be more cautious in the future.</td>
<td>Pick up my things and say nothing.</td>
<td></td>
</tr>
<tr>
<td>I would tell my friends not to greet them.</td>
<td>Push him/her back.</td>
<td>Calmly ask them why they hadn’t talked to me.</td>
<td>Do nothing and act as if nothing had happened.</td>
<td></td>
</tr>
<tr>
<td>Talk about what happened with my friends so they would not be friends with that person.</td>
<td>Talk badly to him/her also.</td>
<td>Calmly tell him/her that we are both entitled to our opinions and there was no need to bad talking.</td>
<td>Do nothing and acted as if nothing had happened.</td>
<td></td>
</tr>
<tr>
<td>When he/she was not present, tell everyone that he/she thinks he/she knows it all, but really doesn’t know what he/she is talking about.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Vagos et al. (2016))
SSIPA Reliability and Validity. In order to investigate the factor structure of the six items evaluating neutral attribution of intent, an exploratory factor analysis (EFA) was employed by gender. The authors found an acceptable model fit in a four-item one-factor solution for both the male sample (CFI = .99, RMSEA = .031 [.000, .127]) and female sample (CFI = .99, RMSEA = .059 [.000, .082]). The four-item one-factor model also achieved acceptable model fit using the complete sample (CFI = 1.00, RMSEA = .000 [.000, .050]) with sufficient internal consistency (.72). Items taken from Scene Three and Four were excluded.

The six items evaluating hostile attribution of intent were investigated using an EFA and CFA. Prior to the CFA, the preliminary EFA revealed a two-factor model with item four loading negatively onto the first factor. Excluding item four resulted in a five-item one-factor model with good model fit (CFI = .99, RMSEA = .057 [.000, .111]). Next, a CFA was employed across gender and results revealed the five-item one-factor solution was an acceptable fit of the data for both males (CFI = .99, RMSEA = .57 [.000, .011]) and females (CFI = .99, RMSEA = .043, CI [.000, .085]) with an adequate internal consistency of .73.

The six emotional intensity items pertaining to anger were used for EFA. The authors found a good fit for the data with a five-item one-factor model for both males (CFI = .99, RMSEA = .040, CI [.000, .099]) and females (CFI = .99, RMSEA = .027, CI [.000, .071]. With the exclusion of the item taken from Scene Four, internal consistency was adequate at .80. The six emotional intensity items pertaining to sadness were used for an EFA. After excluding item six due to cross-loading on the proposed two-factor model and then item four as it loaded negatively onto factor one, a four-item one-factor model produced an exceptional fit for males. CFI = 1.00, RMSEA = .000, CI [.000, .063]) and adequate fit for females (CFI = .99, RMSEA = .071, CI [.017, .123]).
An EFA was conducted on the six emotional intensity items referring to shame. After items one and three were excluded due to negative loadings, a four item, one-factor solution for the full sample achieved acceptable fit (CFI = .99, RMSEA = .038, CI [.000, .088]). The one-factor solution was also confirmed for acceptable fit with the male sample (CFI = 1.00, RMSEA = .000, CI [.000, .103]) and female sample (CFI = .99, RMSEA = .046, CI [.000, .108]). The one-factor model indicated satisfactory internal consistency at .86.

When investigating factor structures related to response evaluation styles proposed by Fontaine and Dodge (2006; e.g., assertiveness, passiveness, overt aggression, relational aggression), the authors of the SSIPA found measurement models with unacceptable fit. Considering the preliminary analysis, the thirty items comprising response evaluation measures were explored using an EFA. The EFA revealed a seven-factor solution and six-factor solution, both of which did not adequately fit the data. The authors than proposed two-factor models of provocation (e.g., relationally provoked or overtly provoked) for each type of response option (e.g., assertiveness, passiveness, overt aggression and relational aggression).

The authors suggested a two-factor model of relationally provoked and overtly provoked assertiveness achieved acceptable fit for males (CFI = .97, RMSEA = .069, CI [.061, .076]) but results indicate the model is not well defined for females (CFI = .97, RMSEA = .075, CI [.070, .080]). Additionally, the correlation between the two factors was .99, indicating that the factors measure the same constructs and only a one-factor model is statistically appropriate. The two-factor model of relationally provoked and overtly provoked passiveness achieved a worse fit for males (CFI = .96, RMSEA = .074, CI [.066, .081]) than females (CFI = .97, RMSEA = .059, CI [.054, .064]). Similarly, the correlation between the two factors was 1.00, indicating that the two factors measure the same constructs and only a one-factor model exists.
The authors indicated a two-factor model of relationally provoked and overtly provoked overt aggression achieved acceptable fit for males (CFI = .98, RMSEA = .058, CI [.050, .065]) and females (CFI = .99, RMSEA = .043, CI [.037, .048]). However, the correlation between the two factors was .95, further suggesting the factors measure the same constructs and only a one-factor model can be statistically interpreted. The two-factor model of relationally provoked and overtly provoked relational aggression achieved acceptable fit for males (CFI = .98, RMSEA = .062, CI [.055, .070]) and females (CFI = .99, RMSEA = .052, CI [.047, .057]). Additionally, the correlation between the two factors was 1.00, indicating the two factors measure the same constructs and only a one-factor model statistically exists.

Although the authors reported that four two-factor models of either relationally or overtly provoked response styles were statistically acceptable, correlations between the two factors for each model of assertiveness, passiveness, overt aggression, and relational aggression indicate they measure the same constructs. Therefore, only one-factor models adequately fit the data for each response evaluation.

When investigating the six items of response decision measures intended to evaluate assertiveness, a five item one-factor model produced unacceptable fit for both males (CFI = .99, RMSEA = .072, CI [.019, .124]) and females (CFI = .99, RMSEA = .071, CI [.038, .108]). After removing items five and four due to negative loadings, a one-factor solution was acceptable for males (CFI = .99, RMSEA = .000, CI [.000, .082]). After excluding items five and three due to negative loadings, a one-factor solution led to acceptable fit for females (CFI = 1.00, RMSEA = .000, CI [.000, .076]). For passiveness, the exclusion of item five resulted in a four-item one-factor model acceptable for both males (CFI = 1.00, RMSEA = .000, CI [.000, .011]), females (CFI = .99, RMSEA = .000, CI [.000, .072]), and overall sample (CFI = .99, RMSEA = .030, CI .
For overt aggression, a four-item one-factor model achieved adequate fit for males (CFI = .99, RMSEA = .052, CI [.000, .140]) while a six-item one-factor model fit acceptably for females (CFI = .99, RMSEA = .050, CI [.021, .079]). The four-item one-factor solution also adequately fit the overall sample (CFI = .99, RMSEA = .045, CI [.000, .094]). For relational aggression, a five-item one-factor model acceptably fit males (CFI = .99, RMSEA = .062, CI [.000, .015]), females (CFI = .99, RMSEA = .026, CI [.000, .070]), and the overall sample (CFI = .99, RMSEA = .046, CI [.017, .077]).

**Research Design**

**Variables**

The following variables were used in the current study: relational aggression, social aggression, interpersonal maturity, and the SIP response decisions. For this study, direct relationally-aggressive behaviors were conceptualized as acts intended to “damage the target’s social status or self-esteem” through the use of confrontational strategies (Crothers et al., 2009, p. 18) and included behaviors such as not talking to someone, deliberately ignoring someone, or threatening to withdraw friendships. Socially-aggressive behaviors were conceptualized as acts intended to “harm the target’s social standing” (Crothers et al., 2009, p. 19) and included behaviors such as social exclusion, alienation, or stalking friends (Crothers et al., 2009). In this investigation, relational aggression, social aggression, and interpersonal maturity were measured using the YASB-V and YASB-P. SIP response decisions were measured using the SSIPA.

**Procedures**

Upon approval from the participating university’s Institutional Review Board (IRB), the investigator distributed flyers across the university’s campus for participant recruitment. The flyers contained an invitation for participation for undergraduate students, contact information
for research team members, and included details describing the study. The flyers were disseminated across the university during a two-year time period. Prior to the COVID-19 pandemic, if students were interested in participating in the research study, they were provided with an email address of a research team member. After indicating the desire to participate, they met with a member of the research team and completed the surveys independently on an iPad in a private room.

During the COVID-19 pandemic and due to social distancing measures, an IRB Amendment was then completed by the researchers for additional participant recruitment methods. The research flyers were modified to contain a QR code that students would scan via personal electronic devices. The QR code directly linked to the anonymous surveys via Qualtrics. Additionally, a subset of freshman and sophomore undergraduate students from the participating university’s School of Education were directly emailed the link to the survey for survey recruitment.

If students indicated the desire to participate in the study, they were provided with an Informed Consent at the top of a Qualtrics webpage prior to being exposed to the survey questions (Appendix A). The participants were informed that they would complete an anonymous survey, that participation was voluntary, and that there were minimal risks in participating in the study. Their agreement to participate in the survey was indicated by their procession to the survey questions. The survey questions consisted of the 14 items from the YASB-V, and 14 items of the YASB-P followed by the six social scenes and corresponding questions from the SSIPA.

Participants were presented with all of the questions from the YASB-V, YASB-P and SSIPA instruments on an iPad or personal device screen depending on the timeframe of survey
participation. No identifying information was requested from the participants. The responses to the survey questions took approximately 20 to 30 minutes to complete. Responses from the participants remained anonymous; *Qualtrics* assigned responses a random alphabetic and numeric identifier. Due to the removal of all personally identifiable information, there was no way to track who chose to participate and who chose not to participate. Any data collected were only shared in aggregate form.

At the conclusion of the anonymous surveys, participants were offered the chance to provide their name and contact information to receive a $5 Starbucks card, which would direct participants to a new and separate survey page. If participants indicated they would like to receive the gift card, they were instructed to clink the link to the separate, anonymous survey that could not be traced back to their original responses. Data from the responses were stored on the university’s password protected cloud with access through password protected computers. Participants who chose to withdraw from the study at any time for any reason without penalty, were instructed to click the “x” on the webpage.

**Potential Limitations**

*External Validity*

External validity is defined as “the extent to which the results of a study can be generalized to and across populations, settings, and times” (Johnson & Christenson, 2000, p. 200). Due to the lack of random sampling available for this study, participants were between the ages of 18-25 and were from a mid-sized private university located in the mid-Atlantic region, therefore limiting the generalizability of the results. When considering the demographics of the sample in this study, the results may only be generalizable to similar populations.
In addition, data collection through self-report measures poses several limitations. First, participants may have consciously or unconsciously reported their bullying and victimization experiences in a way that appeared more socially acceptable or desirable, regardless of the protection conferred by anonymity. This tendency to respond in a manner that is consistent with the perceived desirability of others or society leads to response bias and acquiescent responding. Second, participants may have systematically responded more negatively or positively to the question posed, regardless of content due to situational factors such as time pressures or other cognitive demands. Lastly, due to the nature of the survey content assessing bullying and peer victimization experiences, participants’ responses to previous questions may have served as triggers for determining responses to subsequent questions.

**Internal Validity**

Internal validity refers to the phenomenon by which researchers infer that relationships between a study’s independent and dependent variables are not random, but causal, and there is sufficient scientific evidence to support the claim. One factor that threatens internal validity is called history—where specific events that occur between data collection measures influence outcomes. Due to the collection of data occurring prior to the coronavirus 2019 (COVID-19) pandemic and then during the pandemic, the potential exists that data collected during this time are not valid, representative, or generalizable to a post-pandemic world, and comparable to the pre-pandemic world. Given the global nature, rapidity, and severity of the pandemic, the impact of COVID-19 and uncertainty of associated response measures must be considered.

Evidence of increased prevalence in psychological distress and anxiety has begun to emerge due to the pandemic, suggesting important changes in behavior, as well as cognitive, affective, and other social dimensions should be considered when interpreting results of the study.
(Fell et al., 2020). In particular, women ages 18-30 and with higher education have been reported to have the highest distress levels during the COVID-19 pandemic (Qiu et al., 2020). Thus, recognizing the potential source of COVID-19 as an unintentional bias and understanding the confounding variables during the pandemic as being more complex than pre-pandemic, ensures consideration of the study being exposed to an unbalanced interpretation of the results.

**Instruments**

The SSIPA was developed in Spain and tested on Spanish populations. For the current study, the SSIPA was translated to English, which may have resulted in inconsistent measurement of the original construct (Geisinger, 1994). In regard to cultural appropriateness, the original SSIPA was developed and written with awareness of Spanish culture, ethnic, racial, and linguistic groups (Vagos et al., 2016). Thus, when translated from Spanish to English, differences between Spanish and American value structures, social morals, and culture may be present and influence how the current sample responded to the instrument. In addition, the YASB-V is a relatively new instrument and further scientific validation of its psychometric properties and utility to a larger population is recommended (Crothers et al., 2009).

**Method of Data Analysis**

The IBM Statistical Package for the Social Sciences (SPSS) and R-Studio version 1.4.1103 were used for the statistical analyses of the data for this study. A confirmatory factor analysis was the statistical procedure used to investigate the factor structure hypotheses for the YASB-V and YASB-P instruments used for this study. A CFA is a rigorous analysis due to the statistical provision of both construct and discriminative validity, and the provision of opportunities to test alternative models (Crothers et al., 2009; Kline, 2005; Schreiber, 2017). Structural Equation Modeling (SEM) was the statistical procedures used to examine the
relationship between indirect bullying behaviors on the YASB-P and SIP response decisions on SSIPA. SEM is used to analyze the structural relationships between measured variables and latent constructs (Kline, 2005; Schreiber, 2017). Finally, SEM was the statistical procedure used to investigate gender differences in the factor structure of the YASB-V.

**Research Questions**

The main purpose of this study was to investigate the factor analytic structures of the YASB-V instrument independently and then by gender, provide support for relational and social aggression as separate, distinct entities of indirect bullying behaviors, and ascertain whether the YASB-P factor structure is related or associated with SIP response decision styles in a late adolescent sample. In considering preliminary research findings about the factor structures of the instruments, I hypothesized that the factor structures will be consistent with existing literature and that items from the YASB-V will load onto three separate factors: relational aggression, social aggression, and interpersonal maturity.

Questions designed to assess potential gender differences regarding the reporting of indirect bullying behaviors were also posed to participants. In considering gender differences in reporting of indirect bullying behaviors, I hypothesized that females would report greater victimization through indirect bullying behaviors on the YASB-V. Further, indirect bullying behaviors as related or associated with SIP response decision styles were investigated. I hypothesized that individuals with high perpetration scores in social and relational aggression on the YASB-P would have high relational aggression response decisions on the SSIPA.

**Summary**

In this chapter, I identified the research design for the current study. The sample, methods for data collection, procedures, limitations, and data analysis were discussed. This chapter also
included a description of the general methods for data analysis that were used to test the hypotheses of this study. The next chapter will include an examination of the findings of the CFA and SEM examining gender differences in reporting of indirect bullying behaviors, and results investigating indirect bullying behaviors as related or associated with SIP response decision styles using SEM.
CHAPTER IV
RESULTS

In this chapter, I will present the results regarding the descriptive statistics of the participants of the current study. I will also present the results of the exploratory factor analyses, confirmatory factor analyses, and structural equation modeling.

Preliminary Statistical Analyses

The IBM Statistical Package for the Social Sciences (SPSS) and R-Studio version 1.4.1103 were used for the statistical analyses of the data for this study. All submitted survey responses were reviewed and examined for completeness and demographic criteria prior to coding the data in SPSS. The responses to the 14 items of the YASB-V, 14 items of the YASB-P, and items of the six hypothetical vignettes of the SSIPA were coded and entered into SPSS. The minimum amount of data for the statistical analyses and models being tested (CFA, SEM) was satisfied, with a final sample of $N=451$. According to Kline (2011), a typical sample size where SEM is applied should be 200. However, when examining group differences between gender, the sample contained 402 females and only 49 males. For multi-group modeling in SEM, the rule of thumb is 100-150 cases per group (Kline, 2005).

Demographics

All 451 undergraduate graduate student surveys were included in the current investigation. Of the 451 participants, 402 identified as female (89.1%) and 49 identified as male (10.9%). One-hundred-thirty-six participants were freshman (30.2%), 85 participants were sophomores (18.8%), 105 participants were juniors (23.3%), 88 participants were seniors (19.5%), 33 participants were post-baccalaureate (7.3%), and four participants preferred not to answer (.9%). One-hundred-seven participants identified as being 18-years-old (23.5%), 91
identified as being 19-years-old (20.2%), 106 identified as being 20-years-old (23.5%), 90 identified as being 21-years-old (20.0%), 40 identified as being 22-years-old (8.9%), six identified as being 23-years-old (1.3%), four identified as being 24-years old (.9%), and five identified as being 25-years-old (1.1%). Participants were also prompted to report their ethnicity. All participants responded to this question and were permitted to select all ethnicities that were applicable. Of the 451 participants, 360 identified as White (79.8%), 45 as Asian (10.0%), 20 as Black or African American (4.4%), ten as Hispanic or Latino (2.2%), one as Native Hawaiian or Other Pacific Islander (.2%), 13 as Multiracial or Biracial (2.9%), one as Other (.2%), and one preferred not to answer (.2%).

**Research Question One**

**Confirmatory Factor Analysis**

In order to investigate the factor structure of the YASB-V items, CFA was applied in R-Studio version 1.4.1103 using maximum likelihood (ML) estimator. ML estimates are asymptotically unbiased in handling patterns of missing data (Pritikin et al., 2018). Recent research has focused on the comparison of ML estimates and Weighted Least Squares (WLS) estimates in SEM framework, suggesting that given the possible superior accuracy of ML compared to WLS, it may introduce a new approach to estimation in SEM (Pritikin et al., 2018). Despite a growing consensus that the best approach to the analysis of categorical variables is WLS, the ML estimate provides logit estimates and can also be applied successfully (Newsom, 2018). Lastly, according to Yuan-Bentler (2006), maximum likelihood can be used to approach missing categorical data.

Goodness of fit indices were assessed using convergence across multiple fit indices, including Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean
Square Residual (SRMR), and Comparative Fit Index (CFI), consistent with recommendations proposed by Hu and Bentler (1999). Specifically, good fit was indicated by RMSEA <.06, SRMR <.08, and CFI >.95. Acceptable fit was indicated by RMSEA <.08 and CFI >.90. When evaluating goodness of fit, I prioritized convergence across indices over reliance on any one particular measure of fit (Barrett, 2007; Kenny et al., 2015). Model fit indices found suggested that the three-factor model was a good fit to the data (Chi-square = 148.66, $df$ = 74, CFI = .94, TLI = .92, SRMR = 0.05, RMSEA = .05 [.04, .06], AIC = 14132.94, BIC = 14311.19, $p$-value RMSEA = .44; see Table 4; see Figure 1).
Table 4

Model Fit Indices

<table>
<thead>
<tr>
<th>Chi-square</th>
<th>df</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
<th>RMSEA</th>
<th>RMSEA Upper</th>
<th>RMSEA Lower</th>
<th>p-Value RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>148.66</td>
<td>74</td>
<td>.94</td>
<td>.92</td>
<td>.05</td>
<td>.05</td>
<td>.06</td>
<td>.04</td>
<td>.44</td>
</tr>
</tbody>
</table>
After examining the three-factor model, a four-factor model was conducted for model fit using the ML estimator. Model fit indices of the four-factor model indicated an excellent fit (Chi-square = 111.445, df = 91 CFI = .96, TLI = .95, SRMR = 0.04, RMSEA = 0.04 [.02, .05], AIC = 14107.725, BIC = 14309.737, \( p \)-value RMSEA = .87; see Table 5). The four-factor model was a tighter fit to the data as indicated by the \( p \)-value of RMSEA = .87, where a value of 1.00 would indicate a perfect fit, compared to the three-factor model with a \( p \)-value of RMSEA = .44. There is also a tighter upper confidence interval of the RMSEA. Overall, the four-factor model is an excellent and better model fit when compared to the three-factor model.

Table 5
Model Fit Indices

<table>
<thead>
<tr>
<th>Chi-square</th>
<th>df</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
<th>RMSEA</th>
<th>RMSEA Upper</th>
<th>RMSEA Lower</th>
<th>P-Value RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>111.445</td>
<td>91</td>
<td>.96</td>
<td>.95</td>
<td>.04</td>
<td>.04</td>
<td>.05</td>
<td>.02</td>
<td>.87</td>
</tr>
</tbody>
</table>

When examining the four factors, the relational aggression factor as indicated in the three-factor model analysis is now measuring as two separate latent constructs. Items 5, 7, 8, and 9 became one factor consistent with Relational Aggression and thus remained as the Relational Aggression factor, now titled Discrete Relational Aggression. The new factor consisted of items 11, 12, and 13, which appear to be more indirect, action-based forms of aggression. Therefore, the new factor was named Active Relational Aggression. The Social Aggression and Interpersonal Maturity factors were comprised of the same items found in the three-factor model (see Figure 2; see Appendix A).
Research Question Two

Confirmatory Factor Analysis

In order to confirm the results of the CFA of the YASB-P items as proposed by Crothers et al. (2009), CFA was applied in R-Studio version 1.4.1103 using the ML estimator. Adequacy of model fit to the data was evaluated using several statistical tests as outlined in the previous section (Barrett, 2007; Hu & Bentler, 1999; Kenny et al., 2015). Previous work examining the
structure of the YASB-P indicated that item four failed to load onto any of the latent factors (Crothers et al., 2009). Within the current dataset and factor structure, item four did not load adequately onto any factor and was subsequently removed from the analysis.

With the remaining 13 items, model fit indices suggested that the three-factor model was a below adequate fit to the data (Chi-square = 280.64, df = 62, CFI = .87, TLI = .83, SRMR = 0.07, RMSEA = .10 [.09, .11]). Additionally, the three-factor model indicates that the relational and social aggression factors on the YASB-P are likely one factor (Std. Est = .99, p = 0.00), as a value of 1.00 indicates the latent constructs are the same latent variable. Overall, the results of the analysis indicated that the factor structure as proposed by Crothers et al. (2009) did not accurately represent the present data as suggested by the poor model fit and perhaps instead would fit the data better as a two-factor model (see Figure 3).

**Structural Equation Modeling**

In order to investigate the relationships among the latent factors of the YASB-P and the subscale scores of the SIP response decision styles as measured by the SSIPA, a model was constructed within an SEM framework. In order to assess the response decision style scores (e.g., Assertiveness, Passiveness, Overt Aggression, and Relational Aggression), subscale scores were created by summing items related to each subscale.
Assertiveness consisted of four items, “Ask why I hadn’t been picked because I really wanted to play”, “Ask my colleague why he/she smashed into my table and calmly tell him/her to be more cautious in the future”, “Calmly ask them why they hadn’t talked to me”, and “Calmly tell him/her that we are both entitled to our opinions and there was no need to bad talking.” Passiveness consisted of four items, “Walk away quietly so that no one would notice I hadn’t been chosen”, “Pick up my things and say nothing”, “Do nothing and act as if nothing had happened”, and “Do nothing and acted as if nothing had happened.”

Overt Aggression consisted of four items, “Tell them: You’d better pick me next time of else…”, “Demanded that he/she would pick up me things and if he/she didn’t, I would hit him/her or call him/her bad names”, “Push him/her back”, and “Talk badly to him/her also.”
Relational Aggression consisted of five items, “When no one was watching, I would complain to my teacher or coach”, “When my colleague wasn’t watching, I would badmouth that colleague so that no one would be friends with him/her”, “I would tell my friends not to greet them”, “Talk about what happened with my friends so they would not be friends with that person”, and “When he/she was not present, tell everyone that he/she thinks he/she knows it all, but really doesn’t know what he/she is talking about”.

The factor structure of the YASB-P was created identical to what was previously indicated (the three-factor solution), although was a poor fit to the data in the current study. Each factor from the YASB-P was allowed to covary with each subscale of the SSIPA (see Appendix; see Figure 4).

Results of the model applied in R Studio indicated the Social Aggression factor of the YASB-P was meaningfully and positively related to the Overt Aggression response decision on the SSIPA (Std. Est. = .02, p = .01) and the Relational Aggression response decision (Std. Est. = .19, p = .02). The Interpersonal Maturity factor of the YASB-P was meaningfully related to all four response decisions (e.g., Assertiveness [Std. Est. = .36, p = .00], Passiveness [Std. Est. = .24, p = .00], Overt Aggression [Std. Est. = -.25, p = .00], and Relational Aggression [Std. Est. = -.26, p = .00]). Assertiveness and Passiveness were positively related while Overt Aggression and Relational Aggression were negatively related to Interpersonal Maturity. The Relational Aggression factor did not have any meaningful relationships to the SIP response decisions (see Appendix B).
Research Question Three

Structural Equation Modeling

In order to investigate differences in males’ and females’ reporting of indirect bullying behaviors on the YASB-V, gender was first coded as females = 1 and males = 2. For the purpose of this analysis, gender is the measured variable while relational aggression, social aggression, and interpersonal maturity are the latent variables.

A nested invariance model comparison was then applied with the three-factor model of the YASB-V and gender, as each variable is nested under one another. An initial investigation of the gender differences among the factors was conducted by using gender to predict each factor of the YASB-V. Gender did not significantly predict the factors (p values ranging from 0.07 –
suggesting that gender is not related to differences in the factors of the YASB-V (see Appendix).

A further investigation of the invariance of the model across gender was examined in a stepwise fashion from configural, metric, scalar, and strict invariance. Measurement invariance examines the degree to which a measurement model is psychometrically equivalent across groups and reflects the degree to which a latent construct has the same meaning across groups (Schweizer et al., 2020). Configural invariance assumes the model holds the same structure across groups, metric invariance means the groups have equal factor loadings, scalar invariance assumes the origin of the scale is the same across groups, and strict invariance items intercepts are constrained to be equal across groups.

Results suggested that the invariance variable (e.g., gender) did not predict any variance in the three factors. The fit statistics of Chi-Squared Difference Test for measurement invariance found that only strict invariance indicated adequate fit, suggesting that the meaning of the items is likely the same across genders (AIC = 14133, BIC = 14347, p = .00; see Table 6). However, the results of this analysis are difficult to interpret as there were only 49 males in this study compared to 402 females. According to Kline (2005), sample size groups should have at least 100-150 respondents per group.

Lastly, upon examination of the regression between the factors and gender, moving from the relational aggression factor to the social aggression factor by gender approaches significance (Std. Est. = -.25, p = .08). These results suggest for every one unit of gender, there is a -.25-unit decrease in the factor score (see Appendix C).
Table 6

Chi-Squared Difference Test for Measurement Invariance by Gender for the YASB-V

<table>
<thead>
<tr>
<th>Model</th>
<th>Df</th>
<th>AIC</th>
<th>BIC</th>
<th>Chi-Square</th>
<th>Chi-Square Difference</th>
<th>Df Difference</th>
<th>Pr (&gt; Chi Square)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fit.config</td>
<td>148</td>
<td>14144</td>
<td>14501</td>
<td>242.91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fit.metric</td>
<td>159</td>
<td>14139</td>
<td>14452</td>
<td>259.54</td>
<td>16.63</td>
<td>11</td>
<td>0.12</td>
</tr>
<tr>
<td>Fit.scalar</td>
<td>170</td>
<td>14129</td>
<td>14399</td>
<td>271.98</td>
<td>12.44</td>
<td>11</td>
<td>0.33</td>
</tr>
<tr>
<td>Fit.strict</td>
<td>184</td>
<td>14133</td>
<td>14347</td>
<td>303.89</td>
<td>31.91</td>
<td>14</td>
<td>0.00**</td>
</tr>
</tbody>
</table>

** Denotes significant p value

Summary

In this chapter, I examined and presented the data of the factor structure of the YASB-V and found three distinct and unique constructs (i.e., Relational Aggression, Social Aggression, and Interpersonal Maturity), comprising three-factor model. However, upon further inquiry, I found a better, tighter fit to the data using a four-factor model, which suggested that the Relational Aggression factor is two separate factors. This model indicated four factors—Discrete Relational Aggression, Active Relational Aggression, Social Aggression, and Interpersonal Maturity—and argues for four distinct and unique constructs of victimization.

I also examined whether there were gender differences between the factors on the YASB-V and did not find a significant difference between the genders, although it was approaching significance between the relational aggression factor and the social aggression factor. I re-established the factor structure of the YASB-P as it has been described in prior research, although with a poor fit of the data. Results of the three-factor model suggested that the Social Aggression and Relational Aggression factor may be operating as one factor.

Finally, I investigated whether the three-factor structure of the YASB-P was associated or related to the four Response Decisions (Assertiveness, Passiveness, Overt Aggression, and
Relational Aggression) of the SIP as measured by the Scenes for Social Information Processing Assessment (SSIPA). Each factor of the YASB-P was allowed to covary with the four response decisions. The interpersonal maturity factor of the YASB-P was meaningfully related to the four response decisions on the SSIPA, the social aggression factor was meaningfully related to the overt and relational aggression response decisions, while the relationally aggressive factor had no meaningful relations.
CHAPTER V
DISCUSSION

In this chapter, I will focus on interpreting the findings of the current study. The results of the statistical analyses will be interpreted and explained for the three research questions and hypotheses. Furthermore, the limitations of the current study, implications for further research, and the conclusions of this research will be discussed.

Summary of Findings

In this study, I investigated the factor structure of the YASB-V and found that a four-factor model was an excellent fit to the data. I investigated whether males’ and females’ reporting of indirect bullying behaviors on the YASB-V differed and did not find a meaningful difference, suggesting the items are interpreted similarly by males and females. I also examined whether the relationship between high perpetration scores on the YASB-P are related to or associated with the four Response Decision items for the SIP as measured by the SSIPA and found several meaningful relationships among the variables.

Through this study, I sought to provide statistical evidence of the reliability and validity of the YASB-V in a late adolescent sample, as well as provide evidence of relational aggression, social aggression, and interpersonal maturity as distinct, unique constructs. I also sought to provide evidence of the relationship between the perpetration of indirect bullying behaviors and response decision styles of SIP.

Research Question 1. What is the factor structure of the YASB-V?

Hypothesis 1. The factor structure will be consistent with that which has been reported for the YASB-P in previous research.
Results of the CFA for the YASB-V found statistical evidence that a three-factor model was a good fit to the data. Parameter estimates found values between the latent constructs were related but not too strongly, providing statistical evidence for the theoretical argument of uniqueness between the three factors representing relational aggression, social aggression, and interpersonal maturity. However, when allowing a four-factor model of the data, an excellent fit to the data was evident and approaching optimal. When examining the models, the Relational Aggression factor split into two separate factors in the four-factor model. The new factor included items 11, 12, and 13, which appears to be a victim’s experience of a more active style of relational aggression perpetrated against them.

These findings justify employing the proposed four-factor model of the YASB-V and therefore, further investigation is needed regarding the newfound factor of Active Relational Aggression. The reliability and validity findings support the use of the YASB-V as a measure of discrete relational aggression, social aggression, and interpersonal maturity for older adolescents and young adults ages 18-25, as well as a newly discovered latent construct—active relational aggression.

As the YASB-P was investigated in 2009, the latent variables of indirect aggression may have advanced and changed within the last 14 years. In particular, the use of social media and cyberbullying has come to play a significant role in bullying behaviors. It may be that the use of social media has changed the latent variables of victimization. More importantly, the data collected for this study was accomplished both in the pre- and post-pandemic world. Investigating the factor structure of the YASB-V using the pre and post-pandemic sample may demonstrate that the newfound construct is a result of altered social dynamics associated with the
ecological variables conferred as a result of COVID-19 and how that has changed individuals’ perceptions of victimization.

Nevertheless, these findings are consistent with previous research that suggests that relational and social aggression are separate but moderately related constructs (Crothers et al., 2009). Both the three-factor and four-factor model of the data provides empirical evidence that relational aggression meaningfully differs from social aggression. The four-factor model also provides empirical data of a newly discovered factor hidden within the relational aggression factor. This new factor should be investigated in future research, as well as within the YASB-P. Moreover, the results of the factor structure of the YASB-V contradicts previous research that has suggested relational aggression, social aggression, and indirect aggression represent the same latent construct (Archer & Coyne, 2005). The YASB-V appears to be a useful instrument for assessing self-reporting of victimization through indirect bullying behaviors for those ages 18-25, as well as their self-reported interpersonal maturity in a university environment.

**Research Question 2.** Does the factor structure of the YASB-P associate with the four Response Decisions (Assertiveness, Passiveness, Overt Aggression, and Relational Aggression) of SIP as measured by the SSIPA?

**Hypothesis 2.** Individuals with high perpetration scores in social and relational aggression on the YASB-P will have higher relational aggression in their Response Decisions on the SSIPA.

First, results of the CFA of the YASB-P indicated that the three-factor model (e.g., Relational Aggression, Social Aggression, and Interpersonal Maturity) was a poor fit to the data and suggested that a two-factor model was a better fit. Model fit indices found that the relational and social aggression factors are measuring as the same latent construct. In the existing literature,
the authors theorized three alternative latent construct models measuring factors of relational aggression, social aggression, and interpersonal maturity (Crothers et al., 2009). Although the current study was inconsistent with the three-factor model of the YASB-P measure, the statistical software used in previous research was JASP version 0.14.1, differing from the statistical software used in the present study. Additionally, the findings of the CFA conducted by Crothers et al. (2009) may differ due to the applied estimation method of diagonally weighted least squares (DWLS) in JASP. DWLS is specifically designed for ordinal data, being more unbiased, efficient, and consistent when compared to the maximum likelihood estimation used in R-Studio (Schreiber, 2020).

SEM analysis was used to investigate whether the three-factor model of the YASB-P was associated or meaningfully related to the four response decisions of SIP. Findings of the analysis indicated that each factor was allowed to covary with all response decisions, indicating relationships between the variables. However, results found that only two of the three factors were meaningfully related to various response decisions of the SIP as measured by the SSIPA, while one factor had no meaningful relationships.

First, the social aggression factor was found to be meaningfully and positively related to the response decisions of overt aggression and relational aggression. These findings indicate that respondents who scored low on this YASB-P factor, which indicates high perpetration of socially aggressive behaviors, were less likely to endorse response decisions that are more overtly aggressive or relationally aggressive.

This is consistent with SIP model research that indicates children who endorse socially aggressive behaviors are hesitant or less likely to endorse overt aggressive strategies given the covert nature of social aggression (Landsford et al., 2010). Perhaps these findings suggest that
respondents of the study (i.e., late adolescents and young adults) may have used their cognitive strengths to answer more transparently related to selecting response decisions. Findings of the current study suggest that respondents of this investigation (i.e., late adolescents and young adults) may have used their cognitive sophistication and understanding of social relationships to answer more transparently related to their selection of response decisions.

Conversely, past SIP research has also indicated that children who assume hostile attributions to peers’ ambiguous behaviors generate aggressive, ineffective solutions to social problems that appear to be more overtly aggressive than peers without these socially aggressive patterns (Mikami et al., 2008). It has also been theorized that hostile attribution biases, in particular, are associated with reactive aggression versus proactive aggression (Dodge & Coie, 1997). While most research has focused on children’s SIP response decisions, this study adds to the extant literature of importance of studying SIP biases as individuals age and cognitively develop.

In addition, respondents who scored low on this YASB-P factor, which indicates high perpetration of socially aggressive behaviors, were less likely to endorse response decisions that are relationally aggressive. This is consistent with more recent research that has found social aggression and relational aggression to be two distinct forms of indirect aggression (Crothers et al., 2009). It may be that the sample chose their SIP response decisions based on their social intelligence, as well as their understanding of social cues and social relationships. Perhaps the young adults of this study were more focused on their own peer social relationships which influenced their decisions to not display relationally aggressive acts of aggression.

Of further interest, research has shown that gossip is the most common form of the perpetration of socially aggressive behaviors (Galinsky & Salmond, 2002), which is a more
covert than overt form of aggression. It may also be that those who self-report socially aggressive behaviors in this demographic are more at risk for a special set of SIP biases. Some researchers support the idea of social aggression as part of an age-related, developmental progression (Zimmer-Gembeck et al., 2005). According to Archer and Coyne (2005), social aggression is only possible once the aggressor understands and can artfully utilize the necessary social skills to comprehend and manipulate relations in a social group.

As the sample of this study did not include children or teenagers, the associations of social aggression and the age of the respondents is likely linked to the selecting of developmentally-appropriate and normative forms of aggression, rather than the overt and relationally aggressive response option. This is concurrent with research that suggests that as children and adolescents age, the use of social aggression parallels the development of greater verbal abilities and social sophistication (Card et al., 2008).

The second interesting finding of the results found that the Interpersonal Maturity factor on the YASB-P was meaningfully related to all four response decisions. Respondents who selected items reflecting low scores on this factor (i.e., high levels of interpersonal maturity) had a meaningful and positive association with the assertiveness and passiveness response decisions. Thus, respondents who were low in interpersonal maturity were more likely to report using the assertiveness and passiveness response options. Respondents who selected items reflecting low scores (high levels) of interpersonal maturity had a meaningful and negative association with the overt aggression and relational aggression response decisions. This group was consequently more likely to endorse using the overt aggression and relational aggression response decisions.

The findings of the current study, in which the impersonal maturity factor is the only factor to meaningfully relate to all four response decisions, suggests that college-age students
who self-report high usage of behaviors reflecting interpersonal maturity impact how they choose all four of the SIP response decisions. According to Crick and Dodge (1996), the respondents may have evaluated their selected SIP response decisions based on interpersonal and instructional outcomes regarding their social relationships (Crick & Dodge, 1996). Past research in children has solely focused on indirect, relationally aggressive biases and the SIP model rather than interpersonally mature behaviors. This is often due to interpersonal maturity developing throughout an individual’s lifespan and can be difficult to assess in young children.

Due to the development of psychosocial maturity as a child ages into a late adolescent and young adult, it may be that how an individual learns prosocial behaviors and interpersonal skills over the course of important developmental years impacts how they respond to ambiguous, social situations and SIP biases. Therefore, SIP biases may be largely affected by an individual’s interpersonal skills or interpersonal maturity deficits.

Presently, neuroimaging studies have yet to distinguish a chronological cutoff point for behavioral, cognitive or interpersonal maturity (Johnson et al., 2010). Despite an unknown cutoff point in an individual’s life, developmental research has found that social relationships are generally more positive with age and actions by older adults contribute to more positive social experiences (Luong et al., 2011). Older adults tend to treat their social partners more kindly than younger adults, they seek to maximize enjoyment of time remaining, have an increased focus on emotional harmony and forgive others quicker than younger adults (Luong et al., 2011).

As the sample for this study ranged between the ages of 18-25 years, measuring the levels of interpersonal maturity between the ages is of importance, yet unknown. These differences in ages may have impacted how respondents selected the SIP response decisions. Most studies that have focused on older adults and interpersonal maturity find they report experiencing fewer
problematic and ambivalent relationships than do younger adults (Fingerman et al., 2004; Luong et al., 2011).

Surprisingly, respondents who self-reported more interpersonal maturity were more likely to endorse overtly or relationally aggressive responses. It may be that those in the sample who were younger and higher in interpersonal maturity were more likely to use techniques such as the “silent treatment,” which is relationally aggressive, although a more overtly relational act (Archer & Coyne, 2005). According to NASP (2010), there is often no physical evidence of relationally aggressive behaviors and the consequences are often mislabeled as normal peer relationship developments and transitions. Furthermore, relational aggression tends to be manipulative and subtle (e.g., use of anonymous notes, imitating the victim behind his/her back, social ostracism). Thus, it may be argued that the younger demographic of this study were more likely to choose the relationally aggressive responses that were normative to their respective developmental phase. Since age was not an independent variable in this investigation, such an interpretation is merely speculative. Further research will need to be devoted to understanding the relations between age and relational aggression in young adults.

Conversely, perhaps those in the sample who were older and higher in interpersonal maturity were more likely to be overtly aggressive and use more direct, verbal or physical aggression in hopes of solving interpersonal conflict in a direct manner. Blanchard-Fields and colleagues (2007) found that older adults are more problem-focused when solving difficulties than young adults. Additionally, they found that older adults were also more effective than young adults when solving everyday problems; in particular, for interpersonal problems. Yet, research suggests that older adults typically report higher levels of satisfaction with their social
relationships than younger adults (Luong et al., 2011), and reports of interpersonal conflicts decline with age.

The interpersonal maturity factor was also meaningfully and negatively related to the assertive and passive SIP response decisions. In explanation, those who self-report high levels of interpersonal maturity were less likely to endorse the assertive and passive SIP response decisions. Assertive behavioral responses involve describing your feelings, thoughts, and opinions directly to another person in honest, appropriate and mutually respective ways. Interestingly, those who reported high interpersonal maturity were less likely to report using honest and mutually respective ways to stand up for themselves or use self-expression that is not hurtful and is appropriate for the receiver of the situation. This is potentially concerning and also should be investigated in future study.

At the same time, individuals high in interpersonal maturity were less likely to endorse passive SIP response decisions. Passive behavioral responses involve saying nothing in a response, keeping feelings to yourself, or hiding the feelings from yourself. These findings are consistent with high interpersonal skills, which may be associated with choosing more sophisticated problem-solving conflicts. Considering that respondents high in interpersonal maturity were also more likely to use overt aggression, it may be assumed that they would be less likely to use passive SIP response decisions. This may be due to the desire to solve interpersonal conflict with others actively, and is likely related to the value an individual place on their friendships, as well as the desire to have satisfactory social relationships (Luong et al., 2011).

Interestingly, despite the relational aggression factor covarying with the four SIP response decisions, results indicated that the factor had no meaningful relationships to the four
response decisions as measured by the SSIPA. These results are somewhat inconsistent with past research (Archer & Coyne, 2005). It may be that baseline relationally aggressive behaviors are difficult to measure due to their covert nature (Crothers et al., 2009) and were difficult to assess on the YASB-P — especially given the poor model fit of the data. Indeed, the behavior in this sample suggested that there was no differentiation between relational and social aggression, as these behaviors both loaded on the same factor. Another possibility is that the hypothetical, verbal nature of the vignettes on the SSIPA do not accurately assess the relationship to relational aggression in those ages 18-25 — a demographic group who has more fully developed verbal skills and are more likely to use relational aggression, relative to boys and children (Mikami et al., 2008).

Lastly, past research has suggested that relational aggression and social aggression represent the same concept and researchers have disagreed regarding the distinction of the two constructs (Crothers et al., 2009). In contrast with the earlier hypothesis, because the results of this study suggested that the social aggression factor was related to two response decisions while the relational aggression had no significant factors, it can be argued that the significance in the differing results indicate they measure two distinct and unique constructs.

**Research Question 3.** Are there differences in males’ and females’ reporting of indirect bullying behaviors on the YASB-V?

**Hypothesis 3.** Females will report greater victimization through indirect bullying behaviors on the YASB-V.

Existing research has found that females report greater levels of indirect victimization compared to males. However, the results of the current study indicated no differences in the self-report of victimization based on gender. First, this may be due to the sample size, as 402
participants (89.1%) identified as females and only 49 participants (10.9%) identified as males. According to Kline (2005), for multi-group modeling in SEM, the rule of thumb is 100-150 cases per group, yet some researchers indicate there should not be fewer than 200 case per group (Hu & Bentler, 1999). Considering that this study did not meet the minimum sample size requirement for males, the increased likelihood of convergence problems between the groups and biased standard errors is higher.

Lastly, when examining the findings of the regressions between the factors and gender, results suggested that the factor structure was approaching a significant difference when moving between the relational aggression factor and the social aggression factor ($p = .08$), and in a negative direction (Est. = -.25). Thus, for every one unit of gender, there is a -.25-unit decrease in the factor score. Perhaps if the sample size for males was larger, a significant difference would have been discerned between the factor structure. In order to further investigate the approaching difference between genders, invariance testing across genders was examined. Findings indicated a significant strict factorial invariance, establishing that loadings on the factors were equal across groups and suggesting that the meaning of the items is likely the same across genders. At this time, using this data, there is no difference between males and females in their self-reported victimization through indirect bullying. However, results may preliminarily suggest that with more males, a difference across genders could be found and self-reporting of victimization levels would concur with existing literature.

Summary

Therefore, after analyzing and interpreting the data collected from this sample of late adolescents, the YASB-V four-factor model proved to have an excellent fit for the data, while the three-factor model was a good fit to the data, which is somewhat consistent with past
research (Crothers et al., 2009). We can also see that relational aggression, social aggression, and interpersonal maturity are distinct, unique constructs that are related but meaningfully different. More importantly, the four-factor model with an almost near perfect fit, argues for a newfound construct within relational victimization.

When investigating whether the factor structure of the YASB-P is meaningfully related or associated with the SIP response decisions, findings indicated the social aggression factor was meaningfully and positively related to the overt aggression and relational aggression response decisions. The interpersonal maturity factor was meaningfully and positively related to the assertiveness and passiveness response decisions (those with low interpersonal maturity were more likely to select an assertive or passive response SIP decision). It was also meaningfully and negatively related to the overt aggression and relational aggression response decisions (those with high interpersonal maturity were more likely to select overt or relationally aggressive SIP response decisions). Intriguingly, the relational aggression had no meaningful relationships with the SIP response decisions on the SSIPA.

Lastly, when examining whether males’ and females’ reporting of indirect bullying behaviors differed on the YASB-V, results suggested that gender does not significantly predict the latent variables (i.e., Discreet Relational Aggression, Active Relational Aggression, Social Aggression, and Interpersonal Maturity). It is presently unknown whether this is an artifact of an unequal sample size vastly favoring females, and future research should be devoted to furthering our understanding of this finding.
Limitations

As with many quantitative studies, there are limitations to the current research. In particular, several limitations should be noted for the present study: the data being gathered during the COVID-19 pandemic, the sample demographics, and the statistical software usage.

COVID-19 Pandemic

Data collection for the current study began in the Fall of 2018 and was abruptly halted in March of 2020, when the global COVID-19 pandemic occurred. For the remainder of the Spring 2020 semester, the university was closed. In the Fall of 2020, university classes were still virtual, although the campus had opened back up. Due to the global nature, rapidity, and severity of the pandemic, the impact of the COVID-19 pandemic and uncertainty of the associated response measures must be considered.

Recent research since the acute, worldwide pandemic has focused on the increased prevalence and severity of psychological distress, depression, anxiety, and isolation on individuals across the globe. In particular, one group that was significantly affected both educationally and psychosocially is college-aged students, as they experienced the abrupt change in their day-to-day schedules and witnessed a loss in social activities and gatherings (Tasso et al., 2021). Studies regarding the effects of the pandemic have noted the important changes in behavior, as well as the cognitive, affective, and other social dimensions that must be considered when interpreting results of research studies that happened during the pandemic.

Researchers have suggested that college-aged students faced struggles with sleep quality, substance abuse, eating disorders, suicidality, financial burden, and interpersonal relationship issues (Tasso et al., 2020). Research has also found that women ages 18-30 and with higher education have been reported to have the highest distress levels during the COVID-19 pandemic.
(Qiu et al., 2020). Additionally, according to the authors, college-aged students reported fears about contracting COVID-19, greater fears about people within their social network contracting COVID-19, and academic-related distress. Despite ongoing research studies investigating the impact of the pandemic on all demographics, results of early studies have demonstrated that the college student population was and is experiencing emotional distress on various levels (Tasso et al., 2021).

Due to the collection of data occurring prior to the COVID-19 pandemic and then during the pandemic, the potential exists that data collected during this time are not valid, representative, or generalizable to a post-pandemic world, and thus, are not comparable to the pre-pandemic world. In addition, with the timing of students responding to the survey in this study, it is imperative to take into account that respondents’ emotional, social, and attentional resources were being spread thin. Therefore, recognizing the potential source of COVID-19 as an unintentional bias and considering confounding variables during the pandemic as being more complex and severe than pre-pandemic, results of the study are at risk of an unbalanced interpretation of the findings.

**Sample Demographics**

The research questions of this study are in need of further validation and investigation due to sample demographics. Participants for this study were from a single, albeit mid-size, private university in the mid-Atlantic U.S. Participants were largely females (89.1%) compared to males (10.9%). Due to these constraints, there are limits to the generalization of the findings and utility of the YASB-V, YASB-P, and SSIPA instruments. Many psychological studies rely on student samples due to the accessibility of subject recruitment (Arnett, 2008). However, there are various concerns regarding the use of student samples regarding issues of representativeness,
generalizability, and comparability of results (Henrich et al., 2010). More recently, according to Science (2015), half of the studies within the field of psychology could not be replicated. Because of these limitations and present concerns regarding student sample size, the findings of the current study may not be applicable to the general population.

**Statistical Software**

Existing literature examining the YASB-P found a different model fit compared to the model fit of the current study. This is likely due to the different software used, as well as estimator used for SEM. In previous studies, the CFA for the YASB-P was used in JASP using the DWLS estimator, which is more suited for ordered categorical data, while the current study investigated the CFA in R-Studio using FIML. Nevertheless, further research should be conducted to ascertain whether the original factor structure continues to withstand the test of time.

**Conclusions**

Therefore, after assessing the data collected from this sample of college students ages 18-25, we can see that several key limitations exist. Data collection began in the Fall of 2018 and was halted in March 2020 due to the COVID-19 pandemic. Data collection resumed in the Fall semester of 2020 using a new modality (QR code scan via flyers vs. in-person survey completion with the researcher) and data collection subsequently ended in the Spring semester of 2022. As new research emerges, the impact of COVID-19 on psychological studies within the past three years is unknown. Most recently, as of May 2023, loneliness has been deemed an epidemic by the U.S. Surgeon General, Dr. Vivek Murthy. Given that this psychological study was focused on social situations, aggression, and victimization, the COVID-19 pandemic likely contributed to unprecedented biases and academic and socioeconomic implications.
Sample demographics are a second limitation, as they may not be generalized or representative compared to the general population. In addition, the sample was comprised of undergraduate and graduate students from a mid-Atlantic university. As recent data suggests that half of all psychological research studies cannot be replicated (Science, 2015), results of the current study are at risk of not being replicated. The third limitation reflects the statistical software used in previous studies regarding the YASB-P, which were different from the statistical software used in the present study and may have led to differing results. Lastly, the sample was comprised of 402 females and 49 males, limiting the interpretation of results. In particular, interpreting the results between the groups (i.e., females vs. males) should likely be considered tentative findings, as the ideal number of male participants were not included in this study.

Future Directions

As I conclude this study, I would like to propose two important research suggestions to be investigated using this data. First, I believe that it would be valuable to look at group differences between those who completed the survey pre-pandemic and those who did so post-pandemic. Such an examination would provide additive literature on the implications of COVID-19 on young adults’ SIP, as well as provide evidence of whether COVID-19 has changed how young adults perceive indirect victimization. Group differences may lead to a theoretical argument of whether the impact of COVID-19 led to changes in the perpetration and victimization of indirect aggression, as well as the SIP in college-age students. Secondly, due to the relatively small number of male respondents and results indicating an approach to significance regarding gender differences in the factor structure of the YASB-V, recruitment of male participants may provide evidence for actual meaningful differences.
References


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https://doi.org/10.3390/ijerph18084357


Confirmatory Factor Analysis

Three Factor CFA

```r
cfa3 <- "
f1 =~ yas_vic13 + yas_vic11 + yas_vic8 + yas_vic12 +
       yas_vic7 + yas_vic5 + yas_vic9

f2 =~ yas_vic10 + yas_vic14 + yas_vic6 + yas_vic3

f3 =~ yas_vic1 + yas_vic2 + yas_vic4"

fit3 <- lavaan::cfa(cfa3, data = victim, missing = 'fiml')
```

```r
## lavaan 0.6.15 ended normally after 36 iterations
##
##   Estimator                          ML
##   Optimization method                NLMINB
##   Number of model parameters         45
##
##   Used Total
##   Number of observations             388  451
##   Number of missing patterns         1
##
## Model Test User Model:
##
##   Test statistic                     148.662
##   Degrees of freedom                74
##   P-value (Chi-square)              0.000
##
## Model Test Baseline Model:
##
##   Test statistic                    1250.102
##   Degrees of freedom               91
##   P-value                           0.000
##
## User Model versus Baseline Model:
```
## Comparative Fit Index (CFI)                    0.936
## Tucker-Lewis Index (TLI)                       0.921
##
## Robust Comparative Fit Index (CFI)             0.936
## Robust Tucker-Lewis Index (TLI)                0.921
##
## Loglikelihood and Information Criteria:
##
## Loglikelihood user model (H0)                -7021.471
## Loglikelihood unrestricted model (H1)        -6947.140
##
## Akaike (AIC)                                14132.943
## Bayesian (BIC)                              14311.188
## Sample-size adjusted Bayesian (SABIC)        14168.407
##
## Root Mean Square Error of Approximation:
##
## RMSEA                                       0.051
## 90 Percent confidence interval - lower       0.039
## 90 Percent confidence interval - upper       0.063
## P-value H_0: RMSEA <= 0.050                  0.429
## P-value H_0: RMSEA >= 0.080                  0.000
##
## Robust RMSEA                                0.051
## 90 Percent confidence interval - lower       0.039
## 90 Percent confidence interval - upper       0.063
## P-value H_0: Robust RMSEA <= 0.050           0.429
## P-value H_0: Robust RMSEA >= 0.080           0.000
##
## Standardized Root Mean Square Residual:
##
## SRMR                                        0.049
##
## Parameter Estimates:
##
## Standard errors                             Standard
## Information                                  Observed
## Observed information based on               Hessian
##
## Latent Variables:
##
## |   | Estimate | Std.Err | z-value | P(>|z|) | Std.lv | Std.all |
## |---|----------|---------|---------|---------|--------|---------|
## | f1 |          |         |         |         |        |         |
## | yas_vic13 | 1.000   |         |         | 0.540   | 0.662  |
## | yas_vic11 | 1.121   | 0.098   | 11.441  | 0.000   | 0.606  | 0.720  |
## | yas_vic8  | 0.984   | 0.094   | 10.500  | 0.000   | 0.532  | 0.655  |
## | yas_vic12 | 0.992   | 0.114   | 8.690   | 0.000   | 0.536  | 0.599  |
## | yas_vic7  | 1.083   | 0.114   | 9.463   | 0.000   | 0.585  | 0.580  |
## | yas_vic5  | 1.027   | 0.124   | 8.274   | 0.000   | 0.555  | 0.506  |
## | yas_vic9  | 0.879   | 0.113   | 7.778   | 0.000   | 0.475  | 0.462  |
## | f2 |          |         |         |         |        |         |
## Covariances:

|       | Estimate | Std.Err | z-value | P(>|z|) | Std.lv | Std.all |
|-------|----------|---------|---------|---------|--------|---------|
| f1    | -0.186   | 0.032   | -5.850  | 0.000   | -0.444 | -0.444  |
| f2    | 0.151    | 0.027   | 5.612   | 0.000   | 0.557  | 0.557   |
| f3    | -0.025   | 0.029   | -0.853  | 0.394   | -0.064 | -0.064  |

## Intercepts:

|       | Estimate | Std.Err | z-value | P(>|z|) | Std.lv | Std.all |
|-------|----------|---------|---------|---------|--------|---------|
| .yas_vic13 | 1.528   | 0.041   | 36.869  | 0.000   | 1.528  | 1.872   |
| .yas_vic11 | 1.539   | 0.043   | 36.038  | 0.000   | 1.539  | 1.830   |
| .yas_vic8  | 1.433   | 0.041   | 34.800  | 0.000   | 1.433  | 1.767   |
| .yas_vic12 | 1.925   | 0.053   | 35.989  | 0.000   | 1.925  | 1.827   |
| .yas_vic7  | 2.093   | 0.051   | 40.874  | 0.000   | 2.093  | 2.075   |
| .yas_vic5  | 2.041   | 0.056   | 36.715  | 0.000   | 2.041  | 1.864   |
| .yas_vic9  | 2.325   | 0.052   | 44.597  | 0.000   | 2.325  | 2.264   |
| .yas_vic10 | 3.758   | 0.051   | 73.713  | 0.000   | 3.758  | 3.742   |
| .yas_vic14 | 3.912   | 0.055   | 71.163  | 0.000   | 3.912  | 3.613   |
| .yas_vic6  | 3.750   | 0.051   | 72.864  | 0.000   | 3.750  | 3.699   |
| .yas_vic3  | 3.312   | 0.047   | 70.390  | 0.000   | 3.312  | 3.573   |
| .yas_vic1  | 2.570   | 0.048   | 53.512  | 0.000   | 2.570  | 2.717   |
| .yas_vic2  | 2.647   | 0.049   | 53.931  | 0.000   | 2.647  | 2.738   |
| .yas_vic4  | 2.675   | 0.058   | 46.463  | 0.000   | 2.675  | 2.359   |
| f1      | 0.000   |         |         |         | 0.000  | 0.000   |
| f2      | 0.000   |         |         |         | 0.000  | 0.000   |
| f3      | 0.000   |         |         |         | 0.000  | 0.000   |

## Variances:

|       | Estimate | Std.Err | z-value | P(>|z|) | Std.lv | Std.all |
|-------|----------|---------|---------|---------|--------|---------|
| .yas_vic13 | 0.375   | 0.033   | 11.464  | 0.000   | 0.375  | 0.562   |
| .yas_vic11 | 0.340   | 0.033   | 10.415  | 0.000   | 0.340  | 0.481   |
| .yas_vic8  | 0.375   | 0.033   | 11.532  | 0.000   | 0.375  | 0.571   |
| .yas_vic12 | 0.823   | 0.064   | 12.799  | 0.000   | 0.823  | 0.741   |
| .yas_vic7  | 0.675   | 0.055   | 12.232  | 0.000   | 0.675  | 0.663   |
| .yas_vic5  | 0.892   | 0.070   | 12.813  | 0.000   | 0.892  | 0.744   |
| .yas_vic9  | 0.829   | 0.063   | 13.068  | 0.000   | 0.829  | 0.786   |
| .yas_vic10 | 0.405   | 0.058   | 6.990   | 0.000   | 0.405  | 0.401   |
| .yas_vic14 | 0.726   | 0.066   | 11.018  | 0.000   | 0.726  | 0.619   |
| .yas_vic6  | 0.608   | 0.058   | 10.443  | 0.000   | 0.608  | 0.592   |
| .yas_vic3  | 0.736   | 0.056   | 13.158  | 0.000   | 0.736  | 0.857   |
## yas_vic1          0.642    0.058   11.058    0.000    0.642    0.717
## yas_vic2          0.572    0.062    9.240    0.000    0.572    0.612
## yas_vic4          0.763    0.086    8.878    0.000    0.763    0.594
## f1                0.292    0.044    6.675    0.000    1.000    1.000
## f2                0.604    0.083    7.263    0.000    1.000    1.000
## f3                0.253    0.057    4.436    0.000    1.000    1.000

## R-Square:
##                    Estimate
##     yas_vic13         0.438
##     yas_vic11         0.519
##     yas_vic8          0.429
##     yas_vic12         0.259
##     yas_vic7          0.337
##     yas_vic5          0.256
##     yas_vic9          0.214
##     yas_vic10         0.599
##     yas_vic14         0.381
##     yas_vic6          0.408
##     yas_vic3          0.143
##     yas_vic1          0.283
##     yas_vic2          0.388
##     yas_vic4          0.406

semPlot::semPaths(fit3, "std", intercepts = FALSE)
Appendix B

Four Factor CFA

cfa4 <- "
  f1 =~ yas_vic10 + yas_vic14 + yas_vic6 + yas_vic3 +
    yas_vic7 + yas_vic5 + yas_vic9

  f2 =~ yas_vic8 + yas_vic7 + yas_vic5 + yas_vic9

  f3 =~ yas_vic12 + yas_vic11 + yas_vic13

  f4 =~ yas_vic1 + yas_vic2 + yas_vic4"

fit4 <- lavaan::cfa(cfa4, data = victim, missing = 'fiml')

## Warning in lav_data_full(data = data, group = group, cluster = cluster, :
## lavaan WARNING: some cases are empty and will be ignored:
##   17 20 34 36 133 142 144 145 146 148 151 158 159 161 162 164 165 171 172
##   178 181 200 201 209 211 227 228 229 241 242 244 246 251 258 259 267 272 274 2
##   78 283 284 285 289 290 312 321 323 341 343 344 349 352 375 377 383 397 400 40
##   2 405 422 423 431 443

summary(fit4, fit.measures = T, standardized = T, rsquare = T)

## lavaan 0.6.15 ended normally after 46 iterations
##
##  Estimator                                         ML
##  Optimization method                           NLMINB
##  Number of model parameters                        51

##
##  Used       Total
##  Number of observations                           388         451
##  Number of missing patterns                         1

##
## Model Test User Model:

##
##  Test statistic                                   111.445
##  Degrees of freedom                                 68
##  P-value (Chi-square)                               0.001

##
## Model Test Baseline Model:

##
##  Test statistic                                   1250.102
##  Degrees of freedom                                 91
##  P-value                                             0.000

## User Model versus Baseline Model:

##
##  Comparative Fit Index (CFI)                       0.963
## Tucker-Lewis Index (TLI) 0.950
## Robust Comparative Fit Index (CFI) 0.963
## Robust Tucker-Lewis Index (TLI) 0.950

## Loglikelihood and Information Criteria:
## Loglikelihood user model (H0) -7002.863
## Loglikelihood unrestricted model (H1) -6947.140

## Akaike (AIC) 14107.725
## Bayesian (BIC) 14309.737
## Sample-size adjusted Bayesian (SABIC) 14147.918

## Root Mean Square Error of Approximation:
## RMSEA 0.041
## 90 Percent confidence interval - lower 0.026
## 90 Percent confidence interval - upper 0.054
## P-value H_0: RMSEA <= 0.050 0.873
## P-value H_0: RMSEA >= 0.080 0.000

## Robust RMSEA 0.041
## 90 Percent confidence interval - lower 0.026
## 90 Percent confidence interval - upper 0.054
## P-value H_0: Robust RMSEA <= 0.050 0.873
## P-value H_0: Robust RMSEA >= 0.080 0.000

## Standardized Root Mean Square Residual:
## SRMR 0.041

## Parameter Estimates:

## Standard errors  
| Matrix                        | Estimate | Std.Err | z-value | P(>|z|) | Std.lv | Std.all |
|------------------------------|----------|---------|---------|---------|--------|---------|
| Observed information based on Hessian |          |         |         |         |        |         |
| Latent Variables:            |          |         |         |         |        |         |
| f1 =~                         |          |         |         |         |        |         |
| yas_vic10                    | 1.000    |         | 0.776   |         | 0.773  | 0.773   |
| yas_vic14                    | 0.867    | 0.088   | 9.802   | 0.000   | 0.673  | 0.621   |
| yas_vic6                     | 0.831    | 0.086   | 9.680   | 0.000   | 0.644  | 0.636   |
| yas_vic3                     | 0.446    | 0.072   | 6.198   | 0.000   | 0.346  | 0.373   |
| yas_vic7                     | 0.094    | 0.098   | 0.956   | 0.339   | 0.073  | 0.072   |
| yas_vic5                     | 0.226    | 0.111   | 2.042   | 0.041   | 0.175  | 0.160   |
| yas_vic9                     | 0.260    | 0.106   | 2.461   | 0.014   | 0.201  | 0.196   |
| f2 =~                         |          |         |         |         |        |         |
| yas_vic8                     | 1.000    |         | 0.544   |         | 0.670  |
## Covariances:

|          | Estimate | Std.Err | z-value | P(>|z|) | Std.lv | Std.all |
|----------|----------|---------|---------|---------|--------|---------|
| f1 ~~ f2 | -0.207   | 0.039   | -5.265  | 0.000   | -0.491 | -0.491  |
| f2 ~~ f3 | -0.208   | 0.037   | -5.669  | 0.000   | -0.468 | -0.468  |
| f3 ~~ f4 | -0.021   | 0.029   | -0.722  | 0.471   | -0.054 | -0.054  |
| f2 ~~ f3 | 0.261    | 0.036   | 7.184   | 0.000   | 0.835  | 0.835   |
| f3 ~~ f4 | 0.159    | 0.029   | 5.570   | 0.000   | 0.579  | 0.579   |

## Intercepts:

|          | Estimate | Std.Err | z-value | P(>|z|) | Std.lv | Std.all |
|----------|----------|---------|---------|---------|--------|---------|
| .yas_vic10 | 3.758    | 0.051   | 73.713  | 0.000   | 3.758  | 3.742   |
| .yas_vic14 | 3.912    | 0.055   | 71.163  | 0.000   | 3.912  | 3.613   |
| .yas_vic6  | 3.750    | 0.051   | 72.864  | 0.000   | 3.750  | 3.699   |
| .yas_vic3  | 3.312    | 0.047   | 70.389  | 0.000   | 3.312  | 3.573   |
| .yas_vic7  | 2.093    | 0.051   | 40.874  | 0.000   | 2.093  | 2.075   |
| .yas_vic5  | 2.041    | 0.056   | 36.715  | 0.000   | 2.041  | 1.864   |
| .yas_vic9  | 2.325    | 0.052   | 44.597  | 0.000   | 2.325  | 2.264   |
| .yas_vic8  | 1.433    | 0.041   | 34.800  | 0.000   | 1.433  | 1.767   |
| .yas_vic12 | 1.925    | 0.053   | 35.989  | 0.000   | 1.925  | 1.827   |
| .yas_vic11 | 1.539    | 0.043   | 36.038  | 0.000   | 1.539  | 1.830   |
| .yas_vic13 | 1.528    | 0.041   | 36.869  | 0.000   | 1.528  | 1.872   |

## Variances:

|          | Estimate | Std.Err | z-value | P(>|z|) | Std.lv | Std.all |
|----------|----------|---------|---------|---------|--------|---------|
| .yas_vic10 | 0.407    | 0.057   | 7.149   | 0.000   | 0.407  | 0.403   |
| .yas_vic14 | 0.720    | 0.066   | 10.986  | 0.000   | 0.720  | 0.614   |
| .yas_vic6  | 0.612    | 0.058   | 10.594  | 0.000   | 0.612  | 0.596   |
## R-Square:

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<tr>
<td>yas_vic2</td>
</tr>
<tr>
<td>yas_vic4</td>
</tr>
</tbody>
</table>

semPlot::semPaths(fit4, "std", intercepts = FALSE)
Research Question 2. Does the factor structure of the YASB Perpetrator Scale predict the four Response Decisions (Assertiveness, Passiveness, Overt Aggression, and Relational Aggression) of SIP as measured by the SSIPA?

3 factors for YAS Perpetrator - Relational 1,2,9,11,13 - Social 5,7,8,12 - Interpersonal Maturity 3,6,10,14

4 doesn't load anywhere

Every factor predicting the subscales of the SSIPA

Create CFA for YAS Perpetrator

```r
# Rename Variables
perp <- data %>%
  select(c("ResponseId", Q8_1:Q8_14))

names(perp) <- c("ResponseId", paste0("yas_perp", 1:14))

cfa_perp <- "
  relate =~ yas_perp1 + yas_perp2 + yas_perp9 +
             yas_perp11 + yas_perp13

  social =~ yas_perp5 + yas_perp7 + yas_perp8 +
```

131
yas_perp12

interp =~ yas_perp3 + yas_perp6 + yas_perp10 + yas_perp14

perp_fit <- lavaan::cfa(cfa_perp, data = perp, missing = 'fiml')

## Warning in lav_data_full(data = data, group = group, cluster = cluster, : lavaan WARNING: some cases are empty and will be ignored:
##  17 18 20 21 25 28 34 36 133 142 143 144 145 146 147 148 151 158 159 161 162 164 165 166 171 172 178 181 200 201 209 210 211 227 228 229 238 241 242 244 245 246 251 258 259 262 266 267 272 273 274 278 283 284 285 286 289 290 30 9 312 321 323 341 343 344 349 352 359 375 376 377 383 388 390 397 400 402 405 406 411 422 423 431 443 445

summary(perp_fit, fit.measures = T, standardized = T, rsquare = T)

## lavaan 0.6.15 ended normally after 96 iterations
##
##  Estimator               ML
##  Optimization method    NLMINB
##  Number of model parameters  42
##  Used       Total
##  Number of observations  366         451
##  Number of missing patterns 1
##
## Model Test User Model:
##
##  Test statistic       280.635
##  Degrees of freedom  62
##  P-value (Chi-square) 0.000

## Model Test Baseline Model:
##
##  Test statistic       1735.613
##  Degrees of freedom  78
##  P-value               0.000

## User Model versus Baseline Model:

##  Comparative Fit Index (CFI) 0.868
##  Tucker-Lewis Index (TLI) 0.834

##  Robust Comparative Fit Index (CFI) 0.868
##  Robust Tucker-Lewis Index (TLI) 0.834

## Loglikelihood and Information Criteria:
## Loglikelihood user model (H0)  -5264.747
## Loglikelihood unrestricted model (H1)  -5124.430
##
## Akaike (AIC)  10613.494
## Bayesian (BIC)  10777.405
## Sample-size adjusted Bayesian (SABIC)  10644.156
##
## Root Mean Square Error of Approximation:
##
##   RMSEA                        0.098
##   90 Percent confidence interval - lower  0.087
##   90 Percent confidence interval - upper  0.110
##   P-value H_0: RMSEA <= 0.050  0.000
##   P-value H_0: RMSEA >= 0.080  0.995
##
##   Robust RMSEA                   0.098
##   90 Percent confidence interval - lower  0.087
##   90 Percent confidence interval - upper  0.110
##   P-value H_0: Robust RMSEA <= 0.050  0.000
##   P-value H_0: Robust RMSEA >= 0.080  0.995
##
## Standardized Root Mean Square Residual:
##
##   SRMR                          0.071

## Parameter Estimates:
##
## Standard errors  Standard Information  Observed
##
## Latent Variables:
##
## latent =~
##
##   Estimate  Std.Err  z-value  P(|z|)  Std.lv  Std.all
##
## relate =~
##   yas_perp1  1.000                        0.107  0.104
##   yas_perp2  1.743  1.042  1.673  0.094  0.187  0.182
##   yas_perp9  3.005  1.640  1.833  0.067  0.322  0.392
##   yas_perp11  5.187  2.769  1.873  0.061  0.556  0.810
##   yas_perp13  4.796  2.568  1.867  0.062  0.514  0.798
##
## social =~
##   yas_perp5  1.000                        0.397  0.459
##   yas_perp7  1.150  0.148  7.780  0.000  0.456  0.612
##   yas_perp8  1.341  0.163  8.241  0.000  0.532  0.755
##   yas_perp12  1.365  0.161  8.476  0.000  0.542  0.851
##
## interp =~
##   yas_perp3  1.000                        0.505  0.486
##   yas_perp6  1.422  0.180  7.897  0.000  0.718  0.710
##   yas_perp10  1.391  0.173  8.039  0.000  0.702  0.734
##   yas_perp14  1.527  0.191  8.001  0.000  0.771  0.687
### Covariances:

|                | Estimate | Std.Err | z-value | P>|z|) | Std.lv | Std.all |
|----------------|----------|---------|---------|------|--------|---------|
| relate ~ ~     |          |         |         |      |        |         |
| social         | 0.042    | 0.023   | 1.812   | 0.070| 0.987  | 0.987   |
| interp         | -0.031   | 0.017   | -1.800  | 0.072| -0.578 | -0.578  |
| social ~ ~     |          |         |         |      |        |         |
| interp         | -0.115   | 0.022   | -5.181  | 0.000| -0.576 | -0.576  |

### Intercepts:

|                | Estimate | Std.Err | z-value | P>|z|) | Std.lv | Std.all |
|----------------|----------|---------|---------|------|--------|---------|
| .yas_perp1     | 2.541    | 0.054   | 47.039  | 0.000| 2.541  | 2.459   |
| .yas_perp2     | 2.262    | 0.054   | 42.099  | 0.000| 2.262  | 2.201   |
| .yas_perp9     | 1.932    | 0.043   | 44.959  | 0.000| 1.932  | 2.350   |
| .yas_perp11    | 1.325    | 0.036   | 36.948  | 0.000| 1.325  | 1.931   |
| .yas_perp13    | 1.257    | 0.034   | 37.328  | 0.000| 1.257  | 1.951   |
| .yas_perp5     | 1.852    | 0.045   | 40.957  | 0.000| 1.852  | 2.141   |
| .yas_perp7     | 1.486    | 0.039   | 38.141  | 0.000| 1.486  | 1.994   |
| .yas_perp8     | 1.295    | 0.037   | 35.123  | 0.000| 1.295  | 1.836   |
| .yas_perp12    | 1.249    | 0.033   | 37.518  | 0.000| 1.249  | 1.961   |
| .yas_perp3     | 3.443    | 0.054   | 63.454  | 0.000| 3.443  | 3.317   |
| .yas_perp6     | 4.290    | 0.053   | 81.259  | 0.000| 4.290  | 4.247   |
| .yas_perp10    | 4.126    | 0.050   | 82.596  | 0.000| 4.126  | 4.317   |
| .yas_perp14    | 4.230    | 0.059   | 72.119  | 0.000| 4.230  | 3.770   |
| relate         | 0.000    |         |         |      | 0.000  | 0.000   |
| social         | 0.000    |         |         |      | 0.000  | 0.000   |
| interp         | 0.000    |         |         |      | 0.000  | 0.000   |

### Variances:

|                | Estimate | Std.Err | z-value | P>|z|) | Std.lv | Std.all |
|----------------|----------|---------|---------|------|--------|---------|
| .yas_perp1     | 1.057    | 0.078   | 13.509  | 0.000| 1.057  | 0.989   |
| .yas_perp2     | 1.022    | 0.076   | 13.468  | 0.000| 1.022  | 0.967   |
| .yas_perp9     | 0.572    | 0.043   | 13.213  | 0.000| 0.572  | 0.846   |
| .yas_perp11    | 0.162    | 0.017   | 9.670   | 0.000| 0.162  | 0.344   |
| .yas_perp13    | 0.151    | 0.015   | 10.111  | 0.000| 0.151  | 0.363   |
| .yas_perp5     | 0.591    | 0.046   | 12.986  | 0.000| 0.591  | 0.790   |
| .yas_perp7     | 0.348    | 0.028   | 12.475  | 0.000| 0.348  | 0.626   |
| .yas_perp8     | 0.214    | 0.020   | 10.957  | 0.000| 0.214  | 0.431   |
| .yas_perp12    | 0.112    | 0.013   | 8.838   | 0.000| 0.112  | 0.276   |
| .yas_perp3     | 0.823    | 0.066   | 12.392  | 0.000| 0.823  | 0.764   |
| .yas_perp6     | 0.505    | 0.053   | 9.493   | 0.000| 0.505  | 0.495   |
| .yas_perp10    | 0.421    | 0.046   | 9.163   | 0.000| 0.421  | 0.461   |
| .yas_perp14    | 0.665    | 0.066   | 10.070  | 0.000| 0.665  | 0.528   |
| relate         | 0.011    | 0.012   | 0.936   | 0.349| 1.000  | 1.000   |
| social         | 0.157    | 0.036   | 4.342   | 0.000| 1.000  | 1.000   |
| interp         | 0.255    | 0.058   | 4.399   | 0.000| 1.000  | 1.000   |

### R-Square:

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<th>Estimate</th>
</tr>
</thead>
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<tr>
<td>.yas_perp1</td>
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</tr>
<tr>
<td>.yas_perp2</td>
<td>0.033</td>
</tr>
</tbody>
</table>
Investigate covariance among perp and ssipa

## yas_perp9 0.154
## yas_perp11 0.656
## yas_perp13 0.637
## yas_perp5 0.210
## yas_perp7 0.374
## yas_perp8 0.569
## yas_perp12 0.724
## yas_perp3 0.236
## yas_perp6 0.505
## yas_perp10 0.539
## yas_perp14 0.472

semPlot::semPaths(perp_fit, "std", intercepts = FALSE)

ssipa <- data %>%
  select(c("ResponseId", QID20_3, QID28_3, QID36_4, QID60_1,
           QID20_1, QID28_1, QID36_2, QID44_4,
           QID20_2, QID28_4, QID44_3, QID60_2,
           QID20_4, QID28_2, QID36_1, QID44_2, QID60_4)) %>%
  mutate(assert = QID20_3 + QID28_3 + QID36_4 + QID60_1,
         pass = QID20_1 + QID28_1 + QID36_2 + QID60_1,
         overt = QID20_2 + QID28_4 + QID44_3 + QID60_2,
         relat = QID20_4 + QID28_2 + QID36_1 + QID44_2 + QID60_4)

Investigate covariance among perp and ssipa

#merge files together
rq2 <- perp %>%
135
```r
full_join(ssipa, by = "ResponseId")

# Run CFA with all info in there

cfa_rq2 <- 
  relate =~ yas_perp1 + yas_perp2 + yas_perp9 + yas_perp11 + yas_perp13

  social =~ yas_perp5 + yas_perp7 + yas_perp8 + yas_perp12

  interp =~ yas_perp3 + yas_perp6 + yas_perp10 + yas_perp14

relate ~~ assert
relate ~~ pass
relate ~~ overt
relate ~~ relat

social ~~ assert
social ~~ pass
social ~~ overt
social ~~ relat

interp ~~ assert
interp ~~ pass
interp ~~ overt
interp ~~ relat

"r

rq2_fit <- lavaan::cfa(cfa_rq2, data = rq2, missing = 'fiml')

## Warning in lav_data_full(data = data, group = group, cluster = cluster, :
## lavaan WARNING: some cases are empty and will be ignored:
##  17 18 20 21 25 28 34 36 133 142 143 144 146 147 148 151 158 159 161 162 164 165 166 171 172 178 181 200 201 209 210 211 227 228 229 238 241 242 244 245 246 251 258 259 262 266 267 272 273 274 278 283 284 285 286 289 290 30 9 312 321 323 341 343 344 349 352 359 375 376 377 383 388 390 397 400 402 405 406 411 422 423 431 443 445

summary(rq2_fit, fit.measures = T, standardized = T, rsquare = T)

## lavaan 0.6.15 ended normally after 132 iterations
##
## | Estimator | Optimization method | Number of model parameters | Number of observations | Number of missing patterns |
## |------------|----------------------|----------------------------|------------------------|---------------------------|
## | ML         | NLMINB               | 62                         | 366                    | 3                         |
##
```
## Model Test User Model:

### Test statistic 592.655
### Degrees of freedom 108
### P-value (Chi-square) 0.000

## Model Test Baseline Model:

### Test statistic 2168.774
### Degrees of freedom 136
### P-value 0.000

## User Model versus Baseline Model:

### Comparative Fit Index (CFI) 0.762
### Tucker-Lewis Index (TLI) 0.700
### Robust Comparative Fit Index (CFI) 0.752
### Robust Tucker-Lewis Index (TLI) 0.688

## Loglikelihood and Information Criteria:

### Loglikelihood user model (H₀) -8495.647
### Loglikelihood unrestricted model (H₁) -8199.320
### Akaike (AIC) 17115.294
### Bayesian (BIC) 17357.257
### Sample-size adjusted Bayesian (SABIC) 17160.556

## Root Mean Square Error of Approximation:

### RMSEA 0.111
### 90 Percent confidence interval - lower 0.102
### 90 Percent confidence interval - upper 0.120
### P-value H₀: RMSEA <= 0.050 0.000
### P-value H₀: RMSEA >= 0.080 1.000
### Robust RMSEA 0.114
### 90 Percent confidence interval - lower 0.105
### 90 Percent confidence interval - upper 0.123
### P-value H₀: Robust RMSEA <= 0.050 0.000
### P-value H₀: Robust RMSEA >= 0.080 1.000

## Standardized Root Mean Square Residual:

### SRMR 0.103

## Parameter Estimates:
## Latent Variables:

| Latent Variable | Estimate | Std.Err | z-value | P(>|z|) | Std.lv | Std.all |
|-----------------|----------|---------|---------|---------|--------|---------|
| relate =~       |          |         |         |         |        |         |
| yas_perp1       | 1.000    |         |         |         | 0.101  | 0.098   |
| yas_perp2       | 1.773    | 1.087   | 1.631   | 0.103   | 0.180  | 0.175   |
| yas_perp9       | 3.087    | 1.736   | 1.778   | 0.075   | 0.313  | 0.382   |
| yas_perp11      | 5.342    | 2.948   | 1.812   | 0.070   | 0.542  | 0.804   |
| yas_perp13      | 4.928    | 2.728   | 1.806   | 0.071   | 0.500  | 0.789   |
| social =~       |          |         |         |         |        |         |
| yas_perp5       | 1.000    |         |         |         | 0.390  | 0.453   |
| yas_perp7       | 1.143    | 0.146   | 7.854   | 0.000   | 0.446  | 0.604   |
| yas_perp8       | 1.325    | 0.160   | 8.259   | 0.000   | 0.516  | 0.744   |
| yas_perp12      | 1.345    | 0.159   | 8.482   | 0.000   | 0.525  | 0.841   |
| interp =~       |          |         |         |         |        |         |
| yas_perp3       | 1.000    |         |         |         | 0.513  | 0.500   |
| yas_perp6       | 1.285    | 0.154   | 8.325   | 0.000   | 0.659  | 0.665   |
| yas_perp10      | 1.319    | 0.154   | 8.588   | 0.000   | 0.676  | 0.724   |
| yas_perp14      | 1.457    | 0.170   | 8.562   | 0.000   | 0.747  | 0.680   |

## Covariances:

| Latent Variable | Estimate | Std.Err | z-value | P(>|z|) | Std.lv | Std.all |
|-----------------|----------|---------|---------|---------|--------|---------|
| relate ~ assert | -0.021   | 0.023   | -0.914  | 0.361   | -0.203 | -0.067  |
| relate ~ pass   | -0.042   | 0.031   | -1.390  | 0.165   | -0.419 | -0.137  |
| relate ~ overt  | 0.048    | 0.033   | 1.468   | 0.142   | 0.472  | 0.197   |
| relate ~ relat  | 0.058    | 0.043   | 1.344   | 0.179   | 0.574  | 0.170   |
| social ~ assert | -0.099   | 0.072   | -1.363  | 0.173   | -0.253 | -0.083  |
| social ~ pass   | -0.142   | 0.076   | -1.863  | 0.063   | -0.365 | -0.119  |
| social ~ overt  | 0.190    | 0.077   | 2.454   | 0.014   | 0.488  | 0.203   |
| social ~ relat  | 0.244    | 0.106   | 2.303   | 0.021   | 0.627  | 0.185   |
| interp ~ assert | 0.564    | 0.117   | 4.820   | 0.000   | 1.100  | 0.362   |
| interp ~ pass   | 0.375    | 0.106   | 3.537   | 0.000   | 0.731  | 0.239   |
| interp ~ overt  | -0.310   | 0.105   | -2.949  | 0.003   | -0.604 | -0.252  |
| interp ~ relat  | -0.457   | 0.152   | -3.013  | 0.003   | -0.891 | -0.263  |
| relate ~ social | 0.039    | 0.022   | 1.759   | 0.079   | 0.987  | 0.987   |
| social ~ interp | -0.028   | 0.016   | -1.749  | 0.080   | -0.542 | -0.542  |
| social ~ interp | -0.107   | 0.020   | -5.251  | 0.000   | -0.535 | -0.535  |

## Intercepts:

| Latent Variable | Estimate | Std.Err | z-value | P(>|z|) | Std.lv | Std.all |
|-----------------|----------|---------|---------|---------|--------|---------|
| .yas_perp1      | 2.541    | 0.054   | 47.052  | 0.000   | 2.541  | 2.459   |
| .yas_perp2      | 2.262    | 0.054   | 42.135  | 0.000   | 2.262  | 2.202   |
## Variances:

| Variable   | Estimate | Std.Err | z-value | P(>|z|) | Std.lv | Std.all |
|------------|----------|---------|---------|--------|--------|---------|
| yas_perp1  | 1.057    | 0.078   | 13.508  | 0.000  | 1.057  | 0.990   |
| yas_perp2  | 1.023    | 0.076   | 13.463  | 0.000  | 1.023  | 0.969   |
| yas_perp9  | 0.572    | 0.043   | 13.202  | 0.000  | 0.572  | 0.854   |
| yas_perp11 | 0.161    | 0.017   | 9.633   | 0.000  | 0.161  | 0.354   |
| yas_perp13 | 0.151    | 0.015   | 10.089  | 0.000  | 0.151  | 0.377   |
| yas_perp5  | 0.588    | 0.045   | 12.920  | 0.000  | 0.588  | 0.794   |
| yas_perp7  | 0.346    | 0.028   | 12.429  | 0.000  | 0.346  | 0.635   |
| yas_perp8  | 0.215    | 0.020   | 10.920  | 0.000  | 0.215  | 0.447   |
| yas_perp12 | 0.114    | 0.013   | 8.787   | 0.000  | 0.114  | 0.293   |
| yas_perp3  | 0.791    | 0.064   | 12.296  | 0.000  | 0.791  | 0.750   |
| yas_perp6  | 0.547    | 0.052   | 10.545  | 0.000  | 0.547  | 0.557   |
| yas_perp10 | 0.414    | 0.044   | 9.517   | 0.000  | 0.414  | 0.475   |
| yas_perp14 | 0.650    | 0.062   | 10.448  | 0.000  | 0.650  | 0.538   |
| assert     | 9.226    | 0.726   | 12.715  | 0.000  | 9.226  | 1.000   |
| overt      | 9.358    | 0.730   | 12.827  | 0.000  | 9.358  | 1.000   |
| relat      | 11.455   | 0.896   | 12.778  | 0.000  | 11.455 | 1.000   |
| relate     | 0.010    | 0.011   | 0.906   | 0.365  | 1.000  | 1.000   |
| social     | 0.152    | 0.035   | 4.390   | 0.000  | 1.000  | 1.000   |
| interp     | 0.263    | 0.055   | 4.769   | 0.000  | 1.000  | 1.000   |

## R-Square:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Estimate</th>
</tr>
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<td>yas_perp1</td>
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<tr>
<td>yas_perp2</td>
<td>0.031</td>
</tr>
<tr>
<td>yas_perp9</td>
<td>0.146</td>
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<tr>
<td>yas_perp11</td>
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<tr>
<td>yas_perp13</td>
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<tr>
<td>yas_perp5</td>
<td>0.206</td>
</tr>
</tbody>
</table>
## yas_perp7         0.365
## yas_perp8         0.553
## yas_perp12        0.707
## yas_perp3         0.250
## yas_perp6         0.443
## yas_perp10        0.525
## yas_perp14        0.462

semPlot::semPaths(rq2_fit, "std", intercepts = FALSE)
Appendix C

Research Question 3. Are there differences in males’ and females’ reporting of indirect bullying behaviors on the YASB Victim Scale?

cfa3 <- "
  f1 =~ yas_vic13 + yas_vic11 + yas_vic8 + yas_vic12 + 
      yas_vic7 + yas_vic5 + yas_vic9
  
  f2 =~ yas_vic10 + yas_vic14 + yas_vic6 + yas_vic3
  
  f3 =~ yas_vic1 + yas_vic2 + yas_vic4
"

## nested model comparisons: measurement equivalence/invariance
fit.config <- cfa(cfa3, data = victim, group = "gender")
fit.metric <- cfa(cfa3, data = victim, group = "gender", 
                 group.equal = "loadings")
fit.scalar <- cfa(cfa3, data = victim, group = "gender", 
                 group.equal = c("loadings","intercepts"))
fit.strict <- cfa(cfa3, data = victim, group = "gender", 
                 group.equal = c("loadings","intercepts","residuals"))

measEqOut <- compareFit(fit.config, fit.metric, 
                     fit.scalar, fit.strict, 
                     moreIndices = TRUE)  # include moreFitIndices()

## Warning in FUN(X[[i]], ...): AICc (aic.smallN) was developed for univariate 
## linear models. It is probably not appropriate to use AICc to compare SEMs.

## Warning in FUN(X[[i]], ...): AICc (aic.smallN) was developed for univariate 
## linear models. It is probably not appropriate to use AICc to compare SEMs.

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## linear models. It is probably not appropriate to use AICc to compare SEMs.

## Warning in FUN(X[[i]], ...): AICc (aic.smallN) was developed for univariate 
## linear models. It is probably not appropriate to use AICc to compare SEMs.

summary(measEqOut)

## ################################### Nested Model Comparison ###################################
##
## Chi-Squared Difference Test
##
## Df  AIC  BIC  Chisq  Chisq diff  RMSEA Df diff Pr(>Chisq)
### Model Fit Indices

<table>
<thead>
<tr>
<th>Model</th>
<th>chisq</th>
<th>df</th>
<th>pvalue</th>
<th>rmsea</th>
<th>cfi</th>
<th>tli</th>
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### Differences in Fit Indices

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<td></td>
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summary(measEqOut, fit.measures = "all")

### Nested Model Comparison

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### Chi-Squared Difference Test

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### Model Fit Indices

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### Differences in Fit Indices

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### Model Fit Indices

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<td>182</td>
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</table>
## fit.scalar  .000 .915 .909† .909† .790† .804  .751  .916 .915
## fit.strict  .000 .901  .902  .902   NA   NA  .790† .900  .901
##                 logl unrestricted.logl        aic        bic ntotal
bic2
## fit.config                   6982.077                   6860.624†                   14144.154                   14500.644                   388 14215.693†
## fit.metric                   6990.393                   6860.624†                   14138.786                   14451.705                   388 14201.045
## fit.scalar                   6996.613                   6860.624†                   14129.225†                   14398.574                   388 14182.816
## fit.strict                   7012.568                   6860.624†                   14133.136                   14347.030†                   388 14175.082
##            rmsea rmsea.ci.lower rmsea.ci.upper rmsea.ci.level rmsea.pvalue
## fit.config .057           .044           .070           .900†        .168
## fit.metric .057           .044           .069           .900†        .173
## fit.scalar .056†          .043†          .068†          .900†        .221
## fit.strict .058           .046           .069           .900†        .129†
##            rmsea.close.h0 rmsea.notclose.pvalue rmsea.notclose.h0 rmr
## fit.config          .050†                 .001              .080† .055†
## fit.metric          .050†                 .001              .080† .057
## fit.scalar          .050†                 .000†             .080† .058
## fit.strict          .050†                 .001              .080† .059
##            srmr_mplus srmr_mplus_nomean cn_05 cn_01   gfi  agfi  pgfi
## fit.config      .056†             .060† 284.349  305.990  .989† .982  .615
## fit.metric      .060              .062  284.182  305.075  .988  .982  .660
## fit.scalar      .061              .062  288.347† 308.874† .988  .983† .705
## fit.strict      .065              .065  277.614  296.631 .986  .981 .762†
##              mfi   ecvi gammaHat adjGammaHat baseline.rmsea aic.smallN
## fit.config .885† 1.090          .966†       .952       .185† 14199.305
## fit.metric .878 1.076          .964        .953       .185† 14179.824
## fit.scalar .877 1.051†        .964        .955†      .185† 14158.642
## fit.strict .857 1.062          .958        .952       .185† 14150.974†
## bic.priorN spbic hbic ibic sic hqc
## fit.config 14500.876 14034.967† 13798.745† 14228.797 14394.205 14285.497
## fit.metric 14451.908 14050.947 13835.593 14236.882 14382.075 14262.853
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##                            mfi   ecvi gammaHat adjGammaHat baseline.rmsea
## fit.metric                  -0.006 -0.014 -0.002    0.001  0
## fit.scalar                  -0.002 -0.025  0.000  0.002  0
## fit.strict                  -0.020  0.010 -0.006 -0.004  0
##                              aic smallN bic priorN spbic hbic ibic sic
## fit.strict                  -7.668  -51.579  29.162  57.641  5.122 -20.608
##                              hqc
## fit.metric                  -22.643
## fit.scalar                  -26.835
## fit.strict                  -18.076

summary(measEqOut, fit.measures = c("aic", "bic", "sic", "ibic"))
```

```r
cfa3_gen <- 
  f1 =~ yas_vic13 + yas_vic11 + yas_vic8 + yas_vic12 + yas_vic7 + yas_vic5 + yas_vic9
  f2 =~ yas_vic10 + yas_vic14 + yas_vic6 + yas_vic3
  f3 =~ yas_vic1 + yas_vic2 + yas_vic4
  f1 ~ gender
```
f2 ~ gender
f3 ~ gender
"

gen_fit <- lavaan::cfa(cfa3_gen, data = victim, missing = 'fiml')

summary(gen_fit, fit.measures = T, standardized = T, rsquare = T)

## lavaan 0.6.15 ended normally after 57 iterations

##
## Estimator ML
## Optimization method NLMINB
## Number of model parameters 48
##
## Number of observations 451
## Number of missing patterns 2

## Model Test User Model:
##
## Test statistic 160.057
## Degrees of freedom 85
## P-value (Chi-square) 0.000

## Model Test Baseline Model:
##
## Test statistic 1265.284
## Degrees of freedom 105
## P-value 0.000

## User Model versus Baseline Model:
##
## Comparative Fit Index (CFI) 0.935
## Tucker-Lewis Index (TLI) 0.920

## Robust Comparative Fit Index (CFI) 0.935
## Robust Tucker-Lewis Index (TLI) 0.920

## Loglikelihood and Information Criteria:
##
## Loglikelihood user model (H0) -7019.577
## Loglikelihood unrestricted model (H1) -6939.549

## Akaike (AIC) 14135.154
## Bayesian (BIC) 14332.505
## Sample-size adjusted Bayesian (SABIC) 14180.171

## Root Mean Square Error of Approximation:
##
## RMSEA 0.044
## 90 Percent confidence interval - lower 0.034
## 90 Percent confidence interval - upper 0.055
## P-value H_0: RMSEA <= 0.050 0.810
## P-value H_0: RMSEA >= 0.080 0.000
## Robust RMSEA 0.048
## 90 Percent confidence interval - lower 0.036
## 90 Percent confidence interval - upper 0.059
## P-value H_0: Robust RMSEA <= 0.050 0.618
## P-value H_0: Robust RMSEA >= 0.080 0.000

## Standardized Root Mean Square Residual:
## SRMR 0.048

## Parameter Estimates:
### Standard errors
### Information
### Observed information based on Hessian

## Latent Variables:
### Estimate Std.Err z-value P(>|z|) Std.lv Std.all
### f1 =~
#### yas_vic13 1.000 0.541 0.663
#### yas_vic11 1.118 0.098 11.443 0.000 0.605 0.720
#### yas_vic8 0.981 0.093 10.500 0.000 0.531 0.655
#### yas_vic12 0.992 0.114 8.707 0.000 0.537 0.509
#### yas_vic7 1.082 0.114 9.479 0.000 0.586 0.581
#### yas_vic5 1.023 0.124 8.266 0.000 0.554 0.506
#### yas_vic9 0.877 0.113 7.779 0.000 0.475 0.462
### f2 =~
#### yas_vic10 1.000 0.770 0.767
#### yas_vic14 0.873 0.090 9.750 0.000 0.672 0.621
#### yas_vic6 0.844 0.088 9.622 0.000 0.649 0.641
#### yas_vic3 0.459 0.073 6.277 0.000 0.353 0.381
### f3 =~
#### yas_vic2 1.000 0.502 0.531
#### yas_vic2 1.197 0.166 7.197 0.000 0.601 0.622
#### yas_vic4 1.442 0.216 6.680 0.000 0.725 0.639

## Regressions:
### Estimate Std.Err z-value P(>|z|) Std.lv Std.all
### f1 ~
#### gender -0.009 0.969 -0.093 0.926 -0.017 -0.005
### f2 ~
#### gender -0.250 0.141 -1.772 0.076 -0.325 -0.101
### f3 ~
#### gender 0.010 0.101 0.104 0.917 0.021 0.006

## Covariances:
## Estimate Std.Err z-value P(>|z|) Std.lv Std.all
## .f1 ~~ .f2 -0.186 0.032 -5.865 0.000 -0.449 -0.449
## .f2 ~~ .f3 0.151 0.027 5.614 0.000 0.557 0.557
## .f3                0.151 0.027 5.614 0.000 0.557 0.557
## Intercepts:
##                    Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##    .yas_vic13         1.538 0.115 13.401 0.000 1.538 1.884
##    .yas_vic11         1.550 0.127 12.198 0.000 1.550 1.843
##    .yas_vic8          1.443 0.113 12.790 0.000 1.443 1.779
##    .yas_vic12         1.935 0.119 16.280 0.000 1.935 1.836
##    .yas_vic7          2.104 0.127 16.606 0.000 2.104 2.086
##    .yas_vic5          2.051 0.123 16.704 0.000 2.051 1.873
##    .yas_vic9          2.333 0.107 21.732 0.000 2.333 2.273
##    .yas_vic10         4.037 0.166 24.390 0.000 4.037 4.021
##    .yas_vic14         4.156 0.150 27.652 0.000 4.156 3.838
##    .yas_vic6          3.985 0.144 27.641 0.000 3.985 3.932
##    .yas_vic3          3.440 0.089 38.695 0.000 3.440 3.712
##    .yas_vic1           2.558 0.122 20.958 0.000 2.558 2.704
##    .yas_vic2           2.633 0.143 17.425 0.000 2.633 2.724
##    .yas_vic4           2.658 0.172 15.467 0.000 2.658 2.344
##    .f1                0.000                                0.000 0.000
##    .f2                0.000                                0.000 0.000
##    .f3                0.000                                0.000 0.000
## Variances:
##                    Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##    .yas_vic13         0.374 0.033 11.445 0.000 0.374 0.561
##    .yas_vic11         0.341 0.033 10.428 0.000 0.341 0.482
##    .yas_vic8          0.376 0.033 11.540 0.000 0.376 0.571
##    .yas_vic12         0.822 0.064 12.794 0.000 0.822 0.741
##    .yas_vic7          0.674 0.055 12.228 0.000 0.674 0.663
##    .yas_vic5          0.893 0.070 12.817 0.000 0.893 0.744
##    .yas_vic9          0.829 0.063 13.069 0.000 0.829 0.786
##    .yas_vic10         0.415 0.057  7.229 0.000 0.415 0.412
##    .yas_vic14         0.720 0.066 10.940 0.000 0.720 0.614
##    .yas_vic6          0.606 0.058 10.432 0.000 0.606 0.589
##    .yas_vic3          0.734 0.056 13.132 0.000 0.734 0.855
##    .yas_vic1           0.642 0.058 11.058 0.000 0.642 0.718
##    .yas_vic2           0.573 0.062  9.250 0.000 0.573 0.613
##    .yas_vic4           0.761 0.086  8.820 0.000 0.761 0.592
##    .f1                0.293 0.044  6.688 0.000  1.000 1.000
##    .f2                0.587 0.082  7.160 0.000  0.998 0.990
##    .f3                0.252 0.057  4.429 0.000  1.000 1.000
## R-Square:
##                    Estimate
##    yas_vic13          0.439
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