

Adolescent Social Functioning: The Role of Parental Reflective Functioning and Adolescent
Mentalizing in Predicting Adolescent Prosocial Behaviour and Peer Problems

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

Adolescence is a critical developmental period in which social relationships become especially influential, with social functioning producing a number of important downstream effects for adolescent's psychological and socio-emotional well-being. Yet, our understanding of the individual and familial factors that are associated with positive adolescent social functioning is not comprehensive and this age group remains consistently understudied compared to early childhood years, despite the fact that parents continue to be influential for youth outcomes. One factor that may support adolescent social success is the reflective functioning skills (the ability to reason about the mental states of oneself and others) possessed by the parent. Further, the adolescent's own reflective functioning skills may have important influences on adolescent social functioning, and may mediate the hypothesized association between parental reflective functioning and adolescent social functioning.

In this study of 87 parent-youth pairs (youth ages 12-15), we examine the associations between parental reflective functioning, youth mentalizing, and youth social functioning using a variety of self-report and task-based measures. Regressions and mediation analyses revealed that parental and youth reflective functioning both uniquely contribute to youth social functioning; however, patterns of association differ depending on the social behaviour examined (namely prosocial behaviours versus peer problems) and whether the parent or the youth is the reporter of youth social functioning. Unlike their *parental* reflective functioning skills, parents' general reflective functioning skills were not associated with youth social functioning, suggesting that there may be unique elements of mental state reasoning related to the parenting relationship that are more influential for youths' development. Implications for theory and practice are also discussed.

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Literature Review

Reflective Functioning

The ability to form healthy, supportive social relationships with other people is a quintessential aspect of the human experience throughout the lifespan, and achieving success in these social relationships is of great consequence for an individual's future development and well-being. Individuals who are more successful at forming relationships show a wide variety of positive outcomes, including increased subjective wellbeing (Gallagher & Vella-Brodrick, 2008; Ronen et al., 2016; Siedlecki et al., 2014; Yıldırım & Çelik Tanrıverdi, 2020), life satisfaction (Mellor et al., 2008; Rico-Uribe et al., 2016), greater career success (Albert & Luzzo, 1999; Bullis, 1993; Hogan & Shelton, 1998; Seibert et al., 2017), and more resilient responses to stress (Cutrona & Russell, 1987; Hartling, 2008; Yıldırım & Çelik Tanrıverdi, 2020). Similarly, individuals with a social network high in intimacy and closeness also show more advanced cognitive development (Doise et al., 1975; Hartup, 1989; Wegerif et al., 1999), improved physical and mental health (Beller & Wagner, 2018; Repetti et al., 2002; Rico-Uribe et al., 2016; Thoits, 2011; Uchino, 2009), and reduced feelings of social isolation, regardless of the size of their social network (Beller & Wagner, 2018; Hawkley et al., 2008; Mellor et al., 2008). However, effective engagement with others requires a sophisticated network of cognitive and social skills that allow individuals to rapidly respond to the needs of their social partner. These skills develop throughout childhood and adolescence as young people begin to encounter more complex and nuanced social interactions and dynamics, with a wide degree of variability within the population.

One cognitive skill that has been implicated in the study of social development is perspective-taking and the ability to recognize that other individuals have differing mental states

– thoughts, feelings, goals, and desires – than oneself, and these mental states guide their behaviour and communication. Perspective-taking may be especially important given that effective social communication involves rapidly responding to a partner’s verbal and non-verbal social cues in order to make inferences about that individual’s internal mental states and emotions (Breazeal et al., 2006; Krauss & Fussell, 1991; Nilsen & Fecica, 2011; Sternberg & Smith, 1985). However, the thoughts and feelings of a social partner are not readily accessible to an observer. Instead, individuals must utilize observable behaviour and past experiences to make inferences about their partner’s internal experiences. In this way, effective social communication and relationship-building inherently relies upon an individual’s ability to take their partner’s perspective (Nilsen & Bacso, 2017; Schröder-Abé & Schütz, 2011). Accurately interpreting these cues allows an individual to respond sensitively to their social partner in the moment-by-moment changes that occur throughout a social interaction.

However, effective interactions require going beyond the comprehension or recognition that others have differing mental states; they also involve the ability to self-monitor and reflect upon one’s own contributions to the encounter (Gómez & Strasser, 2021). For example, an individual must monitor how often they are interrupting their partner or allowing for appropriate conversational turn-taking. Additionally, different situational contexts may inform the appropriate type of response; for example, one would be expected to take on a more relaxed style in a gathering with friends than in a workplace setting or would be expected to share greater levels of vulnerability and interpersonal warmth in close relationships than with acquaintances (Collins & Miller, 1994; Sprecher et al., 2013; Won-Doornink, 1979) These interactions can become increasingly complicated when navigating an emotional or frustrating conversation,

which requires greater levels of inhibition and self-monitoring of one's own emotional responses in order to facilitate effective exchanges (Caporaso et al., 2019; Wilkowski et al., 2010).

Regardless of the social context, integrating one's own experiences and responses with inferences about a partner's internal world is an essential skill to navigate social relationships. One cognitive skill that encapsulates this ability, and has been gaining research interest in recent years, is reflective functioning (also synonymously referred to within the literature as mentalizing). Reflective functioning is an advanced form of perspective-taking that requires an individual to have a sophisticated sense of their own mental states, the mental states of others, and how these two factors influence each other (Allen et al., 2008; Fonagy & Target, 1996, 1997, 2002; Steele & Steele, 2008). As described by Peter Fonagy and colleagues, reflective functioning refers to the "capacity to understand both the self and others in terms of intentional mental states, such as feelings, desires, wishes, goals and attitudes" (Fonagy et al., 2016). Research suggests that reflective functioning may be a uniquely human experience, shared in only a very rudimentary form by our genetically closest primate relatives (Tomasello, 2018; Tomasello & Herrmann, 2010) and may be a central feature of our ability to form attachments and foster social connection (Fonagy & Target, 1997; Slade, 2005).

This literature review will examine the development of the empirical understanding of reflective functioning, highlighting conceptual similarities with other constructs and methods for operationalizing and measuring this skill. Then, this review will comprehensively discuss the relevance of reflective functioning to the parenting relationship (Parental Reflective Functioning). Additionally, and in alignment with the focus of this thesis, this review will examine parent and child outcomes related to parental reflective functioning, with a focus on the adolescent age range. Lastly, prior work on social functioning in adolescence will be evaluated in

order to contextualize the ways in which parental reflective functioning and adolescents' own mentalizing may impact this area. A study conducted to address key gaps identified from the extant literature will follow this review.

Proposed Theoretical Components of Reflective Functioning

Conceptually, reflective functioning acknowledges that individuals may have differing levels of ability to recognize their own mental states (self-focused reflective functioning) and to recognize the mental states of others (other-focused reflective functioning). Evidence for a potential split between self- and other- focused reflective functioning has come from research that shows self- vs other-focused reflective functioning may have differential impacts on outcomes for individuals with mental health disorders, with other-focused reflective functioning being particularly impaired in conditions with a strong effect on social relationships, such as borderline personality disorder, ASD, and ADHD (Badoud et al., 2018; Bateman & Fonagy, 2004; Lombardo et al., 2011; Luyten et al., 2020) and substance use disorders (Suchman et al., 2010). Research has also supported the idea that individuals may have differing reflective capacity when describing their awareness of their own mental states and when considering the mental states of others through assessment measures that show a factor structure differentiating reflective functioning related to oneself and others (Fonagy et al., 1998, 2016). Additionally, results from a variety of studies linking poor reflective functioning and psychopathology have shown that individuals with low other-focused reflective functioning often have significantly worse outcomes and are more likely to have clinically severe symptoms (Fonagy & Bateman, 2008; Fonagy & Luyten, 2009; Ha et al., 2013; Sharp et al., 2011), although it would be beneficial for this literature to more consistently examine how these findings hold when controlling for factors like language skills and other mental health symptomatology. Some

authors have also theorized that there may be differences in cognitive-reflective functioning, or the ability to consider others' goal-oriented behaviour and motivations, and affective-reflective functioning, which emphasizes the understanding of individuals' emotional states (Caminiti et al., 2015; Choi-Kain & Gunderson, 2008; Dodich et al., 2015, 2016; Luyten et al., 2020; Molenberghs et al., 2016).

While reflective functioning is often referred to as a global ability, there is mounting evidence to support the claim that it may also have several important sub-components. Effective reflective functioning involves having an appropriate level of insight into your own knowledge of others' opaque interior worlds; therefore, ineffective forms of reflective functioning can incorporate both an under-estimation of the complexity of others' mental states (hypomentalizing) *and* inappropriately complex or unusual explanations of others' behaviour that relies too heavily on mental state interpretations (hypermentalizing) (Fonagy et al., 2015; Luyten et al., 2020; Luyten, Mayes, et al., 2017; Luyten, Nijssens, et al., 2017; Sharp et al., 2011, 2013; Sharp & Vanwoerden, 2015). Hypomentalizing can involve unsophisticated inferences about others' mental states that do not adequately estimate the complexity of others' internal worlds; extreme hypomentalizing is also sometimes referred to as pre-mentalizing (or pre-mentalizing modes) and is indicative of a complete inability to consider the actions of oneself or others in terms of mental states (Fonagy et al., 2015, 2016, 2017; Fonagy & Bateman, 2008, 2016; Luyten et al., 2020; Luyten, Nijssens, et al., 2017). Pre-mentalizing modes are described as a primitive form of mentalizing, with some theorizing there are three foundational errors made by individuals using pre-mentalizing modes: psychic equivalence mode, wherein individuals equate internal experiences with external reality such that thoughts and feelings are experienced as 'real'; teleological mode, wherein understanding of oneself and others is highly concrete and

the individual relies too heavily upon purely observable behaviour; and the pretend mode, wherein the individual struggles to ground their internal experiences and personal narrative within reality at all (Fonagy & Bateman, 2008, 2016). Pre-mentalizing modes have been theorized to be an early, unsophisticated form of mentalizing that individuals may experience in early childhood before transitioning to a less egocentric point-of-view later in development, although research is lacking in confirming this developmental theory (Fonagy & Bateman, 2016). The majority of research on these pre-mentalizing modes has focused on observed differences in the intrapersonal and interpersonal experiences and personal narratives of individuals with BPD who have low mentalizing skills, and work is continuing to develop in this area with general populations (Fonagy & Bateman, 2016). In contrast, hypermentalizing is thought to be a form of over-mentalizing that utilizes unusually complex interpretations of others' mental states to interpret their behaviour, often with higher certainty in one's assessment of others' mental states than is appropriate (Fonagy et al., 2016; Fonagy & Bateman, 2008, 2016; Luyten, Nijssens, et al., 2017). Hypermentalizing can be damaging in that it does not enable one to recognize that others' mental states are inherently opaque to us. An inability to appropriately assess the limitations we have in understanding the minds of others is thought to result in failures to adapt one's behaviour and learn from the cues of others.

These sub-categories of poor mentalizing have been reflected through sub-scales of many of the existing reflective functioning assessment measures, which categorize responses into those that fail to conceptualize others as having mental states which drive their behaviour (pre-mentalizing), those that hypo- or under-mentalize about others, and those that hyper-mentalize others or speak about their internal state with inappropriately high certainty. Research suggests that deficits in mentalizing (through both hypo- and hyper- mentalizing) are associated with a

variety of psychopathological conditions (for review see Luyten et al., 2020 and Nazarro et al., 2017). Most notably, hypomentalyzing has been routinely associated with conditions like borderline personality disorder (Beck et al., 2017; Fonagy et al., 2016; Fonagy & Bateman, 2008; Ha et al., 2013; Sharp et al., 2013), DSM-V Cluster A & B Personality Disorders (Nazzaro et al., 2017), and substance use disorders (Håkansson et al., 2018, 2019; Handeland et al., 2019; Stover & Kiselica, 2014).

Conversely, there may be links between high levels of mentalizing and the ability to cognitively integrate the mental complexity of other individuals. Many individuals who score highly on measures of mentalizing are particularly adept at conceptualizing individuals who have mixed-ambivalent mental states (Rosso et al., 2015), meaning they are better able to integrate the idea that individuals have complex qualities that may at times contradict each other; someone may be generous in certain circumstances but selfish in others, or may act in a way that seems to contradict a goal they have previously voiced.

Conceptual Overlap between Reflective Functioning, Perspective-Taking and Theory-Of-Mind

Reflective functioning shares many conceptual roots with perspective-taking and the development of complex theory of mind. Notably, Fonagy and Target (1997) have proposed that one way in which children develop theory-of-mind is through their parents' attributing intentionality to infants' spontaneous movements and expressions. This theory proposes that through witnessing their parents make attributions about their (the child's) actions, children learn to make attributions to the actions of others. Fonagy and Target (1997) propose that this leads to early theory-of-mind skills – as traditionally studied through false-belief tasks – as well as acting as a precursor to the later development of complex mentalizing/reflective functioning. Many researchers have theorized that theory-of-mind and reflective functioning may not be two distinct

cognitive functions but may in fact be elements of the same overarching ability to represent the minds of others. Indeed, there are many studies that suggest an association between the two concepts: for example, children's ability to engage in symbolic pretend-play has been correlated with their other-focused reflective functioning skills in later childhood (Tessier et al., 2016). Additionally, populations that would traditionally show deficits in theory of mind capabilities, such as individuals with an Autism Spectrum Disorder diagnosis, also tend to show deficits in mentalizing (Chung et al., 2014; Dawson & Fernald, 1987; S. J. White et al., 2014; S. W. White et al., 2014).

Notably, research has supported the idea of conceptual overlap between Theory-of-Mind and reflective functioning through literature that demonstrates similar distinctions in the underlying components of both constructs. Literature on Theory-of-Mind development has documented, through both experimental and neurological research, that there is a distinction between cognitive theory-of-mind and affective theory-of-mind (Baron-Cohen et al., 1997; Gabriel et al., 2021; Shamay-Tsoory et al., 2007; Shamay-Tsoory & Aharon-Peretz, 2007). Further, this conceptual split has been mirrored in recent therapeutic and neuroanatomical reflective functioning research which demonstrated that reflective functioning skills may also differ when individuals are reflecting upon the emotional states of others (i.e., interpreting their subjective feelings) and when reflecting on the cognitive states of others (i.e., their knowledge, beliefs, or goals) (Bigelow et al., 2021; Gullestad & Wilberg, 2011; Healey & Grossman, 2018; Schlaffke et al., 2015; Sebastian et al., 2012).

In contrast, those who propose a conceptual *distinction* between Theory-of-Mind and reflective functioning most frequently emphasize the importance of the self in reflective functioning; unlike Theory-of-Mind, which typically focuses solely on an individual's ability to

reason about others, reflective functioning incorporates both the ability to reason about others and the ability to metacognitively recognize and consider the mental states of oneself. Additionally, reflective functioning focuses on the dyadic dynamics of the interaction; an individual is not just required to recognize that others have a different perspective than themselves, but to also reflect upon the ways in which their mental states interact with behaviour. This bidirectional element of reflective functioning may distinguish it from traditional understandings of Theory-of-Mind. Additionally, reflective functioning has been described by some as relatively context-specific; while preliminary, the suggestion that an individual may have differing abilities to reflect upon their experiences in a coherent way depending on factors like the nature and affective context of the relationship an individual is considering (O'Connor & Hirsch, 1999), suggesting greater flexibility in this ability than the global nature in which researchers traditionally describe Theory-of-Mind.

The debate around distinguishing features of Theory-of-Mind and Mentalizing/Reflective Functioning is ongoing, and a review of how existing research fits within a variety of theoretical frameworks of socio-emotional developmental can be found in Ensink and Mayes' 2010 review paper. Research in this field will need to continue to use a wide variety of methodologies to investigate the neural underpinnings, outcomes, and other constructs that may differ between reflective functioning and theory-of-mind approaches.

Measurement of Reflective Functioning

A variety of measures have been proposed for operationalizing reflective functioning. While a full review of all reflective functioning measurement strategies is beyond the scope of this review, a brief description of key measures of interest is included below. It is important to note that while there are assessment tools available that aim to assess an individual's

sophisticated Theory-of-Mind (for review: Beaudoin et al., 2020; Karmakar & Dogra, 2019) or empathy development (for review: Zhou et al., 2019, this review will focus specifically on assessments claiming to assess reflective functioning/mentalizing ability. Measures of reflective functioning include interview coding schemes, self-report questionnaires, and task-based measures.

Interview-based Assessment. The Reflective Functioning Scale (RFS; Fonagy et al., 1998) is a foundational interview-based measure that was originally designed to be applied to the Adult Attachment Interview (AAI; George et al., 1996), but has been expanded into use with a number of other semi-structured interviews (Katznelson, 2014). Trained administrators review transcripts of the relevant interview and use a coding system to divide responses into those that indicate knowledge of, awareness of, and attention to mental states. The RFS has also been adapted for use with children and teens through the Child Reflective Functioning Scale (CRFS; Ensink et al., 2015), which is applied to the Child Attachment Interview (CAI; Shmueli-Goetz et al., 2008) and allows for insight into how children and youth conceptualize their close relationships. A small number of other interview coding schemes have been developed, including the Metacognition Assessment Scale (MAS; Semerari et al., 2003), which divides responses into measures about mentalization of the self and others, and the Grille de l'elaboration Verbale de l'Affect (Lecours et al., 2000).

Self-Report Questionnaires. Several self-report questionnaires have been developed for clinical screening and research use. While these measures have the advantage of being easy to administer, there is a lack of research agreement on the theoretical underpinnings of these measures which makes comparison across measures difficult (for review, see Rumeo & Oakman, 2022). Notably, the RFS has been adapted into a self-report measure, the Reflective Functioning

Questionnaire (RFQ; Fonagy et al., 2016). At the time of writing, three versions of the RFQ are available: a 54-item version, a 46-item version, and an 8-item short-form version. Currently, Fonagy and colleagues recommend the scale only be used for research purposes as it undergoes additional investigation for suitability as a clinical tool. A youth version, the RFQ-Y, is also available (RFQ-Y; Sharp et al., 2009). Other notable self-report measures of mentalizing include: the Mentalizing Scale (MentS; Dimitrijević et al., 2018), which examines self-focused and other-focused mentalizing, as well as motivation to mentalize about others; the Multidimensional Mentalizing Questionnaire (MMQ; Gori et al., 2021), which was designed around the idea that adequate mentalizing requires flexible movement along four polar axes (Cognitive-affective, self-other, outside-inside, and explicit-implicit); and the Mentalization Questionnaire (MZQ; Hausberg et al., 2012), which examines reflective functioning related to the self along subscales related to the avoidance, integration, and identification of one's own mental and emotional states.

Task-Based Measures. Lastly, although there are no known task-based measures that explicitly aim to assess reflective functioning (including elements of both self and other-focused components), a select number of task-based measures that target other-focused mentalizing and related constructs are available. The Movie for the Assessment of Social Cognition (MASC; Dziobek et al., 2006) has viewers watch a series of short consecutive scenes of four adults during a dinner party. Viewers are asked to interpret the intentions, motivations, and internal feelings of the characters in the scene at various points. Notably, many of the social interactions are ambiguous and ask viewers to identify differences in spoken and intended meaning (e.g., sarcasm vs sincerity). The Awareness of Social Inference Test (TASIT-S; McDonald et al., 2018) uses a similar paradigm that asks viewers to identify the emotions, motivations, and stated vs intended meaning of different characters in a variety of short scenes. Lastly, tasks like the

Reading the Mind in the Eyes Test (Baron-Cohen et al., 2001), the Reading the Mind in the Voice Test (Golan et al., 2007), and the Reading the Mind in Films Test (Golan et al., 2006) ask participants to identify emotion from facial expression, voice, and short movie scenes, respectively. Debate continues around how effectively these tasks isolate mentalizing abilities compared to related constructs like empathy, affective cognition, and emotion recognition; however, the ability to utilize a variety of modalities in the study of this concept is essential to developing our understanding of the key theoretical underpinnings of this work.

Interim Summary

Reflective functioning refers to the ability to consider the mental states of oneself and others. While the field is still under development, a number of measures in a variety of modalities have been established in order to operationalize this construct. Understanding reflective functioning is particularly important given its associations with a number of other constructs that are key to successful functioning, as well as its relevance to fostering effective relationships. Some have theorized that reflective functioning may operate differently depending on the relationship context; in the next portion of this review, we highlight how reflective functioning is relevant to parenting.

Parental Reflective Functioning

One relational dynamic where the ability to accurately interpret and respond to others is particularly consequential is the parenting relationship (for review; Camoirano, 2017). Parenting is a time in which individuals must learn how to respond to their children's physical and socioemotional needs. Additionally, in a child's earliest years, the demands on a parent's ability to interpret their child's states are especially high as young children are unable to verbalize expressions of their mental states. As a result, parents must rely on their ability to interpret their

child's external cues as indicators of an internal mental state in order to not only recognize when their child is in distress, but to also make informed judgments regarding what they may need to do or provide in order to rectify the situation.

Parental reflective functioning is a concept describing the nuances of reflective functioning in the parenting relationship. Indeed, seminal reflective functioning work (and similar work under other names) entered the literature within the realm of research on attachment styles (Fonagy et al., 1991; Kelly et al., 2005; Meins et al., 2001; Sharp & Fonagy, 2008; Slade, 2005), with researchers hypothesizing that a key factor that may distinguish a mother's ability to form a secure attachment style with her infant was her ability to accurately interpret and respond to the external cues of her child (Fonagy et al., 1991).¹ Parental reflective functioning therefore builds on the classical definition of reflective functioning (the ability to accurately attribute mental states to others, and to respond sensitively and effectively to those mental states) by extending this to the specifics of recognizing the complex mental states possessed by children, and responding to the changing physical, social-emotional, and developmental needs of a child. Parental reflective functioning requires the parent to think of their child as an independent agent with their own mental states, desires, and goals, even though the child may not be able to express these internal states verbally (child-focused reflective functioning), while also incorporating the ability to reflect upon their own parenting behaviours (self-focused reflective functioning) and the influence these behaviours have over one's children. In this way, parental reflective functioning is particularly focused on uncovering the underlying components that relate to a

¹ Note that the majority of research on parental reflective functioning and similar concepts (maternal mind-mindedness, parental mentalizing) has been conducted solely with mothers. However, this emphasis within the literature should not be taken to imply that parental reflective functioning is not also important for paternal relationships. A review of the limited research on empirical differences among maternal and paternal reflective functioning is included further in this review.

parent's ability to form a complex, sophisticated idea of their child as having an independent internal mental world, and to understand the ways in which they and their child interact dyadically (Fonagy et al., 1991; Kelly et al., 2005; Rosenblum et al., 2008; Sayre, 2001; Sharp & Fonagy, 2008; Slade et al., 2005).

Measurement of Parental Reflective Functioning

Currently, there are limited resources available to measure parental reflective functioning. As with more general measures of mentalizing/reflective functioning, that which does exist is typically either a coding system that can be applied to a semi-structured interview, or a self-report questionnaire. A brief overview of key measures of parental reflective functioning is included here; for a more comprehensive review, see Camoirano's 2017 review paper.

Interview Measures. The first noted measure of parental reflective functioning is adapted from Fonagy et al.'s RFS by applying the RFS to a variety of parenting-based interviews, like the Pregnancy Interview (PI; Slade et al., 2007), the Parental Development Interview (PDI-R; Slade et al., 2004) and the Working Model of the Child Interview (Zeanah & Benoit, 1995). The Pregnancy Interview asks expectant parents to describe their thoughts and feelings about their pregnancy and unborn child during the third trimester of pregnancy and evaluates the use of mental-state talk. The Parent Development Interview is designed to be somewhat analogous to the AAI, and asks parents to describe their mental representations of their child, themselves as a parent, and the parent-child relationship (Slade et al., 2004; Sled et al., 2020). Similarly, the Working Model of the Child Interview uses open-ended questions that ask parents to reflect upon specific situations with their child or tell stories about their parenting experiences (Zeanah & Benoit, 1995).

Self-Report Questionnaires. Few self-report measures of parental reflective functioning exist. At the time of writing, the most widely used is the Parental Reflective Functioning Questionnaire, a recently developed 18-item self-report measure by Luyten, Mayes, et al. (2017) that provides indications of a parent's tendency towards ineffective forms of mentalizing about their child, their general level of interest and curiosity in their child's mental states, and their certainty about their child's mental states. At present, there is a validated PRFQ for use with parents of children ages 0-5, parents of school-age children, and an Adolescent version (PRFQ-A; Luyten, Mayes, et al., 2017) that is modified to be appropriate for use with parents of children ages 12-18. All versions have been validated in clinical and non-clinical samples and preliminary research utilizing these tools also suggests good reliability and validity (Krink et al., 2018; Pazzagli et al., 2018; Schultheis et al., 2019).

Other Measures. A number of researchers have designed assessments for concepts that resemble that of parental mentalizing/reflective functioning, including mind-mindedness metacognition, and sensitivity in mothers. For example, Meins et al. (2001) introduced a coding scheme that allows evaluators to code mother-child interactions based on observing free play scenarios. While this measure ostensibly measures maternal mind-mindedness, the attention to mental-state comments is in alignment with reflective functioning research. Similarly, Shai and Belsky introduced the concept of parental embodied mentalizing (PEM; 2011), or the measurable ways in which parents imitate the kinesthetics of their infant as a way of demonstrating parental mentalization. The PEM also has the advantage of offering a non-linguistically based assessment of parental mentalizing (Shai et al., 2017). While a detailed review of these measures is beyond the scope of this review, such examples highlight that reflective functioning is a diverse area of study with ongoing efforts to develop specific, multi-modal measures that encompass the

complex interactions in relationships. However, the limited measures available for assessing parental reflective functioning are a limitation within this area of research. In particular, the lack of well-validated self-report or questionnaire measures presents limitations for research, as many research studies do not have the time or resources to administer an interview-based coding system. Furthermore, current research suggests there may be differences between general mentalizing/reflective functioning skills and how these skills are applied in the parenting context (Camoirano, 2017; Luyten, Nijssens et al., 2017; Rutherford et al., 2013; Slade, 2005), meaning it is especially important to have measures available that are specific to parental reflective functioning.

Conceptual Overlaps among Parental Reflective Functioning and Other Constructs

Parental Sensitivity

It is noteworthy that, much like the synonymy of reflective functioning and mentalizing, parental reflective functioning is sometimes referred to by synonymous and closely related concepts like parental reflective capacity, parental mentalizing, and in the context of mothering, maternal mind-mindedness (Camoirano, 2017; Hughes et al., 2017; Luyten et al., 2017). Conceptually, it also shares significant overlap with concepts like maternal sensitivity; however, in this context, most studies have conceptualized parental reflective functioning as a precursor to parental sensitivity or as a concept loosely coupled with parental sensitivity. More specifically, parental sensitivity refers more to a parent's ability to respond to their infant's needs and distress appropriately (Ainsworth et al., 1974; Mesman & Emmen, 2013), while parental reflective functioning focuses more on the underlying cognitions surrounding a parent's ability to consider their child as an agent with independent mental states. A number of recent studies have shown associations between maternal reflective functioning and maternal sensitive caregiving, within

both high- and low-risk maternal samples (Krink et al., 2018; Stacks et al., 2014). For the purposes of this review, we will use the term parental reflective functioning to describe the concept of a parent's capability to recognize themselves and their child as having distinct mental states that impact behaviour, and their ability to consider the ways in which the parent-child relationship is affected by, and in turn affects, this mental-state conceptualization.

Attachment

Given the historical context of the development of research into parental reflective functioning, it is perhaps not surprising that a vast body of research has focused on delineating the connections between parental reflective functioning and attachment. This literature has consistently found links between high levels of reflective functioning and more secure attachment in both children and mothers (Camoirano, 2017; Rosso & Airoldi, 2016; Rostad & Whitaker, 2016; Rutherford et al., 2015; Schultheis et al., 2019). Slade et al. (2005) found that mothers who scored highly on secure attachment on the AAI during pregnancy also had higher maternal reflective functioning when their infant was 10 months old. Additionally, Slade et al. (2005) found evidence that children of mothers who had highly developed parental reflective functioning were more often categorized as securely attached during the Strange Situation Procedure (Ainsworth et al., 1978) at age 14 months. Consequently, children of mothers who demonstrated low reflective functioning skills (and, in particular, a higher amount of pre-mentalizing/hypomentalyzing modes) demonstrated a higher rate of disorganized and ambivalent attachment when assessed at 14 months old (Slade et al., 2005).

Beyond infancy, parental reflective functioning has been shown to be a strong predictor of parent-child relationship quality in early childhood years (Rostad & Whitaker, 2016), and high child-focused parental reflective functioning has been correlated with increased attachment

security among school-aged children (Borelli et al., 2016). Parental reflective functioning has also been theorized as a possible mediator between parental attachment avoidance and children's attachment security (Borelli et al., 2016), with higher parental reflective functioning improving children's rates of secure attachment to insecurely attached mothers.

Similarly, a significant body of work has examined the role of parental reflective functioning as a mediator between attachment and other parental outcomes. Research shows that parental reflective functioning partially mediated the relationship between attachment anxiety and three types of parenting stress (Nijssens et al., 2018), as well as between parental attachment anxiety and lack of trust in one's own parenting competence (Nijssens et al., 2018). Additionally, higher parental reflective functioning has been positively correlated with psychological functioning in parents and mediates the relation between attachment security and beneficial adaptive psychological features (Nazzaro et al., 2017). Furthermore, research suggests that higher parental reflective functioning promotes factors that act as precursors to attachment: higher parental reflective functioning is associated with more sensitive caregiving and more positive responses to stress among mothers both with and without postpartum depression (Krink et al., 2018; Rutherford et al., 2015), and recent work has demonstrated that reflective functioning independently predicts psychological investment towards unborn children in expectant mothers (Berthelot et al., 2019). Taken together, this work suggests that there are close ties between the development of secure attachment and effective parental reflective functioning, but a clear picture of the nature of these relations has yet to be delineated.

Cognitive Constructs Correlated with Reflective Functioning

Executive Functioning

A variety of distinctive cognitive abilities like executive functioning have also been theorized to be associated with effective parental reflective functioning. Executive functioning has been connected to reflective functioning skills in two ways: firstly, some argue that executive functioning skills are highly correlated with reflective functioning; secondly, others argue that executive functioning is imperative to the ability to employ reflective functioning skills effectively. Evidence for the former comes from research showing associations between global measures of executive functioning and reflective functioning (Yatziv et al., 2020), while other studies have found associations between reflective functioning and certain components of executive functioning. For example, Schultheis, Mayes and Rutherford (2019) found that mothers with more difficulty setting goals also showed reduced understanding of their infants as having unobservable mental states. Similarly, Rutherford et al. (2018) found that executive functioning predicts parental reflective functioning in expectant first-time mothers, particularly due to correlations between working memory, set-shifting, and parental reflective functioning. This research suggests a potentially impactful role for the ability to hold multiple competing demands in mind, which may intuitively make sense when considering that mothers, particularly of young children, must frequently shift between their own needs and the needs of their child and must also rapidly switch among the tasks required when caring for their infant, caring for themselves, and completing the many household or career tasks for which many new mothers are also responsible. Similarly, research has shown that many mothers who score as having lower parental reflective functioning are also more likely to demonstrate poorly developed executive

functioning, particularly in clinical populations (Håkansson et al., 2018, 2019; Yatziv et al., 2020).

Arguments supporting a theoretical association between executive functioning and reflective functioning also emphasize that the successful ability to understand your own mental states and those of others is inextricably linked to an individual's ability to simultaneously attend to both their own states and the states of others, or split attention, and one's ability to employ working memory to hold the mental states of others in mind for sustained periods of time (Rutherford et al., 2018). This work is bolstered by well-established literature showing that individuals with deficits in executive functioning often demonstrate greater difficulty with applying theory-of-mind during communication (Nilsen & Bacso, 2017), and through research showing that poorer executive functioning is correlated with a more reactive parenting style (Deater-Deckard et al., 2012).

Emotion Regulation

Relations between parental reflective functioning and emotion regulation have been examined in the literature, although the directionality of any potential relationship between parental reflective functioning and emotion regulation remains unclear. Certainly, when considering general reflective functioning skills there are many reasons one could theorize a connection between the two concepts; for example, it could be the case that to employ reflective functioning skills individuals must be able to regulate their own emotions effectively, as it becomes more difficult to focus on another's perspective when your own needs are unmet or you are in a state of high arousal (for a review, see Luyten et al., 2019; Luyten & Fonagy, 2019). Alternatively, it could be the case that awareness of one's own mental states and the mental

states of others enables greater recognition of factors influencing emotionality and may enable better self-regulation.

While the mechanism of a relationship between emotion regulation and parental reflection is currently unclear, a variety of studies have found associations between parental reflective functioning and emotion regulation in parents. In one 2019 study, mothers with lower levels of emotion regulation and greater emotion suppression demonstrated more frequent pre-mentalizing (an ineffective mode of mentalizing) and showed less interest and curiosity in their own child's mental states (Schultheis et al., 2019). While preliminary, these findings suggest that there may be associations between emotional intelligence, self-regulation, and the ability to effectively reflect on oneself and others.

Parental Reflective Functioning and Parenting Behaviours

Parental reflective functioning has been theorized as one mechanism through which children may develop their own theory-of-mind and mentalizing skills. Fonagy and Target (1997) proposed that it may be through seeing their own parent understand and communicate reflective functioning that the child begins to understand the mental states of themselves and others. Work supporting this conceptualization has explored associations between a parent's ability to retroactively reflect upon their own childhood attachment relationships and experiences, often through applying reflective functioning assessment measures to the Adult Attachment Interview (George et al., 1996), and use this reflection to adapt their own parenting. Theorists suggest that a parent's ability to reflect upon their relationship with their own parental attachment figures informs the ways in which they adapt and modify their own parenting behaviours; indeed, many studies have found results that support this theory. A variety of studies have found that new mothers who show deficits in parental reflective functioning on interview-

based assessments both during pregnancy and postpartum are more likely to disrupt affective communication with their infants and show difficulty regulating their infants' distress, which are important behaviours for forming a secure attachment relationship (Grienenberger et al., 2005). Similarly, research has suggested that mothers who show more reflective functioning on interview-based measures reflecting on their own childhood also show a variety of positive parenting behaviours, including demonstrating more engagement, positive play and teaching activities when their infant is 7-months-old (Huth-Bocks et al., 2014; Smaling et al., 2016); additionally, mothers with higher parental reflective functioning skills demonstrated more positive parenting behaviours during the Still Face Paradigm (Smaling et al., 2016; Still Face Paradigm: (Tronick et al., 1978). Similarly, Rosenblum et al. (2008) found that parental reflective functioning as assessed through applying the Reflective Functioning Scale to the Working Model of the Child Interview (WMCI: Zeanah et al., 1995) predicted both increased comments related to mental states of their infants and increased behavioural sensitivity, even when controlling for education level and depressive symptoms of the mothers.

Similarly to what we see regarding associations between general reflective functioning and psychopathology, research on parental reflective functioning also suggests that the presence of a variety of psychological conditions is correlated with weaker parental reflective functioning skills; for example, there is developing evidence that suggests mothers with a history of substance use disorder may demonstrate greater uncertainty about their child's mental states than parents without such history (Handeland et al., 2019), and a variety of literature has found associations between parental trauma history and poorer parental reflective functioning (e.g., Berthelot et al., 2019; Cristobal et al., 2017). Additionally, parental reflective functioning may mediate the relationship between risk factors like trauma history and psychological well-being

for both parents (Berthelot et al., 2019; Chiesa & Fonagy, 2014) and their children (Borelli, Brugnera, et al., 2019; Borelli, Cohen, et al., 2019; Ensink et al., 2017). As research continues to examine the relationship between parental reflective functioning and parent and child outcomes, it will be important to expand our understanding of reflective functioning as both a precursor of mental health and a protective mediating factor for individuals and families.

Parental Reflective Functioning in Mothers and Fathers

While interest in parental reflective functioning has increased in recent years, there are still a number of important limitations within this field of study. Of particular note is that the vast majority of research on parental reflective functioning has been completed in samples of solely mothers, and primarily mothers of young infants. Existing research on the significance of parental reflective functioning to parenting by fathers is quite limited, and currently there is no consensus within the field regarding if the precursors for developing strong parental reflective functioning or the benefits of reflective parenting among fathers is similar to what we see in maternal populations. The limited research that has been completed suggests there may be some key differences among mothers' and fathers' reflective functioning. Some research has found that mothers generally demonstrate more interest and curiosity in their children's mental states than fathers (Pazzagli et al., 2018), while other research suggests mothers may engage in more accurate reflective functioning than fathers (Esbjørn et al., 2013; Stover & Kiselica, 2014).

In 2007, Madsen, Lind and Munck published one of the first studies examining reflective functioning in fathers and found that when the Reflective Functioning Scale was applied to the transcripts of the Fatherhood Attachment Interview (Lind et al., 1998) of 41 soon-to-be first-time fathers, approximately half of the fathers demonstrated deficiencies in their ability to use mental state talk to refer to their infant compared with RFS norms. Cooke and colleagues (2017) found a

similar pattern, with fathers of 12-month-old children showing lower average reflective functioning scores than mothers of the same infant. Stover and Kiselica (2014) found that reflective functioning seemed to have a significant association with some parenting behaviours among fathers (e.g., discipline practices), although these results were not as strong as what is typically seen for research on maternal reflective functioning. Similarly, Esbjorn and colleagues (2013) found that in a sample examining the effect of mothers' and fathers' parental reflective functioning on school-aged children, mothers had significantly higher parental reflective functioning, while poor parental reflective functioning among both groups was associated with greater anxiety in their children. A similar pattern of differential impact among mothers and fathers emerged in recent work examining the impact of reflective functioning on marital and coparenting relationship quality, which found that reflective functioning was predictive of marital and coparenting behaviours for wives, but this relationship did not hold for husbands (Jessee et al., 2018).

However, these differential patterns may not emerge when incorporating other aspects of parenting in analyses; in a recent study, authors found that parental competence mediated the relationship between parental reflective functioning and infants' socioemotional adjustment in a similar pattern for both mothers and fathers (Gordo et al., 2020). Importantly, the child's gender may also play an important role in these relationships, with parents of daughters engaging in more hypomentalizing and pre-mentalizing about their child than parents of sons (Pazzagli et al., 2018). Such work suggests that parental reflective functioning may not be a skill that is applied consistently in all settings but may instead be one that is impacted by a variety of relational and situational factors. It will be important for the field to continue examining the ways in which parental reflective functioning and its impacts differ among mothers and fathers, and given the

paucity of work outside the infancy and early childhood years, how this impacts the lives and development of older children and adolescents in particular.

Parental Reflective Functioning and Children's Socio-Emotional Skills

Children's Emotion Regulation

A burgeoning body of research has shown connections between parental reflective functioning and children's emotion regulation across development, suggesting that a parent's ability to understand their child's mental states may also have benefits for the child's understanding of their own socio-emotional needs. Evidence for this connection has been found in parents of infants as young as 6 months of age, with research showing that maternal reflective functioning is positively associated with infants' self-regulating behaviours at 6-, 12-, and 20-months-old (Heron-Delaney et al., 2016). Conversely, research shows that first-time mothers who reported low level of reflective functioning during pregnancy had children with higher rates of aggression between ages 6-12 months (Smaling et al., 2017). Recent work by Borelli et al. (2021) has found these patterns continue, with maternal reflective functioning being associated with toddlers' adaptive emotion regulation skills. Notably, this body of work is comprised of correlational studies, making the direction of relations uncertain; while it may be the case that parental reflective functioning benefits children's self-regulation, it may also be the case that children with higher self-regulation are 'easier' to interpret in terms of their mental states.

Some research also shows that parental reflective functioning may play a key role mediating the relationship between children's emotion regulation and other key developmental factors, such as attachment; higher parental reflective functioning (measured at infant age 22 months) mediated the relationship between attachment quality when an infant was 10 months old and that infant's socio-emotional development at 22 months (Nijssens et al., 2020). In school-

aged populations, parental reflective functioning has been positively correlated with children's emotion regulation and negatively correlated with internalizing and externalizing symptoms, as well as reduced anxiety symptoms (Esbjorn et al., 2013). As such, it seems that parental reflective functioning may be connected to emotion regulation in a way that can produce benefits for both parents and children, and similar connections may exist between children's own developing reflective functioning and their emotional regulation skills.

Children's Reflective Functioning

Given that parental reflective functioning is associated with positive parenting behaviours and greater emotion regulation, it is perhaps not surprising that parental reflective functioning is also associated with a child's own mentalizing skills. Research shows that there is a high level of agreement between maternal reflective functioning and child reflective functioning, and mothers who reported a strong relationship with their own mothers during childhood in turn had children who reported higher reflective functioning than children of mothers with a history of poor maternal attachment quality (Rosso & Airaldi, 2016). In school-aged samples, research has shown that maternal reflective functioning scores (as assessed through the RFS on the AAI), and, in particular, maternal ability to reason about negative and mixed-ambivalent mental states, predicted preadolescent-aged children's own mentalization, even when controlling for attachment quality (Rosso et al., 2015; Rosso & Airaldi, 2016). Notably, Rosso et al. (2016) also found that only maternal reflective functioning, and not attachment quality, was predictive of the child's reflective functioning, and only the maternal ability to mentalize about mixed-ambivalent mental states predicted the same ability in children. Similarly, Scopesi et al. (2015) have found positive correlations between parental reflective functioning and school-aged children's mental-state talk, while Ensink et al. (2015) have shown similar results in samples of children with and

without a history of abuse. Research has also demonstrated that the development of theory-of-mind dimensions in 3- to 5-year-olds is closely related to every conceptual element of maternal reflective functioning (Nijssens et al., 2021), and that maternal reflection on parenting behaviour is related to the development of theory-of-mind in children (Meins et al., 2002). Lastly, a recent study by Borelli et al (2017) found that in stressful parenting situations, mothers with high parental reflective functioning showed less physiological reactivity and less controlling parenting; additionally, these parents had children with higher child levels of reflective functioning. Although the majority of studies on associations between parent and child reflective functioning have been done in pre-adolescent samples, recent work by Benbasset & Priel (2012) has found significant associations between both maternal and paternal reflective functioning and mentalizing ability in community samples of adolescents ages 14-18.

Interim Summary

In summary, this body of work suggests that parental reflective functioning is associated with key parenting behaviours like parental warmth, attachment relationships, and emotion regulation, as well as key child factors like perspective-taking, mentalizing skills, and emotion regulation. However, a key gap in our understanding of Parental Reflective Functioning and Reflective Functioning in youth is our understanding of the role of mentalizing in *adolescent* functioning, given that the majority of current research has been conducted in younger populations. Adolescence is a time in which youth take on greater levels of independence from their parents, particularly in their social relationships (Brown, 2004; Brown & Larson, 2009; Collins et al., 1997; Schulman, 1993; Wentzel, 1998), meaning that adolescents' own mentalizing skills may be especially relevant to their relationships during this period of growing independence. Further, this period is often one in which youth increasingly move towards a more

separate social circle from their parents, and one in which adolescents tend to develop more sophisticated cognitive skills like emotion regulation (Ahmed et al., 2015; Riediger & Klipker, 2014; Silvers, 2022; Young et al., 2019; Zeman et al., 2006) and executive functioning (Anderson et al., 2010; Blakemore & Choudhury, 2006; Crone, 2009; Crone et al., 2017; Leon-Carrion et al., 2009; Zelazo & Carlson, 2012), meaning their emotional world may become more internalized and less externally obvious to their parents. In this way, parents may have reduced insight into their child's internal experience due to their reduced externalizing behaviours and parental reflective functioning may therefore need to be more sophisticated to accurately reflect upon the parent-child relationship and their youth's overall well-being. Of particular interest is the degree to which parental reflective functioning is associated with both adolescents' own mentalizing and social functioning during adolescence. The body of research showing associations between parental reflective functioning and the development of mentalizing in younger children suggests there is reason to believe parental reflective functioning would continue to be important to the developmental trajectory of children's mentalizing abilities during adolescence. Additionally, while some work has examined associations with a variety of emotional and mental-health outcomes, fewer studies have examined the role of parental and youth mentalizing in *social* functioning, despite the importance of youth's social functioning for adolescent well-being.

Reflective Functioning in Adolescence

Although research on reflective functioning in adolescence is limited, existing work suggests this cognitive dimension continues to develop throughout adolescence (Dumontheil et al., 2010; Poznyak et al., 2019; Sharp & Hernandez, 2021; Slaughter, 2011) and may play a broad and significant role in predicting adolescent outcomes for a variety of domains. For

instance, higher reflective functioning has been associated with fewer psychiatric symptoms among adolescents (Both et al., 2019), and in a longitudinal study, reflective functioning skills during adolescence were independently predictive of almost all indices of psychological well-being in early adulthood (Borelli, Palmer, et al., 2019). A study of task-based mentalizing in adolescents has shown higher mentalizing is associated with lower self-reported attention difficulties (Poznyak et al., 2019), while some work has shown mentalizing may be a protective factor against the development of mood disorders during adolescence (Fischer-Kern & Tmej, 2019). Similarly, a study of adolescents in community and clinical samples found those in clinical samples were more likely to have low self-focused reflective functioning (Bizzi et al., 2022), while others have found negative associations between adolescent mentalizing and externalizing behaviours in a community sample (Cropp et al., 2019). Longitudinal research has also shown that higher reflective functioning in adolescence was associated with a decrease in externalizing symptoms over a period ranging from 10 months to 5 years, and that worse baseline externalizing problems were associated with worse baseline reflective functioning (Morosan et al., 2020). In contrast, other research has found that higher reflective functioning in youth may be associated with greater internalizing difficulties and propose this may be due to a greater attentiveness to one's emotional state (Chow et al., 2017). Additionally, some recent work suggests adolescent mentalizing may be relatively context-specific; work with high school students suggests adolescents show better reflective functioning when considering the actions of a well-liked teacher compared to a disliked teacher, suggesting that the quality of a relationship may contribute to mentalization (O'Connor & Hirsch, 1999) and raising questions around whether mentalization is best understood as a state-based or trait-based ability.

Of particular interest in the present work is how adolescent reflective functioning may relate to the adolescent's social functioning. Research has largely emphasized the relations between adolescent reflective functioning and emotional problems, but research findings do suggest there may also be connections between mentalizing and social development. For example, previous research has demonstrated that a strong awareness of the perspective of oneself is associated with social competence in preschool-aged samples (Cassidy et al., 2003). In middle childhood, research has shown strong connections between perspective-taking ability and perceived peer sociability (LeMare & Rubin, 1987) and peer social preference (Slaughter, 2011; Slaughter et al., 2015), and these trends seem to continue into pre-adolescence (Bosacki & Wilde Astington, 2001). Within adolescence itself, we see that adolescents who performed better on a mentalizing measure also reported more positive peer relations and prosocial engagement (Nilsen & Bacso, 2017), while adolescent mentalizing is associated with better self-rated social competence (Benbasset & Priel, 2012). Given these findings throughout different developmental stages, it is reasonable to assume that there may be continued associations between adolescents' mentalizing and a variety of elements of their social functioning.

Importance of Adolescents' Social Functioning

The relative paucity of research on the relations between reflective functioning and social functioning during adolescence (relative to earlier stages in development) is somewhat surprising given the crucial role that a youth's relationship with their peers plays for psychological well-being. During adolescence, peer relationships have increasing influence and become more salient, resulting in an increasing influence of peers on adolescent's self-esteem, self-concept, and belief system (Brown, 2004; Brown & Larson, 2009; Gardner & Steinberg, 2005, 2012; Hartup, 1989; Hartup & Stevens, 1999; Laible et al., 2004; Laible & Carlo, 2004; Sandstrom &

Cillessen, 2006). Additionally, social success in adolescence is an important predictive factor for well-being across a number of domains; social-emotional competence in adolescence predicts higher performance on key academic skills and more socially popular adolescents tend to have greater academic success than their socially inhibited peers (Kindermann, 2007; Kiuru et al., 2007; Oberle et al., 2014; Schwartz et al., 2006). Moreover, social success has a number of important correlates with mental health outcomes: more positive peer relationships, lower peer victimization and greater relationship quality with family and friends in adolescence all act as protective factors against anxiety and depressive symptoms (Kullik & Petermann, 2013; la Greca & Harrison, 2005; Lansford et al., 2003; Parker & Asher, 1993; M. J. Prinstein & la Greca, 2002; Roach, 2018). Conversely, negative peer experiences like peer victimization can increase the risk of a number of important outcomes, including poorer emotion regulation during adolescence (Herd & Kim-Spoon, 2021) and decreased psychopathological mental health outcomes (Graham & Bellmore, 2007; Rueger & Jenkins, 2014; Scholte & van Aken, 2006). However, the factors that predict adolescent social success are varied and include relational and cognitive factors.

Parental Predictors of Social Functioning in Adolescence

One of the strongest predictors of adolescents' social success is the quality of their parental relationships. Greater parental social support has been found to correlate with adolescents having a more positive view of their relationships with peers and with greater overall social competence (Laible & Carlo, 2004). Adolescents' overall popularity has also been shown to correlate with secure parental attachment and more adaptive interactions with parents (Allen et al., 2005). Additionally, a secure parent-adolescent attachment relationship has been shown to promote the development of effective social skills (Engels et al., 2001), while reduced reciprocal negative affect in parent and teen interactions is associated with more sophisticated social

development in early adulthood (Kim et al., 2001). Similar trends were found among mothers' and fathers' general affect and youth social behaviour and peer acceptance (Paley et al., 2000). Conversely, less secure and lower-quality mother-teen relationships predict a greater severity and stability of adolescent depressive symptoms, along with increased externalizing behaviours (Allen et al., 2017), and lower levels of maternal warmth and support are associated with poorer adolescent social competence (Laible & Carlo, 2004).

Considering the ways in which mentalizing requires a consideration and concern for the internal experiences of others on both an affective and cognitive level, it is possible this would naturally translate to more sensitive interactions with peers. While one study has found that maternal perspective-taking is associated with both adolescent perspective-taking skills and higher friendship quality for adolescents (Soenens et al., 2007), there is a paucity of research exploring the role of parental reflective functioning or the youth's own reflective functioning on youth social outcomes. Support for a connection between parental reflective functioning and adolescent social outcomes comes from work by Benbasset and Priel (2012), who demonstrated that higher parental reflective functioning was associated with adolescents' social competence and was a significant moderator of the relation between parenting behaviour and adolescent adjustment. However, questions remain surrounding how the youth's own abilities integrate with parental reflective functioning, and if these relations differ based on the kind of peer interaction examined (e.g., prosociality, friendship quality, peer likeability). Given the noted developments in mentalizing that occur during adolescence (Gabriel et al., 2021), it will be beneficial for researchers to continue to investigate the significance of parental and adolescent reflective functioning in determining positive social outcomes for adolescents.

Concluding Comments

This literature review presented the construct of reflective functioning, particularly within the context of the parenting relationship. An overview of the associations between general and parental reflective functioning and key psychological constructs was presented alongside common measurement strategies. Associations between parental reflective functioning, parenting behaviour, and outcomes for children were also reviewed. Throughout this summary, key areas of research in this field that continue to have significant gaps and limitations were identified and serve as motivation for the study presented subsequently. In particular, the majority of work on parental reflective functioning has focused on outcomes for preschool or school-age children, with a lack of work examining the role of parental reflective functioning for adolescent's own mentalizing, as well as their social functioning. Relatedly, despite the extensive literature examining associations between mentalizing and social functioning for younger children, there is limited work examining mentalizing in adolescence even though there is evidence of continued growth in this skill throughout this developmental stage. Finally, while there is some work examining associations between parental factors and youth social functioning, parental reflective functioning specifically has not been examined. Addressing these key gaps, the study presented in the next section investigates relationships between parent reflective functioning, youth reflective functioning, and positive and negative youth peer interactions.

Introduction

To successfully build connections with others, individuals must be able to adjust their behaviour and style of communication to match the cues and needs of a social partner. However, doing so effectively requires a sophisticated ability to make accurate inferences about a social partner's internal mental states, such as their thoughts, feelings, beliefs, desires, and goals. Additionally, individuals must be able to understand the reasoning behind their *own* behaviours and reactions and, in turn, adapt their behaviours accordingly within the specific social context. The ability to understand behaviours in terms of the mental states of oneself and others is referred to as reflective functioning, or, as is often used synonymously within the literature, mentalizing (Allen et al., 2008; Fonagy et al., 1991, 1998; Fonagy & Target, 1996, 2002; Steele & Steele, 2008). Effective reflective functioning has been linked with a host of important socio-emotional outcomes, including reduced risk of psychopathology and higher overall wellbeing (e.g., Beck et al., 2017; Fonagy & Bateman, 2016; Ha et al., 2013; Håkansson et al., 2018, 2019; Katznelson, 2014; Luyten et al., 2020; Nazzaro et al., 2017; Srinivasan, 2006; Stover & Kiselica, 2014).

Moreover, parental reflective functioning - the ability to consider the dyadic interactions between oneself and one's child in terms of mental states - is associated with a number of positive outcomes for children, including lower rates of internalizing and externalizing problems (Esbjorn et al., 2013; Fischer-Kern & Tmej, 2019), improved emotion regulation (Borelli et al., 2021; Heron-Delaney et al., 2016; Smaling et al., 2017) and more feelings of attachment towards parenting figures (Borelli et al., 2016). However, markedly less is known about the extent to which parental reflective functioning is associated with outcomes for adolescents. In the present work, we examine how parental reflective functioning is associated with adolescent social

functioning, and whether this association is driven, in part, by associations with the youths' own mentalizing skills. Given the crucial role that peer relationships have for adolescent well-being (Graham & Bellmore, 2007; Herd & Kim-Spoon, 2021; Kullik & Petermann, 2013; la Greca & Harrison, 2005; Lansford et al., 2003; Parker & Asher, 1993; M. J. Prinstein & la Greca, 2002; Roach, 2018; Rueger & Jenkins, 2014; Scholte & van Aken, 2006), understanding the factors that support social development is important.

Parental Reflective Functioning

The parenting relationship may be one in which reflective functioning is especially influential. For example, given their child's ongoing development of verbal skills and cognitive reasoning, parents must be adept at understanding children's cues in order to sensitively respond to the social, emotional, and physical needs of their child. As such, the concept of parental reflective functioning reflects the specific needs of parents to reason about themselves and their child in terms of mental states and has been implicated as a potentially beneficial factor for both parents and their children (Camoirano, 2017).

When parenting infants, parents must make an extraordinary number of decisions regarding their child's well-being without the verbal input of the child. As such, parental mental state reasoning is essential to the infant's physical and socioemotional development in that it allows a parent to make an accurate estimation of their child's needs. Indeed, parental reflective functioning has been associated with positive outcomes for children across the developmental stages. Within infant years, research has suggested there are benefits to a parent demonstrating a high level of parental reflective functioning. Most notably, having a parent with higher reflective functioning was associated with infants displaying more self-regulatory behaviours (Heron-Delaney et al., 2016), more adaptive emotion regulation skills (Borelli et al., 2021), and lower

rates of aggression (Smaling et al., 2017) throughout infancy and into toddlerhood. Within preschool and early childhood, results suggest that associations between better parental reflective functioning and a child's own socio-emotional development continue to develop. In early school years, children with parents who have higher parental reflective functioning report feeling closer with their parents (Camoirano, 2017; Rostad & Whitaker, 2016), and children with highly reflective parents have been shown to be less likely to demonstrate internalizing and externalizing symptomatology (Esbjorn et al., 2013).

Further, some research suggests there may be associations between parental reflective functioning and the development of children's own mentalizing skills. This would be in alignment with the theoretical framework put forth by Fonagy and colleagues (1991), who propose that parental reflective functioning contributes to a secure attachment style and helps the child develop a sense of self through establishing an association between the infant's spontaneous actions and parental reactions – allowing the child to learn that others are impacted by their behaviour in specific ways. As the child then ages and develops autonomy, they also learn to recognize differences between their internal reality and that of others. Evidence for an association between parental reflective functioning and children's developing mentalizing comes from research showing that among elementary school-aged populations, parental reflective functioning is positively associated with children's use of mental-state talk (Scopesi et al., 2015), their sophistication in theory-of-mind skills in preschool (Nijssens et al., 2021) and elementary years (Meins et al., 2002), and with measures of children's mentalizing (Borelli et al., 2017; Rosso & Airaldi, 2016). Notably, however, despite the body of research suggesting that adolescents continue to develop sophistication in their perspective-taking abilities (Gabriel et al., 2021), very little work has examined associations between parental reflective functioning and the

development of adolescents' mentalizing skills, or between adolescent mentalizing and youth outcomes. This being said, one study has found that parental reflective functioning was associated with 14-to-18-year-olds' mentalizing, as measured by a semi-structured interview (Benbasset & Priel, 2012). However, our understanding of associations between parental reflective functioning and youths' own mentalizing needs further investigation before solid claims can be made. Moreover, it is unknown whether such an association exists for both adolescent self-reported and task-based mentalizing, with the majority of existing work utilizing solely self-report data.

Parental Reflective Functioning and Social Functioning

Of current interest is whether parental reflective functioning is associated with broader areas of adolescent functioning outside of the family unit, such as supporting high-quality interactions with peers. Understanding relations between parental reflective functioning and youth social functioning is particularly consequential given that research clearly shows that social success in adolescence is a key predictor of a variety of downstream benefits to psychosocial well-being, including self-esteem and self-concept (Brown, 2004; Brown & Larson, 2009; Gardner & Steinberg, 2005, 2012; Hartup, 1989; Laible et al., 2004; Laible & Carlo, 2004; Oberle et al., 2010; Sandstrom & Cillessen, 2006), academic success (Kindermann, 2007; Kiuru et al., 2007; Oberle et al., 2014; Schwartz et al., 2006), emotion regulation (Herd & Kim-Spoon, 2021), and mental health (Graham & Bellmore, 2007; Kullik & Petermann, 2013; la Greca & Harrison, 2005; Lansford et al., 2003; Parker & Asher, 1993; Prinstein & la Greca, 2002; Roach, 2018; Rueger & Jenkins, 2014; Scholte & van Aken, 2006).

It is reasonable to explore potential associations between parental reflective functioning and adolescent social functioning given the ways in which we know parents continue to be an

important factor in predicting adolescent social skills in other ways. For instance, past work has found that other parental constructs are associated with adolescent social functioning, such as attachment (Engels et al., 2001), maternal warmth (Laible & Carlo, 2004), reciprocal parent-child affect (Kim et al., 2001), and more adaptive interactions between adolescents and parents (Allen et al., 2005). Moreover, greater parental support has been correlated with youth reporting more positive peer relationships and higher social competence (Laible & Carlo, 2004) and with higher quality friendships for adolescents (Soenens et al., 2007). One study that examined these factors directly found that parents with better reflective functioning had adolescents with greater social competence (Benbasset & Priel, 2012). However, it is unclear whether parental reflective functioning plays a role in supporting an increase in prosocial behaviour in youth, or conversely, in decreasing problematic peer interactions.

Adolescent Mentalizing as a Mediator of Parental Reflective Functioning and Youth Social Functioning

In positing an association between parental reflective functioning and adolescent social functioning one can consider possible mechanisms such as an adolescent's own mentalizing skills. That is, although research in adolescence is limited, research in younger age groups does suggest potential connections between children's own mentalizing and their social outcomes. Most notably, perspective-taking skills in middle childhood and pre-adolescence have been associated with peer sociability (LeMare & Rubin, 1987) and peer social preference (Bosacki & Wilde Astington, 2001; Slaughter, 2011, 2015; Slaughter et al., 2015), while within adolescence, mentalizing is associated with greater social competence (Benbasset & Priel, 2012). Thus, it may be the case that it is through its association with adolescent mentalizing that parental reflective functioning relates to a youth's ability to successfully interact with peers.

In sum, significant gaps remain in our understanding of the influence of parental reflective functioning on children's own mentalizing skills, particularly within the adolescent period. Further, how both parental and adolescent mentalizing relate to social functioning during adolescence is less understood relative to younger developmental periods. Given the crucial role that social functioning has for the psychological well-being of youth, it is important to understand not only the role of parental reflective functioning and adolescent's own mentalizing in crafting these outcomes, but also how these concepts relate to specific elements of peer interactions that are related to overall social functioning. The current study aims to help expand and delineate our understanding of the relationships between these constructs.

The Current Study

The current study's overall aim was to address these gaps in our knowledge by examining the associations between parental reflective functioning, youths' own mentalizing, and adolescent social functioning. In particular, our first research aim was to address the question of whether parental reflective functioning is associated with better adolescent social functioning. To investigate this, we had parents complete self-report measures of parental reflective functioning. To reduce shared method variance (i.e., relying solely on parental report), we asked adolescents to report on their own social functioning. As social functioning contains a wide variety of social behaviours, adolescents completed measures of positive social interactions with others (prosocial behaviours) and negative peer interactions (peer problems). Given the associations between parental reflective functioning and socioemotional outcomes during middle childhood (Borelli et al., 2019; Ensink et al., 2017; Esbjorn et al., 2013; Rostad & Whitaker, 2016) we hypothesized that there would be an effect of parental reflective functioning on adolescent social functioning

such that better parental reflective functioning would be associated with more adolescent prosocial behaviours and fewer peer problems.

Next, we aimed to investigate whether the potential effects of parent reflective functioning on adolescent social functioning are partially explained via the youth's own mentalizing skills. To our knowledge no previous research has investigated whether adolescent mentalizing mediates the relationship between parental reflective functioning and youth socio-emotional outcomes, despite research suggesting associations between parental reflective functioning and child perspective-taking (Borelli et al., 2017; Meins et al., 2002; Nijssens et al., 2021; Rosso & Airaldi, 2016; Scopesi et al., 2015) and between parental reflective functioning and adolescent mentalizing (Benbasset & Priel, 2012). It is possible that these associations may be due to a 'transmission' of reflective functioning skills from the parent through the child. As such, we investigated youth mentalizing and youth social functioning in terms of both direct effects and mediation models. We hypothesized that given the existing correlational research among parent and youth mentalizing, we would observe a relationship where any patterns of association between parental reflective functioning and youth social outcomes was partially mediated by the adolescent's own reflective functioning. Again, given the paucity of research on relations between mentalizing and social functioning, we also examined whether patterns differed when looking at prosocial behaviours or peer problems as our dependent variable – but we did not hypothesize differing patterns for these relations (i.e., we still hypothesized that youth mentalizing would act as a mediator for these outcomes and that the only difference among the two measures of social functioning would be the directionality of the associations).

The above research aims were also examined using a parental report of youth social functioning to explore if patterns of results differed depending on whose perceptions of youth

social functioning were used. This objective, though allowing for us to bridge findings with some previous work that has relied solely on parental report, was exploratory as there is little research within the mentalizing literature indicating if parent report or youth self-report would differ in meaningful ways.

Finally, so as to understand whether parental reflective functioning (wherein parents reflect specifically upon their relationship to and interactions with their adolescent child) shows differential patterns of association from parents' general ability to reason about their own and others' mental states, we also asked parents to complete a measure of general reflective functioning. This aim was of interest given that theoretical literature on reflective functioning posits there are unique qualities about reflective functioning skills within the parenting context, (Fonagy et al., 1998; Rosenblum et al., 2008; Sharp & Fonagy, 2008), but to our knowledge, this has not been empirically tested. Given the theoretical background, we hypothesized that differing patterns of association would emerge, with parent reflective functioning emerging as a stronger predictor of youth social functioning and as a stronger correlate with adolescents' own mentalizing. Results of our investigation are discussed, alongside limitations and implications of our findings.

Method

Participants

Parent-youth pairs ($N = 87$) were recruited through the University of Waterloo Cognitive Development Lab's previous participants and through social media advertisements, partnerships with Ontario-based private and charter schools, and an online platform advertising research studies for children and youth.

Parents

Of the 87 parents included in analysis, 73 (84%) reported their gender as female and 14 (16%) reported their gender as male. No parents reported a gender outside of the gender binary. Parents ranged in age from 37 - 63 years with a mean age of 45.66 years ($SD = 4.73$). The majority of participants (61%) reported English as the only language their child heard at home and reported White/Caucasian as their (the parent's) ethnicity (76%). The second-most reported ethnicity was South Asian (9%). The majority of participants reported that they held an undergraduate degree or higher (69%), as did the youth's other parent (59%). Most parents reported a household income of above \$75,000 (82%), which is roughly the median income for Ontario, Canada (Statistics Canada, 2022), the province from which the majority of our participants were recruited. Additional demographic data can be found in Appendix A, Tables A1.1 – A1.5.

Youth

Of the 87 youth included in analysis, 49% self-reported their gender as female and 49% reported their gender as male. One youth self-reported a gender outside the traditional gender binary (1%). Youth age ranged from 12-15 years ($M = 13.32$, $SD = 1.14$), and 71% of parents reported their youth's ethnicity as White/Caucasian. Parents reported that 13% of youth split

their time between multiple households. Parents also reported that 15% of youth participants had at least one developmental diagnosis (e.g., ADHD, learning disorder), excluding a diagnosis of autism spectrum disorder – which was a criterion for exclusion from this study (see below). 90% of youth had at least one other sibling. Of youth with siblings, 57% were the oldest sibling, 30% were second-born, 9% were third-born, and 5% were fourth-born or later.

Exclusion criteria.

29 additional participants provided data but were not included in the analyses. Exclusion was determined due to either having a youth with a diagnosis of autism spectrum disorder ($N = 6$), which could impact their performance on both our measures of mentalization and the outcome measure of social functioning, or for one member of the parent-child dyad not participating ($N = 25$), with two participants meeting both criteria for exclusion. Parent and youth demographics from the excluded sample were similar to that of the analyzed sample.

Procedure

Interested participants contacted our lab through email and were provided with a letter of information. Then (if interested) participants were provided with a matching participant code and links to our online questionnaires. Prior to completing the study, parents completed an online consent form for themselves and their youth, while youth completed an online assent form. Online questionnaires were administered through Qualtrics. After completing all questionnaires, parents and youth indicated if they wished to be entered into a draw for 1 of 3 \$50 Amazon gift cards (separate draws for parents and youth) or to receive volunteer hours as part of a high school requirement.

The measures included in this study are a subset of the full set of questionnaires completed by parents and youth. A full list of completed measures can be found in Appendix B.

Youth Measures

Task-Based Mentalizing

Youth completed The Awareness of Social Inference Test – Short (TASIT-S; McDonald et al., 2006, 2018). In the TASIT-S, the youth participants view 28 brief videos of adults engaging in a variety of typical daily interactions with others. In Part 1 of the task, youth identified the emotions expressed by a single adult in a short video from a multiple-choice list of seven options. In parts 2 and 3, youth watched a short dyadic interaction and were asked to identify the thoughts, feelings, and intentions of the speakers in these short video scenes using a 3-item multiple choice response set. A total score for this measure is calculated by summing the number of correct responses in parts one, two, and three, with a possible range of scores between 0 – 86. Correctly identifying the speaker’s emotions, intentions, or meaning requires an understanding of the speaker’s mental states, particularly as many scenes require the viewer to differentiate between the spoken meaning and the intended meaning of ambiguous statements like sarcasm or prosocial lying. Previous work suggests this task is an appropriate, ecologically valid measure of social inference and social cognition, with moderate to high test-retest reliability, adequate convergent and construct validity, and strong internal reliability for both adult and adolescent participants (Honan et al., 2016; McDonald et al., 2006, 2015, 2018).

Within our sample, the total score yielded a satisfactory Cronbach’s alpha of $\alpha = .87$.

Self-Reported Mentalizing

Youth mentalizing was also recorded using the Reflective Functioning Questionnaire for Youth (RFQ-Y; Sharp et al., 2009). The RFQ-Y is a 46-item self-report questionnaire asking youth to what extent they agree with various statements about their awareness of their own and others’ mental states, rated on a 6-item Likert scale (1 = Strongly Disagree, 6 = Strongly Agree).

The RFQ-Y generates two subscales, RFQ-Y Scale A (reverse-scored items) and RFQ-Y Scale B (typically scored items), and a total score. Previous work has shown the RFQ-Y has acceptable reliability, particularly with the use of the total score (Duval et al., 2018; Ha et al., 2013; Sharp et al., 2009). This was replicated in our sample, where the total score yielded a Cronbach's alpha value of $\alpha = .77$.

Self-Reported Social Functioning

Youth reported on their social functioning using the self-report version of the Strengths and Difficulties Questionnaire (SDQ; Goodman et al., 1998). The SDQ contains 25 items rated on a 3-point Likert scale, asking youth to what extent they agree with a variety of statements related to their overall well-being (0 = Not True, 2 = Certainly True). The SDQ creates 5 subscales, made up of 5 items each. For our research, we utilized two subscales: The Peer Problems subscale, which asks questions related to youths' difficulties with their peers (aggression, loneliness, victimization/bullying), and the Prosocial Behaviours subscale, which investigates youths' tendency to engage prosocially with others (sharing, empathy, healthy friendships). The SDQ has been utilized in a wide variety of clinical and non-clinical samples through its parent-report, self-report and teacher-report versions, and the adolescent self-report has shown acceptable internal reliability and validity (e.g., Becker et al., 2004; Goodman et al., 1998; Koskelainen et al., 2000; Richter et al., 2011; Theunissen et al., 2019). Within our sample, the peer problems subscale had an internal reliability of $\alpha = .56$ and the prosocial behaviours subscale had an internal reliability of $\alpha = .73$. It is important to note that a Cronbach's alpha value of .56 is relatively low; however, this finding is in keeping with the majority of other research using the SDQ, which has found that although the peer problems subscale is typically found to have acceptable reliability, it is also common for this subscale to have lower reliability

than the other SDQ subscales (e.g., Giannakopoulos et al., 2009; Muris et al., 2003; Riso et al., 2010; van Roy et al., 2008). It has been hypothesized that this may be because this subscale captures a diverse range of peer problem behaviours, which may be unlikely to co-occur or hang together. Regardless of the relatively low internal reliability, we opted to include both subscales in order to capture both positive and negative peer relationships youth may experience.

Parent Measures

Parental Reflective Functioning

Parental reflective functioning was assessed through the Parental Reflective Functioning Questionnaire - Adolescent Version (PRFQ-A; Luyten, Mayes, et al., 2017), a self-report questionnaire for parents of adolescents. Parents indicated to what extent they agree with the 18 items included in the PRFQ-A using a 7-point Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). The PRFQ-A produces scores for three subscales: Pre-Mentalizing Modes, Interest & Curiosity in Mental States, and Certainty About Mental States. Previous work has shown all three subscales to have adequate psychometric properties (Charpentier-Mora et al., 2022; de Roo et al., 2019; Luyten, Mayes, et al., 2017)

Pre-Mentalizing Modes (PM) aims to capture ineffective forms of mentalizing, or a parent's inability to imagine the internal states of their child. As such, a higher score is indicative of worse parental reflective functioning. The subscale score is calculated using the mean of relevant items. In our sample, this subscale had a Cronbach's alpha of $\alpha = .64$, which improved to $\alpha = .75$ with the removal of one item. This item was removed from analyses due to the item being deemed as not age-appropriate to an adolescent sample (i.e., 'I find it hard to actively participate in make believe play or imaginary activities with my child').

Interest & Curiosity in Mental States (IC) measures the degree to which a parent demonstrates a tendency to wonder about their child's mental states and has curiosity about their child's internal experiences. Within the literature, this scale has been interpreted in such a way that a low score is indicative of poor reflective functioning (hypomentalizing), while a very high score indicates an unusual and excessive level of mentalizing (hypermentalizing; Luyten, Mayes, et al., 2017). However, the pattern of correlations among the IC subscale and our other measures of mentalizing suggests that within our sample it is more appropriate to interpret this subscale such that a higher score is indicative of better reflective functioning. This decision was also founded on the basis that the scoring instructions provided for the PRFQ directly from the original study authors do not suggest rescaling this item such that a middle score is of higher value (Luyten, Mayes, et al., 2017). Additionally, other work has found that a higher score on the Interest & Curiosity subscale is associated with better child socioemotional functioning (Gordo et al., 2020; Rutherford et al., 2013) and higher parental competence (Gordo et al., 2020) and feelings of self-efficacy (Cooke et al., 2017), albeit with younger samples. Given this context, our reported results reflect the interpretive stance that a higher Interest & Curiosity subscale score is indicative of better parental reflective functioning. Within our sample, this subscale had an internal consistency of $\alpha = .67$.

Certainty About Mental States (CM) assesses the degree to which a parent feels confident in their ability to infer the mental states of their child. Luyten, Mayes and colleagues (2017) note that this scale is interpreted such that an ideal score should be in the center of the 7-point Likert scale, as a low score would indicate a lack of mentalization (hypomentalizing), while a high score would indicate overmentalizing (hypermentalizing) to a degree that fails to recognize that the child's mental states are opaque and therefore never fully knowable. Due to discrepancies in

this scale's scoring and interpretation within existing literature (Anis et al., 2020; Pajulo et al., 2015, 2018) and a lack of clear guidance on appropriate scoring systems, we opted not to include this measure in our analyses.

General Mentalizing

To allow for comparison among parent-specific reflective functioning and general reflective functioning/mentalizing abilities, parents also completed the Mentalization Scale (MentS; Dimitrijević et al., 2018). The MentS contains 28 items that ask participants to rate to what extent they agree with various statements on a 5-point Likert scale (1 = Completely Incorrect, 5 = Completely Correct). The MentS is comprised of three subscales: Mentalization-Self (MentS-S), which measures insight into one's own mental states; Mentalization-Other (MentS-O), which measures insight into the mental states of others; and Motivation to Mentalize (MentS-M), which provides an indication of general desire or interest in understanding one's own and other actions in terms of mental states. A total score can also be calculated. The MentS has been shown to have adequate reliability (Dimitrijević et al., 2018). Within our sample, the MentS total was analyzed to provide a general indication of overall mentalization skills and had strong internal consistency, with a Cronbach's alpha of $\alpha = .91$.

Parent-Reported Youth Social Functioning

Youth social functioning was assessed through both parent-reported and youth self-reported measures. Parents completed the Strengths and Difficulties Questionnaire - Parent Report (SDQ; Goodman, 1997). The SDQ parent-report contains the same scoring structure and subscales outlined in the youth SDQ self-report highlighted above, with very minor changes to the language of individual items in order to make the content appropriate for informant report (Goodman, 1997). The parent-report has consistently had acceptable reliability within a wide

variety of clinical and non-clinical research (e.g., Goodman et al., 1998; Goodman, 2001; Goodman & Scott, 1999; Hawes & Dadds, 2004; Mellor, 2004; Muris et al., 2003). As with youth self-report, both the Peer Problems and Prosocial Behaviours subscales were used in analyses. Within our sample, the peer problems subscale had an internal reliability of $\alpha = .53$ and the prosocial behaviours subscale had an internal reliability of $\alpha = .68$. Again, it is possible the low Cronbach's alpha value may be due to the wide variety of peer problems this scale encapsulates, which may not frequently co-occur for youth.

Results

Preliminary Analyses

Missing data were analyzed based on separate analyses for parent-reported (0.0002% of parent responses) and youth-reported data (0.007% of youth responses). Little's Missing at Random Test was used to confirm that both parent-reported ($\chi^2 = 69.45$, $df = 70$, $p = .50$) and youth-reported datasets ($\chi^2 = 1186.08$, $df = 1309$, $p = .99$) were missing at random. Missing values were imputed using single-case imputation by comparison with answers available across the subscale or, in the case of the MentS, RFQ-Y, and TASIT-S, the total question set.

All data were analyzed for outliers at the subscale level (± 3 SD). Outliers were identified for the following subscales: Parent-reported Peer Problems ($n = 1$), Parent-reported Prosocial Behaviours ($n = 2$), PRFQ – Prementalizing ($n = 2$), MentS – Total ($n = 1$), Youth-reported Peer Problems ($n = 2$), Youth-reported Prosocial Behaviours ($n = 1$), and RFQ-Y Total – Average ($n = 1$), with two participants accounting for two outliers each. All outliers were Winsorized to be exactly ± 3 SD for analysis. One youth participant incorrectly answered every question on the TASIT-S and was therefore removed from analyses involving the TASIT-S. Data were found to be within acceptable limits in terms of absolute values of skew < 2 and kurtosis < 7 (West et al., 1995). Descriptive statistics for all measures can be found in Appendix A, Table A2.

Correlations

Bivariate correlations among all variables of interest are reported in Table 1. Correlations showed significant associations in the expected directions among parental mentalizing measures: Prementalizing (PRFQA-PM) and Interest & Curiosity in Mental States (PRFQA-IC), Prementalizing and General Mentalizing (MentS), and Interest & Curiosity & General Mentalizing. Moreover, a number of hypothesized associations were found between parental

mentalizing and both youth mentalizing (i.e., task-based [TASIT-S], but not self-report) and youth social functioning (both parent- and youth- reported Prosocial Behaviours; PSDQ-PS and SDQ-PS, respectively). Correlations also showed expected positive associations between youth mentalizing (both self-reported and task-based) and youth-reported prosocial behaviours, as well as negative associations with youth-reported peer problems (SDQ-PP). Notably, bivariate correlations also indicated positive associations between parent-reported and youth-reported measures of social functioning (both prosocial behaviours and peer problems), suggesting concordance in perceptions among parents and youth.

Table 1
Bivariate Correlations for Study Variables (N=87)

Variable	1	2	3	4	5	6	7	8	9
Parent Mentalizing									
1. Prementalizing (PRFQA – PM)	-								
2. Interest & Curiosity (PRFQA – IC)	-.41**	-							
3. General Mentalizing (MentS)	-.51**	.49**	-						
Youth Mentalizing									
4. Task-Based Mentalizing (TASIT-S) ¹	-.22*	.05	.16	-					
5. Self-Reported Mentalizing (RFQ-Y)	-.10	-.07	-.21*	.20 [†]	-				
Youth Self-Reported Social Functioning									
6. Prosocial Behaviours (SDQ – PS)	-.34**	.01	-.004	.22*	.48**	-			
7. Peer Problems (SDQ – PP)	.17	.09	.001	-.23*	-.38**	-.25*	-		
Parent-Reported Youth Social Functioning									
8. Prosocial Behaviours (PSDQ – PS)	-.34**	.06	.16	.13	.18	.41**	-.05	-	
9. Peer Problems (PSDQ – PP)	.13	.15	-.09	-.14	-.24*	-.19 [†]	.39**	-.08	-

1. N = 84

[†] $p < .08$, * $p < .05$, ** $p < .01$

Bivariate correlations were also conducted among variables of interest and key demographic factors (Table 2). Results indicated significant correlations among variables of interest, parent gender, and youth age. Thus, parent gender and youth age were both entered as control variables within regression analyses and as covariates within mediation analyses.

Notably, youth gender did not correlate with any other demographic, independent, or dependent variables; as such, it was not included as a control variable or covariate within our analyses.

Table 2
Bivariate Correlations Among Key Demographics and Variables of Interest

Variable	Parent Age (<i>N</i> = 82)	Parent Gender ² (<i>N</i> = 87)	Youth Age (<i>N</i> = 87)	Youth Gender ² (<i>N</i> = 86)	Household Income ³ (<i>N</i> = 84)	Parent Education (<i>N</i> = 87)
Parent Mentalizing						
1. Prementalizing (PRFQA – PM)	.18	-.39**	.12	-.05	-.13	-.12
2. Interest & Curiosity (PRFQA – IC)	.09	.34**	-.04	-.01	.05	.28**
3. General Mentalizing (MentS)	-.04	.43**	-.18	.10	.05	.18
Youth Mentalizing						
4. Task-Based Mentalizing (TASIT-S) ¹	-.10	.08	.08	.03	.02	.02
5. Self-Reported Mentalizing (RFQ-Y)	.07	-.13	.04	.07	.01	-.10
Youth Self-Reported Social Functioning						
6. Prosocial Behaviours (SDQ – PS)	.05	.11	.07	.12	-.10	-.02
7. Peer Problems (SDQ – PP)	.21 [†]	.04	.08	.07	-.17	.04
Parent-Reported Youth Social Functioning						
8. Prosocial Behaviours (PSDQ – PS)	.08	.10	.02	-.02	.006	-.04
9. Peer Problems (PSDQ – PP)	.21 [†]	-.23*	.38**	-.08	-.06	-.16

1. *N* = 84 for all TASIT-S correlations except TASIT-S by Household Income (*N* = 79).

2. Gender coded such that 0 = male, 1 = female. One youth participant not included in this particular analysis (*N* = 86) due to nonbinary identification.

3. *N* = 79 for Prementalizing by Household Income.

[†] *p* < .08, **p* < .05, ***p* < .01

Multiple Regression Analyses

Hierarchical multiple regressions were utilized to examine the relations between parental mentalizing (as measured through parental reflective functioning and general mentalizing skills) and youth mentalizing (as measured by both a self-report and task-based assessment) with youth social functioning (as measured through both positive and negative peer interactions). These variables were examined separately in order to allow us to address differences around parental reflective functioning and general parental mentalizing, to examine differences in using task-based measures of youth mentalizing and self-report given the lack of validated youth mentalizing measures, and to investigate changes in associations when examining youths’

positive and negative social interactions. All regressions were entered as follows: Step 1 – control variables (Parent gender, youth age); Step 2 – Parental Mentalizing (PRFQ - PM, PRFQ-IC, or MentS) and Youth Mentalizing (RFQ-Y or TASIT-S) with the dependent variable of social functioning (SDQ-PS, SDQ – PP). In order to examine our fourth research question of assessing whether patterns of association differed based on who was reporting on youth social functioning, all analyses were also run with parent-reported youth social functioning (PSDQ – PS, PSDQ – PP). The standardized residuals of all 24 regressions were found to be normally distributed.

To address our objective of determining whether youth mentalizing skills mediated associations between parental reflective functioning and youth social functioning, additional mediation analyses were run using the SPSS 27 PROCESS Macro (Hayes, 2022). Mediation analyses were only conducted when indicated by the pattern of the bivariate correlations. Namely, as per the guidelines provided by Mackinnon et al (2002), mediation analyses were run when there was a significant association between the specific parental mentalization measure and the youth mentalization measure alongside a significant association between the youth mentalization measure and youth social functioning, regardless of whether there was a direct association between parental mentalizing and youth social functioning.

The results are reported below, organized by the dependent variables of youths’ social functioning by type and reporter. Statistical summaries of the regression analyses can be found in Tables 3-6.

Youth-Reported Social Functioning

Prosocial Behaviours. To address our first research question multiple regression effects were used to test if parent mentalizing and youth mentalizing predicted youth-reported prosocial

behaviours (SDQ – PS), with youth age and parent gender entered as control variables (Table 3). At Step 1, the model was not significant ($R^2 = .03$, $F(2, 81) = 1.04$, $p = .34$). However, when parent mentalizing and youth mentalizing were entered (Step 2), the overall models were significant for models that included any type of parent mentalizing with the RFQ-Y (all $ps < .01$), and when the PRFQA-PM (but not PRFQA-IC or MentS) was included with the TASIT-S ($p < .01$).

With respect to individual predictors, at Step 2, parent mentalizing emerged as a significant predictor of youth self-reported prosocial behaviours when measured through the Prementalizing subscale of the PRFQA (PRFQA – PM), but not through the Interest & Curiosity PRFQA subscale or the Mentalization Scale total score ($ps > .05$). More specifically, the significant association between PRFQA-PM and the SDQ-PS emerged regardless of the measure of youth mentalizing that was included in the models (i.e., with TASIT-S ($b = -.79$, $SE = .28$, $\beta = -.33$, $t(2, 79) = -2.86$, 95% CI = [-1.35, 1.24], $p < .01$); with the RFQ-Y ($b = -.71$, $SE = .25$, $\beta = -.28$, $t(2, 82) = -2.82$, $p < .001$)).

Additionally, regardless of which PRFQA subscale was used, youth self-reported mentalizing (RFQ-Y) uniquely accounted for a significant amount of variance in youth-reported prosocial behaviour (i.e., with PRFQA-PM ($b = 1.13$, $SE = .23$, $\beta = .46$, $t(2, 82) = 4.99$, 95% CI = [.68, 1.58], $p < .001$), with PRFQA-IC ($b = 1.24$, $SE = .23$, $\beta = .50$, $t(2, 82) = 5.29$, 95% CI = [.77, 1.71], $p < .001$), and with MentS ($b = 1.26$, $SE = .24$, $\beta = .51$, $t(2, 82) = 5.30$, 95% CI = [.79, 1.73], $p < .001$)). Youth task-based mentalizing did not emerge as a significant predictor in the regressions when the various parental mentalizing measures were included ($ps > .05$).

Given the significant bivariate correlations found between the PRFQA-PM and TASIT-S, as well as between the TASIT-S and SDQ-PS, a mediation analysis was conducted to further

investigate these associations (Figure 1). The total effect of parental reflective functioning (PRFQ-PM) on youth-reported prosocial behaviours (SDQ – PS) was significant, $c = -.67$, $SE = .21$, $t(3, 80) = -3.18$, 95% CI = [-1.08, -.25], $p = .002$, and was comprised of a significant direct effect of PRFQA-PM on SDQ – PS, $c' = -.61$, $SE = .21$, $t(3, 80) = -2.86$, 95% CI = [-1.04, -.19], $p = .005$, and a non-significant indirect effect of PRFQA – PM on SDQ-PS via the TASIT-S, $ab = -.06$, $SE = .06$, 95% CI = [-.21, .05]. The mediation analysis also revealed a marginal effect of PRFQA-PM on the TASIT-S ($a = -.22$, $SE = .12$, $t(3, 80) = -1.88$, 95% CI = [-.45, .01], $p = .06$). Taken together, these results do not support a mediation or partial mediation.

Table 3
Summary of Hierarchical Regression Models Predicting Youth-Reported Prosocial Behaviours

Predictors	Prementalizing		Interest & Curiosity		General Mentalizing	
	TASIT-S β (B, SE)	RFQ-Y β (B, SE)	TASIT-S β (B, SE)	RFQ-Y β (B, SE)	TASIT-S β (B, SE)	RFQ-Y β (B, SE)
Youth Age	.10 (.17, .18)	.10 (.17, .16)	.08 (.13, .19)	.09 (.15, .17)	.08 (.13, .19)	.09 (.15, .17)
Parent Gender	.003 (.02, .57)	.07 (.37, .53)	.14 (.71, .59)	.19 [†] (1.00, .54)	.13 (.67, .61)	.16 (.86, .56)
Parent Mentalizing	-.33** (-.79, .28)	-.28** (-.71, .25)	-.06 (-.13, .26)	-.02 (-.05, .24)	-.03 (-.004, .02)	.05 (.01, .02)
Youth Mentalizing	.14 (.03, .02)	.46** (1.13, .23)	.20 [†] (.05, .02)	.50** (1.24, .23)	.20 [†] (.05, .03)	.51** (1.26, .24)
Model F Value	3.55**	10.27**	1.42	7.57**	1.37	7.63**

Note. For all RFQ-Y analyses, degrees of freedom = (2, 82). For all TASIT-S analyses, degrees of freedom = (2,79).
[†] $p < .08$, * $p < .05$, ** $p < .01$

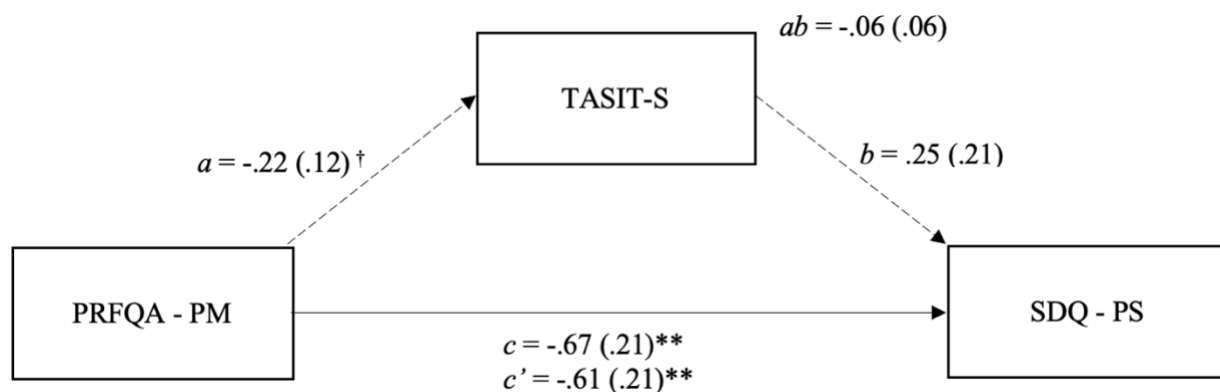


Figure 1. Mediation model demonstrating the total effect of PRFQA – PM on SDQ – PS (c ; controlling for Parent Gender and Youth Age), alongside the direct effect (c') of PRFQA – PM to SDQ – PS, controlling for the indirect effect of TASIT-S (ab). Associations between PRFQA – PM and TASIT-S (a) and TASIT-S and SDQ – PS (b) are also shown. Standard errors are shown in parentheses.

Peer Problems. To accomplish our goal of understanding the role of mentalizing for both positive and negative peer experiences, we also ran regressions with youth-reported peer problems as the dependent variable. At Step 1 (control variables), the model was not significant ($R^2 = .002$, $F(2, 81) = .06$, $p = .94$). When parent mentalizing and youth mentalizing were entered (Step 2), the overall model was significant when using all measures of parent mentalizing with the RFQ-Y for youth (all $ps < .01$).

In terms of individual predictors, no measures of parent mentalizing emerged as uniquely accounting for variance in youth-reported peer problems ($ps > .05$; Table 4). Youth mentalizing (both task-based and self-report) emerged as a significant main predictor for all models ($ps < .03$), except in the model that included PRFQA-PM and the TASIT-S, which was marginally significant ($p = .06$).

Given the pattern of bivariate correlations among the PRFQA-PM and TASIT-S, and the TASIT-S and SDQ-PP, analyses were run to test for a possible mediation relationship (Figure 2). The mediation analysis revealed a total effect of PRFQA-PM on SDQ – PP of $c = .33$, $SE = .19$, $t(3, 80) = 1.75$, 95% CI = [-.05, .70], $p = .08$, including both an nonsignificant direct effect of PRFQA-PM on SDQ-PP ($c' = .26$, $SE = .19$, $t(3, 80) = 1.35$, 95% CI = [-.12, .63], $p = .18$) and the nonsignificant indirect effect of PRFQA-PM on PSDQ-PS via the TASIT-S, $ab = .07$, $SE =$

.06, 95% CI = [-.01, .23]. This pattern of results does not support a mediation.

Table 4

Summary of Hierarchical Regression Models Predicting Youth-Reported Peer Problems

Predictors	Prementalizing		Interest & Curiosity		General Mentalizing	
	TASIT-S β (B, SE)	RFQ-Y β (B, SE)	TASIT-S β (B, SE)	RFQ-Y β (B, SE)	TASIT-S β (B, SE)	RFQ-Y β (B, SE)
Youth Age	.04 (.06, .16)	.09 (.13, .15)	.05 (.07, .16)	.10 (.14, .15)	.05 (.07, .16)	.09 (.13, .15)
Parent Gender	.12 (.51, .51)	.06 (.28, .51)	.04 (.16, .51)	-.02 (-.09, .50)	.06 (.27, .52)	.04 (.17, .51)
Parent Mentalizing	.16 (.33, .25)	.14 (.31, .24)	.06 (.13, .23)	.07 (.15, .22)	-.01 (-.001, .02)	-.08 (-.01, .01)
Youth Mentalizing	-.21 [†] (-.04, .02)	-.37** (-.78, .22)	-.24* (-.05, .02)	-.39** (-.82, .22)	-.24* (-.05, .02)	-.40** (-.85, .22)
Model F Value	1.72	4.29**	1.32	3.93**	1.24	3.96**

Note. For all RFQ-Y analyses, degrees of freedom = (2, 82). For all TASIT-S analyses, degrees of freedom = (2,79).
[†] $p < .08$, * $p < .05$, ** $p < .01$

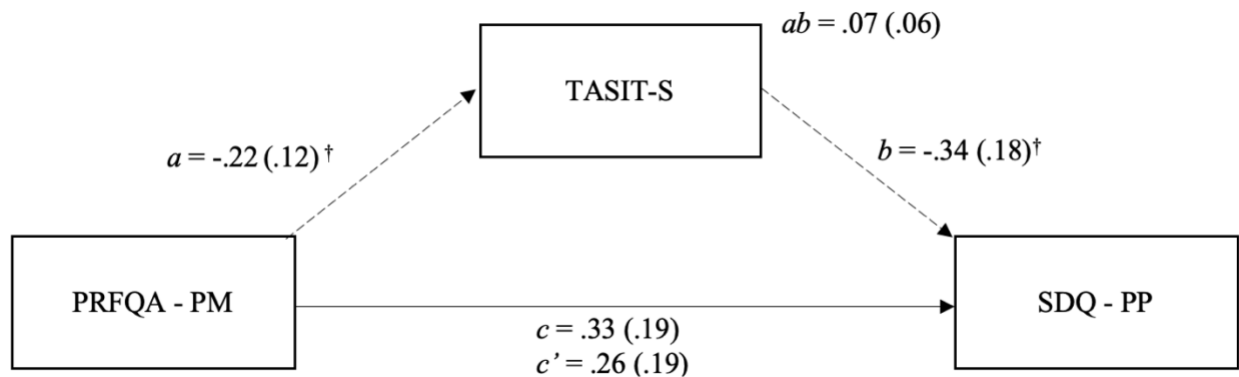


Figure 2. Mediation model demonstrating the total effect of PRFQA – PM on SDQ – PP (c ; controlling for Parent Gender and Youth Age), alongside the direct effect (c') of PRFQA – PM to SDQ – PP, controlling for the indirect effect of TASIT-S (ab). Associations between PRFQA – PM and TASIT-S (a) and TASIT-S and SDQ – PP (b) are also shown. Standard errors are shown in parentheses. [†] $p < .08$, * $p < .05$, ** $p < .01$

Parent-Reported Youth Social Functioning

To examine patterns of associations based on parents' perceptions of their children's social functioning, the same regression analyses described above were also run using parent-reported prosocial behaviours and peer problems as the dependent variables.

Prosocial Behaviours. At Step 1, the control variables together did not predict parent-reported prosocial behaviours ($R^2 = .01$, $F(2, 81) = .43$, $p = .65$). At Step 2, when including PRFQA – PM and TASIT-S as predictors, the overall model was significant ($R^2 = .12$, $F(2, 79) = 2.74$, $p = .03$; Table 5). This was also the case when the model included the PRFQA – PM and the RFQ-Y ($R^2 = .14$, $F(2, 82) = 3.36$, $p = .01$), but not other models ($ps > .05$).

With respect to individual predictors, when examining the model that included the PRFQA - PM and the TASIT-S, PRFQA-PM uniquely accounted for variance in parent-reported prosocial behaviours, $b = -.83$, $SE = .28$, $\beta = -.35$, $t(2, 79) = -2.97$, 95% CI = [-1.40, -.27], $p < .01$. Similarly, when the PRFQA – PM and RFQ-Y were included, PRFQA-PM was a significant predictor, $b = -.82$, $SE = .27$, $\beta = -.34$, $t(2, 82) = -2.99$, 95% CI = [-1.37, -.28], $p < .01$. No other significant associations for other measures of parental mentalizing were found ($ps > .05$). In terms of youth mentalizing, RFQ-Y emerged as a significant predictor of parent-reported prosocial behaviours when included in the models with general parental mentalizing ($b = .52$, $SE = .26$, $\beta = .22$, $t(2, 82) = 2.04$, 95% CI = [.01, 1.03], $p < .05$), but not when included with the PRFQA subscales ($ps > .05$). The TASIT-S did not significantly predict parent-reported prosocial behaviour across all models ($ps > .05$).

Table 5

Summary of Hierarchical Regression Models Predicting Parent-Reported Youth Prosocial Behaviours

Predictors	Prementalizing		Interest & Curiosity		General Mentalizing	
	TASIT-S	RFQ-Y	TASIT-S	RFQ-Y	TASIT-S	RFQ-Y
Youth Age	.05 (.08, .18)	.06 (.09, .17)	.03 (.04, .19)	.04 (.06, .18)	.04 (.07, .19)	.06 (.09, .18)
Parent Gender	-.04 (-.18, .58)	-.007 (-.04, .58)	.08 (.41, .61)	.12 (.58, .59)	.04 (.19, .62)	.05 (.27, .60)
Parent Mentalizing	-.35** (-.83, .28)	-.34** (-.82, .27)	.03 (.06, .27)	.04 (.09, .26)	.14 (.02, .02)	.19 (.03, .02)
Youth Mentalizing	.06 (.01, .02)	.14 (.33, .25)	.12 (.03, .03)	.19† (.45, .26)	.11 (.02, .03)	.22* (.52, .26)
Model <i>F</i> Value	2.74*	3.36*	.54	1.04	.84	1.69

Note. For all RFQ-Y analyses, degrees of freedom = (2, 82). For all TASIT-S analyses, degrees of freedom = (2, 79). † $p < .08$, * $p < .05$, ** $p < .01$

Peer Problems. At Step 1, with parent gender and youth age as predictors of PSDQ – PP, the model was significant ($R^2 = .15$, $F(2, 81) = 7.13$, $p = .001$). At Step 2, when parent mentalizing and youth mentalizing were included as predictors, all models were significant (all $ps < .01$; Table 6).

With regards to individual predictors, differing associations emerged between parent mentalizing, youth mentalizing, and parent-reported peer problems depending on the parent mentalizing measure used. Unlike previously reported models, the measure of parental mentalizing that emerged as a significant predictor was the PRFQA-IC with both the TASIT-S, $b = .43$, $SE = .18$, $\beta = .25$, $t(2, 79) = 2.35$, 95% CI = [.07, .79], $p < .05$, and the RFQ-Y, $b = .45$, $SE = .18$, $\beta = .24$, $t(2, 82) = 2.48$, 95% CI = [.09, .82], $p < .05$.

In terms of youth mentalizing, the RFQ-Y was a significant predictor in all models (i.e., with PRFQA-PM, $b = -.54$, $SE = .19$, $\beta = -.29$, $t(2, 82) = -2.91$, 95% CI = [-.92, -.17], $p < .01$; with PRFQA-IC, $b = -.52$, $SE = .18$, $\beta = -.28$, $t(2, 82) = -2.95$, 95% CI = [-.88, -.17], $p < .01$; and with MentS, $b = -.54$, $SE = .19$, $\beta = -.28$, $t(2, 82) = -2.86$, 95% CI = [-.91, -.16], $p < .01$. The TASIT-S did not emerge as a significant predictor for any model ($ps > .05$).

Table 6*Summary of Hierarchical Regression Models Predicting Parent-Reported Youth Peer Problems*

Predictors	Prementalizing		Interest & Curiosity		General Mentalizing	
	TASIT-S β (B, SE)	RFQ-Y β (B, SE)	TASIT-S β (B, SE)	RFQ-Y β (B, SE)	TASIT-S β (B, SE)	RFQ-Y β (B, SE)
Youth Age	.32** (.40, .13)	.35** (.47, .13)	.32** (.40, .13)	.35** (.46, .13)	.32** (.40, .13)	.35** (.47, .13)
Parent Gender	-.19 (-.72, .43)	-.21 [†] (-.86, .44)	-.26* (-1.00, .41)	-.28** (-1.15, .41)	-.20 (-.75, .43)	-.20 [†] (-.81, .44)
Parent Mentalizing	-.02 (-.03, .21)	-.03 (-.05, .21)	.25* (.43, .18)	.24* (.45, .18)	.04 (.004, .01)	-.003 (.00, .01)
Youth Mentalizing	-.15 (-.03, .02)	-.29** (-.54, .19)	-.16 (-.03, .02)	-.28** (-.52, .18)	-.16 (-.03, .02)	-.28** (-.54, .19)
Model <i>F</i> Value	4.10**	6.68**	5.75**	8.70**	4.13**	6.66**

Note. For all RFQ-Y analyses, degrees of freedom = (2, 82). For all TASIT-S analyses, degrees of freedom = (2, 79).

[†] $p < .08$, * $p < .05$, ** $p < .01$

Discussion

Peer relationships play a crucial role in the psychological well-being of adolescents (Brown, 2004; Brown & Larson, 2009; Choukas-Bradley & Prinstein, 2014; Gardner & Steinberg, 2012; Graham & Bellmore, 2007; Hartup, 1989; Hartup & Stevens, 1999; Kullik & Petermann, 2013; la Greca & Harrison, 2005; Laible et al., 2004; Laible & Carlo, 2004; Lansford et al., 2003; Parker & Asher, 1993; Prinstein & la Greca, 2002; Roach, 2018; Rueger & Jenkins, 2014; Sandstrom & Cillessen, 2006; Scholte & van Aken, 2006). In this work we sought to examine whether a parent's ability to reason about the mental states of their children was associated with their adolescent's social functioning, and, if so, whether this association was mediated through the youth's own mentalization abilities. Findings revealed that while youth mentalizing did not mediate the relationship between parent reflective functioning and adolescent social functioning, both parent reflective functioning and the youth's mentalizing skills made unique contributions to social functioning, with different patterns emerging depending on the outcome variable used. These results have important implications for understanding the differential role of parents and adolescents themselves in adolescent social functioning.

Parental Reflective Functioning and *Youth-Reported Youth Social Functioning*

In examining our first research question of if parental reflective functioning is associated with better youth self-reported social functioning, we found that parents' prementalizing (the inability to mentalize effectively), but not their interest and curiosity regarding their child's mental states, significantly predicted youth self-reported prosocial behaviours. As expected given the fact that pre-mentalizing modes captures ineffective forms of mentalizing, this association was negative, meaning parents with high scores on the PRFQA-PM (worse parental reflective

functioning) had youth who reported engaging in fewer prosocial behaviours. This suggests that the ability of a parent to engage in effective mental state thinking may have important associations with their youth's tendency to engage in prosocial behaviours with others; more specifically, findings demonstrate that ineffective forms of parental mentalizing are correlated with youth self-reporting fewer prosocial behaviours. However, the mechanisms for such a relationship are currently unclear; one possibility may be that a parent with weaker reflective functioning skills engages in parenting behaviours that, in turn, are associated with lower prosociality in their children such as less parental sensitivity, less secure attachment, or lower empathy, as was suggested by a recent systematic review of the relationship between parental reflective functioning and parenting behaviours in infancy and early childhood (Stuhrmann et al., 2022). It could also be the case that, in line with theories of social learning (for summary, see Grusec, 1994), parents with a weaker ability to mentalize demonstrate less responsive and empathetic parenting patterns towards their children, who then model a similar lack of prosociality in their interactions with others regardless of their own understanding of others' mental states (i.e., even if they are able to theorize about others' mental states, they do not engage in behaviours that demonstrate concern for others in alignment with this mental state knowledge). Notably, given that our study is not able to assess causal effects, it is also possible that youth characteristics direct this relationship in that children with higher problem behaviour and poor regulation may be more difficult for parents to develop a feeling of competence around their reflective functioning towards, or this relationship may be bidirectional.

Recalling that one of our research aims was to examine potential differences that may occur based on the kind of youth social behaviour, we also investigated if parent mentalizing was related to youth-reported peer *problems*. Here, we found that, contrary to our hypotheses, no

measures of parental mentalizing were related to youth-reported peer problems. Thus, in our work we find that parental reflective functioning may support youths' positive engagement with others but when parental reflective functioning is weaker it does *not* relate to more negative interactions with peers. This finding was surprising given that previous research has linked poor parental reflective functioning and a variety of internalizing and externalizing behaviours during middle childhood, which can be associated with social challenges (Choukas-Bradley & Prinstein, 2014; Newcomb et al., 1993; Pachucki et al., 2015; Prinstein et al., 2018). Within our sample, it may be the case that we did not detect a result due to low measurement reliability in our study (for instance, the association with prementalizing was in the hypothesized direction), but it may also be the case that as children develop into adolescence their peer interactions become increasingly independent from their parents and there are not meaningful relations between parental mentalizing and peer problems. As such, factors relating to the youth themselves may become increasingly significant in these relationships, with parent influences on peer problems diminishing as the child ages. As will be explored in the following section, we did see that youth's own mentalizing predicted peer problems in the expected direction, which would support this interpretation. However, it is less clear why we would see this pattern emerging for peer problems, but not for prosocial behaviours.

Although speculative, one possibility may be that the prosocial behaviours subscale captures more independent actor behaviours of the youth (e.g., the youth's decision to share with others or volunteer to help), while the peer problems subscale captures elements related to the dyadic or interpersonal relationships of the youth (e.g., whether the youth reports having a good friend). It may be the case that parents' mentalizing influences their child's prosocial behavioural decisions, but this does not adequately capture the complex nature of the social skills necessary

to respond sensitively in dyadic relationship-forming with peers. As such, youths' own mentalizing would be more influential in their ability to form meaningful deep connections with others, while both the youth and the parent influence decisions to engage prosocially. Certainly, it is not unheard of that a child may interact prosocially with others, but this characteristic is not sufficient for them to be accepted, popular, or close with peers. Alternatively, it may be that parents' reflective functioning translates to modelling or demonstrating prosocial behaviours as their child grows and develops, but youth have fewer experiences witnessing their parents engaging in friendship-building, navigate peer networks, or resolving conflict. As such, parental reflective functioning may translate more directly to demonstrations of prosocial behaviour rather than to what is captured within the peer problems subscale, while youth's mentalizing would be impactful for how they navigate the complexities of their social interactions.

Adolescent's Own Reflective Functioning and their Self-Reported Social Functioning

Additionally, we were interested in understanding if any associations between parent mentalizing and youth self-reported social functioning were partially explained by the youth's own mentalizing skills. We investigated these questions using both a task-based and youth self-report measure of mentalizing. Before addressing this aim, it is worth discussing the pattern of relations among the youth and parent measures given the novel contribution they have. First, while the correlation was approaching significance, we did not find that the TASIT-S and RFQ-Y were significantly correlated with one another. Thus, these measures seem to be capturing related (albeit marginally), but distinct, aspects of mentalizing skills. For instance, the task-based measure may be assessing mentalizing knowledge, such as the ability to consider the mental states of others based on behaviour, but does not capture how youth may be applying this skill within their everyday (and potentially more complex) social interactions with their peers. In

contrast, the RFQ-Y captures a youth's reflections on their levels of reflective functioning within their everyday interactions but may be prone to socially desirable responding and/or limits of the adolescent's insight into their own skills. This would function similarly to how some researchers have proposed that task-based and questionnaire measures of executive functioning detect differences in individual's theoretical 'maximum' EF skill level under ideal conditions and the amount of EF skills they are able to employ when confronted with the complications and competing demands of real-world settings (Malanchini et al., 2019; Toplak et al., 2013). Regardless of the underlying cause, in our pattern of results it is important to consider both measures of youth mentalizing separately. Second, it is notable that we found correlations in the expected direction between parent mentalizing (through the PM subscale) and the TASIT-S, which suggests a possible association between parents' mentalizing abilities and youth's own skills and led us to investigate possible mediation relationships. Thus, consistent with previous work, a parent's ability to reason about their child's mental states may contribute to that child's development of mental-state reasoning beyond early childhood and into adolescence.

However, despite this association we found that contrary to our hypothesis youth mentalizing did not mediate the relationship between parent mentalizing and youth-reported prosocial behaviours. Alternatively, we found that the RFQ-Y was a significant unique predictor of youth-reported prosocial behaviours (with a positive medium effect size estimate, (β s = .46 - .50), while the TASIT-S was approaching significance in two out of three models, but had a very small effect size (β s = .14 - .20). These findings suggest that youths' own mentalizing may be an important factor that contributes to a tendency to engage prosocially with peers, with youth who have a better ability to consider the cognitive and affective mental states of their peers also reflecting this knowledge through their prosocial actions (although this is more detectable when

measured through self-report, rather than task-based mentalizing measures). Similarly, when looking at youth-reported peer problems, we did not find a mediation relationship between parental reflective functioning and youth-reported peer problems. Consistent with the pattern for youth-reported prosocial behaviours, youth mentalizing emerged as a unique predictor for youth-reported peer problems. It is surprising that the TASIT-S emerged as a significant predictor of peer problems for most models (and was trending towards significance in the case of the model including the PRFQA-PM), but this was not as strong when looking at youth-reported prosocial behaviours - although the TASIT-S was trending towards significance in these models. Observing similar patterns between the RFQ-Y and the TASIT-S helps alleviate concerns that these patterns may be emerging due to shared method variance between the RFQ-Y and the SDQ-PS/SDQ-PP.

When considering these findings in the context of our results with parents, we see *both* parent reflective functioning and youth's own mentalizing providing unique contributions to youth's self-reported prosocial behaviours, while only youth mentalizing seems to be impactful for peer problems. Taken together, these findings add to the body of literature that has shown perspective-taking skills are associated with greater prosociality (Cigala et al., 2015; Eisenberg et al., 2003; Vaish et al., 2009; Zahn-Waxler et al., 1977) and positive peer relationships (LeMare & Rubin, 1987; Nilsen & Bacso, 2017; Nilsen & Fecica, 2011), and extends research demonstrating that children's mentalizing has benefits for socio-emotional outcomes beyond early childhood. Given that the vast majority of research has examined benefits to children in younger ages, and that this research typically emphasizes children/youths' *emotional* wellbeing, demonstrating that mentalizing is associated with benefits to prosocial behaviour and peer relationships in adolescence is novel in multiple ways. Firstly, it suggests mentalizing's benefits

continue in a later developmental stage. Further, this work builds on research by Benbasset and Priel (2012) by finding that in addition to potentially relating to social competence, youth mentalizing (and, to a lesser extent, parental reflective functioning) are related to both positive and negative peer interactions. Understanding the nuances of mentalizing's benefits among specific elements of a youth's complex social context is essential to determining mechanisms through which mentalizing translates to positive outcomes, and for guiding interventions to target the most potentially beneficial elements of relationships.

Parent-Reported Adolescent Social Functioning

While our primary dependent measure was of the youth's perceptions of their own social functioning, we were also interested in investigating patterns of associations when predicting parents' report of their youth's social functioning. There was convergence in the perceptions of both youth and parents as per significant positive small-moderate correlations between the reports of both prosocial behaviours and peer problems ($r_s = .41$ and $.39$, respectively). However, differing patterns emerged when examining regression analyses.

Consistent with the pattern of results for youth self-reported prosocial behaviours, when using the parent-report we found that parental mentalizing was a significant negative predictor of prosocial behaviours when using the PRFQA-PM as the measure of parent mentalizing, but not when using the PRFQA-IC. Thus, parental pre-mentalizing shows important associations with youth prosocial behaviour regardless of whether this aspect of social functioning is reported by parents or youth.

In contrast to the youth-reported peer problems, we found that parental mentalizing was associated with parent-reported youth peer problems, though in an unanticipated direction. Specifically, parents who reported greater Interest & Curiosity reported that their children had

increased peer problems. One potential explanation for this positive association is that parents who perceive their child as having notable problems with their peers may be prompted to be more attentive to their child and may in turn be more curious about their child's internal reasoning. In this way, this association may exist because parents observing their child as having peer problems may have higher levels of preoccupation with their child's internal understanding of their social interactions. Although correlational, some research has shown associations between child internalizing and externalizing difficulties and parental behaviours like overcontrol (Guajardo et al., 2009; van Leeuwen et al., 2004), which may suggest parents become more watchful and attentive to children having difficulties. However, the directionality of this relationship cannot be discerned from the literature or our research model, so future research would need to investigate the causality of relationships between parents' interest and curiosity in their child's mental states and the child's peer relationships.

In contrast to youth-reported prosocial behaviour, youth mentalizing, whether task based or self-report, did not predict parent-reported prosocial behaviour. However, the youth's self-reported mentalizing did emerge as a significant predictor of parent-reported peer problems. Thus, unlike the task-based measure of youth mentalizing, a youth's report of their own mentalizing skills predicts their peer problems regardless of whether the parent or youth is reporting on the peer problems.

Parents' General Mentalizing Ability

Theoretically, it has been proposed that the unique elements of the parenting relationship may result in a specific form of mentalizing when applied to one's child (Fonagy et al., 1991; Luyten et al., 2017; Slade, 2005); however, to our knowledge no studies have attempted to measure this empirically. Recall that parental reflective functioning refers to a parent's ability to

consider their child in terms of that child's mental states (thoughts, feelings, beliefs, desires). It may be the case that parents who have good reflective functioning are generally higher in their mentalizing skills, even outside the parenting context. Thus, we sought to examine whether a parents' general mentalizing skills predicted their youth's social functioning.

Within our dataset, significant moderate correlations (PRFQA-PM $r = -.51$; PRFQA-IC $r = .49$) between a parent's general mentalizing skills and their parental reflective functioning emerged, suggesting some overlap in the constructs. However, parents' general mentalizing skills did not emerge as a significant predictor of youth social functioning regardless of the reporter. Thus, there may indeed be unique qualities of mentalizing about one's child that emerge as particularly influential for youth social functioning, while general mentalizing has a weaker predictive impact for youth. For example, it may be the case that parents are more successful in their estimations of their child's reasoning given the close nature of the parent-child relationship compared to other relationships in a parent's life. Alternatively, similarities between parents and children (e.g., shared genetics and their correlates with personality, shared experiences) may help bolster reflective functioning within the parenting relationship. Although not yet thoroughly studied, as highlighted in the literature review, some research suggests that the complexity with which one ascribes mental states to others may differ depending on a variety of factors (e.g., relationship quality, gender). This raises the question of whether mentalizing is best understood as a state or trait ability, and if elements of the parent-child relationship may impact the accuracy of mentalizing in alignment with this research.

Limitations

There are a number of limitations that are important to consider when contextualizing the results of this work. Firstly, it is notable that our sample was relatively small and had a tendency

towards high levels of parental education, household income, and was majority White (the majority ethnic identity in the area of data collection; Region of Waterloo, 2016), which may limit the generalizability of our results. A larger and more diverse sample may pick up different patterns; for example, it is possible that parental mentalizing or youth mentalizing may be more impactful on youth social functioning for youth who have access to fewer other supportive resources.

Additionally, it is important to recognize that data collection for this study occurred throughout the COVID-19 pandemic (2021-2022). Two significant impacts of the COVID-19 pandemic were school closures and generally reduced contact with friends and extended family members, and increased time with one's immediate family members. As such, it is possible that some elements of youth social functioning were less tangible during this time. Furthermore, research shows that many elements of youth social relationships occur online (e.g., Anderson & Jiang, 2018; Bucksch et al., 2016; Twenge, 2019), and this was only heightened by the pandemic (Zhang et al., 2021). Together, the reduced contact with friends and the increased role of online peer relationships may present fewer opportunities for parents to observe how their adolescent child engages with peers. Although our questionnaires ask parents and youth to consider their interactions over the past 6 months, which may have helped even the effect of various temporary school closures and lockdowns, this context may still have contributed to our parent-reported outcomes finding fewer significant results overall.

The use of the PRFQ-A to operationalize parental reflective functioning also presented challenges for interpreting our results. While we were able to utilize both task-based and self-report measures of youth mentalizing, at this time no task-based measures of parental reflective functioning exist. This makes it difficult to compare the accuracy of the PRFQA to other

measures and it presents limitations given that self-report measures of parental reflective functioning are more vulnerable to self-report bias and socially desirable responding. Additionally, the PRFQA has a number of interpretive challenges: most notably, the scoring instructions and interpretive guides utilized across studies have varied (e.g., Anis et al., 2020; Luyten, Nijssens, et al., 2017; Pajulo et al., 2015, 2018). As a result, it is difficult to make consistent claims about this measure's validity and reliability or to compare results across studies. This was evident within our own work, where the Certainty in Mental States subscale was dropped due to a lack of consistency in interpretation. As work in this area continues, it will be important for researchers to confirm the validity and interpretation of the subscale through consistent scoring and use, as well as to continue developing other psychometrically strong task-based, observational, interview, and self-report measures for this concept.

Lastly, it is important to note that our parent-reported and youth-reported peer problems subscale had relatively low internal reliability, with a number of participants not endorsing any items. Thus, future work should consider using a more sensitive measure of peer problems that includes more benign social difficulties (rather than more overt problems) in order to detect more subtle differences in social interactions.

Future Directions

This work presents a number of potential avenues for future investigation. Most notably, future work should investigate the mechanisms through which associations between parent mentalizing, youth mentalizing, and youth social functioning emerge. Currently, the field has worked to establish the theoretical underpinnings of reflective functioning and its potential benefits to both parents and youth, but there is significantly less work examining how differences

in parental reflective functioning translate into meaningful relational behaviours like communication strategies and parenting decisions.

Further, while research has suggested parental reflective functioning may be one mechanism through which children and adolescents learn to develop their own mentalizing skills, this research has not been thoroughly empirically validated. Given that our work suggests parent and child/youth mentalizing may have unique roles in a variety of child/adolescent outcomes, understanding the factors that influence the development of mentalizing is essential to delineating pathways to healthy social functioning. Additionally, there is limited research on both the impact of parental reflective functioning and the development of one's own reflective functioning during adolescence, and some research suggests the impacts may be different from that of childhood. For example, Benbasset and Priel (2012) found that in a young adolescent sample, higher parental reflective functioning was correlated with higher adolescent reflective functioning, but also with greater internalizing problems and lower self-esteem in adolescent children; these results differ from research in early and middle childhood samples, which finds parental reflective functioning is typically beneficial for mental health symptoms and emotion regulation. As such, it is important to continue to investigate how factors like adolescents' increasing independence, developing sense of self, and growing significance of peer relationships may result in different relations with reflective functioning. As this field continues to elucidate the nature of reflective functioning and how it operates in different relationships, new avenues for investigation and possibilities for clinical interventions will continue to appear.

Conclusion

This study aimed to increase our understanding of relations between parental reflective functioning, adolescent mentalizing, and adolescent social functioning as measured through prosocial behaviours and peer problems. In particular, we examined if youth mentalizing acts as a mediator of any relations between parental reflective functioning and youth social functioning. Additionally, our research design allowed us to explore if patterns of association differ when examining parent vs youth self-report of youth social functioning, and if patterns differ when examining the impacts of parents' general vs parenting-specific reflective functioning. Our results indicated that while parents' reflective functioning was associated with youth-reported prosocial behaviours, youth mentalizing did not mediate these relationships. However, the youths' own mentalizing acted as a unique predictor of their social functioning regardless of the youth self-report subscale examined.

These results build on previous research suggesting there may be associations between parental reflective functioning and the development of children's mentalizing; further, it is the first of its kind to examine the role of mentalizing in predicting *social* outcomes. Taken together, findings support the idea that youths' own mentalizing becomes increasingly important as a predictor of their social functioning throughout development; however, parental reflective functioning, but not a parent's general reflective functioning (outside of the parenting role), continues to act as an important factor in guiding adolescent behaviours and outcomes when considering youths' prosocial behaviours.

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Appendices

Appendix A

*Table A1.1
Additional Demographics - Ethnicity*

Ethnicity	Parent		Youth	
	N	Percentage	N	Percentage
White	66	76%	69	79%
South Asian	8	9%	9	10%
East/Southeast Asian	7	8%	7	8%
Mixed Race	3	3%	7	8%
Latinx	1	1%	-	-
Middle Eastern	1	1%	1	1%
Guyanese Indian	1	1%	-	-
Indigenous	-	-	1	1%

*Table A1.2
Additional Demographics – Non-English Languages Spoken at Home*

Language	N	Percentage
French	17	20%
Punjabi	5	6%
Mandarin	4	5%
German	3	3%
Cantonese	2	2%
Hindi	2	2%
Spanish	1	1%
Japanese	1	1%
Dari	1	1%
Greek	1	1%
Hungarian	1	1%
Kiswahili	1	1%
Marathi	1	1%
Pashto	1	1%
Portuguese	1	1%
Telugu	1	1%

Table A1.3

Additional Demographics – Household Income

Income (CAD)	N	Percentage
< 15, 000	2	2%
15, 000 – 24, 999	2	2%
25, 000 – 49, 999	5	6%
50, 000 – 74, 999	6	7%
75, 000 – 99, 999	10	12%
100, 000 – 124, 999	12	14%
125, 000 – 149, 999	13	15%
150, 000 – 174, 999	12	14%
> 175, 000	22	25%
Missing	3	3%

Table A1.4

Additional Demographics – Parent Education

Highest Level of Education Received	N	Percentage
Secondary (High School) Degree	3	3%
Some post-secondary training (certificate program, diploma)	10	12%
Some post-secondary education (Undergraduate/bachelor's degree level, degree not completed)	7	8%
College/CEGEP or other non-university certificate or diploma	7	8%
Completed Bachelor's degree/undergraduate degree	30	35%
Some graduate-level training	7	8%
Completed graduate (Masters) degree or higher	23	26%

Table A1.5
Additional Demographics – Youth who Divide Time Among Multiple Households

Average number of days spent in participating parent's house per week	N	Percentage
Youth does not split time between multiple households	76	87%
7	2	2%
6	3	3%
5	-	-
4	5	6%
3	-	-
2	1	1%
1	-	-

Table A2
Descriptive Statistics for Questionnaires and Task Measures (N=87)

Measure	<i>M</i>	<i>SD</i>	Range
Parent Mentalizing			
Prementalizing (PRFQA – PM)	1.60	.92	1 - 4
Interest & Curiosity (PRFQA – IC)	5.71	.81	3.5 – 7.0
General Mentalizing (MentS)	111.13	13.56	70.09 – 137.0
Youth Mentalizing			
Task-based Mentalizing* (TASIT-S)	60.50	8.48	29.99 - 75.00
Self-Reported Mentalizing (RFQY)	203.12	18.24	147.07 – 237.0
Youth Self-Reported Social Functioning			
Prosocial Behaviours (SDQ – PS)	7.61	1.96	1.64 – 10.0
Peer Problems (SDQ – PP)	1.92	1.69	0 - 7
Parent-Reported Youth Social Functioning			
Prosocial Behaviours (PSDQ – PS)	7.91	1.87	2.21 – 10.0
Peer Problems (PSDQ – PP)	1.60	1.58	0 - 8

Note. Data reported after Winsorization

* *N* = 84 (3 participants did not complete measure)

Appendix B

Full List of Measures Collected from Parent Participants

1. Consent for Self
2. Consent for Child
3. Demographics
4. Strengths & Difficulties Questionnaire – Parent Proxy (SDQ; Goodman, 1997)
5. Parental Reflective Functioning Questionnaire – Adolescent Version (PRFQA; Luyten, Mayes et al., 2017)
6. Mentalization Questionnaire (MentS; Dimitrijevic et al., 2018)
7. Social Readjustment Rating Scale (SRRS; Holmes & Rahe, 1967)
8. Covid Family Stressor Scale (CoFaSS; Prime et al., 2021)
9. Perceived Stress Scale (PSS; Cohen et al., 1983)
10. Depression, Anxiety and Stress Scale - Stress-related questions removed (DASS21; Lovibond & Lovibond, 1995a, Lovibond & Lovibond, 1995b)

Full List of Measures Collected from Youth Participants

1. Assent
2. Demographics
3. Strengths & Difficulties Questionnaire – Youth Self-Report (SDQ; Goodman et al., 1998)
4. PROMIS Pediatric Peer Relationships Scale – Short Form (DeWalt et al., 2013)
5. Reflective Functioning Questionnaire – Youth (RFQ-Y; Sharp et al., 2009)
6. Child and Adolescent Social Support Scale - Parent Support Only (Malecki et al., 2014)
7. The Awareness of Social Inference Test – Short (McDonald et al., 2018)