Empathetic Concern in Emerging Adolescents: The Role of Theory of Mind and Gender Roles

Katherine Andrews1, Liliana Lariccia1, Victoria Talwar1, and Sandra Bosacki2

Abstract
The current study examined the roles of gender, and gender-role orientation in young adolescents’ empathetic concern. In addition, this study aimed to explore the contribution of Theory of Mind in participants’ empathetic concern. Finally, this study examined whether gender and gender-role orientation were implicated in emerging adolescents’ Theory of Mind understanding. One-hundred-fifty 11- to 12-year-olds (79 self-identified females) completed questionnaires measuring their empathetic concern, Theory of Mind, and their perceived gender-role orientation. Results showed that gender-role orientation, specifically, femininity and masculinity predicted empathetic concern above and beyond gender. In addition, the effects of cognitive and affective Theory of Mind are explored and discussed in relation to empathetic concern. Finally, neither gender nor gender-role orientation was found to contribute to participants’ Theory of Mind understanding. These findings suggest that emerging adolescents’ perceived gender roles, as well as their ability to consider another’s beliefs, play a role in their expression of empathetic concern.

1McGill University, Montreal, Quebec, Canada
2Brock University, St. Catharines, Ontario, Canada

Corresponding Author:
Katherine Andrews, Doctoral Candidate, Department of Educational & Counselling Psychology, McGill University, 3700 McTavish Street, Montreal, Quebec, Canada H3A 1Y2.
Email: katherine.andrews@mail.mcgill.ca
The ability and tendency to experience an affective response through understanding and identifying with the thoughts and emotions of others is a crucial component of social and moral development. This ability is broadly known as empathy (Decety, 2010), and the degree to which individuals exhibit this ability impacts their social interactions and relationships with others over the lifespan (Hoffman, 2000). Empathy is often defined in slightly differing ways. Generally, most definitions include the following core components. First, it is necessary for the individual to be aware of, and understand the thoughts and feelings of another. Second, the individual must be able to identify with and experience the other’s emotional state vicariously. Finally, this ability takes place through the use of emotional and cognitive processes (Decety, 2010; Grühn, Rebucal, Diehl, Lumley, & Labouvie-Vief, 2008).

As an integral part of social and emotional development, the tendency to feel empathy acts as motivation and as a precursor for carrying out prosocial behavior toward others (Eisenberg et al., 2000). Therefore, it plays an important role in our social interactions with others, and how we develop relationships (Grühn et al., 2008). Overall, this impacts our ability to adapt successfully and is therefore related to our psychological health and well-being (Keefer, Holden, & Parker, 2013).

The primary goal of the current study is to examine pertinent factors that influence empathy during the emerging adolescent age range given the relevant developmental changes that are occurring during this period. Specifically, the current study seeks to examine the individual impacts of gender and the gender-role orientation that individuals ascribe to empathetic concern. In addition, the current study seeks to examine how the ability to consider another’s perspective (i.e., Theory of Mind [ToM]) impacts empathetic concern. In particular, this study aims to explore the individual impacts of both cognitive and affective ToM. The secondary goal of the current study is to better understand the impact of gender and gender-role orientation on ToM during this age range. Together, these two goals will help provide a more complete picture of how gender and gender-role orientation differentially impact emerging adolescents’ socio-cognitive development.

**Gender and Empathy**

Gender must also be considered in the development of empathy. Generally, sex refers to a set of biological attributes in humans and animals, while gender
refers to the socially constructed roles, behaviors, and identities of females, males, and gender diverse people (Heidari, Babor, De Castro, Tort, & Curno, 2016). Previous research has used the terms sex and gender in different ways. For example, gender is often used as a term to refer to biological sex or how an individual chooses to present themselves (Hankivsky, Springer, & Hunting, 2018). The term self-identified gender has also been used in recent research articles (Yarnell, Neff, Davidson, & Mullarkey, 2019). To provide clarity and to distinguish between the variables of interest in the current study, we use the term gender-role orientation to refer to the feminine and masculine gendered roles associated with social factors. We use the term gender to refer to one’s self-identity, which may or may not correspond to biological attributes that were assigned at birth. However, we do so with the assumption that sex and self-identified gender are deeply interconnected given how embedded they are within our social conventions (Hankivsky et al., 2018). In addition, these terms will also be used when referring to previous studies, regardless of how they were represented in the original articles.

Although some inconsistency exists, generally, research shows that girls and women tend to score higher in terms of their ability and tendency to exhibit empathy toward others (Karniol, Gabay, Ochion, & Harari, 1998; Keefer, 2015; Keefer et al., 2013; Perry, Pauletti, & Cooper, 2019; Yarnell et al., 2019). These differences between boys and girls become apparent by approximately 10 years of age, and continue into adulthood (Keefer, 2015). Specifically, research has revealed an interesting developmental pattern that takes place during the transition from childhood to adolescence. Although empathy initially increases in children, for girls, it begins to plateau around 12 to 13 years of age. For boys, however, a decrease in empathy is reported during this time which continues into late adolescence (Lam, Solmeyer, & McHale, 2012; Van der Graaff et al., 2014). This decline causes differences across genders to become more apparent during adolescence.

This developmental trend lends support to the Gender Intensification Hypothesis (Hill & Lynch, 1983). According to this hypothesis, the time period in which children begin to emerge into adolescence is accompanied by an increase in socialization pressure to adhere to traditional gender-role stereotypes (Bosacki, 2000; Galambos et al., 2009). In turn, a greater discrepancy in terms of boys’ and girls’ behavior, and psychological functioning is observed throughout this developmental period (Lam et al., 2012; Van der Graaff et al., 2014). Based on this hypothesis’ propositions, researchers suggest that the observed differences between girls’ and boys’ levels of empathy are largely a result of the degree to which societal gender-role stereotypes have been ascribed to, rather than differences in gender alone (Bosacki & Moore, 2004). In Western cultures, studies show that the trait and ability to be
empathetic, or otherwise emotionally expressive, is traditionally viewed as a stereotypically feminine trait (Bosacki, 2007; Gutierrez, Halim, Martinez, & Arredondo, 2020). Therefore, it would make sense, based on the Gender Intensification Hypothesis, that boys’ levels of empathy would begin to be less apparent than girls’ as the pressure to conform to these traditional stereotypes increases.

Another relevant proposition, which helps to further unpack the complexities surrounding young adolescents’ development of empathy, is that femininity and masculinity are two independent dimensions (Bem, 1974, 1984; Bem & Lewis, 1975). Therefore, regardless of gender, an individual can be high and/or low on each of these dimensions. Although, the degree to which an individual ascribes to each dimension may be influenced by the increasing societal pressure to conform to gender norms. However, based on Bem’s proposition, the degree to which each dimension is adopted would account for differences in empathy over and above gender. A number of studies have found support for this theory (e.g., Kent & Moss, 1994; Pajares & Valiante, 2001; Skoe, Cumberland, Eisenberg, Hansen, & Perry, 2002). One such study that is particularly relevant to the current research is the work by Karniol et al. (1998).

Karniol and colleagues (1998) examined the impact of gender and gender-role orientation in Israeli adolescents in Grades 8 and 11, using a series of self-report measures. Results showed that the younger boys and girls were less similar to each other in terms of their femininity and masculinity, whereas the older participants were more similar across genders in these traits. This supports the proposition that greater differences in gender roles are adopted in the emerging adolescent developmental period and suggests that these differences may become less apparent into late adolescence. In addition, in both age groups, girls had higher levels of empathy compared with boys. One interesting and relevant finding related to the present study was that the gender-role orientation of femininity was related to empathy, whereas masculinity was not. Furthermore, although gender alone predicted levels of empathy, once gender-role orientation was taken into account, gender was no longer a significant predictor.

More recently, Martin et al. (2017) have proposed and found support for a related concept, the Dual-Identity Approach. This approach stipulates that the comparisons an individual makes toward both genders (boy and girl) inform their gender identity, rather than gender identity being informed only by a comparison of how similar we are to others from the same gender category. Martin et al. found support for two distinct scales and found that more variance was explained by including two scales rather than one. The work by Martin and colleagues suggests the importance of simultaneously consider-
ing how individuals relate to both genders as individuals vary in their identification with each gender.

Such findings provide support for Bem’s proposition that the adoption of gender roles, rather than biological sex or gender, is linked to differences in individuals’ psychological functioning. In addition, given the changes that take place in emerging adolescents’ empathy around 12 to 13 years of age (Karniol et al., 1998; Lam et al., 2012; Van der Graaff et al., 2014), investigating whether these findings can be replicated in this age range would provide valuable information given the increased variability in empathy during this developmental period.

**ToM and Empathy**

Some researchers consider empathy as a multidimensional construct, examining its different facets separately (e.g., Davis, 1983; Decety, 2010; Van der Graaff et al., 2014). Although differences exist in the specific dimensions included in various research, most consistently, research has distinguished between cognitive and affective dimensions of empathy (Grühn et al., 2008). Cognitive empathy has been described as the process of adopting another’s perspective and involves a cognitive recognition of others’ experiences and emotions. In contrast, affective empathy is described as the ability to experience an emotional reaction to another’s experience (Dvash & Shamay-Tsoory, 2014). However, these dimensions are also interconnected. For instance, increases in cognitive empathy (also referred to as perspective-taking) have been shown to increase the tendency for affective empathy (Batson, 2009). Therefore, other studies have considered the construct as a broad, overarching concept, acknowledging that within the concept of empathy, cognitive and affective dimensions are at play. The current study conceptualizes empathy as such.

A particularly relevant concept is ToM, the ability to consider one’s own, or another’s mental states. More specifically, ToM involves the ability to understand thoughts, intentions, desires, beliefs, and emotions as representations of reality (e.g., Premack & Woodruff, 1978; Wimmer & Perner, 1983). Given that empathy requires the ability to take into account another’s perspective in terms of their thoughts, feelings, and emotions (Decety, 2010), ToM is likely involved in an individual’s ability to exhibit empathy (Ibanez et al., 2013; Singer, 2006). The majority of the literature on ToM is focused on its development in younger children (Bensalah, Caillies, & Anduze, 2016; Lonigro, Laghi, Baiocco, & Baumgartner, 2014), whereas much less has been done to examine these abilities in older children and adolescents (Hughes, 2011). There is, however, some evidence that these abilities continue to
develop during adolescence, such that their ability to infer mental states and take another’s perspective increases (Decety, 2010).

Within the literature on ToM, a distinction has been made between cognitive and affective ToM (otherwise known as “cold” and “hot” aspects of ToM; Brothers & Ring, 1992). This distinction is particularly relevant to the study of empathy. Compared with affective ToM that requires an understanding of others’ emotional states, cognitive ToM involves the ability to make inferences about others’ thoughts and beliefs (Shamay-Tsoory & Aharon-Peretz, 2007). It is likely that both of these processes are required to exhibit empathy. For example, for someone to exhibit empathy, it would be necessary for them to first be able to identify and adopt the other’s perspective based on the thoughts and beliefs (i.e., cognitive ToM) that they would have about a given situation. In addition, they would need to have an understanding of the emotions (i.e., affective ToM) that the other would be experiencing in that type of situation. Furthermore, this would require an understanding of the other’s feelings as a representation by an intentional agent (Decety, 2010). Together, this would contribute to the ability to experience and respond to others in an empathetic way. Therefore, while empathy is a broader construct that involves recognizing and experiencing an emotional response to another, ToM represents a set of skills that are likely required to exhibit empathy. Support of the distinction between these types of ToM also comes from neurological studies which have identified different neural mechanisms involved in each (Kanske, Böckler, Trautwein, & Singer, 2015; Shamay-Tsoory & Aharon-Peretz, 2007).

Furthermore, affective ToM is typically viewed as being a more difficult ability to master as it develops later than cognitive ToM abilities (Ibanez et al., 2013; Marton, Wiener, Rogers, Moore, & Tannock, 2009; Vetter, Altgassen, Phillips, Mahy, & Kliegel, 2013). More specifically, Shamay-Tsoory, Harari, Aharon-Peretz, and Levkovitz (2010) suggest that cognitive ToM is a prerequisite for affective ToM. Given the differential patterns of development and the conceptual distinction made by Shamay-Tsoory et al. (2010), it is possible that each makes a unique contribution to the development of empathy and should both be considered separately.

Decety (2010) describes related bottom-up and top-down processes with different developmental trajectories. Infants have shown affective and involuntary responses to others’ facial expressions, which suggests that precursors to shared emotional experiences are present very early in a child’s life. This bottom-up process is contrasted with a top-down process which is involved in more mature empathetic responses. Specifically, it first requires the understanding of the other person as an intentional agent with feelings and emotions. Furthermore, considering another’s perspective in a given situation
impacts how the emotional experience is interpreted. This top-down process in which cognitive processes are seen as prerequisites to affective reasoning is of relevance to the current study.

Despite the relevance of ToM in the study of empathy, research on the impact of ToM on empathy is somewhat limited, especially in the emerging adolescent age range (Ibanez et al., 2013; Marton et al., 2009). However, there is some evidence within the literature that supports the proposition that ToM plays a role in empathy development. For instance, the argument for a conceptual relation between ToM and empathy has been made across numerous studies (e.g., Decety, 2010; Marton et al., 2009; Van der Graaff et al., 2014). In addition, in studies examining the neurological basis of ToM and empathy, these processes have been found to engage common, as well as distinct neural networks, providing evidence that these concepts are related, yet separate (Reniers, Völlm, Elliott, & Corcoran, 2014). However, this type of study does not allow for the distinction of whether ToM is influencing the tendency to exhibit empathy, rather, it solely conveys a relationship between these two concepts. There is also some evidence that these two concepts are related in younger children. Specifically, Lonigro et al. (2014) found that ToM and empathy were interrelated in 9- to 10-year-old children. However, other studies have found less conclusive results in which the relation was no longer significant when taking into account age and verbal skills (Peterson, 2014). In addition, correlations between ToM and empathetic understanding were found in an adult population by Spenser, Betts, and Gupta (2015) using a novel ToM task that incorporated both cognitive and affective aspects of ToM. Although these researchers intentionally used a measure that would take into account both cognitive and affective ToM, it is also important to have information about the individual contributions of each of these constructs, as they may differentially influence empathy. To the best of our knowledge, to date, researchers do not know how cognitive and affective ToM impacts empathy in the emerging adolescent age range.

**Gender Differences in ToM Understanding**

Unlike the literature on gender and empathy, which reveals gender differences in the tendency and ability to exhibit empathy, the literature on differences in ToM abilities between boys and girls is much more inconsistent (Kołodziejczyk & Bosacki, 2015). Although some studies have found no differences between girls and boys in terms of their ToM understanding (Hughes, Ensor, & Marks, 2011), others have found that girls outperform boys in these abilities, especially in the case of affective ToM (Białecka-Pikul, Kołodziejczyk, & Bosacki, 2017; Bosacki, 2000). However, more research is needed to develop a better understanding of differences in ToM abilities across girls and boys.
Similarly, to the research on empathy, it has also been suggested that gender-role orientation plays a role in the discrepancy that some studies have shown across girls’ and boys’ ToM understanding (Hughes, 2011). Bosacki (2014) examined this speculation and found that at 8 years of age, children who scored higher in ToM understanding, also ascribed to having a more masculine gender-role orientation. This finding supports the proposition that self-perceptions and gender-role perception may impact children’s ToM understanding. However, these results are also somewhat surprising given that social perspective-taking is generally considered stereotypically feminine in Western cultures (Bosacki, 2007). It is clear that additional research is required to develop a better understanding of the impact of gender role in the development of ToM understanding.

**ToM, Empathy, and Gender-Role Orientation in Emerging Adolescence**

It is possible that ToM and gender-role orientation influence the ability and tendency to exhibit empathy in emerging adolescence. Studying the influence of these variables is especially important during the emerging adolescent age range, when children begin to transition into teenagers. Not only is this developmental period important to research given the lack of studies within this area and this age range (Blakemore, 2018), it is also a time of cognitive and social advances that may have an important influence on the development of empathy (Lam et al., 2012).

During this transition, social pressures become more salient, and fitting in takes on greater importance. Based on the Gender Intensification Hypothesis, this results in an increase in pressure to conform to stereotypical gender norms (Hill & Lynch, 1983). Given the support within the literature for this hypothesis, it is clear that emerging adolescence is an important and interesting age to examine gender differences in empathy and the factors involved in its development. Furthermore, individual differences are especially malleable during the transition from late childhood to adolescence as it marks a period of instability (Keefer et al., 2013). While a number of changes are taking place (e.g., onset of puberty, transition to high school), it allows for the opportunity for positive growth, as well as new risks for maladjustment (Keefer et al., 2013). Therefore, the intersection between this period of development, and increased pressure to abide by stereotypical gender norms can be examined in the context of emerging adolescents’ cognitive and socio-emotional development.

In addition, empathy emerges in young children and continues to develop into adolescence and adulthood (Grühn et al., 2008). Although a great deal of the research has focused on young children and adults, there is evidence that
the development of empathy becomes more complex and changes through adolescence as cognitive, emotional, and social progressions are experienced (Eisenberg, 2000; Perry et al., 2019). Therefore, additional research into this construct in this age group is warranted.

**Current Study**

While previous research suggests that empathy is a gendered concept, and that cognitive processes such as ToM are linked with its development, it is currently unclear how these constructs impact emerging adolescents’ empathy. Therefore, the primary goal of the current study is to examine the impact of gender-role orientation, gender, and ToM on emerging adolescents’ empathetic concern. Specifically, this study aims to distinguish whether gender-role orientation or gender plays a greater role in emerging adolescents’ empathy. In addition, we aim to examine the impact of ToM on emerging adolescents’ empathy. Specifically, this study explores the differential impact of cognitive and affective ToM on empathy. Two main hypotheses are tested based on these goals. Based on previous research, it is hypothesized that gender-role orientation will impact participants’ empathy above and beyond gender (e.g., Karniol et al., 1998; Pajares & Valiante, 2001; Skoe et al., 2002).

**Hypothesis 1 (H1):** Specifically, it is hypothesized that those higher in femininity will be higher in empathy and that those higher in masculinity will be lower in empathy.

**Hypothesis 2 (H2):** Our second hypothesis is that both cognitive and affective ToM will predict empathy, but affective ToM will predict empathy above and beyond cognitive ToM.

This is hypothesized given the previous research indicating that mature empathetic reasoning follows a top-down process, requiring cognitive understanding to inform affective reasoning (Decety, 2010). Furthermore, research has shown that cognitive ToM acts as a prerequisite for affective ToM and that affective ToM is a more complex ability (e.g., Ibanez et al., 2013; Shamay-Tsoory et al., 2010; Vetter et al., 2013).

Given the inconsistent findings regarding the impact of gender in the development of ToM, the secondary aim of the current research is to examine the role of gender and gender-role orientation on emerging adolescents’ ToM. Specifically, we examined whether gender-role orientation or gender plays a greater role in participants’ cognitive, and affective ToM understanding. Due to the inconsistent nature of previous research findings, no specific hypotheses were made regarding the contributions of gender and gender-role orientation in participants’ ToM understanding.
Method

Participants

In total, 150 preadolescents (52% self-identified female, $\overline{X}_{age} = 11.8$ years, $SD = 0.41$ years) participated in a 5-year longitudinal study. The current study reports on data from the first year (2015-2016). A subset of measures from this longitudinal study is used in the current study and will be discussed below. Parents reported their own level of education: the three most common were bachelor’s degree (47.5%), college diploma (19%), and graduate degree (10%). Parents also reported their household income: the three most common were $100,000+ (41%), $80,000 to $99,000 (11%), and $70,000 to $80,000 (10%). The majority of the participants was Caucasian, English-speaking, and reflected mainly middle-class backgrounds.

Measures

Empathy

**Interpersonal Reactivity Index.** This measure examines the different dimensions of empathy. This measure includes four different subscales, specifically, Fantasy, Perspective-Taking, Empathetic Concern, and Personal Distress (Davis, 1980). Participants were asked to rate 28 statements on a 5-point Likert-type scale from 0 (“this statement does not describe me well”) to 4 (“this statement does describe me well”). While this measure includes multiple subscales relating to empathy, for the purposes of the present study, this study focused on the Empathetic Concern subscale, as it is most closely related to the construct of interest. From this 7-item subscale, participants responded to statements such as, “I often have tender, concerned feelings for people less fortunate than me” and “I would describe myself as a pretty soft-hearted person.” A total score was created from the participants’ responses for each item on this subscale. Some items here were reverse scored and then entered as such before being calculated into the total for this subscale. Once the sum of the subscale was created, the total score was then used within the analysis of the current study. The Empathetic Concern subscale was found to be internally reliable ($\alpha = .74$) within the current study and has shown strong test-retest reliability in previous research ($\alpha = .71$; Davis, 1983).

Cognitive ToM

**Second order false belief stories.** To evaluate participants’ cognitive ToM, two widely used second-order ToM stories were used in the present study. The first story, “Ice Cream Truck,” was originally developed by Perner and Wimmer (1985) to examine how children understand and conceptualize
social situations. Overall, the measure aims to understand what and how individuals think about others’ thoughts (Perner & Wimmer, 1985). To assess this, the measure outlines a story with three characters, a boy (John), a girl (Emma), and an ice cream man. This measure is structured into episodes with questions asked between each episode. After the first episode of the story, the participant is asked the following question: “What did the ice cream man say to John?” The second episode is followed by the question, “What did the ice cream man say to Emma?” After the final episode, the participant is asked three questions: “Does John know that Emma knows where the ice cream man is now?” “Where does John think Emma will go and buy ice cream?” and “Why does John think that Emma will go to the park?”

The first four responses are scored as either correct or incorrect. The final response is coded for behavioural (e.g., “because he didn’t see him tell her”), psychological (e.g., “because he thinks that Emma thinks the ice cream truck is in the park”), or tangential components (e.g., “I don’t know” or “because she wanted ice cream”). Specifically, responses for this question that were deemed to be tangential were scored as a 0, behavioral responses were coded as a 1, and psychological responses were scored as a 2. Inter-rater agreement was found to be 87% accurate. The total score is then obtained by summing the score from each of the questions, for a total possible score of 4.

The second story, “Will’s Birthday,” was originally developed by Sullivan, Zaitchik, and Tager-Flusberg (1994). This measure consists of a story about a parent who has purchased a surprise gift for their child (Will). However, unbeknownst to the parent, the child has seen what the gift will be (Sullivan et al., 1994). In a similar format to Perner and Wimmer (1985), this measure was created with both probe and target questions. Through the use of these different question types, the story aims to look into whether there is a difference in acquisition of first- and second-order reasoning. In other words, if participants understand an individual’s knowledge of what they think others think (Sullivan et al., 1994). After reading this story, participants were asked four probe questions. For example, “What does Will think he will get for his birthday?” and “What does mom think Will will tell his friends he is getting for his birthday?” These probe questions are followed by the target question: “Why does mom think this?”

The coding for this set of questions was done in the same way as the previous ToM story. Total scores are created by combining sums from the four probe questions and the coded target question. The analysis for the current study then combines the total score from the first ToM story to that of the second story for a total score out of 8. Overall, this measure has been found to have good test-retest reliability and internal consistency in previous research (Bosacki & Moore, 2004; Hughes, 2011; Lecce et al., 2017). An
acceptable level of reliability was also found between the two ToM stories in the current study ($\alpha = .79$).

**Affective ToM**

*Reading the mind through the eyes.* This measure evaluated participants’ affective ToM. Developed by Baron-Cohen, Jolliffe, Mortimore, and Robertson (1997), this task is designed to understand ToM through pairing pictures of eyes with mental state words. Overtime, this task was revised to its current format, which includes 36 pairs of eyes, each presented with four mental state words (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001). For each item, participants are asked to choose the appropriate mental state word that corresponds to the emotion represented by the image of the eyes. The number of correctly identified mental state words is totaled. This is the value used within our analysis. This measure is commonly used to assess affective ToM in this age range (e.g., Gunther Moor et al., 2012; Holt et al., 2014; Overgaauw, van Duijvenvoorde, Gunther Moor, & Crane, 2015; Tonks, Williams, Frampton, Yates, & Slater, 2007). This measure is valid, and it was found to replicate results (Baron-Cohen et al., 2001). The internal consistency of this task in the current study was found to be $\alpha = .58$. This is consistent with previous studies that have used the Reading the Eyes through the Mind Test (RMET), which generally report internal consistencies ranging from .37 to .65 (e.g., Bosacki, Moreira, Sitnik, Andrews, & Talwar, 2020; Gallant, Lavis, & Mahy, 2020; Laghi et al., 2019; Meinhardt-Injac, Daum, & Meinhardt, 2020; Oakley, Brewer, Bird, & Catmur, 2016; Plousia, 2018; Vellante et al., 2013; Voracek & Dressler, 2006).

**Gender-role orientation**

*Children’s gender role inventory.* This measure was selected to assess each participant’s gender orientation. The earliest form of this measure was created to assess adults’ psychological androgyny (Bem, 1974). This measure was referred to as the Bem Sex Role Inventory (BSRI). Later, Boldizar (1991) conceptualized the BSRI as a children’s questionnaire assessing masculinity and femininity (Children’s Sex Role Inventory [CSRI]). Based on the study by McHale, Crouter, and Tucker (1999), on gender roles in middle childhood, the current study used an adapted version of Boldizar’s short form CSRI. This adapted version is referred to as the “Children’s Gender Role Inventory” in the current study. In both the CSRI and the Children’s Gender Role Inventory, participants are asked to answer a series of 18 statements by rating how much they identified with each statement on a 4-point Likert-type scale ($4 = \text{"very true of me"}$ to $1 = \text{"not at all true of me"}$). The items within the measure correspond to three subscales (i.e., feminine, masculine, and neutral).
with six items in each. Female oriented statements on the Children’s Gender Role Inventory include items such as “When I like someone, I do things for her or him to show how I feel” and “I like babies and small children a lot.” While masculine oriented statements in this inventory include items such as “When I play games, I really like to win” and “I am good at sports.” The neutral statements in the Children’s Gender Role Inventory include items such as “I like to do things that other people do” and “I usually get things done on time.” The Feminine and Masculine subscales from the Children’s Gender Role Inventory were used in the present study’s analysis.

The scores for these subscales were calculated by obtaining the total score for each gender-role orientation. These totals are used in our analysis. The construct validity of the CSRI is equivalent to that of the BSRI, as well as The Toys and Activities Preference Questionnaire and Harter’s Self-Perception Profile for Children (Boldizar, 1991). Previous research has found there to be acceptable internal consistency with young adolescents (femininity $\alpha = .84$, masculinity $\alpha = .83$; Leszczynski & Strough, 2008). In the current study, the internal consistency was lower compared with previous studies (femininity $\alpha = .66$, masculinity $\alpha = .49$).

**Procedures**

Participants were recruited from elementary schools and through a recruitment database of a medium sized North-American city. Parents who were recruited for the study through the database were contacted by telephone. They were told that they were being contacted about a 5-year longitudinal study that would examine the changing perspective-taking skills of emerging adolescents as they move from elementary school (i.e., Grade 6) to high school (i.e., Grade 10). In addition, they were told that the study would examine skills and related introspective qualities that emerging adolescents possess, such as moral emotions, spirituality, gender, and other constructs. For participants who were recruited through elementary schools whose principals had agreed to participate in the study, students were sent home with a letter containing the information about the study, as well as a consent form. When a research assistant visited elementary school classrooms, children with signed parental consent forms were invited to participate in the study in a separate room (i.e., separate classroom, library) and were provided with information about the study verbally. They were also presented with a written assent form to sign which was a developmentally appropriate version of the consent form. For lab-based recruitment, appointments were scheduled, and parents accompanied their children to a research lab. Parental consent and child assent forms were signed on the day of the study, and participants
completed the study in a separate room. In both classroom and lab-based data collection, the research assistant provided the participants with the instructions for each of the study measures, and the students were then provided with packages of all the measures that contained all questionnaires in a fixed order. The researcher was present during the data collection session to answer any of the students’ questions or explain any of the measures in detail to the participants. The research assistant also conducted an interview with each participant individually. Participants’ gender was obtained through parent report while scheduling, and through self-identification by asking the participant to describe themselves during the interview and in no instance did participants report that their sex and gender did not align. In addition, parents were asked to complete a demographics questionnaire.

Results

Data Analysis Plan

To address the primary goal of the study, we conducted a multiple linear regression which examined the effects of gender, ToM (affective and cognitive), as well as gender-role orientation (feminine and masculine) on participants’ empathetic concern. Next, to address the secondary goal of the current study, we conducted two additional multiple linear regression analyses. Specifically, we sought to examine the effect of gender, and gender-role orientation on both affective and cognitive ToM. Data analysis was performed using IBM for Windows, Version 25.

Preliminary Analyses

Preliminary analyses were run to test the statistical assumptions prior to conducting the main analyses. To address the missing data present within each of the variables of interest, a Little’s Missing Completely at Random (MCAR) test was conducted, \( \chi^2(8, N = 150) = 2.44, p = .96 \). Given that this test failed to reject the null hypothesis, it can be concluded that the data are MCAR and can be addressed using imputation methods. The following variables were found to have more than 5% of the data missing: RMET, Empathetic Concern, and Masculine Gender Role. Estimation Maximization imputations were used for each of these variables to improve statistical power of analyses (Enders, 2001; Scheffer, 2002). Skewness and kurtosis were also assessed. All skewness values were below 0.57 (with z scores below 2.89), while kurtosis values were below 1.6 (with z scores below 4.10), indicating that neither was of concern (Tabachnick & Fidell, 2013).
Main Analyses

This study explored whether children’s perceived gender-role orientation would predict empathetic concern to a greater extent than gender, as well as whether affective and cognitive ToM would predict emerging adolescents’ empathetic concern. The contribution of gender and gender-role orientation on participants’ ToM understanding was also explored. Descriptive statistics and correlations among the variables are presented in Tables 1 to 3. Participants who did not complete a questionnaire (due to time constraints or administrative error) that was included in the analysis were excluded. This resulted in a maximum of 14 participants being excluded within the analyses.
Table 3. Bivariate Correlations.

| Variables          | Empathetic concern | Affective ToM | Cognitive ToM | Gender | Femininity | Masculinity |
|--------------------|--------------------|---------------|---------------|--------|------------|-------------|
| Empathetic concern | —                  | 0.171*        | .110          | -.193* | .572**     | -.187*      |
| Affective ToM      | —                  | .260**        | -.181*        | .135   | .047       |
| Cognitive ToM      | —                  |               | -.034         | -.129  | .149*      |
| Gender             | —                  |               |               | -.378**| .189*      |
| Femininity         | —                  |               |               |        | -0.077     |
| Masculinity        | —                  |               |               |        |            |

*Note. ToM = Theory of Mind. *

*p < .05. **p < .001.
To address the first research question and set of hypotheses, a multiple linear regression was run with empathetic concern as the outcome variable. In the first step, gender was entered as a predictor variable. In the second step, affective ToM and cognitive ToM were entered as predictor variables. In the third step, two scales for perceived gender-role orientation were included as predictor variables: Femininity and Masculinity.

The first regression step which included gender was significant, $F(1, 134) = 5.21, p = .024$, $R^2 = .037$. Specifically, girls had higher empathetic concern ratings compared with boys, $\beta = -.20, t(134) = -2.28, p = .024$. See Table 1 for descriptive statistics.

The second regression step was also significant, $F(3, 132) = 2.88, p = .038$, $R^2 = .10$, but did not result in a significant increase in variance, $F(2, 132) = 1.70, p = .19$. Neither of the variables included in the second model were significant predictors of children’s empathetic concern, including cognitive ToM, $\beta = .07, t(134) = 0.83, p = .41$, and affective ToM, $\beta = .12, t(134) = 1.38, p = .171$. Furthermore, gender became nonsignificant with the addition of the ToM variables into the model, $\beta = -.17, t(134) = -1.97, p = .051$.

The third regression step was also significant, $F(5, 130) = 17.30, p < .001$, $R^2 = .40$, and resulted in a significant increase in variance, $F(2, 130) = 36.60, p < .001$. Both of the scales included for gender-role orientation, Femininity and Masculinity, were significant predictors. Children with higher scores on the Femininity scale also reported higher ratings of empathetic concern, $\beta = .61, t(130) = 8.15, p < .001$. In contrast, children with higher scores on the Masculinity scale reported lower ratings of empathetic concern, $\beta = -.19, t(130) = -2.72, p = .007$. Once gender-role orientation was added to the model, gender was no longer a significant predictor of empathetic concern, $\beta = .10, t(130) = 1.21, p = .23$. Finally, cognitive ToM became a significant predictor, $\beta = .20, t(135) = 2.82, p = .006$, whereas affective ToM remained nonsignificant. See Table 1 for descriptive statistics, and see Table 4 for regression results.

Given the increase in beta of cognitive ToM in the third step, the lack of a significant correlation between cognitive ToM and empathetic concern, as well as the significant correlations that cognitive ToM has with the other predictors (namely, affective ToM and masculinity), it is possible that this variable is acting as a suppressor in the model (Meyers, Gamst, & Guarino, 2016). See Table 3 for bivariate correlations. To explore the regression model further, the analysis was run while excluding cognitive ToM from the model. All other variables were entered into the regression analysis in the same order. Results revealed a very similar pattern of results (see Table 5 for regression results with cognitive ToM excluded from the analysis). The main
differences across the regression analyses were that affective ToM was found to be nonsignificant when entered in the second step, $\beta = .16$, $t(140) = 1.96$, $p = .053$, and gender remained a significant predictor in the second step, $\beta = -.17$, $t(140) = 2.01$, $p = .046$. Once the gender-role variables were included in the third step, both affective ToM, and gender were found to be nonsignificant predictors.

The secondary goal of this study was to examine the contribution of perceived gender-role orientation and gender, on participants’ ToM understanding. Two additional regression analyses were conducted to investigate this relation in emerging adolescents’ affective and cognitive ToM. Cognitive ToM and affective ToM were included as dependent variables in the analyses. In terms of predictor variables, gender (female/male) was entered in the first step, and the two scales for perceived gender-role orientation were included in the second step, specifically, Femininity and Masculinity. In the first of these analyses, neither gender nor gender-role orientation was found to significantly predict participants’ cognitive ToM understanding, $F(3, 135) = 0.16$, $p = .40$, $R^2 = .050$. Similarly, in the second analysis, neither gender nor gender-role orientation was found to significantly predict participants’ affective ToM understanding, $F(3, 139) = 3.01$, $p = .08$, $R^2 = .035$. See Table 2 for descriptive statistics, and Tables 6 and 7 for regression results.

### Table 4. Multiple Regression Analysis Predicting Empathetic Concern.

| Predictor          | $B$ (SE) | $\beta$  | $t$ | $R^2$ | $\Delta R^2$ | $F$  |
|--------------------|----------|----------|-----|-------|--------------|------|
| Step 1             |          |          |     |       |              |      |
| Gender             | -1.719 (0.753) | -.193    | -2.3* | .037 | 5.206*       |      |
| Step 2             |          |          |     |       |              |      |
| Gender             | -1.501 (0.762) | -.169    | -1.96 | .062 | .024         | 2.88* |
| Cognitive ToM      | 0.20 (0.24)  | .072     | 0.828 |      |              |      |
| Affective ToM      | 0.14 (0.10)  | .12      | 1.37  |      |              |      |
| Step 3             |          |          |     |       |              |      |
| Gender             | 0.81 (0.67)  | .09      | 1.21  |      | .34**        | 17.30** |
| Cognitive ToM      | 0.56 (0.20)  | .20      | 2.82* | .40  |              |      |
| Affective ToM      | 0.07 (0.08)  | .06      | 0.86  |      |              |      |
| Femininity (GR)    | 0.83 (0.10)  | .61      | 8.15**|      |              |      |
| Masculinity (GR)   | -0.30 (0.11) | -.19     | -2.72*|      |              |      |

*Note. ToM = Theory of Mind; GR = gender role.

*p < .05, **p < .001.
Due to the low reliability found in the Gender Role Inventory for the femininity and masculinity variables, the three most highly correlated items from each scale were averaged in an effort to increase the reliability. This was done to explore whether an increase in reliability of the subscales would impact the results. Cronbach’s alpha for the Femininity scale increased to .74, while the Masculinity scale only increased by .01 (for a total of .50). The analyses were re-run with these variables. The results using the revised femininity and masculinity variables largely remained the same. One difference that was found
was that masculinity did not predict empathy, $\beta = -0.06$, $t(138) = -0.86$, $p = 0.39$. However, given that the new variable did not substantially increase the reliability of the Masculinity scale, this finding may be due to the reduced variability.

**Discussion**

This study examined the impact of gender-role orientation, compared with gender, on emerging adolescents’ empathetic concern. In addition, we aimed to shed light on the contributing cognitive factors that are involved in empathy, namely, cognitive and affective ToM. Our secondary goal was to explore the contribution of gender and gender-role orientation on emerging adolescents’ ToM understanding.

Our H1 was that gender-role orientation would predict emerging adolescents’ empathy over and above gender. We had proposed that ascribing to higher levels of femininity would predict higher empathy while ascribing to higher levels of masculinity would predict lower empathy. Results revealed that this hypothesis was supported.

These findings suggest that gender differences in empathy may be impacted by stereotypical gender norms, rather than simply gender (Bosacki & Moore, 2004). In addition, before considering gender-role orientation, girls were observed to have a higher level of empathy compared with boys. Given the age of the participants, these findings support past research that shows that around the 12- to 13-year-old age range, girls’ levels of empathy plateau, while boys’ tends to decrease (Lam et al., 2012; Van der Graaff et al., 2014). These findings add support to the proposition made by the Gender

### Table 7. Multiple Regression Analysis Predicting Affective Theory of Mind.

| Predictor          | $B$ (SE) | $\beta$ | $t$ | $R^2$ | $F$  |
|--------------------|----------|---------|-----|-------|------|
| **Step 1**         |          |         |     |       |      |
| Gender            | -1.22 (0.70) | -.15   | -1.74 | .02   | 3.01 |
| **Step 2**         |          |         |     |       |      |
| Gender            | -0.98 (0.77) | -.12   | -1.28 | .04   | 1.66 |
| Femininity (GR)    | 0.14 (0.12) | .11    | 1.12  |       |      |
| Masculinity (GR)   | 0.10 (0.12) | .07    | 0.78  |       |      |

GR = gender role.

*p < .05. **p < .001.
Intensification Hypothesis that as children approach adolescence, a greater amount of social pressure to conform to societal norms is placed upon them which causes the behaviors and psychological functioning of girls and boys to become increasingly differentiated (Hill & Lynch, 1983).

The findings from the current study also support past findings from Karniol et al. (1998), who examined the impact of gender role compared with gender on empathy in a group of older adolescents. Past studies show that early adolescence is a time in which girls’ and boys’ gender role ascriptions become more differentiated based on societal stereotypes (Bem, 1974, 1984; Bem & Lewis, 1975; Bosacki & Moore, 2004). Therefore, we would expect that by the early adolescent period, those who ascribe to greater levels of masculinity would display lower levels of empathy, while those who ascribe to greater levels of femininity would display higher levels of empathy. The current findings support this notion. Furthermore, these results speak to gender identity being informed by the comparisons that an individual makes toward both genders, as stipulated by the Dual-Identify Approach (Martin et al., 2017). As both feminine and masculine gender role scales predicted empathetic concern above and beyond gender, it speaks to the idea that boys and girls vary in terms of how closely they ascribe to each gender’s stereotypical traits, and that this in turn has an influence on how they express empathy.

Second, in H2, we predicted that cognitive and affective ToM would both predict emerging adolescents’ empathy, and that affective ToM would do so over and above cognitive ToM. Although cognitive ToM appeared to influence emerging adolescents’ empathy in the final regression model, because it had not been a significant predictor in the previous step of the analysis, and did not have a significant correlation with empathetic concern, it is likely acting as a suppressor variable, rather than a true predictor of empathetic concern (Meyers et al., 2016). When cognitive ToM was removed from the analysis, affective ToM predicted empathy with marginal significance. However, feminine and masculine gender roles predicted empathy over and above affective ToM.

The ability to understand another’s thoughts and beliefs and to consider their perspective and emotions is an important aspect of empathy and is a cognitive skill that has been shown to increase across adolescence (Decety, 2010). Therefore, it was expected that both cognitive and affective ToM would be involved in emerging adolescents’ empathetic concern. In addition, compared with cognitive ToM or perspective-taking which usually develops in early childhood (Hughes, 2011), past findings suggest that affective ToM is more complex and develops later than cognitive ToM (Bosco et al., 2014; Vetter et al., 2013). For these reasons, we hypothesized that affective ToM
 would make a larger contribution in predicting the participants’ empathetic concern. The current findings, however, suggest that adolescents’ adherence to more feminine gender roles, and less masculine gender roles, plays a larger role in their empathetic concern. It may be that having the ability to identify others’ emotions is not sufficient to respond to those emotions in an empathetic way.

An alternative explanation could be that the distinction between participants’ self-reported level of empathetic concern, and their actual ability and tendency to behave empathetically in real life may be where affective ToM comes into play. For instance, in response to questions regarding one’s tendency to behave empathetically, one does not necessarily have to correctly identify another’s emotion to express empathy appropriately. However, this is a requirement when in a real-life situation. Due to the intensification of societal gender roles (Hill & Lynch, 1983), this may also result from the suppression of their abilities to act empathetically as young adolescents may feel obligated or pressured to behave according to their socially ascribed gender-role stereotypes (Bosacki, 2000; Brown, 2019; Hill & Lynch, 1983).

Finally, given the discrepancies found in past research on the role of gender (Kołodziejczyk & Bosacki, 2015), and gender-role orientation on children’s ToM understanding (Bosacki, 2014), we sought to examine how each of these factors affected ToM during emerging adolescence. Our results showed that neither gender nor gender-role orientation made a significant contribution to participants’ cognitive or affective ToM understanding. This finding adds to the existing evidence that girls and boys often show similar ToM abilities (Hughes et al., 2011). This finding also contradicts previous research that showed an impact of gender role on children’s ToM understanding (Bosacki, 2014). It is possible that the older age range used in the current study may partially account for the discrepancy in our findings. That is, gender-role orientation may play less of a role in children’s ability to consider others’ perspectives as they develop into adolescents. However, future research is necessary to examine this speculation.

**Future Directions and Limitations**

Although this study provides unique and novel information and insight into emerging adolescents’ empathetic concern, there are limitations within the current study that should be addressed. First, the cross-sectional design of the study prevented conclusive statements to be made on how the emerging adolescent age range influenced their development of empathy. Although the current study outlines the importance and relevance of this age range in terms of empathy development due to social-cognitive changes, developmental
claims cannot be made, as this study analyzed 1 year of a 5-year longitudinal data set. Future research should focus on the developmental trajectory during the emerging adolescent age range. Furthermore, this study included a sample of primarily Caucasian, middle-class participants. This limits how generalizable the findings are to children from different cultures, and different socioeconomic backgrounds. Therefore, it will be important to replicate these results in future studies to examine how robust the findings are, especially in different cultures.

Another limitation involves the conceptual difference between one’s perceptions of their empathetic concern, and how it translates into real-world situations. Some argue that because empathy is something felt within one’s self, an individual’s self-report is the best representation of the construct (Rose & Rudolph, 2006). However, the subjectivity that comes along with this type of measure is unavoidable, and it is not possible to make concrete claims about how the individual expresses empathy in their day-to-day life. Including parent and teacher reports in addition to self-report measures of empathy could aid in providing a more complete picture of the adolescents’ expression of empathy.

Similarly, the ability to take on another’s perspective does not necessarily mean that one uses this ability in real-life situations, outside of a testing scenario (Smith & Rose, 2011). Although the ToM tasks involved in this study allowed for the objective assessment of the participants’ ToM abilities, it does not provide information on how the participants use these abilities in other situations. As the self-report nature of this study limits the generalizability of the results, future research could employ various methods to assess these abilities in a more ecologically valid way. For instance, the inclusion of parents’ or teachers’ reports on a student’s behavior, or participant personal log or diary of social interactions could provide richer information about ToM during early adolescence.

A final limitation within the current research concerns the reliability of the Gender Role Inventory subscales. The internal consistency of the Femininity and Masculinity subscales were found to be lower compared with previous studies which reported acceptable levels of internal consistency, in a similar age range (Leszczynski & Strough, 2008). The Masculinity subscale’s internal consistency was of particular concern. When investigating the individual items within the subscale, no particular item was found to negatively affect the subscale’s reliability to a substantial degree. Therefore, to maintain consistency across studies, the scale was not altered. This may indicate that an adherence to this set of stereotypically masculine traits is becoming less prevalent during this age range. Future research should explore whether different
items of masculinity and femininity may be more relevant and provide higher reliability.

The approach to adolescence is an important time of transition for social and cognitive development that involves the ability and tendency to exhibit empathetic concern (Blakemore, 2018). However, to the best of our knowledge, to date, little research exists on emerging adolescents’ social-cognitive development. During this age, children are in the process of transitioning into a different stage of development, and begin to feel greater social pressures to conform to norms that exist within society to be accepted by their peers. For instance, as children approach adolescence, they begin to become increasingly aware of, and ascribe to stereotypical gender norms which can influence their expression of empathy (Gutierrez et al., 2020; Lam et al., 2012; Perry et al., 2019; Van der Graaff et al., 2014). Furthermore, this developmental period is also a time in which cognitive advances are taking place, such as the ability to take into account others’ perspectives (Blakemore, 2018). All of these factors have a substantial impact on emerging adolescents’ expression of empathetic concern.

Taken together, the current study provides novel information regarding how gender, gender-role orientation, and ToM impact emerging adolescents’ empathetic concern. For instance, this research speaks to the notion that levels of empathy are not only determined by gender, rather, the gender roles that young adolescents ascribe to seem to have a greater impact. This is promising as perceived gender-role orientations are more flexible and fluid than gender, which means that these attributes may be influenced to promote empathy in this age group. In addition, knowing that cognitive ToM impacts empathy can inform curriculum in school systems or provide important information to parents. Targeting skills such as identifying and understanding another’s perspective may provide a means by which to improve empathetic concern. Future research will be necessary to investigate whether these characteristics are amenable to change through interventions. However, this study adds to the body of literature on empathy and provides useful information with regard to relevant and practical constructs to target in the emerging adolescent age range.

This research also informs future studies by highlighting the impact of gender roles, rather than gender, on empathy. It is possible that this is the case for other social-emotional constructs, which will be important to consider when investigating gender differences in the future. Overall, this study informs future research on how perceived gender roles may influence social-emotional learning, and also promotes the need for gender sensitive curriculum programs that target social and emotional skills in young adolescents.
Author’s Note

Resubmitted to *Journal of Early Adolescence*: December 18, 2020.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Katherine Andrews https://orcid.org/0000-0002-7430-079X

References

Baron-Cohen, S., Jolliffe, T., Mortimore, C., & Robertson, M. (1997). Another advanced test of theory of mind: Evidence from very high functioning adults with autism or Asperger syndrome. *Journal of Child Psychology and Psychiatry, 38*, 813-822. doi:10.1111/j.1469-7610.1997.tb01599.x

Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The “reading the mind in the eyes” test revised version: A study with normal adults, and adults with Asperger syndrome or high-functioning Autism. *The Journal of Child Psychology and Psychiatry and Allied Disciplines, 42*, 241-251. doi:10.1017/S0021963001006643

Batson, C. D. (2009). These things called empathy: Eight related but distinct phenomena. In J. Decety & W. Ickes (Eds.), *The social neuroscience of empathy* (pp. 1-12). Cambridge: Massachusetts Institute of Technology Press. doi:10.7551/mitpress/9780262012973.003.0002

Bem, S. L. (1974). The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology, 42*, 155-162. doi:10.1037/h0036215

Bem, S. L. (1984). Androgyny and gender schema theory: A conceptual and empirical integration. In T. B. Sondregger (Ed.), *Nebraska symposium on motivation 1984: Psychology and gender* (Vol. 32). Lincoln: University of Nebraska Press.

Bem, S. L., & Lewis, S. A. (1975). Sex role adaptability: One consequence of psychological androgyny. *Journal of Personality and Social Psychology, 31*, 634-643. doi:10.1037/h0077098

Bensalah, L., Caillies, S., & Anduze, M. (2016). Links among cognitive empathy, theory of mind, and affective perspective taking by young children. *The Journal of Genetic Psychology, 177*, 17-31. doi:10.1080/00221325.2015.1106438
Białecka-Pikul, M., Kołodziejczyk, A., & Bosacki, S. (2017). Advanced theory of mind in adolescence: Do age, gender and friendship style play a role? *Journal of Adolescence*, 56, 145-156. doi:10.1016/j.adolescence.2017.02.009

Blakemore, S. J. (2018). Development of the adolescent brain: Implications for executive function and social cognition. *European Neuropsychopharmacology*, 28, S1. doi:10.1016/j.euroneuro.2017.12.017

Boldizar, J. P. (1991). Assessing sex typing and androgyny in children: The children’s sex role inventory. *Developmental Psychology*, 27(3), 505–515. https://doi.org/10.1037/0012-1649.27.3.505

Bosacki, S. L. (2000). Theory of mind and self-concept in preadolescents: Links with gender and language. *Journal of Educational Psychology*, 92, 709-717. doi:10.1037/0022-0663.92.4.709

Bosacki, S. L. (2007). Children’s understandings of emotions and self: Are there gender differences? *Journal of Research in Childhood Education*, 22, 155-172. doi:10.1080/02568540709594619

Bosacki, S. L. (2014). A longitudinal study of children’s theory of mind, self-concept, and gender-role orientation. *International Electronic Journal of Elementary Education*, 6, 213-227.

Bosacki, S. L., & Moore, C. (2004). Preschoolers’ understanding of simple and complex emotions: Links with gender and language. *Sex Roles*, 50, 659-675. doi:10.1023/B:SERS.0000027568.26966.27

Bosacki, S. L., Moreira, F. P., Sitnik, V., Andrews, K., & Talwar, V. (2020). Theory of mind, self-knowledge, and perceptions of loneliness in emerging adolescents. *The Journal of Genetic Psychology*, 181, 14-31. doi:10.1080/00221325.2019.1687418

Bosco, F. M., Gabbatore, I., & Tirassa, M. (2014). A broad assessment of theory of mind in adolescence: The complexity of mindreading. *Consciousness and Cognition*, 24, 84-97. https://doi.org/10.1016/j.concog.2014.01.003

Brothers, L., & Ring, B. (1992). A neuroethological framework for the representation of minds. *Journal of Cognitive Neuroscience*, 4, 107-118. doi:10.1162/jocn.1992.4.2.107

Brown, B. (2019). From hegemonic to responsive masculinity: The transformative power of the provider role. In J. A. Barry, R. Kingerlee, M. Seager, & L. Sullivan (Eds.), *The Palgrave handbook of male psychology and mental health* (pp. 183-204). New York, NY: Springer. doi:10.1007/978-3-030-04384-1_10

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, 44, 113-126. doi:10.1037/0022-3514.44.1.113

Decety, J. (2010). The neurodevelopment of empathy in humans. *Developmental Neuroscience*, 32, 257-267. doi:10.1159/000317771

Dvash, J., & Shamay-Tsoory, S. G. (2014). Theory of mind and empathy as multidimensional constructs: Neurological foundations. *Topics in Language Disorders*, 34, 282-295. doi:10.1097/TLD.0000000000000040

Eisenberg, N. (2000). Emotion, regulation, and moral development. *Annual Review of Psychology*, 51, 665-697. doi:10.1146/annurev.psych.51.1.665
Enders, C. K. (2001). The performance of the full information maximum likelihood estimator in multiple regression models with missing data. *Educational and Psychological Measurement, 61*(5), 713–740. https://doi.org/10.1177/0013164401615001

Galambos, N. L., Berenbaum, S. A., & McHale, S. M. (2009). Gender development in adolescence. In Handbook of adolescent psychology. *American Cancer Society*. https://doi.org/10.1002/9780470479193.adpsy001011

Gallant, C. M. M., Lavis, L., & Mahy, C. E. V. (2020). Developing an understanding of others’ emotional states: Relations among affective theory of mind and empathy measures in early childhood. *The British Journal of Developmental Psychology, 38*, 151-166. doi:10.1111/bjdp.12322

Grühn, D., Rebucal, K., Diehl, M., Lumley, M., & Labouvie-Vief, G. (2008). Empathy across the adult lifespan: Longitudinal and experience-sampling findings. *Emotion, 8*, 753-765. doi:10.1037/a0014123

Gunther Moor, B., Op de Macks, Z. A., Guroglu, B., Rombouts, S. A. R. B., Van der Molen, M. W., & Crane, E. A. (2012). Neurodevelopmental changes of reading the mind in the eyes. *Social Cognitive and Affective Neuroscience, 7*, 44-52. doi:10.1093/scan/nsr020

Gutierrez, B. C., Halim, M. L. D., Martinez, M. A., & Arredondo, M. (2020). The heroes and the helpless: The development of benevolent sexism in children. *Sex Roles, 82*, 558-569. doi:10.1007/s11199-019-01074-4

Hankivsky, O., Springer, K. W., & Hunting, G. (2018). Beyond sex and gender difference in funding and reporting of health research. *Research Integrity and Peer Review, 3*, 6. doi:10.1186/s41073-018-0050-6

Heidari, S., Babor, T. F., De Castro, P., Tort, S., & Curno, M. (2016). Sex and gender equity in research: Rationale for the SAGER guidelines and recommended use. *Research Integrity and Peer Review, 1*, 2. doi:10.1186/s41073-016-0007-6

Hill, J. P., & Lynch, M. E. (1983). The intensification of gender-related role expectations during early adolescence. In J. Brooks-Gunn & A. C. Petersen (Eds.), *Girls at puberty: Biological and psychosocial perspectives* (pp. 201-228). New York, NY: Springer. doi:10.1007/978-1-4899-0354-9_10

Hoffman, M. L. (2000). *Empathy and moral development: Implications for caring and justice*. Cambridge University Press. https://doi-org.proxy3.library.mcgill.ca/10.1017/CBO9780511805851

Holt, R. J., Chura, L. R., Lai, M.-C., Suckling, J., von dem Hagen, E., Calder, A. J., & Spencer, M. D. (2014). “Reading the mind in the eyes”: An fMRI study of adolescents with autism and their siblings. *Psychological Medicine, 44*, 3215-3227. doi:10.1017/S0033291714000233

Hughes, C. (2011). *Social understanding and social lives: From toddlerhood through to the transition to school*. Hove, UK: Taylor & Francis. Retrieved from http://ebookcentral.proquest.com/lib/mcgill/detail.action?docID=672407

Hughes, C., Enson, R., & Marks, A. (2011). Individual differences in false belief understanding are stable from 3 to 6 years of age and predict children’s mental
state talk with school friends. *Journal of Experimental Child Psychology, 108*, 96-112. doi:10.1016/j.jecp.2010.07.012

Ibanez, A., Huepe, D., Gempp, R., Gutiérrez, V., Rivera-Rei, A., & Toledo, M. I. (2013). Empathy, sex and fluid intelligence as predictors of theory of mind. *Personality and Individual Differences, 54*, 616-621. doi:10.1016/j.paid.2012.11.022

Kanske, P., Böckler, A., Trautwein, F.-M., & Singer, T. (2015). Dissecting the social brain: Introducing the EmpaToM to reveal distinct neural networks and brain–behavior relations for empathy and theory of mind. *NeuroImage, 122*, 6-19. doi:10.1016/j.neuroimage.2015.07.082

Karniol, R., Gabay, R., Ochion, Y., & Harari, Y. (1998). Is gender or gender-role orientation a better predictor of empathy in adolescence? *Sex Roles, 39*, 45-59. doi:10.1023/A:1018825732154

Keefer, K. V. (2015). Self-report assessments of emotional competencies: A critical look at methods and meanings. *Journal of Psychoeducational Assessment, 33*, 3-23. doi:10.1177/0734282914550381

Keefer, K. V., Holden, R. R., & Parker, J. D. A. (2013). Longitudinal assessment of trait emotional intelligence: Measurement invariance and construct continuity from late childhood to adolescence. *Psychological Assessment, 25*, 1255-1272. doi:10.1037/a0033903

Kent, R. L., & Moss, S. E. (1994). Effects of sex and gender role on leader emergence. *The Academy of Management Journal, 37*, 1335-1346. doi:10.2307/256675

Kołodziejczyk, A. M., & Bosacki, S. L. (2015). Children’s understandings of characters’ beliefs in persuasive arguments: Links with gender and theory of mind. *Early Child Development and Care, 185*, 562-577. doi:10.1080/03004430.2014.940930

Laghi, F., Cerutti, R., Terrinoni, A., Lonigro, A., Pongetti, A., Ferrara, M., & Fantini, F. (2019). Evaluation of the “Reading the Mind in the Eyes Test” with Non-Suicidal Self-Injury (NSSI) adolescents: A pilot study. *Current Psychology*. https://doi.org/10.1007/s12144-019-00505-5

Lam, C. B., Solmeyer, A. R., & McHale, S. M. (2012). Sibling relationships and empathy across the transition to adolescence. *Journal of Youth and Adolescence, 41*, 1657-1670. doi:10.1007/s10964-012-9781-8

Lecce, S., Bianco, F., Devine, R. T., & Hughes, C. (2017). Relations between theory of mind and executive function in middle childhood: A short-term longitudinal study. *Journal of Experimental Child Psychology, 163*, 69–86. https://doi.org/10.1016/j.jecp.2017.06.011

Leszcynski, J. P., & Strough, J. (2008). The contextual specificity of masculinity and femininity in early adolescence. *Social Development, 17*, 719-736. doi:10.1111/j.1467-9507.2007.00443.x

Lonigro, A., Laghi, F., Baiocco, R., & Baumgartner, E. (2014). Mind reading skills and empathy: Evidence for nice and nasty ToM behaviours in school-aged children. *Journal of Child and Family Studies, 23*, 581-590. doi:10.1007/s10826-013-9722-5
Martin, C. L., Andrews, N. C. Z., England, D. E., Zosuls, K., & Ruble, D. N. (2017). A dual identity approach for conceptualizing and measuring children’s gender identity. *Child Development, 88*, 167-182. doi:10.1111/cdev.12568

Marton, I., Wiener, J., Rogers, M., Moore, C., & Tannock, R. (2009). Empathy and social perspective taking in children with Attention-Deficit/Hyperactivity Disorder. *Journal of Abnormal Child Psychology, 37*, 107-118. doi:10.1007/s10802-008-9262-4

McHale, S. M., Crouter, A. C., & Tucker, C. J. (1999). Family context and gender role socialization in middle childhood: Comparing girls to boys and sisters to brothers. *Child Development, 70*, 990-1004. doi:10.1111/1467-8624.00072

Meinhardt-Injac, B., Daum, M., & Meinhardt, G. (2020). Theory of mind development from adolescence to adulthood: Testing the two-component model. *British Journal of Developmental Psychology, 38*, 289-303. doi:10.1111/bjdp.12320

Meyers, L. S., Gamst, G., & Guarino, A. J. (2016). *Applied multivariate research: Design and interpretation* (3rd ed.). Thousand Oaks, CA: SAGE.

Oakley, B. F. M., Brewer, R., Bird, G., & Catmur, C. (2016). Theory of mind is not theory of emotion: A cautionary note on the reading the mind in the eyes test. *Journal of Abnormal Psychology, 125*, 818-823. doi:10.1037/abn0000182

Overgaard, S., van Duijvenvoorde, A. C. K., Gunther Moor, B., & Crone, E. A. (2015). A longitudinal analysis of neural regions involved in reading the mind in the eyes. *Social Cognitive and Affective Neuroscience, 10*, 619-627. doi:10.1093/scan/nsu095

Pajares, F., & Valiante, G. (2001). Gender differences in writing motivation and achievement of middle school students: A function of gender orientation? *Contemporary Educational Psychology, 26*, 366-381. doi:10.1006/ceps.2000.1069

Perner, J., & Wimmer, H. (1985). “John thinks that Mary thinks that . . .” attribution of second-order beliefs by 5- to 10-year-old children. *Journal of Experimental Child Psychology, 39*, 437-471. doi:10.1016/0022-0965(85)90051-7

Perry, D. G., Pauletti, R. E., & Cooper, P. J. (2019). Gender identity in childhood: A review of the literature. *International Journal of Behavioral Development, 43*, 289-304. doi:10.1177/0165025418811129

Peterson, C. (2014). Theory of mind understanding and empathic behavior in children with autism spectrum disorders. *International Journal of Developmental Neuroscience, 39*, 16-21. doi:10.1016/j.ijdevneu.2014.05.002

Plousia, M. (2018). Individual differences in children’s understanding of guilt: Links with theory of mind. *The Journal of Genetic Psychology, 179*, 219-229. doi:10.1080/00221325.2018.1474848

Premack, D., & Woodruff, G. (1978). Chimpanzee problem-solving: A test for comprehension. *Science, 202*, 532-535. doi:10.1126/science.705342

Reniers, R. L. E. P., Völlm, B. A., Elliott, R., & Corcoran, R. (2014). Empathy, ToM, and self–other differentiation: An fMRI study of internal states. *Social Neuroscience, 9*, 50-62. doi:10.1080/17470919.2013.861360

Rose, A. J., & Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development
of girls and boys. Psychological Bulletin, 132, 98-131. doi:10.1037/0033-2909.132.1.98

Scheffer, J. (2002). Dealing with missing data. https://mro.massey.ac.nz/handle/10179/4355

Shamay-Tsoory, S. G., & Aharon-Peretz, J. (2007). Dissociable prefrontal networks for cognitive and affective theory of mind: A lesion study. Neuropsychologia, 45, 3054-3067. doi:10.1016/j.neuropsychologia.2007.05.021

Shamay-Tsoory, S. G., Harari, H., Aharon-Peretz, J., & Levkovitz, Y. (2010). The role of the orbitofrontal cortex in affective theory of mind deficits in criminal offenders with psychopathic tendencies. Cortex, 46, 668-677. doi:10.1016/j.cortex.2009.04.008

Singer, T. (2006). The neuronal basis and ontogeny of empathy and mind reading: Review of literature and implications for future research. Neuroscience & Biobehavioral Reviews, 30, 855-863. doi:10.1016/j.neubiorev.2006.06.011

Skoe, E. E. A., Cumberland, A., Eisenberg, N., Hansen, K., & Perry, J. (2002). The influences of sex and gender-role identity on moral cognition and prosocial personality traits. Sex Roles, 46, 295-309. doi:10.1023/A:1020224512888

Smith, R. L., & Rose, A. J. (2011). The “cost of caring” in youths’ friendships: Considering associations among social perspective taking, co-rumination, and empathetic distress. Developmental Psychology, 47, 1792-1803. doi:10.1037/a0025309

Spenser, K. A., Betts, L. R., & Gupta, M. D. (2015). Deficits in theory of mind, empathic understanding and moral reasoning: A comparison between young offenders and non-offenders. Psychology, Crime & Law, 21, 632-647. doi:10.1080/1068316X.2015.1028542

Sullivan, K., Zaitchik, D., & Tager-Flusberg, H. (1994). Preschoolers can attribute second-order beliefs. Developmental Psychology, 30, 395-402. doi:10.1037/0012-1649.30.3.395

Tabachnick, B. G., & Fidell, L. S. (2013). Using multivariate statistics (6th ed.). Boston, MA: Pearson Education.

Tonks, J., Williams, W. H., Frampton, I., Yates, P., & Slater, A. (2007). Assessing emotion recognition in 9–15-years olds: Preliminary analysis of abilities in reading emotion from faces, voices and eyes. Brain Injury, 21, 623-629. doi:10.1080/02699050701426865

Van der Graaff, J., Branje, S., De Wied, M., Hawk, S., Van Lier, P., & Meeus, W. (2014). Perspective taking and empathic concern in adolescence: Gender differences in developmental changes. Developmental Psychology, 50, 881-888. doi:10.1037/a0034325

Vellante, M., Baron-Cohen, S., Melis, M., Marrone, M., Petretto, D., Masala, C., & Preti, A. (2013). The “reading the mind in the eyes” test: Systematic review of psychometric properties and a validation study in Italy. Cognitive Neuropsychiatry, 18, 326-354. doi:10.1080/13546805.2012.721728
Vetter, N. C., Altgassen, M., Phillips, L., Mahy, C. E. V., & Kliegel, M. (2013). Development of affective theory of mind across adolescence: Disentangling the role of executive functions. *Developmental Neuropsychology, 38*, 114-125. doi:10.1080/87565641.2012.733786

Voracek, M., & Dressler, S. G. (2006). Lack of correlation between digit ratio (2D:4D) and Baron-Cohen’s “reading the mind in the eyes” test, empathy, systemising, and autism-spectrum quotients in a general population sample. *Personality and Individual Differences, 41*, 1481-1491. doi:10.1016/j.paid.2006.06.009

Wimmer, H., & Perner, J. (1983). Beliefs about beliefs: Representation and constraining function of wrong beliefs in young children’s understanding of deception. *Cognition, 13*, 103-128. doi:10.1016/0010-0277(83)90004-5

Yarnell, L. M., Neff, K. D., Davidson, O. A., & Mullarkey, M. (2019). Gender differences in self-compassion: Examining the role of gender role orientation. *Mindfulness, 10*, 1136-1152. doi:10.1007/s12671-018-1066-1

**Author Biographies**

**Katherine Andrews** is a PhD candidate in the department of educational and counseling psychology at McGill University. Her masters was completed at Carleton University.

**Liliana Lariccia** is currently completing her master’s degree in human development at McGill University. She previously completed a bachelor’s degree in psychology at McGill University and a graduate diploma in youth work at Concordia University.

**Victoria Talwar** is professor and Canada Research Chair (II) in the department of educational and counseling psychology at McGill University. Her research examines social cognition and moral development in children and youth.

**Sandra Bosacki** is a professor of education at Brock University, St. Catharines, Ontario, Canada. Her teaching and research focus on social cognition and mental health in children and adolescence.