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The relationship between reciprocal friendships and self-esteem in school aged children

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Bachelor thesis

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Declaration

I declare that I have written this thesis myself and on my own. I have duly referenced and quoted all the sources and literature that I used in it. I have not yet submitted this work to obtain another degree. I will sign this declaration and consent by handwritten signature.

In Prague, Czech Republic, 28th of June 2024

Signature:

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Author's contribution to the project

I am responsible for the formulation of the research question, data collection, literature review interpretation of the results, and writing. I also assisted in the scoring of tests and statistical analysis.

Abstract

Throughout childhood, friendships influence numerous health and developmental outcomes. While the number of friends is important, specific aspects of friendship, such as whether the friendship is reciprocal, may be especially important in shaping children's self-concept, since reciprocal friendships are more stable and supportive. This investigation aimed to test the hypotheses that 1) children with a higher number of reciprocal friendships would have higher self-esteem, and 2) that the relationship between self-esteem and the number of reciprocal friendships would be stronger in older children, and 3) stronger in girls. We recruited 115 children aged 8-14 years in different classes from schools throughout Prague. The Rosenberg Self-esteem Scale measured self-esteem. The number of reciprocal friendship relationships was examined by asking each child in each class to nominate who their friends were in their respective classes. General linear modeling tested whether self-esteem depended on the number of reciprocal friendships and whether this association was moderated by age or gender. Contrary to our first hypothesis, the number of reciprocal friendships was non-significantly associated with self-esteem. Nonetheless, children who named more friends (regardless of reciprocity) exhibited significantly higher self-esteem. Contrary to Hypothesis 2, age did not moderate the association between number of reciprocal friendships and self-esteem. However, in line with other studies, older children had significantly lower self-esteem. Regarding Hypothesis 3, no significant interaction was found between gender and the number of reciprocal friendships, however consistent with our other research, girls exhibited lower self-esteem. In conclusion, our results suggest that simply having friends, regardless of whether the friendship is significant, is associated with better self-esteem in both older and younger children, and in both girls and boys.

Keywords: friendships; friendship reciprocity; children; adolescence; self-esteem; gender; friendship development

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1. Introduction

Converging evidence suggests that self-esteem and friendships are intricately linked throughout development. The lack of research examining the relationship between the number of reciprocal friends and self-esteem, particularly considering age and gender, highlights a significant gap in the literature. There is also a lack of research exploring whether the relationship between the number of reciprocal friends and self-esteem is moderated by age and gender. Therefore, my thesis aims to investigate the relationship between the number of reciprocal friendships and self-esteem in children while also examining whether this association varies with age or differs between girls and boys.

Childhood and adolescence are important periods for social, cognitive, and emotional development. Previous studies have shown that as children mature, friendships with peers become increasingly influential in the formation of self-concept, including self-esteem (Groene & Inderbitzen-Pisaruk, 1992). Children who do not have close, intimate friendships, regardless of their popularity among peers, are likely to experience lower self-esteem, increased feelings of loneliness, and more social anxiety (Wheeler & Ladd, 1982; Harter, 1982). These findings establish a link between self-esteem and friendships. It is thus important to determine the specific attributes of friendship that relate to children's self-esteem. One important potential attribute is whether the friendship is reciprocal. Reciprocal friendships, where mutual recognition and support exist have a significant positive impact on various aspects of children's development, including social, emotional, and academic growth. As I review later on, reciprocal friendships may be particularly beneficial as they are likely more supportive, reliable, and intimate than dyadic relationships where only one child considers the other to be a friend. Clark and Ladd (2000) discovered that connectedness and autonomy support within friendships enhance socioemotional orientation and peer relationships, thereby boosting self-esteem. Bukowski and Hoza (1989) highlighted that high-quality friendships improve

children's sense of worthiness. Parker and Asher (1993) showed that strong friendships ease the feeling of loneliness, positively affecting self-esteem. Hartup, French, Laursen, Johnston, and Ogawa (1993) noted that positive peer relationships help prevent future adjustment issues, emphasizing the importance of reciprocal friendships. Recent meta-analytic findings by Harris and Orth (2020) reveal a bidirectional relationship between social relationships and self-esteem, suggesting that positive social connections enhance self-esteem, and higher self-esteem, in turn, improves the quality of social connections. Additionally, these friendships provide emotional support, validation, and companionship, essential for a positive self-image (Rodriguez, Moreno, & Mesurado, 2021; Holder & Coleman, 2015). They are crucial for developing social skills like expressing and interpreting social cues, conflict resolution, and empathy, which contribute to a positive self-concept and self-esteem (Baiocco et al., 2019). Positive friendships also support better school adjustment and academic performance, further boosting self-esteem (Holder & Coleman, 2015). Wentzel, Jablansky, and Scalise (2018) emphasize that reciprocal friendships offer significant academic benefits, enhancing cognitive skills such as reasoning and memory, and improving grades and test scores. These friendships foster a supportive and motivating environment that promotes engagement and problem-solving behaviors, directly contributing to academic success. In contrast, non-reciprocal friendships do not provide the same academic benefits due to the lack of mutual support and engagement. There are thus a variety of ways by which friendships benefit self-esteem, particularly those that are supportive, close, and mutual.

Children with non-reciprocal friendships often experience heightened feelings of loneliness and social dissatisfaction. Research indicates that these children frequently report greater loneliness and receive less social support, leading to emotional distress and increased social withdrawal (Clark & Ayers, 1988; Parker & Asher, 1993; Hymel, Rubin, Rowden, & LeMare, 1990). This issue is especially pronounced among children who are already socially withdrawn

or struggle with peer acceptance (Parker & Asher, 1993; Rubin et al., 2006). The absence of reciprocal friendships can result in less motivation to participate in school activities and lower levels of academic engagement, which negatively impacts their academic success over time (Ladd & Kochenderfer, 1996; Mamas, 2011). Positive social interactions and reciprocal friendships are crucial for fostering a supportive and motivating school environment. For instance, children who experience reciprocal friendships are more likely to receive emotional support and encouragement, enhancing their engagement and performance in school (Avramidis et al., 2018). Overall, the presence of reciprocal friendships appears to be essential for both the emotional well-being and academic success of children. These friendships provide the necessary support and encouragement that children need to thrive both socially and academically. Previous findings highlighted the critical role of reciprocal friendships in shaping personal outcomes. Another factor examined in this study that significantly impacts an individual's life is self-esteem. According to Orth, Robins, and Widaman (2012), self-esteem should be understood as a cause rather than a consequence of various life outcomes. Their study highlights that individuals with low self-esteem are at a higher risk of experiencing depression, while high self-esteem is associated with increased positive affect, better relationship and job satisfaction, and higher occupational status. Similarly, Boden, Fergusson, and Horwood (2008) found that lower self-esteem at age 15 is linked to higher rates of depression, anxiety disorders, conduct/antisocial personality disorders, and suicidal ideation at later ages. Although the strength of these associations often reduced after accounting for family and personal background factors, some links, like those with life satisfaction and peer attachment, remained significant. Quatman and Watson (2001) explored gender differences in adolescent self-esteem and found that girls often experience lower self-esteem than boys, particularly in athletic abilities and family satisfaction. Lower self-esteem in girls could likely have negative impacts on their mental health and academic performance. Derdikman-Eiron et al. (2011) noted that

girls with anxiety and depression symptoms have greater difficulties in social relations and school functioning compared to boys.

Given the significant impact of self-esteem on life outcomes, several interventions in primary schools can be beneficial. Studies have shown that enhancing students' social and emotional learning through targeted interventions can significantly improve their social skills, self-esteem, and academic performance (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Gresham & Elliot, 1987). Promoting a healthy lifestyle, stress management techniques and parental involvement through educational programs can further support self-esteem development (Epstein, 2001; González Moreno & Molero Jurado, 2024; Hofmann et al., 2012). By implementing these interventions, primary schools can create an environment that fosters high self-esteem in children, leading to more favorable life outcomes as they grow.

In addition to the aforementioned interventions, children's self-esteem can also be improved by developing high-quality peer relationships. This could, in fact, lead to a positive feedback loop where higher quality friendships bolster self-esteem, and higher self-esteem facilitates the formation of higher quality peer relations. Indeed, Caldwell et al. (2004), Hutteman et al. (2015), and Reitz et al. (2016) suggest a bidirectional relationship between self-esteem and peer support, where higher levels of self-esteem contribute to more positive peer relationships, and vice versa. These findings align with the sociometer theory, which posits that self-esteem operates as an indicator of an individual's social belonging and interpersonal relationship quality. Consistent with this idea, Parker and Seal (1996) found that children without friends were seen by their peers as shy and timid, spent more time playing alone, were more sensitive, less mature, with fewer social skills, and showed more isolation behaviors and anxiety. The authors emphasize that social rejection at preschool age is a predictor of many externalizing problems in adolescence, such as delinquency, disorderly conduct, aggression, attention difficulties, and substance abuse. Moreover, the authors also argued that, over time, isolation

is associated with internalization problems, such as low self-esteem, anxiety, loneliness, and depression. (Parker & Seal, 1996).

Overall, reciprocal friendships play a crucial role in promoting various positive outcomes for adolescents, including better academic performance, lower delinquency, and improved emotional and social adjustment. In contrast, non-reciprocal friendships, while still beneficial, do not match the significant positive impact of reciprocated friendships. One potential way through which reciprocal friendships promote positive outcomes is by enhancing self-esteem. Individuals with high self-esteem experience a range of positive life outcomes, such as better mental health and greater job satisfaction, while low self-esteem is associated with higher risks of depression and other mental health issues. While self-esteem is consistently associated with various positive outcomes, there are important gender differences as well as age differences in self-esteem that should be taken into consideration when determining how friendships and other factors influence self-esteem. It is therefore important to understand how reciprocal friendships relate to self-esteem, and whether this relation varies with age or between genders.

2. Literature review

2.1. Self-esteem

Understanding self-esteem is crucial for comprehending how individuals form their self-concepts and the implications of these perceptions on their overall well-being. Self-esteem, a central component of self-perception, and is defined by Rosenberg (1965) as the subjective evaluation of one's own value and significance. This core psychological construct plays a significant role in improving health and developmental outcomes, as highlighted by studies from Kuster, Orth, and Meier (2013) and Moksnes and Espnes (2013).

Furthermore, self-esteem influences success and well-being across different areas of life, such as personal relationships, career, and health. Orth and Robins (2014) found that high

self-esteem in adolescence predicts success in various aspects of life, such as personal relationships, professional work environments, and overall health in adulthood, underscoring the importance of self-esteem in personal and professional development. Additionally, high self-esteem acts as a protective factor during challenging times, enabling individuals to handle adverse circumstances more effectively, which leads to better health and psychological outcomes (Baumeister et al., 2003). Conversely, low self-esteem is linked to negative behaviors and mental health issues, such as delinquency, drug use, and suicidal tendencies in adulthood (Kaplan, 1980; Kaplan & Pokorny, 1969; Kaplan & Pokorny, 1976). Moreover, individuals with lower self-esteem are more susceptible to mental illnesses like anxiety and depression and have greater difficulty coping with adverse life events (Buunk & Prins, 1998; Orth & Robins, 2014). Understanding self-esteem, or more specifically, identifying factors that correlate with self-esteem, can therefore aid in identifying at-risk individuals and implementing preventive measures across a range of health, academic, occupational, and social problems.

Self-esteem is profoundly influenced by social factors, particularly peer relationships and social support. The sociometer theory posits that self-esteem functions as an internal gauge of social acceptance (Leary & Baumeister, 2000), highlighting the importance of social dynamics in shaping self-esteem. The relationship between self-esteem and peer relationships is not specific to adulthood. Longitudinal studies show that social inclusion and peer relationship quality predict the development of self-esteem in early life (Gruenenfelder-Steiger et al., 2016; Morin et al., 2013; Tartakovsky, 2009; Wagner et al., 2018). These findings suggest that understanding the interplay between self-esteem and social factors is vital for fostering supportive environments for youth. Furthermore, there is a bidirectional relationship between self-esteem and social support. Enhancing self-esteem can lead to better social support, which in turn further boosts self-esteem (Caldwell et al., 2004; Hutteman et al., 2015;

Reitz et al., 2016). This bidirectional relationship indicates that comprehensive support programs can significantly impact individuals' self-esteem and overall well-being.

In summary, studying self-esteem is fundamental to promoting psychological health, enhancing resilience, and fostering positive developmental outcomes. By understanding the factors that influence self-esteem and its effects, targeted interventions can be developed to improve individuals' quality of life and societal well-being. While many factors influence self-esteem, peer relationships are particularly influential. This thesis will explore the intricate relationship between self-esteem and friendships, aiming to provide insights into how peer relationships shape self-esteem and, in turn, influence various aspects of life.

2.2. Self-esteem Development

Understanding the development of self-esteem is critically important because it undergoes significant transformations throughout our lifespan, influenced by various social and environmental factors. Self-esteem is a fundamental aspect of psychological well-being, affecting our mental health, behavior, and overall quality of life. Investigating how self-esteem develops helps identify sensitive phases where individuals might be more vulnerable or resilient, informing interventions to support healthy development.

It is important to understand how self-esteem changes over development. It is also important to understand how the factors that affect self-esteem may also vary across development. Self-esteem is influenced by social relations throughout the lifespan, there may be particular phases of development where specific types of relationships are more influential. During middle childhood and adolescence, children begin to form more complex social relationships and engage in social comparisons, which are pivotal in shaping their self-worth. In this section, I will describe age-related changes in self-esteem as well as age-related changes in the factors that influence self-esteem.

Self-esteem undergoes transformations throughout our lifespan, exhibiting fluctuations that are influenced by various factors (Robins & Trzesniewski, 2005). Reitz (2022) provides an overview of self-esteem development, emphasizing its dynamic nature across the lifespan. Self-esteem tends to remain relatively stable but can fluctuate in response to environmental factors, indicating its state-like quality. While recent research has focused on life events as potential influences on self-esteem, the magnitude of mean-level changes in response to these events has often been modest or even negligible. Nonetheless, life events consistently trigger significant individual differences in self-esteem change, suggesting sensitive phases in self-esteem development. Orth, Erol, and Luciano (2018) conducted a meta-analysis synthesizing longitudinal data on mean-level changes in self-esteem across the lifespan. Their findings reveal systematic changes: self-esteem tends to increase from ages 4 to 11, stabilizes from ages 11 to 15, experiences strong growth until around age 30, continues to increase more slowly until age 60, peaks between ages 60 and 70, and then declines after age 70. These findings align with Robins and Trzesniewski (2005), who emphasized that self-esteem undergoes transformations throughout life, influenced by factors such as social contexts, developmental milestones like puberty, and cognitive changes in early life and old age. Specifically, childhood and adolescence typically witness declines in self-esteem due to cognitive and social developments, while adulthood shows a gradual increase, peaking in the late 60s. However, old age is associated with a decline in self-esteem. Changes in social and cognitive abilities likely play a role in age-related changes in self-esteem, particularly in early life. In the developmental phase of middle childhood, Harter (2006) notes that children acquire essential cognitive skills and commence utilizing external comparisons to realistically assess themselves. This aligns with Erikson's (1968) emphasis on the importance of preadolescence in the formation of self-esteem. Erikson regards this period as crucial for positive psychological development in adulthood. Acknowledging middle childhood as a time of self-esteem

instability and formation, understanding self-esteem during this developmental period thus becomes critically important (Erikson, 1968; Harter, 2006; Robins & Trzesniewski, 2005; Trzesniewski et al., 2003).

Bhardwaj and Agrawal (2013) identify three primary determinants influencing self-esteem development in middle childhood, emphasizing the crucial role of academic success in the early school years. This assertion aligns with findings from Crocker, Sommers, and Luhtanen (2002), highlighting that success or persistent failures in academic endeavors strongly shape an individual's sense of self-worth. The transition into adolescence amplifies the significance of peer influence, emphasizing the crucial role of successful peer connections (Bhardwaj & Agrawal, 2013). In the context of self-esteem development, Magro et al. (2019) propose that as children develop self-evaluation capacities, including comparing themselves to others and integrating feedback, they gain the ability to realistically assess their competencies. This notion aligns with Rosenberg's (1979) competencies model of self-esteem, emphasizing the importance of social comparisons and interpersonal relationships in the self-esteem development process (Magro et al., 2019; Rosenberg, 1979). Family support also plays a crucial role in children's self-esteem development, as evidenced by longitudinal studies. (Orth, Erol, & Luciano, 2018; Wu et al., 2014; Amato & Fowler, 2002; Brummelman et al., 2015).

2.3. Gender differences in self-esteem

In addition to age-related differences in self-esteem, there are also differences between males and females. Given that self-esteem is associated with a range of health and developmental outcomes as reviewed above, understanding and addressing gender differences in self-esteem may help address gender differences in various health and developmental outcomes. In the exploration of gender differences in self-esteem, numerous studies have illuminated a consistent trend: adolescent girls consistently exhibit lower levels of self-esteem compared to their male counterparts. This trend is underscored by the research of Bolognini, Plancherel,

Bettschart, and Halfon (1996), which shows that girls generally have lower self-esteem, particularly in areas related to appearance and athletic competence. According to their study, societal and cultural pressures place a greater emphasis on physical appearance for girls, leading to lower self-esteem when they feel they do not meet these standards. The study also notes that during early adolescence, physical changes associated with puberty intensify these pressures, contributing to a decline in self-worth. Supporting these findings, Gentile et al. (2009) conducted a meta-analysis showing that males had higher self-esteem related to physical appearance and athletic competence, whereas females scored higher in social acceptance and close friendships. The authors concluded that these differences in self-esteem focal points reflect broader gender trends, where societal and cultural influences place greater importance on physical appearance for girls, resulting in lower self-esteem in these areas. Conversely, boys often derive self-esteem from athletic achievements, which are socially reinforced as important for males. Further studies, such as one by Savoye et al. (2015), found that school-aged girls reported lower life satisfaction, self-confidence, and higher levels of body dissatisfaction compared to boys, particularly during the transition from childhood to adolescence (ages 9 to 15). These findings are explained by the developmental changes and increased societal pressures girls face during puberty, leading to a decline in self-worth. Boys, while also undergoing developmental changes, do not experience the same level of pressure regarding appearance, resulting in different self-esteem trajectories. Vaquera and Kao (2008) further elucidated this trend by revealing that females tend to experience lower levels of belongingness at school, potentially attributed to their diminished self-esteem during the crucial developmental period of adolescence. Additionally, girls often report greater dissatisfaction with their appearance compared to boys, which is more strongly correlated with self-esteem for females (Allgood-Merten, Lewinsohn, & Hops, 1990). This may be partly due to boys developing more muscles and aligning closer with the ideal masculine

body image during adolescence, while girls gain fat, moving them further from the ideal female body image of many Western societies (Harter, 1993). Furthermore, girls may feel less powerful and capable in mixed-gender groups dominated by boys, as traditionally masculine qualities such as power are positively correlated with self-esteem for both genders (Whitley, 1983). This perception may also contribute to the gender differences in self-esteem observed during adolescence.

2.4. Gender Differences in the Development of Self-Esteem

The gender disparity in self-esteem becomes increasingly pronounced during adolescence, as observed by Kling et al. (1999) and Robins et al. (2002), where adolescent boys consistently reported higher self-esteem compared to girls. This robust finding has been reiterated in studies examining self-esteem across the lifespan, such as those conducted by Orth and Robins (2014) and Robins and Trzesniewski (2005), thus contributing to a comprehensive understanding of self-esteem development. Furthermore, recent research by Magro et al. (2019) suggests that gender differences in self-esteem may begin to emerge as early as age 8, indicating a potential foundational influence on subsequent self-esteem trajectories into adulthood. While cultural and social factors may play a role in gender differences, this assertion aligns with cross-cultural investigations by Bleidorn et al. (2016), which suggest that gender differences in self-esteem are not confined to specific cultural contexts but are influenced by a complex interplay of biological and shared cultural factors. The cumulative evidence from these studies not only highlights the pervasive nature of gender differences in self-esteem but also underscores the importance of addressing these disparities in psychological research and intervention efforts. Moreover, studies such as those conducted by Quatman and Watson (2001) and Derdikman-Eiron et al. (2011) further illuminate the specific domains in which these gender differences manifest, providing insights into the societal, psychological, and developmental factors contributing to the observed disparities. Finally, the overarching

trajectory of self-esteem development throughout the lifespan, as explored by Orth, Maes, and Schmitt (2015), reveals consistent patterns across genders and educational levels, emphasizing the influence of various sociocultural factors on shaping individuals' self-perceptions from childhood to old age. Taken together, evidence suggests that self-esteem differs between males and females which could potentially contribute to gender differences in various health and developmental outcomes. It is therefore important to understand how specific factors, such as the quality of peer relationships, can enhance self-esteem in specific genders.

3. Friendships

Friendship is defined as a voluntary, interpersonal relationship characterized by affection, trust, support, and intimacy. Friendships are formed through shared experiences and interactions, where both individuals feel a sense of belonging and connection. These relationships are essential for emotional well-being, as they offer companionship, understanding, and a sense of security (Hartup & Stevens, 1999).

Studying friendship is vital due to its significant impact on children's development. Friendships offer essential emotional support, help build social skills, and foster a sense of belonging. According to Fink and Hughes (2019), friendships are crucial during early school years for developing social, emotional, and cognitive skills. Policarpo (2015) explains that friendships provide a context for children to practice empathy, cooperation, and conflict resolution. Berndt (1982) highlights the role of friendships in fostering self-esteem and overall well-being, emphasizing their importance in early adolescence. While friendships are generally beneficial, specific types of friendships, such as reciprocal friendships, may be better than others.

3.1. Reciprocal friendships and non-reciprocal friendships

Reciprocal friendship and non-reciprocal friendship differ mainly in mutual acknowledgment. While a friendship can be one-sided, where only one person in the dyad considers the other to be a friend, a reciprocal friendship involves both individuals mutually acknowledging each other as friends. Research indicates that reciprocal friendships tend to be more intimate, offer greater emotional support, and serve as a stronger source of social capital compared to non-reciprocal friendships (Harris & Orth, 2020; Almaatouq, Radaelli, Pentland, & Shmueli, 2016). These attributes make reciprocal friendships particularly significant for emotional well-being and personal development.

4. Reciprocal friendships

Positive social relationships, such as reciprocal friendships, have been shown to boost self-esteem over time, as mutual recognition and support in these relationships help individuals feel valued and accepted, which enhances their self-worth (Harris & Orth, 2020). By focusing on reciprocal friendships, my research aims to highlight the importance of mutual support in fostering self-esteem and provide guidance for interventions aimed at enhancing children's social and emotional development.

Close friendships are essential for building healthy relationships and are crucial during this dynamic and sensitive developmental period (George & Hartmann, 1996). Newcomb (1956) identifies reciprocity as a key aspect of close intimate friendships, while Bowker and Ramsay (2018) emphasize that reciprocal friendships are relationships where both individuals willingly participate and find enjoyment. These connections are governed by mutual loyalty and commitment, making them adaptable to changes and ensuring a balanced, satisfying relationship for both parties involved. Laursen and Hartup (2002) define reciprocity as social interaction involving matched or mutually equivalent exchanges, stressing the importance of giving and taking in kind. Homans (2017) highlights that spending time together symmetrically

contributes to developing reciprocated friendships, and Selman (1980), along with Clark and Mills (1979), argues that children's understanding of reciprocity evolves from self-interest to mutual exchanges of resources, both material and emotional, and finally to a need-based exchange emphasizing mutual concern. Given that reciprocal friendships are likely closer, more intimate, and more supportive, reciprocal friendships may have a greater impact on self-esteem than friendships in general.

4.1. Self-esteem and reciprocal friendships

Self-esteem and the number of reciprocal friendships should be related, although this relationship is likely bidirectional. Reciprocal friendships provide a more emotionally supportive and stable environment, which enhances children's self-image (Coleman, 1988). Children with higher self-esteem tend to have better social skills, such as emotional control, self-awareness, and sensitivity to others' emotions, facilitating the formation of reciprocal friendships (Riggio, Throckmorton & Depaola, 1990; Pinheiro Mota & Matos, 2013). Higher self-esteem gives individuals greater confidence in their ability to form and maintain interpersonal connections, motivating them to engage in behaviors necessary to establish and sustain close friendships. Indeed, children with better social skills, like emotional regulation, are more likely to form reciprocal friendships (Coelho et al., 2017). Furthermore, adolescents with reciprocal friendships report higher levels of school belonging, are more popular, motivated, and involved in school, achieve higher academic scores, and are more socially competent than those with less supportive friendships (Vaquera & Kao, 2008; Vaughn et al., 2000).

Reciprocal friendships can also improve self-esteem indirectly by affecting academic performance, as they provide a supportive environment conducive to healthy development and educational outcomes. Adolescents in reciprocal friendships tend to achieve higher educational outcomes compared to those without such friendships, and both reciprocal friendships and

shared activities contribute independently to students' GPA (Vaquera & Kao, 2008). Indeed, reciprocal friendships are associated with higher likability, motivation, school engagement, academic achievement, social competence, and a sense of belonging in the school environment (George & Hartmann, 1996; Dechant, 2011; Coelho et al., 2017; Vaquera & Kao, 2008). Based on these findings, it is reasonable to hypothesize that children with more reciprocal friendships have higher self-esteem. If self-esteem and the number of reciprocal friendships are related, independent of age, gender, and total number of friends, it could mean that having more reciprocal friendships, regardless of the total number of friends, plays an important role in developing a positive self-concept and should therefore be a focus for interventions aiming to enhance children's self-esteem. It could also mean that self-esteem is important for children's social development by helping them establish more supportive relationships, given that reciprocal friendships offer more emotional support (Coleman, 1988). Furthermore, research indicates that children's happiness is strongly linked to positive social relationships, such as best friends and reciprocated friendships, which in turn enhance self-esteem and overall well-being (Harris & Orth, 2020). The evidence suggests that reciprocal friendships not only enhance self-esteem but also contribute to academic performance, overall happiness, and well-being.

4.2. Development of reciprocal friendships

It is essential to discuss age-related changes in the context of this research to better understand the evolving nature of reciprocal friendships and their impact on self-esteem. The significance of such changes becomes evident through the developmental trajectory of individuals from infancy to adolescence.

Since birth, an individual's development is profoundly influenced by interactions with 'significant others,' including parents, family members, and eventually, teachers, friends, and peers (Beazidou & Botsoglou, 2016). Interactions with significant others are pivotal in shaping

children's cognitive, emotional, and personality development. They contribute significantly to emotional regulation and the formation of enduring personality traits through early socialization experiences (Block & Block, 2006; Thompson, 1994). Vygotsky (1978) emphasizes that interactions with knowledgeable individuals foster cognitive development and understanding. Peer interactions also play a crucial role in developing social skills and shaping personality (Rubin et al., 2015). These studies collectively highlight how interactions with significant others across various contexts profoundly influence children's overall development, including emotional, cognitive, and social aspects.

The concept of friendship reciprocity is crucial in understanding these developmental stages. Early friendships may initially be rooted in self-interest, aiming to maximize personal gain. However, true reciprocity, characterized by mutual equality, likely emerges as friendships evolve (Laursen & Hartup, 2002). Even at a young age, children exhibit an appreciation for reciprocity and social exchange, employing self-regulating strategies to acquire knowledge through cooperation and negotiation (Trevarthen, 1988). This indicates that the foundations for mutual and equal friendships are present early in development, even if initially driven by self-interest.

Essential to human behavior is the need to belong, which extends beyond individual relationships to include many social connections. This necessity underscores the importance of forming and maintaining social bonds for overall psychological health (Allen, Gray, Baumeister, & Leary, 2022). Furthermore, Hofer and Hagemeyer (2018) highlight that affiliation and intimacy motivations are crucial for social bonding. These motivations enhance the ability to establish and maintain diverse social connections, which are vital for emotional well-being and social integration. Therefore, understanding how reciprocal friendships develop and influence self-esteem at different ages is crucial. Reciprocal friendships are shaped by numerous factors, including socioeconomic status (SES), family dynamics, gender differences,

peer play, social competence, peer acceptance, personality, and proximity. SES significantly impacts the ease with which individuals form reciprocal friendships, with higher SES often associated with better access to resources and greater social desirability (Vaquera & Kao, 2008; Milner, 2004). Family dynamics also play a pivotal role, as children's experiences within their familial context shape their social behaviors and interactions (Beazidou & Botsoglou, 2016).

Peer play interactions are instrumental in developing social-emotional competencies, providing valuable opportunities to acquire skills crucial for lifelong adaptation (Bredenkamp & Copple, 1997). Social competence and peer acceptance are critical for forming reciprocal friendships, with socially competent children navigating social situations more adeptly (Beazidou & Botsoglou, 2016; Eivers et al., 2012). Physical proximity and shared activities also significantly contribute to friendship formation and maintenance (Clark & Ayers, 1988). Additionally, temperament and disposition influence the capacity to establish enduring friendships (Beazidou & Botsoglou, 2016). Taken together, a wide range of individual and environmental contribute to an individual's capacity to develop reciprocal friendships.

In addition to environmental influences, age also influences the quality of an individual's social relationships. Indeed, the nature of friendship evolves across various developmental stages. In early childhood, children embark on a journey of self-discovery, gaining autonomy and understanding their place within family and friend groups. This period is characterized by the formation of crucial social and emotional attributes, including self-concept, self-esteem, and emotional regulation (Frost, Wortham, & Reifel, 2008). Social experiences during this period set the stage for later social development, as early peer acceptance and reciprocal friendships predict later social relationships (Quinn & Hennessy, 2010).

As children progress into pre-adolescence, their perspective on friendships evolves. Older children begin defining friendships based on emotional reciprocities like trust and loyalty

(Bigelow, 1977). Social competencies developed in early childhood are refined and applied during more intricate interactions in school, where social skills are further honed during these years become valuable life assets (Beazidou & Botsoglou, 2016).

Adolescence, marking the transition from childhood to adulthood, brings significant changes in social dynamics. Adolescents spend more time with friends, and reciprocal friendships gain more importance (Lam et al., 2014). Adolescents increasingly engage in societal activities, though the reliance on interpersonal trust in these larger community relationships is yet to be fully understood (Sweijen et al., 2023). With hormonal changes associated with puberty, adolescents undergo major cognitive and social transformations, with peers playing a crucial role in identity development (Goddings et al., 2019; Dahl et al., 2018; Ahmed, 2015). The advent of technology further amplifies the significance of peer opinions in the lives of contemporary adolescents (Ahmed, 2015). As children start comparing themselves to their peers, their self-esteem often declines (Crocker & Park, 2004). This phenomenon underscores the importance of considering age-related changes to understand the evolving nature of reciprocal friendships and their impact on self-esteem. As children grow older, their cognitive and social abilities increase, enabling them to better recognize and value reciprocity in their friendships. This comprehensive understanding highlights the necessity of considering developmental stages when studying the relationship between reciprocal friendships and self-esteem. Therefore, it is reasonable to hypothesize that as children grow older, the impact of reciprocal friendships on self-esteem becomes stronger.

4.3. Gender differences in reciprocal friendships

The research literature consistently underscores the higher propensity of girls to reciprocate friendships compared to boys. Vaquera and Kao's study (2008) substantiates this, revealing that girls are almost twice as likely as boys to reciprocate friendships. This trend aligns with broader research positing that females tend to cultivate longer-lasting, more

disclosing, and exclusive friendships (Belle, 1989; Billy & Udry, 1985; Eder & Hallinan, 1978). Markovits, Benenson, and Dolenszky (2001) contend that girls' close friendships exhibit greater intimacy through the sharing of detailed personal information, while boys typically construct their friendships around shared activities. Moreover, Carson, Wagner, and Schultz (1987) observe that, in general, girls are more sociable than boys.

Structural disparities in boys' and girls' peer relationships, such as variations in the number of friends, peer group size, and activities, are emphasized by Rose and Smith (2009). Mutual friendships are more prevalent among girls, as indicated by research on junior-high-school friendships (Clark & Ayers, 1988), and Cohen's study (1965) underscores the formation of more cliques among girls, defined as groups with at least two members in a mutual-choice relationship.

Additional support for the notion that adolescent and preadolescent females tend to have more reciprocal friendships comes from Berndt (1982), Eder and Hallinan (1978), and Hansell (1981). Additionally, Epstein (1983) notes an increase in the number of female reciprocal relationships with age. There are also significant differences in how girls and boys interact with close friends. Crockett, Losoff, and Petersen's findings (1984) highlight that adolescent girls spend more time daily talking on the phone with their best friends compared to boys. Regarding social contact, boys generally engage in extracurricular activities and form more out-of-school friendships, whereas girls have more in-school contact through student government and service clubs (Karweit, 1983). Buhrmester and Furman (1987) provide additional insights, revealing that adolescents, especially older girls, spend more time with same-gender peers than younger children and boys, based on questionnaire data from different age groups.

Rose and Rudolph (2006) further elaborate on the gender differences in social-cognitive styles and responses to stress which may also be relevant to gender differences in reciprocal

friendships. Their review highlights girls' relational orientation characterized by deeper interpersonal engagement compared to boys. Specifically, girls demonstrate a greater emphasis on nurturing dyadic friendships, prioritize connection-oriented goals in peer interactions, and display higher levels of empathy towards others. In contrast, boys tend to focus more on achieving agentic goals, such as establishing dominance within peer groups.

In conclusion, the extensive literature consistently supports the assertion that girls are more inclined to reciprocate friendships, foster more intimate relationships, and participate in more social activities than boys. We expect that the relationship between the number of reciprocal friendships and self-esteem may be stronger in girls than in boys. This hypothesis is rooted in the recognition that girls' friendships are typically more intimate, reciprocal, and supportive, which significantly enhances their self-worth and social confidence. The quality and nature of girls' friendships play a pivotal role in shaping their self-esteem. The reciprocal, intimate, and supportive nature of these relationships can enhance girls' self-worth and social confidence. However, the complexities of these dynamics also mean that negative experiences within friendships can adversely affect self-esteem. Thus, fostering healthy, supportive, and stable friendships is crucial for the positive self-esteem development of girls.

5. Research question and hypotheses

Recruiting children and adolescents throughout Prague, we aimed to test the hypothesis that children with more reciprocal friendships have higher self-esteem, independent of age, gender, and total number of friends. We further expected that self-esteem and number of reciprocal friendship would be stronger in older children. For our third hypothesis, we expected that the association between the number of reciprocal friendships and gender will be stronger in girls, specifically, we predict that girls with a higher number of reciprocal friendships will exhibit higher levels of self-esteem compared to boys. Understanding how self-esteem relates to reciprocal friendship and whether such relationship varies by age or gender may provide

insight into the specific attributes of friendships that benefit self-esteem for girls and boys across development. Such information may aid in developing interventions for improving self-esteem. We therefore tested the following hypotheses:

- **H1:** Children with more reciprocal friendships have higher self-esteem.
- **H2:** The relationship between the number of reciprocal friendships and self-esteem will be stronger in older children.
- **H3:** The association between the number of reciprocal friendships and self-esteem will be stronger in girls.

6. Methods

6.1. Sample

This study made use of secondary data provided by Dr. Jitka Lindová and her research team, who are conducting a larger project focused on social behavior, personality, and friendships among school children. Dr. Lindová's project is still ongoing, and its results have not yet been published. With her permission, I utilized this data for my thesis. Under the guidance of my supervisor, Dr. Ellen Zakreski, I conducted all data analyses specifically for this thesis. We recruited six classes, ranging from Grades 2 to 8, resulting in a sample of 120 Czech children (58 girls and 62 boys) from various public schools throughout Prague. The participants' ages spanned from 8 to 14 years. 5 participants were excluded due to missing self-esteem data. The final sample thus included 115 children (56 girls and 59 boys). Informed written consent was obtained from the legal guardian of each participant.

6.2. Procedure

Participants provided data during class time. Our research team arrived at the school at 8 a.m. and then entered the class. Students whose legal guardians did not consent left the class under the supervision of the teacher or a school staff member, or they quietly read alone in another area of the classroom.

The children's first activity was to complete a series of questionnaires. This involved completing a questionnaire measure of self-esteem (see below) as well as additional questionnaires that were used for separate projects unrelated to this investigation. Questionnaire completion took 15-20 minutes, depending on the number of students present and their age. Research assistants monitored the participants as they completed the questions and provided assistance if children had difficulty understanding a question. The questionnaire phase was followed by a series of activities that folded into a separate research project. These activities took approximately 2 hours. Following these activities, each child was then interviewed. Each research assistant took one participant to a secluded nearby area outside of the classroom so that the interview was conducted in privacy. The interviewer asked the participant a series of questions; for our purposes, the first series of questions was the most important, which involved nominating their friends in the class. The procedure ended around noon. The children then continued with their regular class schedule.

6.3. Variables and Measures

6.3.1. *Self-esteem*

We used the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) to measure self-esteem due to its well-established validation and availability in the Czech language. The RSES is a self-report questionnaire extensively used in research and validated across various populations, including high school-aged children (Bagley, Bolitho, & Bertrand, 1997). The RSES contains 10 items that measure overall self-esteem. Example items include "Overall, I am satisfied with myself." and " Sometimes I feel like I'm no good at anything.". Each item is answered using a four-point Likert scale ranging from strongly agree (1 point) to strongly disagree (4 points). A single index of self-esteem is obtained for each participant by summing their responses to the 10 items.

6.3.2. Number of reciprocal friendships

Reciprocal friendships were counted by checking whether friendship nominations within the class were mutual, using a structured interview as explained above. A friendship was considered reciprocal when person A nominated person B as their friend and person B also nominated person A as a friend. Additionally, as a control variable, we counted the total number of friends each child nominated in the class (i.e., both reciprocal and non-reciprocal), as well as the number of classmates. We only considered peers who were present in the class.

7. Data analysis

Statistical analysis was performed using MATLAB 2021b (MathWorks, Inc. Massachusetts, United States). To test our hypotheses, we constructed a general linear models (GLMs). To test our first hypothesis, we created a model regressing self-esteem onto the number of reciprocal friendships. To control for age, gender, total number of friends, and class size, we included these variables as covariates in our model. Class size was included as a covariate because children from larger classes have more potential peers to nominate as friends. We expected that the number of reciprocal friendships would be positively associated with self-esteem.

We also examined whether gender and age moderated the effect of the number of reciprocal friendships on self-esteem. We created a second model with the same dependent and independent variables as the previous model, except we included the interaction between age and the number of reciprocal friendships. We then created a third model that included the same dependent and independent variables in addition to the interaction between gender and the number of reciprocal friendships.

Given that GLMs assume normally distributed errors, we tested for violations of this assumption by performing an Anderson-Darling test on the model residuals. If the error significantly departed from normality, we used Anderson-Darling tests to determine which

variables in the model were not normally distributed. We also ensured that independent variables were not excessively correlated by calculating the variance inflation factor (VIF) for each predictor.

We used G*Power (Faul et al., 2007) to determine whether we had a sufficient sample size to test our hypotheses. Specifically, to detect a medium effect size ($f^2 = 0.15$) (Cohen, 1992), with power set to .80 and alpha set to .05, a minimum sample size of 43 was required for each GLM. With 115 participants, we therefore had a large enough sample to detect at least moderately sized effects for each hypothesis.

8. Results

8.1. Descriptive statistics

The descriptive statistics for the measures used in the study are presented in Table 1. The final sample consisted of 115 children (56 girls, 59 boys) with an average age of 10.73 years ($SD = 2.22$). Due to a record-keeping error beyond the author's control, we only have the average age of each class and not the individual ages of each child. The sample included one second-grade class, two fourth-grade classes, one sixth-grade class, one seventh-grade class, and one eighth-grade class. On average, 62.7% ($SD = 30.8\%$) of friendships were reciprocal. All participants had at least one reciprocal friendship.

8.1.1. H1: Reciprocal friendships and self-esteem

To test the first hypothesis, we recreated a GLM with self-esteem as the dependent variable and the number of reciprocal friends, age, gender, class size, and number of nominated friendships (reciprocal and non-reciprocal friendships) as predictors. Model residuals were normally distributed according to the Anderson-Darling test. VIF for all predictors was below 5 suggesting that multicollinearity was not excessive. Table 2 provides the statistics for this GLM model. Self-esteem was significantly lower in older children, $\beta = -$

0.763, SE = 0.194, $t(109) = -3.934$, $p < .001$, partial eta-squared = .124. Self-esteem was also significantly lower in girls than in boys, $\beta = 2.257$, SE = 0.648, $t(109) = -3.483$, $p < .001$, partial eta-squared = .1. Contrary to the first hypothesis, there was a small non-significant association between the number of reciprocal friendships and self-esteem, $\beta = -0.290$, SE = 0.276, $t(109) = -1.048$, $p = .297$, partial eta-squared = .01. Figure 1 shows the effect of the number of reciprocal friends on self-esteem while controlling for the effects of gender, age, class size, and overall number of nominated friends. Although there was no significant association between self-esteem and the number of reciprocal friendships. Figure 2 shows that children who named more friends (regardless of whether the friendship was reciprocal) had significantly higher self-esteem $\beta = 0.412$, SE = 0.190, $t(109) = 2.173$, $p = .032$, partial eta-squared = .042.

8.1.2. H2: Interaction between Reciprocal Friendships and Age

The second hypothesis was that the relationship between self-esteem and reciprocal friendship quantity would be stronger in older children. To determine whether the relationship between self-esteem and the number of reciprocal friendships is moderated by age we conducted a regression with self-esteem as the dependent variable and age, gender, class size, and number of nominated friendships as predictors. The model also included the interaction between age and the number of reciprocal friendships. Contrary to the second hypothesis, there was very weak and non-significant interaction between age and the number of reciprocal friendships, $\beta = -0.010$, SE = 0.099, $t(108) = -0.098$, $p = .922$, partial eta-squared < .001. The association between self-esteem and the number of reciprocal friendships therefore did not significantly vary with age.

8.1.3. H3: Interaction between Reciprocal Friendships and Gender

The second hypothesis was that the relationship between self-esteem and reciprocal friendship quantity would be stronger in girls. To determine whether the relationship between

self-esteem and the number of reciprocal friendships is moderated by gender, we conducted a regression with self-esteem as the dependent variable and age, gender, class size, and number of nominated friendships as predictors. The model also included the interaction between gender and the number of reciprocal friendships. Contrary to the third hypothesis, there was weak and non-significant interaction between gender and the number of reciprocal friendships, $\beta = 0.222$, $SE = 0.423$, $t(108) = 0.526$, $p = .600$, partial eta-squared = .003. The association between self-esteem and the number of reciprocal friendships thus did not significantly differ between girls and boys.

9. Discussion

This research aimed to investigate the relationship between the number of reciprocal friendships and self-esteem in children, and whether this relationship is moderated by age or gender. It was hypothesized that children with more reciprocal friendships would have higher self-esteem. Furthermore, it was expected that the relationship between the number of reciprocal friendships and self-esteem would be stronger in older children. Additionally, we aimed to examine gender differences in the relationship between self-esteem and the number of reciprocal friendships. Specifically, we hypothesized that the association between the number of reciprocal friendships and gender will be stronger in girls. Contrary to our first hypothesis, the regression analysis revealed that the number of reciprocal friendships did not significantly predict self-esteem. However, the analysis showed that children who named more friends (reciprocal and non-reciprocal) had significantly higher self-esteem. For our second hypothesis, there was no significant interaction between age and the number of reciprocal friendships, but self-esteem was significantly lower in older children. Contrary to our third hypothesis, there was no significant association between gender and the number of reciprocal friendships. However, self-esteem was significantly higher in males than females. While the three hypotheses were not supported, it is important to note that we had sufficient statistical

power to detect at least a moderately sized effect. We therefore cannot attribute these null findings to a small sample size. Alternatively, our findings likely reflect conceptual and methodological complexities and nuances in the assessment of reciprocal friendships and self-esteem, in addition to aspects of our research design.

9.1. Reciprocal friendships and self-esteem

Our first hypothesis was that children with more reciprocal friendships would have higher self-esteem. Contrary to our expectations, children with a higher number of reciprocal friends did not exhibit significantly higher self-esteem. However, we found that children who named more friends in general had notably higher self-esteem. One possible explanation for our finding that the number of reciprocal friendships did not significantly predict self-esteem is that the relationship between reciprocal friendships and self-esteem is nonlinear. Having at least one reciprocal friendship can be sufficient to positively impact self-esteem. This possibility is worthwhile exploring; however, we could not compare the self-esteem of participants with no reciprocal friendships to those who had at least one reciprocal friendship because all participants in this sample had at least one reciprocal friendship. This proposition is supported by findings from Harris and Orth (2020). Their study emphasizes the importance of friendship quality over quantity, demonstrating that a single reciprocal friendship can significantly contribute to an individual's self-esteem. This limitation in the study, where all participants had at least one reciprocal friendship, underscores the need for further exploration into the effects of having no reciprocal friendships compared to having at least one (Harris & Orth, 2020).

The finding that self-esteem is more strongly associated with the total number of friends a child nominates rather than the number of reciprocal friendships is substantiated by several studies. For example, Gifford-Smith and Brownell (2003) emphasize that the simple presence of friendships considerably contributes to a child's social competence and

adjustment. They argue that while reciprocal friendships are essential for specific prosocial behaviors and mitigating antisocial behaviors, a broader social network and the overall number of friends are critical for understanding social competence and self-esteem. This indicates that the overall number of friendships, regardless of whether they are reciprocal or not, plays a crucial role in a child's self-esteem and social adjustment. Moreover, Gifford-Smith and Brownell (2003) highlight that non-reciprocal friendships still provide substantial social and emotional support, suggesting these relationships are meaningful to children and positively contribute to their social experience.

The relationship we observed between the total number of friends and self-esteem is supported by other findings as well. Sveningsson (2013) explored the relationship between sociometric¹ and perceived popularity, depressive affect, and self-esteem among adolescents. The study found that sociometric popularity, which includes the total number of friends nominated by a child, directly influences self-esteem and depressive affect. This suggests that the number of nominations, rather than the quality of reciprocal friendships, is crucial in determining a child's self-esteem. Although sociometric popularity is associated with less conflict and more reciprocal friendships, the primary predictor of self-esteem remains the overall number of nominations (Sveningsson, 2013). Jackson and Bracken (1998) also identified a significant relationship between sociometric status (popularity measured by nominations) and self-esteem levels. Popular children, who receive many positive nominations, exhibit higher self-esteem compared to their peers, reinforcing the notion that the total number of friends is a more critical factor than reciprocal friendships in predicting self-esteem (Jackson & Bracken, 1998). Additionally, Harter & Bukowski, (2015) noted that high-status groups, those with a higher number of nominations, scored significantly higher on

¹ Sveningsson (2013) defines sociometric popularity through the nomination method, where participants nominate peers they like or dislike. This measurement reflects social competence, with higher sociometric popularity indicating more positive nominations. Sociometric popularity is associated with fewer conflicts and more friendships characterized by reciprocity, influencing self-esteem positively (Sveningsson, 2013).

self-esteem scales compared to low-status groups. This underscores the importance of the number of friends a child nominates in determining their self-esteem.

In conclusion, these findings collectively affirm that self-esteem may be more strongly associated with the total number of friends a child nominates rather than the number of reciprocal friendships. This is evidenced by the studies and analyses discussed, which highlight the critical role of peer nominations in the development of self-esteem. Research indicates that a higher number of friends can boost self-esteem due to broader social acceptance and a larger support network. For instance, studies have shown that peer acceptance and the number of mutual friends contribute uniquely to self-esteem, emphasizing the significance of social acceptance and broad peer networks over specific reciprocal friendships (Antonopoulou et al., 2019; Parker & Asher, 1993; Sletta et al., 1996). These findings suggest that the sheer number of social connections is a pivotal factor in enhancing self-esteem in children, supporting the idea that broader social engagement rather than the quality of a few reciprocal friendships plays a more crucial role in their psychosocial adjustment and self-perception.

9.2. Reciprocal friendships and age

For our second hypothesis, we expected that the relationship between self-esteem and reciprocal friendship quantity would be stronger in older children. Contrary to this hypothesis, however, age did not significantly moderate the relationship between self-esteem and the number of reciprocal friendships. We did however find that self-esteem was significantly lower in older children. In the following section, we explore our findings in greater depth.

One potential reason for the absence of a significant interaction could be the imprecise measurement of age, as we only had access to the average age per class rather than the exact ages of individual children due to a record keeping error. Obtaining precise ages, including

months, could have revealed a significant interaction between age and reciprocal friendships. Accurate age measurement is crucial when researching children due to their rapid developmental changes, as even a few months' difference can significantly impact various developmental aspects, including social development. The Institute of Medicine and National Research Council (2015) emphasize that early childhood development involves rapid and significant changes, where precise age data is essential for effectively tracking and understanding these changes. Furthermore, the limited age range of our sample (8 to 14 years) might have influenced the results. Including younger and older children might reveal significant changes in the relationship between self-esteem and reciprocal friendships.

Another possible explanation for our null findings may be due to our choice of cross-sectional research design. A longitudinal study design, which observes the same individuals over time, would be more effective in capturing these patterns than our cross-sectional design. Longitudinal studies, though more resource-intensive, prevent age differences from being confounded by individual differences.

Our finding that older children had lower self-esteem is supported by the comprehensive literature review provided, which explores the multifaceted nature of self-esteem development. Self-esteem undergoes significant transformations throughout our lifespan, influenced by various social and environmental factors. According to the literature, self-esteem tends to fluctuate during middle childhood and adolescence, often experiencing declines due to significant cognitive and social developments (Robins & Trzesniewski, 2005; Orth, Erol, & Luciano, 2018). During these stages, children start forming more complex social relationships and engage more in social comparisons. Robins and Trzesniewski (2005), Orth, Erol, and Luciano (2018), and Harter (2006) highlight that children acquire essential cognitive skills and begin to realistically assess themselves through external comparisons.

These comparisons can often lead to negative self-assessments, particularly if children perceive themselves as lacking compared to their peers. In other words, as children develop, they become more adept at comparing themselves to others. This increased ability to evaluate their competencies in relation to peers can negatively impact their self-esteem if they frequently perceive themselves as inferior (Magro et al., 2019; Rosenberg, 1979).

9.3. Gender in self-esteem and reciprocal friendships

Contrary to our third hypothesis, the anticipated stronger relationship between the number of reciprocal friendships and self-esteem in girls was not confirmed. Indeed, gender did not significantly moderate the relationship between self-esteem and reciprocal friendship quantity. The literature suggests that the quality of friendships, rather than their quantity, plays a more crucial role in influencing self-esteem, especially in terms of gender. Our focus on the number of reciprocal friendships may have overlooked important qualitative aspects, such as emotional support and validation, which are essential for self-esteem development (Schacter, Hoffman, & Ehrhardt, 2023; Alsarrani et al., 2022). The research consistently demonstrates that the self-esteem of girls who maintain high-quality friendships—those marked by emotional support, trust, and mutual understanding—is significantly higher compared to girls with numerous but lower-quality friendships. For instance, a systematic review found that the self-esteem of adolescent girls is greatly influenced by the quality rather than the quantity of their friendships. Girls who reported having high-quality friendships experienced greater emotional support and stability, which positively impacted their self-esteem and overall well-being (Alsarrani et al., 2022; Luijten, van de Bongardt, & Nieboer, 2023). High-quality friendships offer significant benefits for school-aged children, enhancing their emotional, social, and academic development. According to Wentzel, Jablansky, and Scalise (2018), these friendships are linked to better academic performance and cognitive skills due to the emotional and motivational support they provide. This support

helps children manage stress, improve social competence, and reduce feelings of loneliness and anxiety, which in turn boosts self-esteem and fosters a sense of belonging and validation, crucial for school engagement and academic success. Similarly, Parker and Asher (1993) found that high-quality friendships in middle childhood reduce loneliness and social dissatisfaction while promoting peer group acceptance. This acceptance is vital for emotional and social development, contributing to better interpersonal skills and higher satisfaction in social interactions.

Cultural and environmental factors specific to our sample, such as the social norms and educational contexts in Prague schools, could also have influenced friendship patterns, making it difficult to detect gender differences. Furthermore, existing research indicates that girls and boys engage in different types of social interactions. Girls are more likely to form intimate and emotionally supportive friendships, while boys often engage in shared activities (Rose & Rudolph, 2006). These qualitative differences in friendship dynamics might not be adequately captured by simply counting reciprocal friendships, thus masking any significant gender-based differences in the relationship between self-esteem and the number of reciprocal friendships.

In terms of gender differences in self-esteem, our findings align with extensive research showing that girls generally have lower self-esteem than boys during adolescence. Studies by Bolognini et al. (1996), Vaquera and Kao (2008), Kling et al. (1999), Robins et al. (2002), and Orth and Robins (2014) have consistently demonstrated these gender differences, which persist across the lifespan. This robust body of literature supports our findings on self-esteem development and underscores the need for future research to further explore these complex relationships. To address these issues, future studies should consider longitudinal designs to understand causal relationships better, incorporate qualitative measures to capture the depth of friendships and use larger, more diverse samples to improve the generalizability and power of

the findings. Additionally, examining the role of cultural, educational, and social contexts in shaping friendship patterns and self-esteem could provide deeper insights into these dynamics.

9.4. Additional complexities in the assessment of reciprocal friendships

Our failure to confirm the three hypotheses may be partly due to complexities inherent to assessing reciprocity in friendships. Gifford-Smith and Brownell (2003) comment that "The question of whether or not to require that friendship nominations be reciprocated provides a good example of the complexity involved since it is rooted in both conceptual and methodological issues" (p. 251).

One factor that complicates the assessment of reciprocal friendships is the fact that friendships often go through different phases, including formation, maintenance, and dissolution. During the maintenance phase, the level of reciprocity can fluctuate, and one friend might engage more actively than the other due to external demands or personal circumstances. This imbalance can lead to a perception of non-reciprocity despite the friendship remaining intact (Blieszner & Adams, 1992). Furthermore, many individuals have high expectations for reciprocity in friendships. However, research has found that nearly half of friendships are not mutual. Specifically, Almaatouq et al. (2016) discovered that only about 45-53% of friendships are reciprocated across various datasets, revealing a significant number of one-sided relationships. This often happens because people nominate others as friends in the hope of mutual acknowledgment, but this expectation is frequently unmet, especially in hierarchical social structures where individuals of higher status are less likely to reciprocate friendships offered by those of lower status. In summary, these factors could have impacted our findings. During the maintenance phase, fluctuating levels of engagement can create perceived non-reciprocity. Additionally, high expectations for reciprocity often contrast with the reality that many friendships are non-reciprocal. These dynamics, along with hierarchical social structures where higher-status individuals are less likely to reciprocate, could explain the study's findings.

Moreover, the method of measuring friendships may have significantly impacted the findings of this study. Self-reported data might not capture the full complexity of social interactions. Behavioral observations during interactive tasks could provide more accurate and less biased data, offering richer insights into children's social interactions (Spielberger, 2009). Considering the degree of friendship (e.g., best friends) rather than a binary measure of reciprocity might yield different results. By considering these factors and potentially integrating behavioral observations and longitudinal study designs, future research can provide a more nuanced understanding of the dynamics of reciprocal friendships among children.

10. Limitations

Several limitations of the research should be noted and improved upon in future research. First, this research was correlational, so we could not determine whether high self-esteem was conditional for creating reciprocal friendships or whether the amount of reciprocal friendships had a significant influence on a person's self-esteem. It is also possible that self-esteem and the number of reciprocal friendships are both consequences of another variable we did not account for. A better understanding of the causal direction between self-esteem and friendship reciprocity could be achieved by longitudinal studies to see whether the number of friendships at one point in time predicts later self-esteem and vice versa. This research design was not used here however since it required resources beyond what we had access to. Information about causality could also have been obtained through experiments; however, attempting to experimentally manipulate a child's self-esteem or the aspects of their friendships presented some ethical and feasibility challenges.

Methodological limitations of this investigation may have contributed to our failure to observe a significant age and gender differences in the relationship between self-esteem and the number of reciprocal friendships. As mentioned earlier, our imprecise measurement of age

and use of cross-sectional design may have prevented us from observing a significant interaction between age and the number of reciprocal friendships. In terms of gender differences in the relationship between self-esteem and the number of reciprocal friendships, our study design might not have fully captured the nuanced ways in which gender influenced these dynamics. Gender differences in socialization, friendship dynamics, and the perceived importance of friendships could have shaped how self-esteem was influenced by reciprocal friendships, yet our study might not have explicitly examined these aspects.

Indeed, research from the past two decades underscores the importance of a nuanced and non-binary analysis of gender in studies of socialization. Cross-gender friendships, for example, have been highlighted as significant for the practice and development of social interaction skills (Howes, 1988), as well as for navigating society's evolving gender roles and relationships (Maccoby, 1990; Smith & Inder, 1990). Additionally, studies have emphasized the role of gender as an important component of socialization (Thomas & Daubman, 2001).

Moving forward, it would be valuable for future research to delve deeper into the specific ways in which gender shaped the interplay between self-esteem and friendships. This could involve exploring gender-specific friendship patterns, examining how societal expectations influenced the formation and maintenance of friendships, and considering how gender norms impacted self-perceptions and social interactions. By acknowledging and addressing the complexities of gender differences and their interaction with age differences, future studies could provide a more comprehensive understanding of the factors influencing children's self-esteem and social development.

A further limitation of the research pertains to the choice of the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) as the primary measure for assessing self-esteem. While the RSES is a widely used instrument, its validity and reliability in younger children, particularly those within the age range of our study, might not have been firmly established. This raises

concerns about the accuracy of self-esteem measurement in this study, potentially leading to misinterpretations or an incomplete understanding of the relationship between self-esteem and reciprocal friendships. Moreover, the use of a more developmentally appropriate measure, such as the Beck Youth Inventories (Beck, Beck & Jolly, 2001), designed specifically for individuals aged 7 to 18 years, could have offered a clearer picture of the relationship between self-esteem and reciprocal friendships in our study population. Lastly, considering the magnitude of reciprocity and the context of friendships, both within and outside school, could provide a more comprehensive understanding of these relationships (Vaquera & Kao, 2008; Parker & Seal, 1996).

Another limitation concerned the lack of repeated observations. We only had the resources to examine each child's self-esteem and friendship status on a single occasion. Relationships and self-esteem are not always stable, however, and could fluctuate across time and situations. To gain more insight into this issue, longitudinal studies would have been better to track friendships under different conditions, possibly using multiple instruments for other aspects of these relationships, such as closeness, stability, or outcomes of cross-gender peer friendships for a particular gender.

This research was conducted in the context of school since it was where most children had the greatest opportunity to form relations with same-aged peers. We could not account for friendships that were reciprocal outside of school. The relationship between self-esteem and the number of reciprocal friendships may have been stronger if we considered friendships both inside and outside of the classroom, however, this would have required interviewing each child's entire network of peers which would have exceeded the resources available for this project.

A final limitation was that we did not consider the magnitude of reciprocity. For instance, person A and person B might both consider each other as friends, but person A might

feel much closer to person B than person B feels towards person A. Acquiring information on the magnitude of reciprocity would have required asking additional questions which we would not have had time to ask in this study. Future research should consider how reciprocal the friendship is—not just whether or not two children consider each other as friends. Limitations aside, this study aimed to provide important information about how children’s self-concept relates to a specific aspect of friendships, namely reciprocity across a wide range of ages.

11. Conclusion

In conclusion, this research aimed to investigate the relationship between the number of reciprocal friendships and self-esteem in children, as well as to explore how these friendships evolve as children grow older. We hypothesized that children with more reciprocal friendships would exhibit higher self-esteem and that this relationship would be stronger in older children, specifically that the relationship between the number of reciprocal friendships and self-esteem would be stronger in older children. Additionally, we examined potential gender differences in self-esteem and reciprocal friendships, hypothesizing that the association between the number of reciprocal friendships and gender will be stronger in girls. Contrary to our first hypothesis, the regression analysis revealed that the number of reciprocal friendships did not significantly predict self-esteem. However, our analysis indicated that children who named more friends (regardless of whether it was reciprocal) had significantly higher self-esteem. Regarding our second hypothesis, we found no significant interaction between age and the number of reciprocal friendships, but, in line with other studies, older children exhibited significantly lower self-esteem. Lastly, contrary to our third hypothesis, the relationship between self-esteem and the number of reciprocal friendships did not significantly differ between girls and boys. However, consistent with other research, self-esteem was significantly higher in males than in females.

These findings highlight the complex dynamics between social relationships and self-esteem in children, suggesting that while the quantity of reciprocal friendships may not directly predict self-esteem, the total number of friendships (reciprocal or not), in addition to individual characteristics such as age and gender play a critical role. Despite these findings, the study contributes to the existing body of knowledge by highlighting the complexities of the relationship between self-esteem and reciprocal friendships and the need for a more nuanced assessment of reciprocal friendships. The lack of significant association suggests that other factors may play a more crucial role in influencing self-esteem, such as overall social skills, the quality of friendships, and individual personality traits. The study also underscores the importance of considering a multifaceted approach when examining the determinants of self-esteem in children.

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Table 1*Descriptive Statistics of the Sample*

Class	Grade	N males	N females	N total	Average age	Number of nominated friends, M (SD)	Number of reciprocal friends, M (SD)	Self-esteem, M (SD)
2B	2	10	6	16	8	4.19 (2.37)	2.3 (1.35)	19.19 (3.6)
4A	4	9	12	21	9	3.33 (2.06)	1.71 (1.59)	16.16 (3.06)
4B	4	10	14	24	9	3.17 (1.47)	1.92 (1.21)	15.79 (2.3)
6B	6	8	9	17	12	4.12 (1.62)	2.71 (1.36)	12.94 (2.68)
7A	7	14	7	21	13	4.38 (2.06)	2.48 (1.63)	14.67 (4.62)
8A	8	8	8	16	14	6.06 (2.79)	4 (1.16)	14.56 (3.1)

Table 2*Results from the general linear model predicting self-esteem*

	Estimate	SE	<i>t</i>	<i>p</i>
Intercept	23.176	4.870	4.759	<.001
Gender (male-female)	2.257	0.648	3.483	<.001
Class size	-0.078	0,157	-0.499	.619
Number of nominated friends	0.412	0.190	2.174	.032
Number of reciprocal friendships	-0.290	0.276	-1.048	.297
Age	-0.763	0.194	-3.934	<.001

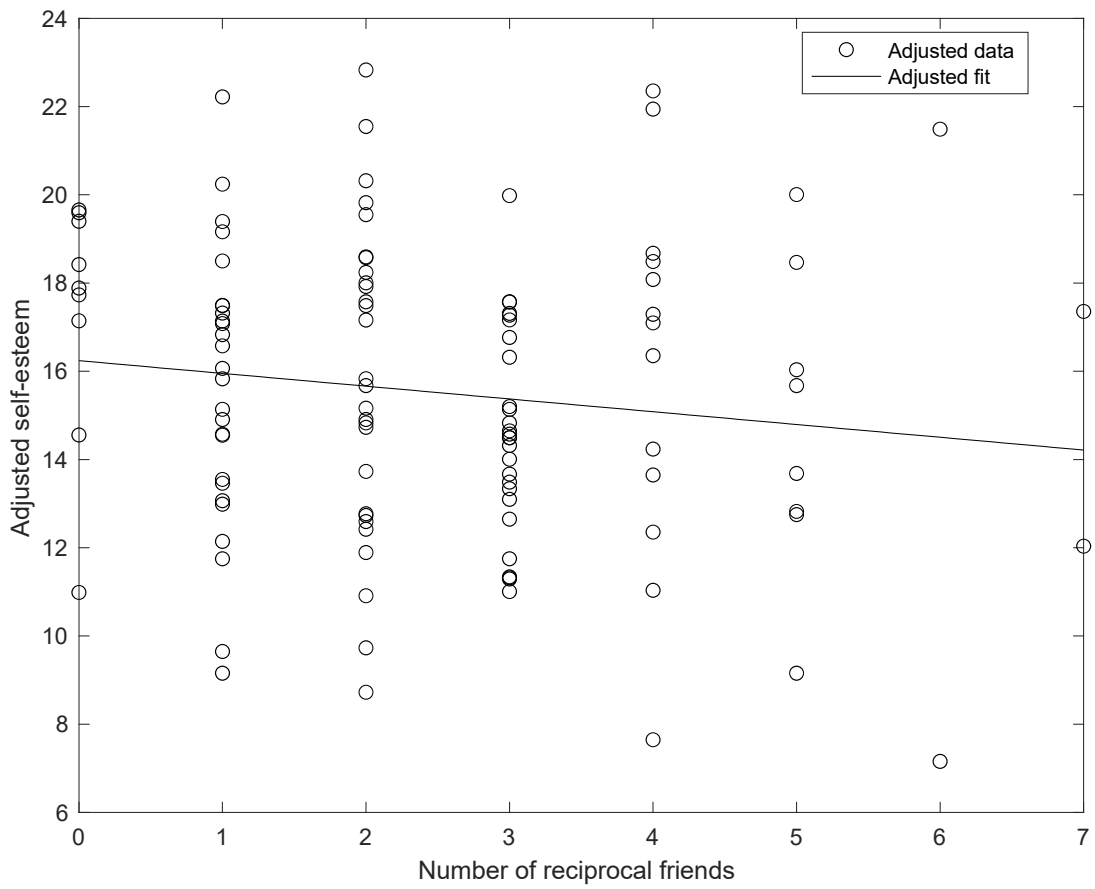


Figure 1 Adjusted response plot showing the effect of the number of reciprocal friends on self-esteem while controlling for gender, age, class size, and number of nominated friends (reciprocal and non-reciprocal). There was no significant association between self-esteem and number of reciprocal friends.

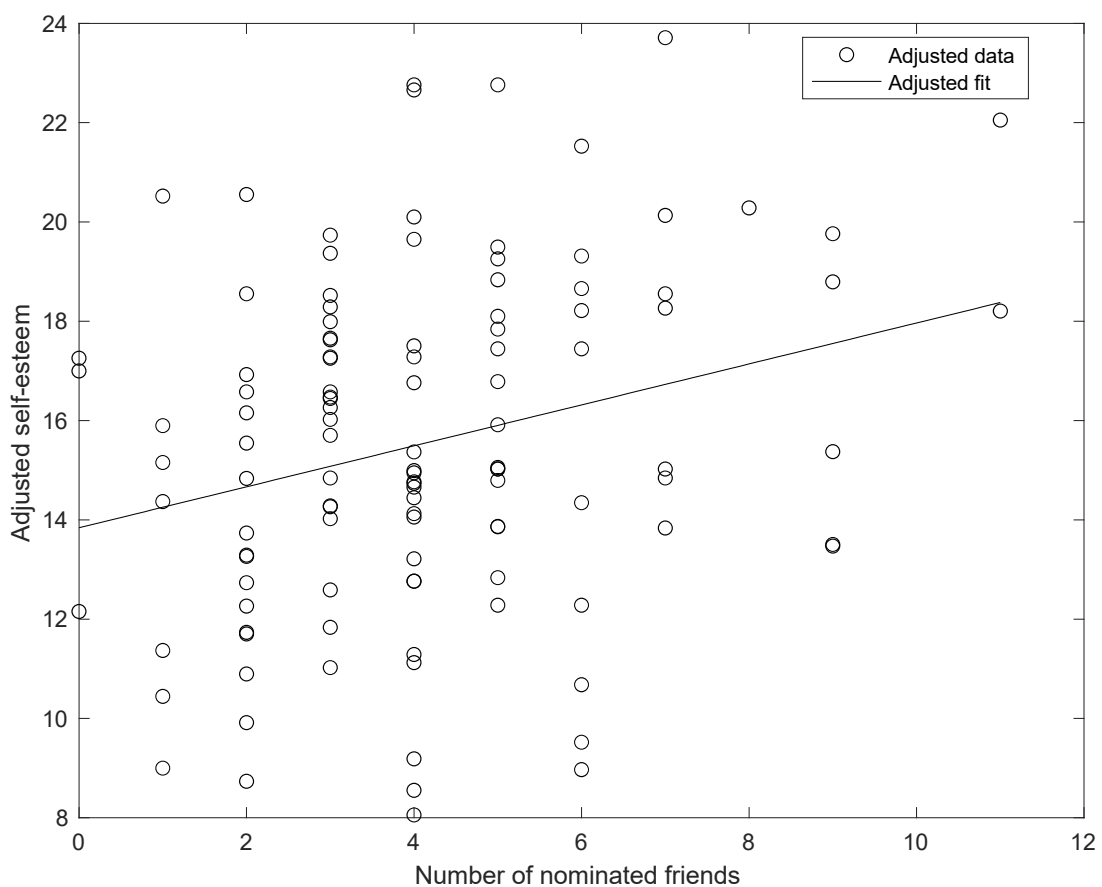


Figure 2 Adjusted response plot showing the effect of the number of nominated friends on self-esteem while controlling for gender, age, class size, and number of reciprocal friends. Children who nominated more friends exhibited significantly higher self-esteem.