



The Role of Perceived Parental Differential Treatment, Sibling Relationship, and Peer Relationships for Children With and Without Siblings in China

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Abstract

Sibling relationships play a crucial role in adolescent development, yet research on this topic within the Chinese context remains scarce, primarily due to China's long-lasting one-child policy. The unique cultural and historical factors in China suggest that insights from Western sibling studies may not be directly applicable, highlighting the need for studies focused specifically on Chinese sibling dynamics. This study aims to explore: (1) the impact of perceived paternal versus maternal differential treatment on the quality of sibling relationships among Chinese adolescents; (2) the influence of sibling relationship quality on peer relationships; and (3) differences in peer relationships between children with and without siblings.

A total of 516 Chinese primary school students were recruited for the study (aged 9-13, $M=11$ years and 8 months, $SD=0.71$, 51.9% boys), with 74.8% of them having siblings. Data were collected through quantitative questionnaires assessing perceived parental differential treatment, sibling relationship quality, and peer relationships. Participants without siblings were only assessed on peer relationships.

The findings revealed that perceived maternal favouritism was associated with greater sibling warmth and reduced sibling conflict, while higher levels of perceived differential treatment, whether from mothers or fathers, correlated with poorer sibling relationships, characterized by more sibling conflict and less sibling warmth. Furthermore, sibling warmth was positively and significantly related to the quality of peer relationships. Variations in these relationships were observed based on sibling-gender composition. Notably, there were no significant differences in peer relationships between children with and without siblings, nor were there gender differences.

This study offers critical insights into the influence of parental differential treatment on sibling and peer relationships among Chinese adolescents, emphasizing the importance of cultural context. These findings have practical implications for parents, educators, and policymakers aiming to foster family harmony and support adolescent development.

Keywords: Perceived Parental Differential Treatment, Sibling Relationship, Peer relationship, Chinese Adolescents

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Dissertation Structure

This dissertation will be structured into five parts. Chapter 1 is the Introduction, including the background of the current studies, theoretical frameworks, related previous studies, and research questions of the current study. Chapter 2 is the Methods, introducing the data collection materials and processes. Chapter 3 is the Results, presenting the analyses of the data. Chapter 4 is the Discussion, discussing the insights from the findings, their linkage to previous studies, limitations and future studies. Chapter 5 is the Conclusion. References and Appendices can be found after the main text.

Chapter 1: Introduction

This chapter contains background of the study (1.1), definition of terms (1.2), literature reviews for parental differential treatment and sibling relationships (1.3), literature reviews for siblings and peer relationships (1.4), comparisons on Western and Chinese studies (1.5), research gap (1.6) and current study (1.7) which contains research aim (1.7.1), model (1.7.2), and research questions (1.7.3).

1.1. Background of the Study

Sibling relationship is an important early relationship in children's development, and the existence of parental differential treatment (parents treating each child differently) can play a vital role in influencing sibling's warmth and conflict, causing children to compete for parents' attention (Szymańska, 2020). Children experience numerous social interactions both within their families and with peers outside the family. The connections between family life and interactions outside the family have received significant attention in both Western and Asian contexts, for example, supportive parental practices reduces the bad outcome of children's peer bullying (Healy et al., 2015), positive parent-child relationship are usually linked with children's positive peer relationships (L. Liu et al., 2020), and the sibling relationship quality may influence children's individual adjustments (Jensen & McHale, 2017). Specifically, sibling relationships are crucial for human development, as siblings are often the longest companions in a person's life (Chen B.-B. et al., 2017). Sibling relationships have a lasting impact on children's development, influencing internalising and externalising behaviours (Buist et al., 2017a), social and emotional development (Lockwood et al., 2001), educational outcomes (Yucel & Yuan, 2015), and more.

However, most research on sibling relationships has been conducted in Western countries, with few studies focusing on Asian collectivist cultures. In China, much of the research has concentrated on parent-child relationships rather than sibling relationships. This may be due to the one-child policy, which began in the 1970s and was fully lifted in 2016, limiting the number of siblings in many families. Therefore, the lack of sibling experiences leads to the lack of sibling research in mainland China. The policy was relaxed over time: in 2011, parents who were both only children could have a second child; in 2013, if one parent was an only child, they could have a second child (Feng et al., 2016). Since 2016, all couples were allowed to have a second child, and from 2019, they could have up to three children. According to the Chinese Statistical Bulletin on the Development of Health and Family Planning (National Institutes of Health, 2017, 2018, 2019, 2020, 2021, 2022), the proportion

of second-born children increased from 30% in 2013 to 45% in 2016 and has remained above 50% since 2018.

As more families in China now have multiple children, understanding sibling relationships and their impact on child development has become crucial. Western studies suggested that sibling relationship influences children's competence and problem behaviours (Buist & Vermande, 2014), adjustments (Richmond et al., 2005), and peer relationships (Yucel & Yuan, 2015), but we do not know whether similar influence and pattern about sibling relationship may also show in Chinese contexts. Under the situation of a lack of sibling relationships in China, and most current parents do not have siblings themselves, it is crucial for parents and educators to understand more about sibling relationship in order to help with their healthy relationship development. This includes exploring how family characteristics affect sibling relationships and how these relationships, in turn, influence various aspects of children's development. Additionally, comparing the development of children with and without siblings could be insightful for helping parents and educators adopt appropriate strategies.

1.2. Definition of Terms

1.2.1. Sibling Relationship Quality

Siblings play crucial roles within a family, and their relationships are as significant as those between parents and children (Furman & Buhrmester, 1985). Due to their unique close biological and social bonds, sibling relationships typically involve both positive emotions such as warmth and intimacy, and negative emotions like competition or conflict. In Western countries, sibling relationship quality is often measured by a combination of intimacy, conflict, competition, and power comparison (Furman & Buhrmester, 1985). However, cultural differences mean that in China, intimacy and conflict are more frequently used to assess sibling relationship quality (B.-B. Chen, 2023; Dai et al., 2021). In this paper, sibling relationship quality is defined as the level of intimacy and conflict between children who share the same mother and/or father and live together.

1.2.2. Peer Relationship Quality

Peer relationships refer to the connections between children of similar ages, including friends and classmates. The quality of these relationships is vital for children's social development and can influence their psychological adjustment and well-being (Parker et al., 2015), emotional development (Dishion & Tipsord, 2011), and academic achievement (Juvonen et al., 2012). This study will adopt a modern view of peer relationship quality,

considering factors such as intimacy, popularity, trust, and insightfulness (Aydođdu, 2021). However, different understandings may show up among different cultures even for the same factor, for example, Western cultures may emphasise emotional openness and personal sharing (Kito, 2005), while Eastern cultures might focus more on loyalty and long-term commitment in friendship (X. Chen et al., 2006).

1.2.3. Parental Differential Treatment

Parental differential treatment occurs in families with more than one child, where parents may treat each child differently due to various reasons. This treatment can involve differences in time spent, emotional support, or resource allocation, often favouring one child over another (Chen B.-B. et al., 2017). For example, one sibling might receive more attention and better treatment (Dai et al., 2021). In this paper, parental differential treatment is divided into paternal differential treatment and maternal differential treatment, defined as differences in parents' attitudes and behaviours toward each of their children.

1.2.4. Sibling-Gender Composition

Sibling-gender composition refers to the characteristics of sibling structure, including gender, birth order, and age gap (Buist & Vermande, 2014). This study will focus on the gender and birth order of siblings. The four types of compositions examined are: older sister-younger sister, older brother-younger brother, older sister-younger brother, and older brother-younger sister. This paper will not consider the relationships between more than two siblings.

1.3. Parental Differential Treatment and Sibling Relationships

The quality of children's sibling relationships is closely connected to parent-child interactions and the overall family environment (Brady & Stoneman, 1988). While parents can foster harmonious relationships among siblings, some of their behaviours can also have negative effects. A significant factor affecting sibling conflict is parental differential treatment; more intense sibling conflict is often associated with greater differences in treatment and fewer parental interventions (Brady & Stoneman, 1988). Recent meta-analyses have shown that parents tend to treat siblings differently based on factors such as gender, birth order, and age gap: generally, higher level of parental differential treatment showed up when siblings had big age gap or different sex (Jensen, Jorgensen-Wells, et al., 2023). Theories and previous research discussed below will focus on how parental differential treatment influences sibling relationships.

1.3.1. Theoretical Framework

1.3.1.1. Family Systems Theory. Family Systems Theory views the family as an

interconnected system, where each member is linked to the others, and the family functions as a whole entity (Bavelas & Segal, 1982; Cox & Paley, 2003). Each member, such as the father, mother, older sibling, or younger sibling, has distinct roles influenced by age, gender, and family expectations. For example, in some families, an older sibling may take on a caregiving role similar to a parent's role. Beyond individual roles, there are subsystems within the family, such as the parental subsystem (mother and father) and the sibling subsystem (siblings). Interactions within and between these subsystems can affect the overall balance of the family. For example, a meta-analysis showed that interparental relationships have positive relationships with sibling relationships, and positive interparental relationships tend to foster healthier sibling dynamics and better overall family functioning (Zemp et al., 2021). In families with two or more children, differential treatment by parents can disrupt the sibling balance, leading to tension and competition among siblings.

1.3.1.2. Social Comparison Theory. Social Comparison Theory suggests that individuals evaluate their social and personal worth based on comparisons with others (Suls et al., 2002). In the context of sibling relationships, children may assess their own standing by comparing how they are treated relative to their siblings. Parental favouritism can lead to "downward comparisons" for the favoured sibling, boosting their self-esteem and well-being. Conversely, less favoured siblings may engage in "upward comparisons," feeling inferior and experiencing negative impacts on their well-being (Jensen & McHale, 2017). These perceptions of differential treatment can influence siblings' view of sibling relationship quality. Siblings who perceive unfair treatment and less favouritism may report higher levels of conflict and lower levels of warmth in their sibling relationships, while those who feel more favoured may report the opposite (Jensen & McHale, 2017).

1.3.2. Western Studies

This section will consider studies from the global West. Problematic parenting styles, such as differential treatment of siblings, are linked to higher levels of sibling conflict and poorer sibling relationships among adolescents (Shanahan et al., 2008). In contrast, fair treatment of siblings promotes positive relationships (Derkman et al., 2011; Jensen, Killoren, et al., 2023).

Younger children, who spend more time within the family and with their siblings, show more noticeable and negative effects of parental differential treatment on their sibling relationships. Parental differential treatment can lead to young adolescents' feelings of jealousy and perceived unfairness, negatively affecting sibling relationship quality (Loeser et al., 2016). Adolescents who perceive themselves as favoured experience greater warmth and

less conflict with their parents (Jensen & McHale, 2017). Both paternal and maternal differential treatment, as well as the sibling's birth order, influence sibling relationships (Jensen, Jorgensen-Wells, et al., 2023). For Canadian's older adolescents, perceived maternal and paternal affection had a positive association with sibling warmth, and perceived maternal and paternal control was negatively correlated with sibling rivalry and conflict (Iftikhar & Sajjad, 2023). That is, feeling favoured from parents may lead the child to manage warmer relationship with siblings, and more parental control can reduce sibling conflict. For white, middle/working-class adolescents, older siblings' perceived warmth from mothers is associated with their reports of sibling warmth, while younger siblings' perceived conflict from parents correlates with their reports of sibling conflict (Shanahan et al., 2008). The author suggested that the reason might be that the older siblings have longer time with their mother due to the traditional caring role without siblings, therefore have more influence from mothers. Moreover, older children were expected not to have conflict with younger siblings, therefore their only way to show disappointment is to decrease sibling warmth. But younger siblings leading conflict is more acceptable.

Perceived parental differential treatment can lead not only to poorer sibling relationships but also to more external behavioural problems. For example, younger siblings who feel less favoured and experience poorer sibling relationships are more likely to exhibit delinquent behaviour during adolescence (Scholte et al., 2007). A longitudinal study spanning six years also found that less-favoured siblings, regardless of birth order, in middle childhood and early adolescence displayed increasing externalising behaviours (Richmond et al., 2005).

The presence and degree of parental differential treatment and the role of favouritism significantly influence sibling relationships (Jensen et al., 2013). Several studies have explored the impact of parental differential treatment on siblings. Both sibling warmth and conflict are linked to perceived parental favouritism (Finzi-Dottan & Cohen, 2010). Among U.S. undergraduates, higher levels of perceived parental differential treatment are associated with lower warmth in sibling relationships and more internalising symptoms (Ponappa et al., 2017). Similar findings were observed in Italian young adults, where perceptions of maternal and paternal partiality correlated with negative sibling relationships (Somantico et al., 2019). The Western literature show similar findings.

The direction of parental differential treatment—who is more favoured—also affects sibling relationship quality. For siblings who are less favoured, their perception of sibling intimacy is more strongly correlated with the extent of differential treatment (Jensen et al., 2013). Additionally, there are different effects of differential treatment depending on whether

it comes from mothers or fathers. Maternal differential treatment is associated with lower intimacy among young adult siblings, while paternal differential treatment has little impact (Jensen et al., 2013). However, the study found that both parental differential treatment influenced warmth and intimacy but did not significantly affect sibling conflict (Jensen et al., 2013).

The Western understanding of how differential treatment affects sibling relationships across different family dynamics provides a foundation for exploring these dynamics in Chinese families, where traditional values and modern influences intersect in unique ways.

1.3.3. Chinese Studies

Research on Parental Differential Treatment and sibling relationships began earlier in Western countries, about 20 years ago. In contrast, Chinese research in this area has only recently emerged, following the end of the one-child policy in 2016. Moreover, in order to involve both siblings in research, siblings should be old enough to answer questions.

Several studies have examined how parents influence sibling relationships in China. Sibling conflict can be reduced by positive maternal involvement such as guiding adolescents on how to interact effectively, while a more controlling style such as restricting sibling's daily interaction has a negative impact (B.-B. Chen, 2019). Treating siblings differently, seen as inappropriate guidance, is associated with increased sibling conflict. For example, Lam and colleagues (2021a) conducted a longitudinal study on children in late childhood in Hong Kong, examining the effects of maternal differential treatment and sibling-gender compositions on socioemotional competencies. Their findings indicated that the less-favoured child by the mother had lower socioemotional competencies after one year, and the sibling-gender compositions did not significantly moderate this relationship (Lam et al., 2021a). Although significant, this study had limitations: it focused solely on mothers' differential treatment and did not consider fathers' roles. Additionally, this study asked mothers to rate their warmth and conflict with each child, and teachers to rate children's emotion regulation and peer exclusion. While using a multi-informant design allowed for more objective data, children's perceptions of maternal differential treatment were not directly measured; only their empathy was assessed.

A recent study conducted in mainland China explored parental differential treatment and adolescent sibling relationships. This longitudinal study examined the relationships between the parent-parent subsystem (marital relationship and co-parenting), the parent-child subsystem (parental differential treatment), and the child-child subsystem (sibling relationship). Results showed that children perceived parental differential treatment was

negatively correlated with sibling intimacy and positively correlated with sibling conflict, highlighting the detrimental effects of treating siblings differently (B.-B. Chen, 2023). While significant, this study combined paternal and maternal differential treatment into a single variable and did not separately analyse their effects. Moreover, it did not account for the influence of sibling-gender composition, which is significant given the historical preference for boys over girls in Chinese culture (W. Wang, 2005). This preference might influence parental treatment of siblings, particularly in older sister-younger brother composition, where parents may treat siblings differently due to cultural biases favouring males. Additionally, only children tend to have closer relationships with their parents than those with siblings (Y. Liu & Jiang, 2021). Considering gender dynamics, girls often benefit more as only children, especially compared to those with younger brothers, because parents tend to favour younger children and especially younger brothers than older sisters (W. Wang, 2005). These cultural nuances make it essential to investigate how parental differential treatment affects perceived sibling relationships across different sibling-gender compositions in China.

Although there are some similarities between the Western and Eastern findings, significant differences rooted in history and culture prevent the direct transfer and application of Western conclusions to Eastern contexts. Exploring cultural values and attitudes regarding different sibling-gender compositions could provide interesting insights.

1.4. Siblings and Peer Relationship Quality

Peers play a crucial role in children's development and socialisation, especially during the transition to adolescence (X. Chen et al., 2005; Fry et al., 2021). Family relationships can significantly influence how children communicate with their peers, they can either hinder or support peer relationships (Fry et al., 2021). The social skills used in peer relationships are often more closely related to those developed in sibling relationships than those in parent-child relationships due to children needing to develop skills to interact with other children, not just adults (Lam et al., 2021b). Additionally, the number of only children in China remains significant. Although there is no exact number of how many only child families and multi-child families there are now in China, we can infer from the statistics in 2022 that about half of the new-borns were second or third child, and half of them were only child (National Institutes of Health, 2022), the number of only children families is still significant. Having better knowledge of the relationship between siblingship and peer relationship can help with the social education in schools. Therefore, it is crucial to study and compare the development and experiences of children with and without siblings. Siblings may have varied family

experiences, such as different parenting patterns, gender combinations, and age differences, which can influence their social relationships (Chen B.-B. et al., 2017).

1.4.1. Theoretical Framework

1.4.1.1. Ecological System Theory. According to the Ecological System Theory, children interact with multiple systems beyond the family system, such as school and community (Bronfenbrenner, 1986). These systems are interconnected, and experiences within the family system can affect behaviours in other settings and vice versa. Dysfunctional family dynamics, such as those caused by parental differential treatment, may lead children with siblings to seek stability and acceptance in peer groups. Differences in family dynamics between only children and those with siblings can also influence how children relate to their peers (Downey & Condrón, 2004). Consequently, siblingship and the presence of parental differential treatment can shape children's peer relationships.

1.4.1.2. Social Learning Theory. Social Learning Theory, proposed by Albert Bandura, posits that children acquire behaviours, social skills, and norms through observation and imitation, especially from those in close relationships like siblings (Bandura, 1985). Siblings provide a unique environment for learning social interactions, conflict resolution, and cooperative behaviours, which can impact how children interact with their peers. Given their proximity and frequent interactions, siblings serve as powerful role models. For instance, when older siblings demonstrate prosocial behaviours such as sharing and empathy, younger siblings are likely to imitate these behaviours, enhancing their social competence (McHale et al., 2012). Research also shows that positive sibling relationships are associated with better social skills and fewer behavioural problems in children. One study demonstrated that siblings who engage in cooperative play and resolve conflicts constructively tend to have more positive interactions with friends and classmates (Kramer & Kowal, 2005). Therefore, under the framework of social learning theory, the quality of sibling relationships can significantly influence children's peer relationships.

1.4.2. Western Studies

Western studies have established a strong link between the quality of sibling relationships and children's and adolescents' peer relationships. Positive sibling relationships, characterised by warmth, are associated with better peer relationships, while sibling conflict is linked to negative peer outcomes (Lockwood et al., 2001). Sibling relationships also relate to social competence (Stormshak et al., 1996).

A study conducted among Dutch children in late childhood and early adolescence used self-reports to measure sibling relationship quality (Buist et al., 2017a). It found that children

with high warmth and low conflict in their sibling relationships exhibited better peer social competence than those with low warmth and low conflict. Additionally, children who experienced both high warmth and high conflict in sibling relationships also showed better peer social competence than those with low warmth and low conflict. The study highlighted the importance of sibling warmth in promoting good social competence and better peer relationships. Sibling gender composition also influenced relationship quality, with most sister pairs showing high warmth and low conflict, whereas siblings with older brothers experienced high conflict and low warmth (Buist & Vermande, 2014). Cross-cultural comparisons revealed that Indian early adolescents reported more sibling warmth than their Dutch counterparts (Buist et al., 2017a). One possible reason can be that Indian is a more collectivistic culture while Dutch is a more individualistic one. The collectivist culture emphasised more on the harmony in social relationships, and the harmony also showed up in sibling relationships, that children tend to mark their relationship as higher level of warmth.

Sibling relationships can act as social support, buffering adolescents against maladaptive peer relationships and externalising behaviours. This buffering effect varies by birth order. A longitudinal study in the U.S. found that warmth from older sisters served as a buffer against social problems and external behaviours for younger sisters, but warmth from younger sisters did not provide the same benefit for older sisters (Fry et al., 2021). The study used objective observations to measure sibling warmth and self-reports to assess social problems, which might not fully capture the participants' subjective views of their relationships. Even if a participant showed warm behaviours towards siblings, they might still perceive the relationship as more conflictual, which could affect the buffering effect.

Moreover, Fry's study (Fry et al., 2021) focused exclusively on female sibling pairs, but the sibling-gender compositions may influence perceived warmth and conflict. Higher levels of conflict have been reported in female-female sibling pairs compared to male-male pairs (Doron & Sharabi-Nov, 2016). However, sisters also tend to form closer, warmer relationships (Barroso, 2011; Riggio, 2004), possibly due to more sensitive perceptions. Considering the variation in sibling relationships among different gender compositions, their impact on peer relationships is worth exploring. Since most studies were conducted in Western countries, Chinese different cultural expectations about gender (e.g., expect boys to be more responsible; prefer boys than girls etc. (W. Wang, 2005)) may also affect how sibling relationships influence peer relationships.

A critical review concluded that supportive and warm sibling relationships are linked to better social skills, more peer competence, and generally better peer relationships, although

the impact of sibling conflict on peer relationships remains unclear (Jensen, Killoren, et al., 2023). This is an area for further exploration in the current study. Furthermore, different family structures can lead to varied peer relationship qualities. Previous studies suggested that having a sibling is beneficial for social development. One Western study analysed about 20,000 kindergarten children, and they found that children with siblings were more likely to be rated by teachers as having better social skills and better peer relationship than their only-child peers (Downey & Condrón, 2004). A UK study showed that the quality of sibling relationships, rather than simply having siblings, influences peer relationships. Only having siblings is insufficient; a good quality and warm relationship with a sibling enhances social skills (Yucel & Downey, 2015). A U.S. study examined the impact of having a sibling or being an only child on children's perspective-taking and social skills. It found that girls benefited more from being an only child in terms of perspective-taking than those with brothers, while boys with brothers had better perspective-taking abilities. Additionally, the study observed that children with a younger sister had better social skills than only children (Sang & Nelson, 2017).

1.4.3. Chinese Studies

Chinese studies on the relationship between sibling dynamics and peer interactions are limited. For young Chinese children, the first-born child's perception of their sibling relationship is linked to their behavioural outcomes: a positive perception of the sibling relationship is significantly associated with the first-born's prosocial behaviours and leads to more harmonious peer relationships (Yin et al., 2019). Lam and colleagues (2021b) conducted a longitudinal study on the associations between sibling and peer relationships in Hong Kong children. They found that sibling warmth predicted better prosocial and communication skills after one year, while sibling conflict predicted more peer exclusion, particularly for younger brothers. However, similar to Lam's previous study, peer relationships were assessed by teachers rather than the children themselves, and the factors measuring peer relationships differed from those used in this study, which are based on a more recent model (Lam et al., 2021b).

While it is commonly believed that only children may lack social skills compared to those with siblings, an intriguing longitudinal study found that only children were more likely to have conventional friends—positive peers or "good students" by social norms—than children with siblings (R. X. Liu et al., 2010). Additionally, only children performed better academically than their peers with siblings. The researchers suggested that these differences might stem from parental influence and involvement. This study indicates that differences in

family structure can affect social relationships and academic outcomes. However, there is a scarcity of research focusing on these aspects. Therefore, comparing the social and academic outcomes of Chinese only children and children with siblings may yield interesting results.

1.5. Comparisons on Western and Chinese Studies

Between parental differential treatment and sibling relationship, Western studies suggested that higher levels of perceived parental differential treatment are associated with only lower warmth (Ponappa et al., 2017), and specifically, maternal differential treatment is associated with lower sibling intimacy (Jensen et al., 2013), while Chinese studies showed that perceived parental differential treatment was negatively correlated with sibling intimacy and positively correlated with sibling conflict (B.-B. Chen, 2023). Western studies also brought out that being favoured by the father or mother may lead to only higher sibling warmth (Iftikhar & Sajjad, 2023).

For the relationship between sibling relationship and peer relationship, studies from both Western countries and China showed that higher sibling warmth is linked to better peer relationships, with no significant relationship between sibling conflict and peer relationship (Barroso, 2011; Buist et al., 2017a; Buist & Vermande, 2014; Lam et al., 2021b). However, Western studies showed that older sisters expressing more warmth to the younger sisters might help with the social development of the younger one (Fry et al., 2021), which is different from what Chinese study found: older siblings' perception of sibling relationship may be related to the older siblings' peer relationship (Yin et al., 2019). The results on the influence of siblingship on peer relationships were mixed in Western countries, and there is a lack of research on this topic in China. One Western study showed that having siblings is associated with better peer relationships compared to being an only child (Downey & Condrón, 2004), while another suggested that it was the quality of sibling relationship rather than the quantity of siblings that matters (Yucel & Downey, 2015).

To briefly conclude, China has relatively few studies related to siblings compared to Western countries, especially lacking those comparing development and relationship quality among children with siblings and as only children. Moreover, although the general findings are similar, Chinese studies lack investment focusing on different sibling-gender composition, and need further explorations.

1.6. Research Gaps

A key finding from the literature review is that many Western studies on sibling

relationships were conducted before 2010, indicating an early development in this research field. In contrast, Chinese studies on similar topics have only emerged in the past five years. Moreover, it may not be possible to directly transfer what we know from Western studies onto Chinese families and siblings due to cultural differences (e.g., Chinese culture of preference on boys than girls (W. Wang, 2005)). Therefore, research is needed to explore sibling research with Chinese samples. Since the end of the one-child policy in mainland China in 2016, there has been a growing focus on Chinese sibling relationships and related factors (B.-B. Chen, 2019; Chen B.-B. et al., 2017). While a few studies have been conducted in Hong Kong (e.g., Lam et al., 2021b, 2021a), cultural and political differences between Hong Kong and mainland China, under the “one country, two systems” policy, mean that findings may not be directly comparable, especially as having siblings becomes more common among Chinese students.

However, recent studies in mainland China have several limitations:

(1) Focus on Parents as a Whole: Most research examines parents as a unit and does not separate the influences of mothers and fathers. This trend is also observed in Western studies, where the focus is primarily on mothers' parenting and mother-child relationships, often overlooking the role of fathers in sibling relationships. Some studies have only investigated the impact of mothers' differential treatment on children, neglecting the significant influence fathers can have on children's development (Chen B.-B. et al., 2017). However, children perceived father's favouritism can lead to increased sibling rivalry and conflict, the influence might be different from mothers and need investigating (Ripoll-Núñez & Carrillo, 2014).

(2) Lack of Focus on Sibling-Gender Compositions: Many studies do not consider the impact of sibling-gender combinations. The traditional preference for males over females is prevalent in China (J. Li, 2012). As a result, cross-gender sibling combinations, such as "older brother-younger sister" and "older sister-younger brother," might experience poorer sibling relationships. One study found that boys are more likely to be the only child than girls, reflecting Chinese parents' differing preferences for sons and daughters. If the firstborn is a girl, parents often desire a son next; if the firstborn is a boy, they are more likely to be content with just one child (R. X. Liu et al., 2010).

(3) Limited Research on Only Children vs. Children with Siblings: There is a lack of recent research comparing only children to those with siblings, especially given the rapid increase in families with multiple children. Understanding the differences in how these children interact with peers can provide valuable insights for developing school peer support systems.

1.7. Present Study

1.7.1. Research Aims

This study aimed to address the identified research gaps by examining: 1) the influence of paternal versus maternal perceived differential treatment on the quality of sibling relationships among Chinese adolescents; 2) how the quality of sibling relationships affects peer relationships among Chinese adolescents; 3) differences in peer relationships between children with and without siblings. Understanding the interplay between parental differential treatment, sibling relationships, and peer relationships can help develop interventions to promote family harmony and enhance child development.

1.7.2. Model

Model used in the present study is presented in Figure 1. This model explores the impact of differential parental treatment (both maternal and paternal) on sibling relationship quality, the subsequent influence of sibling relationship quality on peer relationship quality, and the difference in peer relationship quality between individuals with siblings and only children.

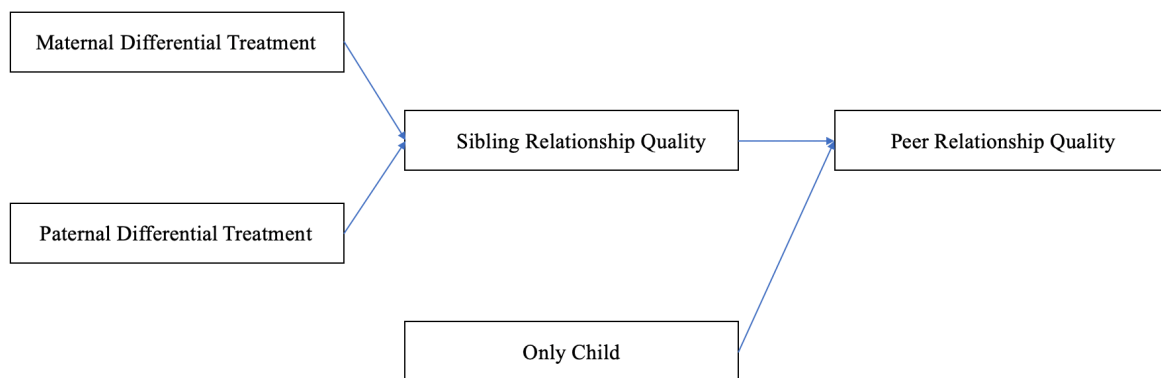


Figure 1. Parental Differential Treatment-Sibling Relationship Quality-Peer Relationship Model

1.7.3. Research Questions

Below are three research questions, and where it is appropriate based on the literature, hypotheses have been included.

Question (1): Do perceived maternal and paternal differential treatments relate to sibling relationship quality in young adolescents in mainland China? And are there any differences due to sibling-gender compositions?

Hypothesis 1: Maternal differential treatment is positively related to sibling conflict.

Hypothesis 2: Maternal differential treatment is negatively related to sibling warmth.

Hypothesis 3: Paternal differential treatment is positively related to sibling conflict.

Hypothesis 4: Paternal differential treatment is negatively related to sibling warmth.

Hypothesis 5: Sibling-gender compositions influence the relationship between maternal/paternal differential treatment and sibling relationship quality, but the influence remains exploratory.

Question (2): Is sibling relationship quality related to peer relationship quality? And are there any differences due to sibling-gender compositions?

Hypothesis 1: Sibling warmth is positively related to high peer relationship quality.

Hypothesis 2: Sibling conflict is positively related to low peer relationship quality.

Hypothesis 3: Sibling-gender compositions influence the relationship between sibling relationship quality and peer relationship quality, but the influence remains exploratory.

Question (3): Is there a difference in peer relationships between children with siblings and children without siblings? Is there a gender difference?

Chapter 2: Methods

In this chapter, an overview of methodologies used to solve the research question is provided. The design of the study (2.1) is in the first part, followed by participants (2.2) and the materials used (2.3). Three materials are discussed separately. After this, the procedure (2.4) and ethical approval (2.5) are talked about. In the final parts of this chapter, the data analysis plan (2.6), including statistical analysis and missing data analysis, is discussed.

2.1. Design

This study used a cross-sectional design. Data were collected in April 2024. Since this study wanted to look at the associations and relationships between each variable and not attempt to predict anything, a cross-sectional design is suitable (Hunziker & Blankenagel, 2024). Since all variables (age, sibling type, parental differential treatment, sibling relationship, peer relationship) have been quantified in previous research (Aydoğdu, 2021; Furman & Buhrmester, 1985), it is more convenient to use quantitative design to gain an overview of the research questions (Ahmad et al., 2019). Moreover, I want to understand the generalisable associations through larger numbers of participants, which is more suitable for quantitative design. After finding the broad association, qualitative design can be used in future work to explore specific findings in more depth with fewer participants.

2.2. Participants

2.2.1 Power Analysis

The number of participants was decided based on previous studies and power calculations. Participants of previous studies focusing on related topics ranged from 100-1000 people, most of which included 200-300 people (Buist et al., 2017b; B.-B. Chen, 2019; L. Liu et al., 2020). When recruiting the participants, their sex and siblingship were not controlled, and all the results were based on the natural population in that school.

Correlation and two-way ANOVA will be used in the study. Previous research has shown that the effect sizes range from small to medium (Lam et al., 2021a). G*Power was used to calculate power and sample size. All α level was set at 0.05 and power at 80%. For correlation, when the null hypothesis was set as 0 correlation, the estimated sample size is from 782 down to 84 when the effect size ranges from 0.1 to 0.3. For two-way ANOVA, when df was 1 (gender*siblingship) and the number of groups was 4, the participants' number ranged from 125 (medium partial eta squared: 0.06) to 387 (large partial eta squared: 0.02). When df was 3 (gender*sibling type) and the number of groups was 8, the participants'

number ranged from 175 (medium partial eta squared: 0.06) to 539 (large partial eta squared: 0.02). Therefore, the overall acceptable sample size was set at 175 to 387.

2.2.2. Sampling Method and Recruitment

Convenience sampling was used in this study and the researcher asked whether the school she knew wanted to take part in (Etikan, 2017). Participants were recruited via one Chinese primary school in Shenzhen, Guangdong province, southern China. There are 6 grades in the school and 5 classes for each grade. Each class has about 50-55 students. All students in year 5 and year 6 were invited to participate in this study, and a total of 516 students participated with valid responses.

2.2.3 Participants Demographic Characteristics

A total of 516 students in year 5 (age 9-11, $n = 206$) and year 6 (age 12-13, $n = 308$) participated in this study. Participants included 268 boys (51.9%) and 248 girls (48.1%). The participants' ages ranged from 9 to 13, with only 1 student aged 9 and 41 students aged 13. Two participants' ages were not disclosed. The mean age was 11 years and 8 months ($SD = 0.71$). A total of 74.8% of students had siblings. There were 4 types of sibling-gender compositions: older sister-younger sister (23.1%), older sister-younger brother (30.3%), older brother-younger sister (24.6%), and older brother-younger brother (22.0%). Participants' siblings' ages ranged from 1 to 33 years old, with the age gap ranging from 1 to 21 years. A total of 94.3% of participants with siblings had an age gap of less than 10 years.

2.3. Materials

2.3.1. Demographic Information

Participants' age (years), sex (girl or boy), and siblingship (whether they have siblings) were collected as demographic information. For those students with siblings, siblings' age (years) and type (e.g., older sister, older brother, younger sister, younger brother) were also asked. If the participant has several siblings, the participant was asked to report only on the sibling closest in age to them. The definition of age is different in different parts of China; some are biological age, while some include the belly age (child is 1-year old right after birth) (Zhou, 2017). Moreover, since this study does not focus on students' accurate age, the age was only collected in years, not months. To avoid the different calculation of age, age in this study was defined as the number of the birth year subtracted from the current year. Participants' names were not collected in the study.

2.3.2. Sibling Relationship Questionnaire (Student Version)

The original version of the Sibling Relationship Questionnaire was developed in 1985

(Furman & Buhrmester, 1985) and was translated and adapted to the Chinese version of the Sibling Relationship Questionnaire (Student Version) in 2021 (Dai et al., 2021). Participants were asked to answer questions about their relationship with siblings in the last three months. If the participant has more than one sibling, they selected the sibling closest to their age as the target sibling. If the participant did not have a sibling, they skipped this questionnaire.

It was designed for students from year 3 to year 12. The original version had four factors: 1. intimacy (warmth/closeness), 2. conflict, 3. competition, and 4. power comparison. It contained 48 items, with 21 items in intimacy, 9 items in conflict, 6 in competition, and 12 in power comparison. However, in the adaptation of the questionnaire for the Chinese adolescent population, three factors (1. intimacy (warmth/closeness), 2. conflict, and 3. competition) and the same amounts of items of each factor remained in the Chinese version of the Sibling Relationship Questionnaire (Student Version) and one factor (power comparison) was deleted due to the overlapping with other factors by exploratory factor analysis and confirmatory factor analysis (Dai et al., 2021). Similar results were shown in the German and Greek versions of this questionnaire with different adaptation strategies (Bojanowski et al., 2015; O'Neill et al., 2015).

In terms of the remaining factors, intimacy contains 21 items (e.g., “How many things do you like in common?” “Some siblings really care about each other, whereas others don’t care that much. How much do you care about each other?”), conflict contains 9 items (e.g., “How often did you disagree and argue?” “How many times have you been mean to each other?”), and competition contains 2 subdimensions (father differential treatment and mother differential treatment) with 3 items in each subdimension (e.g., “Who gets more attention from mom/dad, you or this sibling?” “Who does mom/dad usually treat better, you or this sibling?”). Each factor can be used individually, referring to the scale developer (Furman & Buhrmester, 1985). In the current study, the first two factors of the questionnaire, intimacy (21-items) and conflict (9-items), were used to test sibling relationship quality, while the questionnaire of the third factor, competition (6-items), was used to investigate the students’ maternal and paternal differential treatment, separating the 2 subdimensions. Please see Appendix A for the questionnaire used.

For factors of intimacy and conflict, they used a 5-point Likert scale (1 = “hardly at all,” 2 = “relatively few,” 3 = “sometime,” 4 = “relatively many,” and 5 = “extremely much”). The final score for these two factors was calculated using the average of all the items in the factor, and the final averaged score for each participant ranged from 1 to 5. The higher the score, the more intimate the students are or the more conflict they have with their siblings. While for

the competition scale, a 5-point Likert scale was also used with different content (1 = “Almost always him/her [favoured],” 2 = “Often him/her [favoured],” 3 = “About the same,” 4 = “Often me [favoured],” and 5 = “Almost always me [favoured]”). Two calculation methods were used in the current study. The first method is used to calculate the parental differential treatment magnitude (whether the paternal/maternal differential treatment exists and the extent of it) (Dai et al., 2021; Furman & Buhrmester, 1985). The raw score 3 (“About the same”) was recoded as 0, meaning no paternal/maternal differential treatment or a low level of paternal/maternal differential treatment. The raw score 2 (“Often him/her [favoured]”) and 4 (“Often me [favoured]”) were recoded as 1, meaning a medium level of paternal/maternal differential treatment. The raw score 1 (“Almost always him/her [favoured]”) and 5 (“Almost always me [favoured]”) were recoded as 2, meaning a high level of paternal/maternal differential treatment. The final averaged score for each participant ranged from 0 to 2. A lower final score means less differential treatment, and a higher score means more differential treatment. The second method is used to calculate the parental differential treatment direction (who (the participant or the sibling) was favoured more by the father/ mother). This calculation method averaged all the scores, and the final score ranged from 1 to 5. A higher score means the participant is favoured more, while a lower means the sibling is favoured more.

In the current study, Cronbach's α is 0.95, 0.90, 0.77 for factors of intimacy, conflict, and competition.

2.3.3. Peer Relationship Scale

2.3.3.1. Original Scale. The peer relationship scale was developed in Turkey in order to follow the new perspective of peer relationships (Aydođdu, 2021). A total of 29 items were included, and there was an uneven number of items for different factors. The peer relationship scale includes 4 factors: 1. intimacy (13 items, e.g., “I share my happiness and joys with my friends.” “I feel safe when I am with my friends.”), 2. popularity (4 items, e.g., “Other children also want to be friends with me.” “Making friends is easy for me.”), 3. trust (7 items, e.g., “My friends trust me.” “I do not share my friends' secrets with anyone.”), and 4. insightfulness (5 items, e.g., “When my friends get angry with me, I calm them down.” “I like the warnings of my friends for my good.”). The scale adopted a 5-point Likert scale (1 = “strongly disagree,” 3 = “undecided,” 5 = “completely agree”). The factor score was calculated by averaging all the items in that factor, ranging from 1 to 5. The final score of the peer relationship was calculated by averaging 4 factor scores, ranging from 1 to 5. A higher score means better peer relationship quality, while a lower score means poorer peer

relationship quality. Cronbach's α for the current study is 0.93 and ranges from 0.77 to 0.89 for four factors. Due to the dense typography of this scale, one attention check question was asserted in the middle of this scale: If you are carefully filling in this scale, please choose “Strongly Agree.” Please see Appendix A for the questionnaire used.

2.3.3.2. Pilot Study. This scale had not been translated into Chinese before, so the researcher translated it based on the standard guideline: Beaton’s guidelines (Beaton et al., 2000). First, two Oxford graduate bilingual students were invited to translate this scale into Chinese. Second, the two researchers synthesised their translations and resolved any discrepancies through discussions. Third, two other Oxford graduate bilingual students were invited to back-translate the synthesised Chinese version into English to check initial translation accuracy. Finally, the researcher and the supervisor previewed all the translated versions, which produced a pre-final version of the Chinese translation. Finally, we pretested the pre-final version among 30 participants to assess their understandability of the scale using a 5-point Likert scale, from 1 (I don’t understand this item at all/this item is very unclear) to 5 (I totally understand this item very much/this item is very clear). The mean score of all items is 4.87 (SD=0.35). Based on their feedback that all of the participants clearly understood the items, no modifications were needed. Thus, the prefinal version was used in the present study.

2.4. Procedure

Invitation emails were first sent to the head teachers of two schools known to the researcher. One head teacher consented to her school taking part and did not request an additional ethical review from China. All forms and correspondence were in Chinese, but English versions can be found in the Appendix. The paper information sheet for the head teacher was sent to the head teacher in the participating school, and the paper informed consent was signed after the ethical approval. Then, a digital information sheet for parents and an opt-out form were sent to the parents via school. The digital version form was used here due to concerns about convenience. Parents could opt out their children any time before the start of data collection (at least 2 weeks after they received the information letter). The opt-out forms were given back to the teachers and not returned to the researcher. Students were given their own information sheet and the assent form before the questionnaires.

All year 5 and year 6 students (10 classes in total) whose parents did not opt them out were invited to join this research. The study was conducted class by class in a classroom-based setting during the psychology classes, with the help of a psychology teacher in the

school. During the process, the classrooms were kept quiet so that participants could concentrate. All materials used for students were in paper format since the school lacked equipment for all students to do digital questionnaires, and paper forms were more familiar to the students. The study was first introduced by the researcher to the students, and then paper information sheets and paper questionnaires were sent to the students. Students were given 30 minutes to answer all the questions. Most of them finished within 20 minutes and all students completed within 30 minutes. Students who have siblings were asked to complete both the sibling relationship questionnaire and the peer relationship scale, while students without siblings were asked not to complete the sibling relationship questionnaire and complete only the peer relationship scale. The researcher and the psychology teacher were around to explain the wording of the questionnaires, if needed. There was enough gap between each desk to prevent students from looking at others' questionnaires and the students who finished the questionnaires first were asked to do some personal stuff quietly (e.g., finish homework) and not disturb other students. After all the students completed the questionnaires, the questionnaires were collected one by one by the researcher and the psychology teacher to maintain privacy. The questionnaires did not contain participant names and were therefore fully anonymised. Then, one 10-minute short video related to psychology knowledge was played in the classroom by the psychology teacher as a small gift of participating in the study. The data collection period lasted for two weeks.

2.5. Ethics

Researchers need to conduct the research ethically (Head, 2020). This study was approved by the Social Sciences and Humanities Interdivisional Research Ethics Committee (SSH IDREC) at the University of Oxford (Research ethics reference: R92584/RE001) on 3rd April (see Appendix B). CUREC form 2 was used to obtain the approval and CUREC approved procedure 25 (Non-invasive research methods with children recruited via an organisation) was followed with the exception of using an opt-out consent process.

Parents were all informed about the study and had the right to opt their child out before the data collection. Four students opted out based on the teachers' report and were not present in the data collection class. Students had the right not to assent and were allowed to stop taking part at any time before the collection of questionnaires. No identifiable data from the students (e.g., unique participant number, name, date of birth) were collected or shown in the research. Because all data were anonymised, participants (or their parents) could not withdraw after the submission of the questionnaires. After the data collection, all the paper

versions of the data were inputted into an electronic form whilst in China. The electronic data were safely stored in a password-protected file in the researcher's locked computer (on Nexus365 OneDrive for Business). The paper copies were securely destroyed.

2.6. Data Analysis

2.6.1. Statistical Analysis

IBM SPSS Statistics 29 was used to analyse the data (IBM Corp, 2023). First, descriptive analyses were conducted to see the frequency and percentage of sex, siblingship, and sibling type. The mean and standard deviation of the age of participants and their siblings were also shown. All descriptive data can be found in tables in the Results section. Second, correlation analyses were run to look for any relationships between maternal differential treatments, paternal differential treatments, sibling relationships, and peer relationships in participants with siblings. These correlational analyses were then split by sibling-gender-composition (gender*sibling types). Finally, a two-way ANOVA would be used to see whether there was a difference in peer relationships between participants of different genders and siblingships. Assumptions check tests were run before all analyses. All the analyses are defined as statistically significant by $p < 0.05$ (Franks & Huck, 1986).

2.6.2. Missing Data

Six students handed in the questionnaires with only demographic information filled in: those were deleted from the final results. For demographic information, data was missing only for the questions asking participants' ages and their siblings' ages. The analyses were conducted using a listwise function in SPSS to remove participants without this information if the analyses were age-related. The final scores for questionnaires were calculated by re-averaging the score based on the number of responses. However, if up to 30% of questions in a questionnaire were missing for a participant, the child was excluded from the questionnaire analyses. The 30% cut-off value was the most frequently used value in previous studies (Newman, 2014).

Chapter 3: Results

This chapter includes the description of demographic data (3.1), the correlation analyses for research question 1 and research question 2 (3.2), and the 2-way ANOVA analysis for research question 3 (3.3). Please refer back to Chapter 2 (2.6.2) regarding the inclusion and exclusion of missing data and to Chapter 1 (1.7.3) for the research question and hypotheses.

3.1. Descriptive Analysis

The results of demographic information and descriptive analyses can be found in Table 1 and Table 2. The descriptive analyses included the total number, minimum, maximum, mean, standard deviation, skewness and kurtosis of seven variables: peer relationship quality, sibling warmth, sibling conflict, mother differential treatment direction (which sibling is favoured), father differential treatment direction, mother differential treatment magnitude (whether the differential treatment exists and the level of it) and father differential treatment magnitude. There were 516 children in total participated in this study, with 386 of them having at least one sibling.

Table 1

Demographic Information

	N	Percentage	Min	Max	Mean	SD
Gender	516	100.00				
Boys	268	51.90				
Girls	248	48.10				
Age	514	99.60	9	13	11.62	0.71
9 years old	1	0.20				
10 years old	26	5.00				
11 years old	179	34.70				
12 years old	267	51.70				
13 years old	41	7.90				
Siblingship	516	100.00				
Yes	386	74.80				
No	130	25.20				
Sibling Type	386	74.80				
Older Brother	72	14.00				

	Older Sister	80	15.50				
	Younger Brother	114	22.10				
	Younger Sister	120	23.30				
Sibling Age		385	74.60	1	33	10.37	5.92

Table 2
Descriptive Analysis for Variables

	N	Score Range	Min	Max	Mean	SD	Skewness	Kurtosis
Peer Relationship	511	1-5	1	5	3.56	.64	-.44	.53
Sibling Warmth	380	1-5	1.05	4.95	2.99	.86	-.05	-.73
Sibling Conflict	380	1-5	1	5	2.57	.96	.25	-.76
Maternal Differential Treatment Direction	384	1-5	1	5	2.83	.64	-.07	1.01
Paternal Differential Treatment Direction	385	1-5	1	5	2.85	.77	-.26	1.81
Maternal Differential Treatment Magnitude	384	0-2	0	2	0.42	.53	1.24	.92
Paternal Differential Treatment Magnitude	385	0-2	0	2	0.49	.61	1.03	-.07

3.2. Parental Treatment, Sibling Relationships, and Peer Relationships

For research question 1 (RQ1) “Do maternal and paternal differential treatments relate to sibling relationship quality in young adolescents in mainland China? And are there any differences due to sibling-gender compositions?” and research question 2 (RQ2) “Is sibling relationship quality related to peer relationship quality? And are there any differences due to sibling-gender compositions?”, we tried to find the correlation between several variables, therefore, correlation analyses were conducted. General findings were presented first and then separated by sibling-gender compositions.

3.2.1. Assumptions for Correlation Analysis

All variables were included in RQ1 and RQ2. In order to conduct Pearson correlation

analysis, four assumptions should be met: two variables should be continuous variables; data were related pairs; data fit normal distribution; and the correlation between them is linear (Field, 2017). The first and the second assumptions are met since all variables are continuous variables measured by the Likert scale, and every participant answered the questions about parental treatment, sibling relationships (if they have siblings), and peer relationships. Skewness and kurtosis in Table 2 can show whether variables fit a normal distribution. For both maternal and paternal differential treatment magnitude (whether the differential treatment exists and the level of it), the absolute values of skewness are larger than 1, which violates the third assumption (Field, 2017). Therefore, only non-parametric correlation analysis was conducted for pairs related to maternal and paternal differential treatment magnitude. Lastly, linearity was detected using a scatterplot for each pair of relationships. However, no clear linearity was shown in each pair. Please see Appendix C for the assumption check for correlation analysis. Therefore, all pairs failed the fourth assumption, and a non-parametric correlation (spearman's rho) was conducted on all pairs of variables.

3.2.2. General Findings

Results of all children are shown in Table 3, and results for different sibling-gender compositions are shown in Table 4, Table 5, and Appendix D. Results for peer relationship quality are shown in Table 6. A positively significant but very weak correlation was identified between maternal differential treatment direction and sibling warmth ($r = .12, p < 0.05$), that is, the more favoured a child feels from their mother, the more perceived sibling warmth the child reports. A negatively significant but weak correlation showed up between maternal differential treatment direction and sibling conflict ($r = -.20, p < 0.01$), which means that the less favoured a child feels from their mother, the more perceived sibling conflict the child reports. Both paternal differential treatment magnitude and maternal differential treatment magnitude were negatively associated with sibling warmth, and both relationships were weak (father: $r = -.30, p < 0.01$; mother: $r = -.28, p < 0.01$). Paternal differential treatment magnitude had a positively significant but very weak association with sibling conflict ($r = .16, p < 0.01$), while maternal differential treatment magnitude had a positively significant and weak association with sibling conflict ($r = .22, p < 0.01$). These suggest that the higher the level of differential treatment exists, regardless of whether it is from the mothers or fathers, the worse the sibling relationship will be, showing more conflict and less warmth. Moreover, sibling warmth was positively and significantly related to peer relationship quality, and the relationship is weak ($r = .26, p < 0.01$). Sibling conflict is not significantly related to children's peer relationship quality ($r = -.06, p = 0.24$). To briefly conclude, for RQ1,

Hypotheses 1 to 4 were all supported (Please see 1.6.3 for the hypotheses). For RQ2, only hypothesis 1 was supported, while hypothesis 2 was rejected. Moreover, the maternal favoured direction (which sibling is favoured by mother) was also related to sibling relationship quality.

Table 3
Correlation Analysis (Spearman's rho) for All Children (N=375)

	1	2	3	4	5	6	7
1. Sibling Warmth		-.27**	.07	.12*	-.30**	-.28**	.26**
2. Sibling Conflict			-.07	-.20**	.16**	.22**	-.06
3. Father Differential Treatment Direction				.20**	-.30**	-.16**	.05
4. Mother Differential Treatment Direction					-.19**	-.39**	.03
5. Father Differential Treatment Magnitude						.53**	-.08
6. Mother Differential Treatment Magnitude							-.11*
7. Peer Relationship							

Note: All parameter estimates are from SPSS 29. * = $p \leq 0.05$, ** = $p \leq 0.01$.

Table 4
Relationship with Differential Treatment Magnitude

	Paternal Differential Treatment		Maternal Differential Treatment	
	Boys	Girls	Boys	Girls
(With) Older Brother	Warmth (-)	NSRI	NSRI	NSRI
(With) Older Sister	Warmth (-)	Warmth (-)	Warmth (-)	Warmth (-)
(With) Younger Brother	Warmth (-)	NSRI	Warmth (-); Conflict (+)	Warmth (-)
(With) Younger Sister	Conflict (+)	Warmth (-)	NSRI	Conflict (+)
General	Warmth (-); Conflict (+)		Warmth (-); Conflict (+)	

Note: “-” means that the relationship between differential treatment magnitude and warmth or conflict is negative; “+” means that the relationship between differential treatment magnitude and warmth or conflict is positive; “NSRI” means that there is no significant relationship identified.

Table 5***Relationship with Differential Treatment Direction***

	Paternal Differential Treatment		Maternal Differential Treatment	
	Boys	Girls	Boys	Girls
(With) Older Brother	Warmth (-)	NSRI	NSRI	NSRI
(With) Older Sister	NSRI	NSRI	NSRI	NSRI
(With) Younger Brother	Warmth (+)	NSRI	Conflict (-)	Warmth (+)
(With) Younger Sister	NSRI	Warmth (+)	NSRI	NSRI
General	NSRI		Warmth (+); Conflict (-)	

Note: “-” means that the relationship between being favoured by parent and warmth or conflict is negative; “+” means that the relationship between being favoured by parent and warmth or conflict is positive; “NSRI” means that there is no significant relationship identified.

Table 6***Relationship with Peer Relationship***

	Boys	Girls
(With) Older Brother	Warmth (+)	Warmth (+)
(With) Older Sister	NSRI	Warmth (+)
(With) Younger Brother	NSRI	NSRI
(With) Younger Sister	Warmth (+)	Warmth (+)
General Findings	Warmth (+)	

Note: “-” means that the relationship between peer relationship and warmth or conflict is negative; “+” means that the relationship between peer relationship and warmth or conflict is positive; “NSRI” means that there is no significant relationship identified.

3.2.3. Sibling-Gender Composition 1: Older Brother, Younger Brother

For older brother-younger brother composition, the paternal differential treatment direction ($r = -.37, p < 0.05$) and magnitude ($r = -.38, p < 0.05$) were negatively and significantly associated with the younger brother’s perceived sibling warmth, and both relationships were weak. That is, when the paternal differential treatment level is higher, and the younger brother feels less favoured, the younger brother perceived less sibling warmth. As for peer relationships, younger brothers’ perceived sibling warmth has a moderately positive relationship with peer relationship quality ($r = .57, p < 0.01$).

However, for older brothers, the paternal differential treatment direction had a weak and positively significant association with sibling warmth ($r = .32, p < 0.05$), the maternal

differential treatment direction had a weak and negatively significant relationship with sibling conflict ($r = -.32, p < 0.05$). This means when the older brother is perceived to be favoured more by his father, he perceives more sibling warmth; when he is favoured more by his mother, he perceives less sibling conflict. Paternal differential treatment magnitude had a strong but negative correlation with older brother's sibling warmth ($r = -.60, p < 0.01$), while maternal differential treatment magnitude had a weak but negative correlation ($r = -.39, p < 0.01$) with older brothers' sibling warmth. Maternal differential treatment magnitude also had a weak but positive relationship with sibling conflict ($r = .32, p < 0.05$). That is, when the older brother perceives a higher level of differential treatment from his parents, he reports less sibling warmth, and a higher level of differential treatment from his mother may lead to more sibling conflict. No significant relationship was shown between sibling relationship quality and peer relationship quality among older brothers.

3.2.4. Sibling-Gender Composition 2: Older Brother, Younger Sister

Under the older brother-younger sister composition, the paternal differential treatment magnitude was weakly and positively associated with older brothers' sibling conflict ($r = .26, p < 0.05$). That is, for boys who have younger sisters, the higher level of differential treatment from the father is linked to more sibling conflict perceived. Moreover, both the older brother's ($r = .26, p < 0.01$) and the younger sister's ($r = .46, p < 0.01$) perceived sibling warmth has a positive significant relationship with peer relationship quality, with the relationship among older brothers is moderate while among younger sisters is weak. This suggests that the more sibling warmth the older brother and younger sister perceive, the better peer relationship quality they have.

3.2.5. Sibling-Gender Composition 3: Older Sister, Younger Brother

Among older sister-younger brother composition, the maternal differential treatment direction had a weak and positive relationship with the older sister's sibling warmth ($r = .34, p < 0.01$), and the maternal differential treatment magnitude had a weak and negative relationship with the older sister's sibling warmth ($r = -.34, p < 0.01$). That is, if the older sister perceives that her mother favours her more, she reports more sibling warmth; however, if the differential treatment level from the mother is high, she reports less sibling warmth. Moreover, there is no significant relationship shown between sibling relationship quality and peer relationship quality among older sisters.

For younger brothers, paternal differential treatment magnitude had a moderate and negative relationship with sibling warmth ($r = -.44, p < 0.01$), and maternal differential treatment magnitude had a weak and negative relationship with sibling warmth (boys: $r =$

-.39, $p < 0.01$). This means that the higher the level of parental differential treatment the younger brother feels, the less sibling warmth he reports.

3.2.6. Sibling-Gender Composition 4: Older Sister, Younger Sister

For older sister-younger sister composition, for older sisters, paternal differential treatment direction was weakly and positively related to sibling warmth ($r = .26, p < 0.05$), and paternal differential treatment magnitude was weakly and negatively related to sibling warmth ($r = -.30, p < 0.05$). Additionally, maternal differential treatment magnitude had a weak and positive relationship with sibling conflict for older sisters ($r = .33, p < 0.05$). The results suggest that if the older sister perceives that her father favours her more, she reports more sibling warmth. Moreover, if the differential treatment level from the father is high, she reports less sibling warmth, while the differential treatment level from the mother is high, she reports more sibling conflict.

For younger sisters, both paternal ($r = -.43, p < 0.01$) and maternal ($r = -.48, p < 0.01$) differential treatment magnitude were moderately and negatively related to sibling warmth. Similarly, if the younger sister feels higher level of parental differential treatment, she reports less sibling warmth.

Specifically, older sisters' perceived sibling warmth was weakly and positively related to peer relationship quality ($r = .34, p < 0.01$), and younger sisters' perceived sibling warmth was moderately and positively related to peer relationship quality ($r = .52, p < 0.01$). If both siblings perceive a warmer sibling relationship, they have better peer relationship quality.

3.3. Siblings versus no siblings

For research question 3 (RQ3) "Is there a difference in peer relationships between children with siblings and children without siblings? Is there a gender difference?", in order to compare the differences between four groups in two variables (sibleness and gender), a 2-way ANOVA was conducted.

3.3.1. Assumptions for the 2-way ANOVA

Three assumptions should be met before the analysis: the dependent variable is normally distributed, homogeneity of variance, and independence of observations (Park et al., 2009). The dependent variable is peer relationship quality, its skewness and kurtosis were shown in Table 2 (skewness = -.44, kurtosis = .53), and they met the standard that absolute value of skewness is less than 1 and the absolute value of kurtosis is less than 3 (Field, 2017). Therefore, the dependent variable is normally distributed. Moreover, variances in each subgroup were homogeneous according to the Levene's Test ($F_{[3,507]} = 1.24; p = .29$) Please see

Appendix E for the assumption check for 2-way ANOVA. Since all observations were independent, the three assumptions are met.

3.3.2. Siblingship and Gender Difference in Peer Relationship

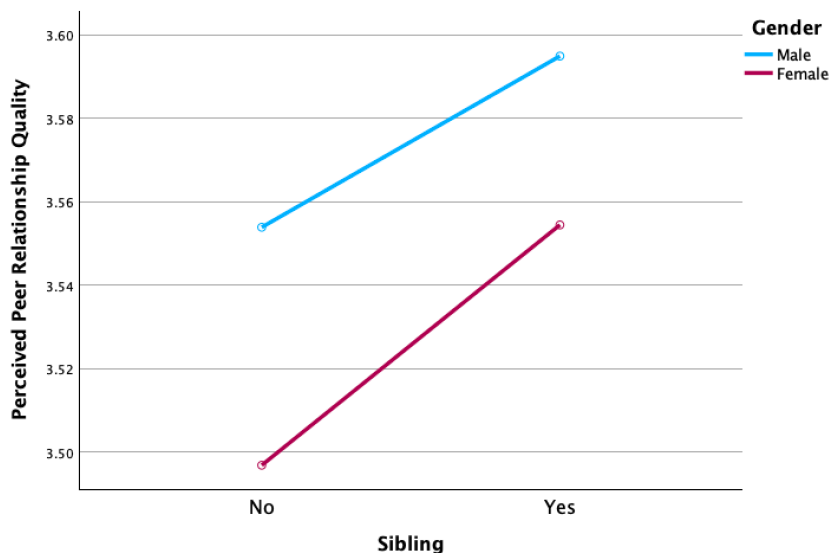
Results are shown in Table 6 and Figure 2. The 2-way ANOVA showed no main effect of gender ($F_{[1,507]} = 0.56, p = 0.46$) or siblingship ($F_{[1,507]} = 0.57, p = 0.45$), or the Gender*Siblingship interaction effect ($F_{[1,507]} = 0.02, p = 0.90$) to be significant. Therefore, there is no difference in peer relationships between children with and without siblings and there is also no gender difference. However, although it is not significant, the perceived peer relationship quality appears to be higher in both boys and girls who have siblings (see Figure 2).

Table 7

2-way ANOVA Analysis for Peer Relationship Quality in Gender and Siblingship

	Gender				Main and interaction effects		
	Boys		Girls		Gender	Siblingship	G*S
Siblingship	M	SD	M	SD			
Yes	3.59	0.62	3.55	0.64	$F_{[1,507]} = 0.56$	$F_{[1,507]} = 0.57$	$F_{[1,507]} = 0.02$
No	3.55	0.71	3.5	0.59			

Note: All parameter estimates are from SPSS 29.



Note: The higher score means the better peer relationship. The score of Perceived Peer Relationship Quality range from 0-5.

Figure 2. Peer Relationship Quality under Gender and Siblingship

Chapter 4: Discussion

This Chapter contains a discussion of the results and their connection with, and impact on, the current literature. Results will be interpreted based on three research questions (4.1, 4.2, and 4.3). The current results will be compared with previous studies to see the consistency and difference. Implications of this study will be discussed (4.4). Limitations (4.5) and future study (4.6) will also be put forward.

4.1. Parental Treatment and Sibling Relationship among Chinese Children

For research question 1 (RQ1) “Do maternal and paternal differential treatments relate to sibling relationship quality in young adolescents in mainland China? And are there any differences due to sibling-gender compositions?”, the discussion is divided into two aspects of differential treatment: differential treatment magnitude and differential treatment direction. Differential treatment magnitude refers to the level of differential treatment the child perceives (regardless of who is favoured), while differential treatment refers to which of the siblings is favoured more. After the interpretation of general findings for all children, the discussion will be divided into four sibling-gender compositions to see whether the relationship depends on the sibling gender compositions.

4.1.1. Parental Differential Treatment Magnitude

The differential treatment magnitude is the level of differential treatment that exists no matter which sibling is favoured. There are several main findings regarding the relationship between differential treatment magnitude and sibling relationship:

- A higher level of both paternal and maternal differential treatment is related to Chinese adolescents’ reduced sibling warmth and increased sibling conflict;
- For children with older sisters, a higher level of both paternal and maternal differential treatment is associated with less sibling warmth; however, for those with older brothers, only a higher level of paternal differential treatment is associated with less sibling warmth for younger brothers;
- Most of the parental differential treatment influences sibling warmth, except for two pairs of siblings-gender composition: When boys with younger sisters feel a higher level of paternal differential treatment and when girls with younger sisters feel a higher level of maternal differential treatment, they report more sibling conflict;
- Compared to girls, the level of paternal differential treatment has more influence on boys’ sibling relationships.

Both mother’s and father’s magnitude of differential treatment, that is, the level of

differential treatment that exists no matter which sibling is favoured, were positively but weakly related to children's sibling conflict and negatively but weakly related to children's sibling warmth. This finding aligned with a previous Italian study that stated that the higher level of parental differential treatment exists, no matter from which parent and no matter whether a child is favoured or not, it had a negative influence on sibling relationship quality, with no specification on sibling warmth or sibling conflict (Sommanico et al., 2019). In two additional American studies, it was suggested that higher levels of perceived parental differential treatment were associated with lower sibling warmth (Jensen et al., 2013; Ponappa et al., 2017), without mention of sibling conflict. The previous studies all showed the existence of differential treatment among siblings is harmful to sibling relationship quality. This current study indicated that among Chinese adolescents, sibling conflict, as well as sibling warmth, was also related to children's perceived parental differential treatment. One reason for the different influence of parental differential treatment on sibling conflict might be the difference in participants' age. The Italian study and the two American studies recruited young adults (aged 18-30), but the current study recruited young adolescents (aged 9-13). Parents' influence might be larger for young adolescents since they still live together and have more time to interact with each other. Therefore, when young adolescents feel the differential treatment, their inner imbalance may cause them to have more arguments with their siblings. The second reason might be the cultural difference. Chinese culture is more of a collectivist culture and American culture is an individualist culture. According to family system theory, the family is an interconnected system and each member is linked to the other (Bavelas & Segal, 1982; Cox & Paley, 2003). In the collective culture, such as the Chinese culture, the family is generally a tighter unit with parents often having a higher hierarchy. In this case, children may receive more influence from parents; for example, they need parental approval to do things or need resources from parents. If differential treatment exists, children might fight with their siblings for more resources within the tight unit. However, in an individualist culture, such as the American culture, the family unit may be looser, and the differential treatment may lead to less warmth among siblings, but children still have more space to go out and find more resources, therefore not increase the conflict between siblings. Moreover, the current results also aligned with one recent study among Chinese adolescents (B.-B. Chen, 2023). Chen (2023) combined paternal and maternal differential treatment into one variable, and the results showed that parental differential treatment was negatively correlated with sibling intimacy and positively correlated with sibling conflict (B.-B. Chen, 2023). The current study extended this finding by separating paternal and maternal

differential treatment and found the same results, showing that both father and mother have similar influences on children's sibling relationships. The current study also, novelly, analysed the influence of parental differential treatment on sibling relationships based on sibling gender compositions, to see whether Chinese culture influences different sibling gender compositions.

The results showed slight variations when examining each sibling's gender composition separately (please refer to Table 4 in Chapter 3). Some interesting relationships are discussed here. First, for children with older sisters, the magnitude of their mother's and father's differential treatment was negatively related to their sibling's warmth: a higher level of both paternal and maternal differential treatment is associated with less sibling warmth. In contrast, for those with older brothers, only the father's differential treatment negatively affected the boys' sibling warmth: a higher level of paternal differential treatment is associated with less sibling warmth for younger brothers. These differences indicate that even among children with older siblings, those with older sisters and older brothers exhibit different sensitivities to levels of parental differential treatment. This phenomenon was not observed in previous Western studies (Jensen, Killoren, et al., 2023), possibly because earlier research did not categorise sibling-gender compositions as thoroughly as this study. One possible explanation for these findings lies in Chinese culture, which traditionally views boys and girls differently (W. Wang, 2005). Boys, especially older ones, are often more valued in Chinese families and are expected to serve as role models for their younger siblings. This societal expectation might make boys less sensitive to their parents' differential treatment, as they are more accustomed to being in a privileged position. Conversely, older sisters are generally expected to adopt a caring role for their younger siblings, and elders usually pay more attention to the younger children. Additionally, under the cultural norm of "preference for boys over girls," older sisters may be more sensitive to parental differential treatment (Q. Li, 2012). Therefore, when differential treatment occurs in compositions with older sisters, it tends to have a more negative impact on the sibling relationship.

Second, most of the parental differential treatment influences sibling warmth, except for children with younger sisters. When boys with younger sisters feel a higher level of paternal differential treatment and when girls with younger sisters feel a higher level of maternal differential treatment, they report more sibling conflict. Previous Western studies showed that siblings closer in age might experience more sibling conflict (Furman & Buhrmester, 1985). In the current study, rather than the age gap, the level of maternal differential treatment is easily influential on the daughter's perceived sibling conflict, while the level of paternal

differential treatment is easily influential on the son's perceived sibling conflict. Girls may have more to learn and more resources to get from their mothers, and boys from their fathers. Therefore, when the parent shows a high level of differential treatment no matter which sibling is favoured, the sibling of the same gender as that parent may express and perceive more explicit and direct competition with the other sibling, shown as sibling conflict. Girls' perceived sibling conflict is generally more vulnerable to mother's differential treatment, and boys' perceived sibling conflict is generally more vulnerable to father's differential treatment

Third, compared to girls, paternal differential treatment has more influence on boys' sibling relationships. This may be due to the traditional view in Chinese culture where the father's role is more authoritative and influential, especially in sons who are expected to follow in their father's footsteps (W. Wang, 2005). Therefore, fathers showing differential treatment may have more influence on boys.

Although the above correlations were significant, the level was very weak to weak. It suggested that the sibling relationship quality was influenced by parental differential treatment, but there were more predictors. Parental influence was a small part of it and other influencers can affect sibling relationships (Kramer, 2010). Moreover, although parents cannot avoid treating their children differently, they should pay attention to the level of how different they treat children. Small differences may not lead to that bad influence, but long-lasting and huge different treatments should be avoided (McHale et al., 2012). The higher level of differential treatment may be linked to lower sibling warmth and higher sibling conflict, all in all, poorer sibling relationship quality. This consideration is particularly important in Chinese culture, where family harmony and the balance of relationships within the family are highly valued (Wei & Li, 2013).

4.1.2. Parental Differential Treatment Direction

Differential treatment direction is which sibling the parent favours more. There are several main findings regarding the relationship between differential treatment direction and sibling relationship:

- The sibling who perceives favours from the mother reports more sibling warmth and less sibling conflict;
- Among older brother-younger brother composition, when the older brother is favoured more by the father, he reports more sibling warmth; when the older brother is favoured more by the mother, he reports less sibling conflict; when the younger brother is favoured more by the father, he reports less sibling warmth;
- For girls with younger brothers, being favoured by father is linked to more sibling

warmth; for girls with younger sisters, being favoured by mother is linked to more sibling warmth.

Generally, children who felt that their mother favoured them more than the siblings reported more sibling warmth and less sibling conflict, although the correlation between them was from very weak to weak and so should be treated with caution. As the child receives more favour from the mother, they may feel more secure, hence reducing their need to compete and start a conflict with siblings, therefore creating a more harmonious sibling relationship. Moreover, sibling relationships may be a projection of parent-child relationships (Agger, 1988). The more warmth and favour the child perceives from the mother, the more warmth they may display in their other social relationships, including sibling relationships. However, such a relationship between favouritism direction and sibling relationship did not show up on the father's side. This may be because, in most cases, the mother takes the primary caregiving role and spends more time and has a stronger influence on children's development, while fathers are perhaps comparatively, less involved in children's family life. Moreover, according to attachment theory (Ainsworth, 1989), children often build initial attachments with mothers through nursing and feeding, which lead to stronger emotional bonds; therefore favouritism from mothers seems more important for children's sibling relationships. It might also be viewed through the lens of Darwin's theory of "survival of the fittest" (Darwin, 1859). The mother, often serving as the primary caregiver, plays a crucial role in a child's early survival by providing food, protection, and emotional security. Children may compete for the mother's attention and resources, reflecting a survival strategy within the family unit where fighting for the favour of the primary caregiver can keep the child alive. Another possible explanation may be due to the different communication styles between father and mother, that is, mothers may express more about their feelings and preferences, therefore their different attitudes toward children may be more apparent than fathers' (Pierce et al., 2015).

One Western study showed that both sibling warmth and conflict are linked to perceived parental favouritism (Finzi-Dottan & Cohen, 2010), but this current study only discovered *maternal* favouritism on Chinese adolescents' sibling warmth and conflict. The results from this current study were aligned with Jensen's American studies' result that maternal differential treatment is associated with lower intimacy among young adult siblings, while paternal differential treatment has little impact (Jensen et al., 2013). The influence of parental favouritism on Chinese adolescents' sibling relationships is therefore similar to some of the Western studies (Jensen et al., 2013) but different from the others (Finzi-Dottan & Cohen,

2010), and further research is needed to discover why.

However, digging more into the different sibling-gender compositions, the relationship between parental differential treatment direction (parental favouritism) and sibling relationship identified some interesting differences (please refer to Table 5 in Chapter 3). Although generally paternal differential treatment direction is not related to sibling relationships, it did influence specific sibling gender dyads: boys with older or younger brothers, or girls with younger sisters.

For the older brother-younger brother composition, when the father favoured the older brother more, the older boy reported more sibling warmth, but when the father favoured the younger brother more, the younger boy reported less sibling warmth. This could be due to the dynamics within male sibling relationships. Younger brothers often look up to older brothers, creating a more hierarchical and protective relationship when the older boy feels favoured. When the respect within sibling relations is also approved by the father (e.g., the father also favours the older boy more and pays more attention to the older brother), the sibling relationship becomes warmer. The situation becomes opposite, that is, the sibling relationship becomes less warm, when the father favours the younger one: this may be due to the disruption of the expected hierarchy and logical norm that older boys have more power and receive more attention. Typically, it is assumed that parents are closer to the older child, who has had more time to bond with them and often begins to take on parental duties, acting as a "mini-me" version of the parents (Whiteman et al., 2011). The younger sibling grows up observing this bond and accepts it as the natural order. However, when the father suddenly favours the younger child, it challenges this logical norm, creating tension and jealousy. This unexpected favouritism challenges the older sibling's expectations and reshapes the younger sibling's understanding of their role, leading to a more competitive relationship between them. Moreover, for older sister-younger sister composition, when fathers favoured the older girl, she reported higher warmth with her younger sisters. This might be because girls with younger sisters often take on a nurturing role, which could be enhanced when they feel favoured by their fathers. According to social learning theory, the treatment from the father toward the daughter can transfer onto the treatment among siblings, therefore, the emotional bond with the father might translate into a more caring and supportive relationship with younger sisters according to social learning (Bandura, 1985).

The influence of paternal favouritism among older brother-younger brother compositions, could be explained by the social comparison theory, which suggests that individuals evaluate their social and personal worth based on comparisons with others (Suls

et al., 2002). Boys may compare themselves more directly with their brothers, leading to more pronounced effects of paternal favouritism in these relationships. Fathers may also share similar behaviour patterns with their sons, making their favouritism more impactful. For boys, the relationship with their sisters does not appear to be significantly influenced by parental differential treatment. This might be because boys typically engage in activities with other boys, including their brothers, reducing the impact of favouritism from either parent on their relationship with sisters.

As for mothers, the maternal favouritism direction influences sibling warmth among boys and girls with younger brothers. When mothers favoured the older boy, the boy reported less conflict with his younger brothers. This could be due to the mother's role in mitigating conflicts and promoting harmony among her children. Moreover, when mothers favoured the older girl, the girl reported more warmth with her younger brothers. Mothers often encourage older sisters to take on caregiving roles, and favouritism might reinforce this behaviour, leading to stronger sibling bonds. Mothers also have a significant influence on older sister-younger brother dyads. As the primary caregivers, mothers who do not show a preference for younger boys can help older sisters feel more secure and valued, fostering a positive environment and stronger sibling relationships. The older sibling may feel conflict and insecure after a new sibling is born. For example, before the birth of the younger sibling, the older child may have been the centre of attention. With the arrival of the new baby, parents often focus more on the new-born, which can make the older sibling feel neglected or less important. An older sibling might feel that the special bond they had with their parents is now diluted and the younger sibling as an intruder (Volling, 2012). Ensuring that older siblings feel loved and valued even after the birth of a younger sibling can also contribute to better sibling dynamics (Kim et al., 2006). Encouraging older siblings to take on caring roles can help them feel important and reduce feelings of conflict and rivalry.

The findings highlight the importance of equitable treatment in fostering healthy sibling relationships. Parents should be mindful of their behaviours and the potential impacts of favouritism. Ensuring that older siblings feel equally valued and loved, even after the birth of younger siblings, is crucial. Encouraging older siblings to take on nurturing roles may also help them develop positive relationships with their younger siblings. Understanding the nuanced effects of parental differential treatment on sibling relationships can help parents foster more harmonious family dynamics.

4.2. Sibling Relationship and Peer Relationship among Chinese Children

To answer research question 2 (RQ2), “Is sibling relationship quality related to peer relationship quality? And are there any differences due to sibling-gender compositions?”, the discussion will be divided into general adolescents and adolescents depending on sibling dyads. Several main findings are shown as follows:

- Generally, Chinese adolescents who perceive more sibling warmth are likely to have better peer relationships;
- Sibling conflict is not related with peer relationship quality;
- Sibling warmth for boys with older sisters and children (boys and girls) with younger brothers is not related to their peer relationship quality.

4.2.1. General Findings

Generally, sibling warmth has a weak positive relationship with peer relationship quality. Children who feel more sibling warmth tend to have better peer relationships. This may be due to the social skills transfer effect, where the warmth received in sibling relationships can be utilised in connections with peers (Feinberg et al., 2012). Sibling relationships often serve as a training ground for social interactions, where children learn crucial skills such as empathy, communication, and conflict resolution (Bandura, 1985). These skills are transferable to peer relationships, enhancing their quality. The results were aligned with the ecological system theory, which states that children interact with multiple systems, like the family system and the school system, and sibling dynamics may influence children’s other social relationships like peer relationships (Bronfenbrenner, 1986).

Interestingly, sibling conflict did not relate significantly to peer relationship quality. This finding deviates from the hypothesis that sibling conflict would negatively impact peer relationships. The non-significant results suggest that sibling conflict is not necessarily detrimental to peer relationships. One possible explanation could be that the sibling conflict within the family may differ from conflicts with friends. For example, sibling conflicts may arise from competing for parental attention and favour, as discussed in RQ1. In contrast, conflicts with friends are less likely to involve such competition. This difference in the nature of conflicts could explain why sibling conflict does not negatively impact peer relationships.

4.2.2. Sibling-Gender Compositions

When examining sibling relationships by gender dyads, nuanced differences emerge. Boys with older sisters and children with younger brothers did not show a significant positive relationship between sibling warmth and peer relationship quality (please refer to Table 6 in Chapter 3). Viewing through the lens of the ecological systems theory (Bronfenbrenner, 1986), sibling dynamics are a critical component of the family system and can have a

significant impact on other areas of a child's life, including peer relationships. Previously, a Hong Kong study found that a less-favoured child by the mother had lower socioemotional competencies after one year, and the sibling-gender dyad did not significantly moderate this relationship (Lam et al., 2021a). The current study did not study the influence of parental differential treatment on peer relationships. However, it was found that sibling relationships was correlated with peer relationships for some sibling-gender compositions. This variation suggests that the influence of sibling warmth on peer relationships *is* moderated by the sibling gender composition: for children with older brothers or younger sisters, and girls with older sisters, their sibling warmth is related with peer relationship (please refer to Table 6 in Chapter 3).

Traditional gender roles in Chinese society might influence how sibling dynamics play out. For instance, boys might be socialised to be more independent. This can lead to more reserved or competitive sibling interactions. In peer relationships, these boys may rely on themselves and focus on activities or shared interests rather than seeking emotional support, resulting in less emotionally expressive friendships. In contrast, girls might be socialised to be more nurturing, affecting their social interactions differently based on the gender of their siblings. This nurturing role leads to closer, more affectionate sibling bonds. These skills translate to peer relationships, where girls are more likely to seek and offer emotional support, fostering deeper, empathetic friendships. The gender of their siblings also influences these interactions: girls with younger brothers may develop protective instincts, while those with sisters might enhance collaborative and communicative skills. These dynamics highlight how traditional gender roles might shape social development.

In conclusion, while sibling warmth generally enhances peer relationship quality, sibling conflict does not necessarily harm it. The influence of sibling relationships on peer relationships varies depending on the gender composition of the sibling dyad, reflecting traditional gender roles and socialisation patterns in Chinese society.

4.3. Siblings versus No Siblings

Research Question 3 (RQ3) explores whether there is a difference in peer relationships between children with siblings and children without siblings and whether there is a gender difference in this dynamic. The expectation, based on social learning theory, was that siblingship would significantly and positively influence peer relationships. According to Bandura's social learning theory (Bandura, 1985), children acquire behaviours and social skills through observation and interaction, particularly with those in close relationships, such

as siblings. Therefore, it was assumed that children with siblings would learn more social skills and thus maintain better peer relationships compared to only children.

Surprisingly, the results of the study indicated that neither gender, siblingship, nor the interaction between these factors significantly influenced the peer relationships of Chinese young adolescents. This finding contradicts the theoretical assumption that siblings play a crucial role in the development of social skills and peer relationships (Bandura, 1985) and also contradicts one previous study that observed that children with a younger sister had better social skills than only children (Sang & Nelson, 2017). Several explanations might account for this unexpected result. First, reflecting back on a previous study, maybe only having siblings is insufficient, but a good quality and warm relationship with a sibling enhances social skills (Yucel & Downey, 2015). For this research question, the participants were only asked whether they have siblings and did not contain the sibling relationship quality in the analysis. Therefore, maybe the quality of the sibling relationship is the key point, but not the quantity, for those who have siblings. Results might be different if the analysis were conducted based on no sibling, good sibling relationship quality, and low relationship quality. The second possible reason might be the context of Chinese collectivist culture and the educational emphasis. In Chinese culture, which is traditionally collectivist, children may receive ample socialisation opportunities outside the family, such as in school or community settings. These opportunities might diminish the unique influence siblings have on social skill development as children engage with a broader social network from an early age. Moreover, Chinese schools emphasise more on educational outcomes rather than relationship outcomes. The strong emphasis on academic success in Chinese society might lead to structured and supervised interactions that do not rely heavily on sibling dynamics. Schools and extracurricular activities may provide sufficient environments for children to develop peer relationships, reducing the distinctive impact of having siblings (Yang et al., 2023). The third reason might be the long-lasting influence of the previous one-child policy. One Western study analysed about 20,000 kindergarten children, and they found that children with siblings were more likely to be rated by teachers as having better social skills and better peer relationship than their only-child peers (Downey & Condrón, 2004). However, the long-standing one-child policy in China has led to many families having only one child, normalising the experience of growing up without siblings. As a result, schools or other communities have already developed a good way for only children to learn good social skills without siblings and, hence, good peer relationships. Therefore, both children with and without siblings may develop peer relationships through similar pathways, such as school and

community engagement. However, one interesting point that needs to be paid attention to is that, although the relationship is not significant, there is a trend that both boys and girls with siblings have better peer relationship quality than only children.

To sum up, the lack of significant differences in peer relationships between children with and without siblings in the Chinese context can be attributed to several factors, such as the quality of sibling relationships, cultural norms, and the legacy of the one-child policy. These factors collectively suggest that while siblings can play an important role in social development, other influential factors and contexts may mitigate their impact, leading to the observed findings.

4.4. Theoretical and Practical Implications

4.4.1. Theoretical Implications

This study has significant theoretical implications, particularly in the context of cross-cultural research. The model of sibling relationships and parental differential treatment used in this study is largely based on theories developed in Western cultures (Bandura, 1985; Bavelas & Segal, 1982; Bronfenbrenner, 1986; Suls et al., 2002). However, Chinese culture, deeply rooted in Confucian values, emphasises family cohesion, respect for elders, and the importance of harmony within the family unit (Zhang et al., 2005). The findings of this study highlight the need to adapt and possibly revise existing theories to better reflect the unique aspects of sibling relationships in non-Western cultures, particularly those influenced by Confucian ideals.

In Confucian culture, relationships with family, siblings, and friends are central to an individual's social network and personal identity. The emphasis on filial piety and respect for hierarchy within the family can shape sibling relationships differently than in Western contexts (Zhang et al., 2005). This study suggests that theoretical models of sibling dynamics must consider these cultural values to accurately capture the experiences and interactions of siblings in Chinese families. Future frameworks should integrate cultural dimensions like filial piety, hierarchy, and collectivist orientation. Incorporating respect for hierarchy can highlight older siblings' roles as caregivers, while considering collectivist values can explain cooperative behaviours. Including conflict resolution strategies and the broader influence of extended family will provide a holistic understanding. Additionally, the role of education and societal expectations on sibling interactions should be acknowledged. By incorporating these elements, theories can better reflect the unique values and familial structures of Confucian cultures.

4.4.2. Practical Implications

The practical implications of this study are particularly relevant for parents, educators, and policymakers. One of the key findings is the potential impact of parental differential treatment on sibling relationships (parents showing a preference towards one sibling, and the impact that has on their children's sibling relationship). Given that many current parents in China are themselves only children, they may lack personal experience in managing sibling dynamics. This study provides valuable insights that can guide these parents in raising multiple children.

For instance, the study suggests that parental favouritism can significantly influence sibling relationships, especially for some sibling-gender compositions. Parents who are only children may benefit from guidance on how to distribute their attention and resources fairly among their children. The research indicates the existence of differential treatment is harmful for sibling relationship. However, it is hard to completely avoid favouring one of the siblings. In this case, favouring the older child may help mitigate feelings of jealousy or rivalry, fostering a more harmonious and less conflict sibling relationship. Educators and family counsellors can use these insights to develop parent programs, resources and interventions that support parents in managing sibling dynamics effectively.

Furthermore, the study highlights the importance of culturally relevant parenting strategies. In a culture where respect for elders and family hierarchy is paramount, parents may need to balance these values with the need to treat their children equitably. Although there is still a cultural value preference for boys over girls, new parents should give equal attention and favour to girls, especially older sisters. Practical recommendations for parents could include strategies for demonstrating equal affection and support to all children while maintaining cultural values of respect and hierarchy.

Policymakers can also draw on the findings of this study to inform family policies and programs. As China continues to adapt to the three-child policy, understanding sibling dynamics becomes increasingly important. Policies that support family cohesion and provide resources for parents raising multiple children can contribute to healthier family environments and better sibling relationships. This could include providing access to parenting workshops, family counselling services, and educational materials that address the unique challenges of raising multiple children in a rapidly changing societal context. For example, several previous studies showed that parenting programs could improve parenting skills, children's behaviour, and sibling relationships (Lindsay et al., 2011; Sackett & Marie, 2021). In response to these needs, policies like the Law of the People's Republic of China on

Family Education Promotion (Ministry of Education of the People's Republic of China, 2021) have been introduced to promote harmonious Chinese family environment under the rapidly changing family structure and society. A growing need of policies and governmental support will be needed to in the future face more changes (e.g., three-child policy).

This study offers valuable theoretical and practical implications for understanding parental differential treatment, sibling relationships, and peer relationships in Chinese families. The findings underscore the need to adapt existing theories to reflect cultural differences and provide practical guidance for parents navigating sibling dynamics.

4.5. Limitations of the Study

This study has several limitations that should be considered when interpreting the results. Firstly, this study did not restrict the age range of participants' siblings. This lack of control may have included very young siblings, such as new-borns, whose sibling dynamics and relationships are not yet fully developed, and also older siblings who have left home and spent little time with the participants. As sibling relationships evolve over time, the inclusion of a wide age range (from 0 to 21, with 152 out of 384 participants have a sibling over 5 years different from them) could have influenced the findings and their generalisability across different stages of sibling development.

Secondly, this study was unable to collect data from multiple siblings within the same family. Having data from only one sibling limits our understanding of the family dynamics and the full scope of sibling relationships within the family unit. Participants were asked to report their relationship with only one sibling that was closest in age to the participant, even if they had more than one sibling. Families with multiple siblings might exhibit different dynamics compared to those with only two children. Also, if the sibling is the middle child, their perception of differential treatment and sibling relationship might be different to the first-born or last-born child. With the recent implementation of the three-child policy in China, it becomes crucial to study sibling relationships in larger families, since more and more third-born children are coming to families according to the Chinese Statistical Bulletin on the Development of Health and Family Planning (National Institutes of Health, 2022)

Additionally, the study relied on quantitative Western-developed questionnaires and theories, which might not fully capture the nuances of sibling relationships in a Chinese context (Y. Z. Wang et al., 2022). Cultural differences can play a significant role in shaping family dynamics, and Western instruments may not be entirely applicable or sensitive to the unique aspects of Chinese sibling relationships. For example, in the peer relationship scale,

there is one question, “I apologise to my friends when I have misbehaved”, which might not entirely suit the Chinese context. It is common to feel sorry about the misbehaviour but not common for apologising explicitly due to the introverted culture to “say sorry”. In this case, the current study only used quantitative methods rather than qualitative research methods, which can provide valuable insights into how Chinese adolescents view their sibling relationships (Ahmad et al., 2019). Additionally, the peer relationship scale used in the current study was translated and piloted by the researcher without standardising (Aydoğdu, 2021). The lack of standardising process may result in several potential issues, for example, it may not consistently measure what it is intended to measure (reliability) or not accurately capture the construct of peer relationships in the new context (validity) (Adcock & Collier, 2001). Moreover, the Chinese understanding of sibling relationships may differ from Western perspectives, needing research methods that can accurately reflect these cultural distinctions. Without qualitative insights, this study can only speculate or rely on existing literature to interpret the significant relationships observed between some variables in only certain sibling dyads of these findings.

4.6. Future Research

Building upon the limitations identified in this study, there are several directions for future research that can enhance our understanding of sibling relationships and the broader family dynamics within which they exist. Addressing these areas will provide a more comprehensive view and allow for more nuanced insights into the factors influencing sibling interactions and parental differential treatment across the world.

One important direction for future research should consider a more controlled approach to the age range of participants’ siblings. Including a wide age range can lead to variations in sibling relationships that are not accounted for by the study. Focusing on specific developmental stages or comparing across distinct age groups can provide clearer insights into how sibling dynamics evolve and how parental differential treatment is perceived at different ages. For example, research often examines sibling relationships in children aged 4 to 18 years, when children and adolescents have more time spent with their siblings, and this range captures significant developmental changes and variations in sibling dynamics (Hughes & White, 2021). Controlling both siblings’ ages within this range can make sure that both siblings are in similar developing stages, also helping standardise findings and provide more precise insights into sibling relationships and parental differential treatment.

Collecting data from multiple siblings within the same family is another important step

and should explore families with varying numbers of children, especially in light of China's three-child policy. By obtaining information from all siblings, researchers can gain a holistic view of family dynamics and better understand how differential treatment from parents affects each child differently. This approach can help identify patterns and provide a more comprehensive understanding of the factors influencing sibling relationships. For example, the more siblings dilute the time parents used on each sibling, leading to less individual attention, which may influence sibling's development (Öberg, 2017). Moreover, the oldest sibling tend to take the caring role while the youngest sibling tend to get more attention, with usually little attention given to the middle-born sibling (Lehmann et al., 2018). Understanding how sibling dynamics differ in larger families can provide valuable insights into the factors that influence sibling relationships in these contexts. Research could focus on how parental attention and resources are distributed among multiple children and how this affects sibling interactions and perceptions of fairness.

Another critical area is incorporating culturally relevant tools and methodologies, which is essential for future research (Y. Z. Wang et al., 2022). Western-developed questionnaires and theories may not fully capture the unique aspects of sibling relationships in different cultural contexts. Developing or adapting instruments that are culturally sensitive will provide more accurate insights into the dynamics of sibling relationships in various cultural settings, such as those found in Chinese families, for example, focusing more on the implicit expression (e.g., refer to the example in 4.5., feeling sorry and make some compensation action) rather than explicit expression (e.g., saying apologies out loud). Moreover, future research should also incorporate quantitative methods to complement qualitative insights. Quantitative data can provide a broader perspective and allow for statistical comparisons, enhancing the generalisability of findings. Combining qualitative and quantitative approaches will provide a more robust understanding of sibling relationships and parental differential treatment, for example, gaining insight of what Chinese adolescents consider as parental differential treatment and marking how parental differential treatment may be related to their sibling relationships.

Additionally, future research can consider twins against other types of siblings in China. Twin relationships can be distinctly different from those of other sibling pairs due to their unique bond, shared developmental stages, and often more equal parental treatment (O'Connor et al., 1995). Investigating how twins perceive parental differential treatment and how this impacts their relationship dynamics can offer valuable insights, for example, whether twins' special bond may change the influence of parental differential treatment

among them. Studies could compare twin relationships with those of non-twin siblings to identify specific factors that contribute to the differences in sibling dynamics and how parental behaviour is perceived and internalised.

Finally, future research can investigate the influence of grandparents. While this study did not explore the role of grandparents, their impact on family dynamics and sibling relationships can be significant. Grandparents often play a crucial role in caregiving and shaping family values and attitudes, including potential biases such as favouritism or gender preferences (Connor, 2006). Future research should examine how grandparents' involvement influences sibling relationships and parental differential treatment. This could include studying the effects of grandparents' attitudes towards gender roles and their preference for certain grandchildren, which can contribute to the overall family system and affect sibling dynamics.

By addressing the above areas, we can achieve a deeper and more comprehensive understanding of sibling relationships and the factors influencing them within different family and cultural contexts.

Chapter 5: Conclusion

This study explored the dynamics of parental differential treatment and its effects on sibling relationships among Chinese adolescents and investigated the relationship between sibling relationships and peer relationships, considering the influence of gender compositions and the presence of siblings. The findings provide a comprehensive understanding of these dynamics, which are crucial for both theoretical and practical applications.

It utilised a cross-sectional design, collecting data from 516 students in Shenzhen, China. The methodology was robust, incorporating power analysis to determine an appropriate sample size and convenience sampling for participant recruitment. The study used the sibling relationship questionnaire (Student Version) (Dai et al., 2021; Furman & Buhrmester, 1985) and the peer relationship scale (Aydoğdu, 2021) translated into Chinese, ensuring cultural relevance and accuracy in measuring sibling and peer relationship qualities. Data collection was conducted ethically, with informed consent obtained from the school, opt-out options given to parents, and assent from students, and rigorous data analysis methods were employed to ensure the validity of the findings.

The study revealed that both maternal and paternal differential treatment significantly influence sibling relationships. Specifically, the magnitude of differential treatment was positively related to sibling conflict and negatively related to sibling warmth, consistent across different sibling gender dyads. This suggests that parental differential treatment, regardless of whether it comes from the mother or father, generally leads to poorer sibling relationship quality. The study also found variations based on sibling gender compositions. For instance, children (either boys or girls) with older sisters were more negatively affected by parental differential treatment than those with older brothers, reflecting cultural norms that place different expectations on boys and girls in traditional Chinese families. The direction of differential treatment played a crucial role as well. Children who felt favoured by their mothers reported higher sibling warmth and lower conflict, while paternal favouritism did not have the same effect. This difference may stem from the primary caregiving role mothers often play in Chinese families, leading to stronger emotional bonds and greater influence on sibling relationships. However, paternal favouritism influences mainly boys' sibling relationships, indicating a same-sex learning procedure.

Furthermore, the study found that sibling warmth positively correlated with peer relationship quality, suggesting that social skills learned in sibling interactions are transferable to peer relationships. Interestingly, sibling conflict did not significantly impact peer relationship quality, indicating that conflict within the family might differ in nature from

conflicts with peers. This difference could explain why sibling conflict does not negatively affect peer relationships, as family conflicts often involve competition for parental attention, unlike conflicts with friends.

The study also explored differences between children with and without siblings. Contrary to expectations based on social learning theory, the presence of siblings did not significantly influence peer relationship quality. This finding suggests that other socialisation opportunities in Chinese culture, such as school and community interactions, may mitigate the unique influence of siblings on social skill development, due to the previous one-child policy.

The current study provided both theoretical and practical implications. The theoretical implications of this study are significant, highlighting the need to adapt existing Western theories of sibling relationships and parental differential treatment to better reflect the cultural context of Chinese families. The study underscores the importance of considering cultural values, such as collectivism and respect for family hierarchy, in understanding sibling dynamics. Future theoretical models should integrate these cultural dimensions for a more comprehensive understanding of sibling relationships across different cultural contexts. From a practical perspective, the study offers valuable insights for parents, educators, and policymakers. For parents, especially those who are only children themselves, the findings emphasise the importance of equitable treatment to foster healthy sibling relationships. Guidance on fair distribution of attention and resources can help mitigate feelings of jealousy and rivalry among siblings. Educators and family counsellors can use these insights to develop programs that support parents in managing sibling dynamics effectively. Policymakers can draw on these findings to inform family policies and programs that support family cohesion, particularly in the context of China's three-child policy.

Despite its contributions, this study has several limitations. The lack of age restriction for participants' siblings may have included very young siblings whose dynamics are not fully developed and older siblings who have left home, potentially influencing the findings. Additionally, data was not collected from multiple siblings within the same family, limiting the understanding of family dynamics. The study relied on quantitative Western-developed questionnaires and theories, which might not fully capture the nuances of sibling relationships in a Chinese context. The absence of qualitative insights is another limitation.

Future research should address these limitations by adopting a more controlled approach to the age range of participants' siblings and collecting data from multiple siblings within the same family. Including families with varying numbers of children will help identify patterns and provide a comprehensive understanding of sibling relationships. Incorporating culturally

relevant tools and methodologies is essential for accurate insights. Combining qualitative and quantitative approaches will offer a robust understanding of sibling relationships and parental differential treatment. Investigating twin relationships and the role of grandparents in family dynamics can also provide valuable insights.

In conclusion, this study provides valuable insights into the dynamics of parental differential treatment and sibling relationships among Chinese adolescents. It highlights the importance of considering cultural context in understanding family dynamics and offers practical guidance for parents, educators, and policymakers. By addressing the identified limitations and exploring new research directions, future studies can deepen our understanding of sibling relationships and contribute to healthier family environments across the world.

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Appendix A

Questionnaire

Demographic Information

1. Your Gender: Male/Female
2. Your Age:
3. Do you have sibling(s)? Yes / No
4. If you choose "yes" for the third question, then answer this question: Your sibling's age (if you have more than one sibling, please choose the one who is nearest in age to you)
5. If you choose "yes" for the third question, then answer this question: Your sibling's gender: M/F

Student Version Sibling Relationship Questionnaire SRO-Revised (Child)

Instructions: In the next questionnaire, you will talk about another child in your family who is your sibling closest to your age. Please answer based on the daily communication between you and this sibling in the past three months. There is no right or wrong answer to all questions. Answers are for research purposes only. The results are guaranteed not to be leaked. Please feel free to answer.

1. Some siblings will often do thoughtful things for each other, while some brothers and sisters rarely do this. How often do you and this sibling do thoughtful things for each other?
A Almost none B Relatively little C Some D Quite a lot E Very much
2. Who does mom usually treat better, you or this sibling?
A The sibling almost always gets preferential treatment
B The sibling often gets preferential treatment
C We were both treated almost the same
D I often get preferential treatment
E I almost always get preferential treatment
3. Who does dad usually treat better, you or this sibling?
A The sibling almost always gets preferential treatment
B The sibling often gets preferential treatment
C We were both treated almost the same
D I often get preferential treatment
E I almost always get preferential treatment
4. Some siblings always care about each other, while some brothers and sisters rarely care about each other. How much do you and this sibling care about each other?
A Almost none B Relatively little C Some D Quite a lot E Very much
5. How often do you travel and do things together with this sibling?
A Almost none B Relatively little C Some D Quite a lot E Very much
6. How often do you and this sibling insult or scold each other?
A Almost none B Relatively little C Some D Quite a lot E Very much
7. How many things do you and this sibling like in common?
A Almost none B Relatively little C Some D Quite a lot E Very much
8. How many times have you been able to talk to this sibling about anything?
A Almost none B Relatively little C Some D Quite a lot E Very much
9. Some siblings try to surpass or beat each other in many things, while others try to surpass each other in only a few things. How much do you and this sibling want to outdo each other?
A Almost none B Relatively little C Some D Quite a lot E Very much

10. How much do you appreciate and respect this sibling?
A Almost none B Relatively little C Some D Quite a lot E Very much
11. How much does this sibling appreciate and respect you?
A Almost none B Relatively little C Some D Quite a lot E Very much
12. How often do you and this sibling have different ideas and argue?
A Almost none B Relatively little C Some D Quite a lot E Very much
13. Some siblings always like to cooperate with each other, while some brothers and sisters rarely cooperate with each other. How much cooperation do you and this sibling have with each other?
A Almost none B Relatively little C Some D Quite a lot E Very much
14. Who gets more attention from your mother, you or this sibling?
A My siblings almost always get more attention
B My siblings often get more attention
C We both get almost the same attention
D I often get more attention
E I almost always get more attention
15. Who gets more attention from your father, you or this sibling?
A My siblings almost always get more attention
B My siblings often get more attention
C We both get almost the same attention
D I often get more attention
E I almost always get more attention
16. How much do you and this sibling like each other?
A Almost none B Relatively little C Some D Quite a lot E Very much
17. Some siblings always play together and feel happy, while some brothers and sisters rarely play together happily. How often do you play with this brother and sister and feel happy?
A Almost none B Relatively little C Some D Quite a lot E Very much
18. How many times have you and this sibling treated each other badly?
A Almost none B Relatively little C Some D Quite a lot E Very much
19. How much do you have in common with this sibling?
A Almost none B Relatively little C Some D Quite a lot E Very much
20. How often do you and this sibling share your secrets and private feelings with each other?
A Almost none B Relatively little C Some D Quite a lot E Very much
21. How much competition do you have with this sibling?
A Almost none B Relatively little C Some D Quite a lot E Very much
22. How much do you admire and feel proud of this brother and sister?
A Almost none B Relatively little C Some D Quite a lot E Very much
23. How much do your brothers and sisters admire you and are proud of you?
A Almost none B Relatively little C Some D Quite a lot E Very much

24. How often do you and this sibling get angry at each other and argue?
A Almost none B Relatively little C Some D Quite a lot E Very much
25. How much time do you share with this sibling?
A Almost none B Relatively little C Some D Quite a lot E Very much
26. Who does mother prefer more, you or this sibling?
A almost always prefers my siblings
B often prefers my brothers and sisters
C No one is more favoured
D often prefers me
E almost always prefers me
27. Who does dad prefer more, you or this sibling?
A almost always prefers my siblings
B often prefers my brothers and sisters
C No one is more favoured
D often prefers me
E almost always prefers me
28. How much strong emotion (love) do you have with this sibling?
A Almost none B Relatively little C Some D Quite a lot E Very much
29. Some children spend a lot of time with their siblings, and some don't spend that much time. How much free time do you and this sibling spend together?
A Almost none B Relatively little C Some D Quite a lot E Very much
30. How often do you and this sibling make trouble for each other or deliberately make things difficult for each other?
A Almost none B Relatively little C Some D Quite a lot E Very much
31. How similar are you to this sibling?
A Almost none B Relatively little C Some D Quite a lot E Very much
32. How much do you and this sibling tell each other that you don't want anyone else to know?
A Almost none B Relatively little C Some D Quite a lot E Very much
33. How often do you and this sibling try to do things better than each other?
A Almost none B Relatively little C Some D Quite a lot E Very much
34. How much do you admire this sibling?
A Almost none B Relatively little C Some D Quite a lot E Very much
35. How much does this sibling appreciate you?
A Almost none B Relatively little C Some D Quite a lot E Very much
36. How often do you and this sibling argue with each other?
A Almost none B Relatively little C Some D Quite a lot E Very much

Peer Relationship Scale

Please choose 1 (strongly disagree) to 5 (strongly agree) for each question.

1. When I have a problem, I share it with my friends.
2. In my spare time, I want to spend time with my friends.
3. Sharing my feelings and thoughts with my friends makes me happy.
4. When I am separated from my friends, I miss them.
5. I can achieve many things together with my friends.
6. I share my happiness and joys with my friends.
7. I chat with my friends on many topics.
8. I feel safe when I am with my friends.
9. I would be sad if I saw other people getting angry with my friends.
10. I sacrifice for the sake of my friends.
11. When my friends get offended, I reconcile them.
12. My friends are affectionate.
13. My friends do good for others.
14. Other children also want to be friends with me.
15. Making friends is easy for me.
16. I have many close friends.
17. My friends appreciate me in every respect.
18. My friends think I am a good person.
19. My friends trust me.
20. My friends know that I am with them in difficult moments.
21. I do not share my friends' secrets with anyone.
22. My friends care about me.
23. My friends enjoy spending time with me.
24. Everyone should have a friend like me.
25. When my friends misbehave, I warn them without hurting them.
26. When my friends get angry with me, I calm them down.
27. I do not lie to my friends.
28. I apologize to my friends when I have misbehaved. 29. I like the warnings of my friends for my good.

Appendix B

Ethical Approval

**SOCIAL SCIENCES & HUMANITIES
INTERDIVISIONAL RESEARCH ETHICS COMMITTEE**

Research Governance, Ethics & Assurance Team, Research Services, University of Oxford,
Boundary Brook House, Churchill Drive, Headington, Oxford OX3 7GB, UK
Tel: +44(0)1865 289881 Email: ethics@socsci.ox.ac.uk



Department of Education]
University of Oxford

4 April 2024

Dear [REDACTED]

Research ethics approval

Research title: Comparing Peer Relationships of Children With and Without Siblings in China: The Role of Perceived Parental Differential Treatment, Sibling Relationship, and Sibling-Gender Composition

Research ethics reference: R92584/RE001

The above application has been considered on behalf of the Social Sciences and Humanities Interdivisional Research Ethics Committee (SSH IDREC) in accordance with the University's procedures for ethical approval of all research involving human participants.

I am pleased to confirm that, on the basis of the information provided to the IDREC, ethics approval has now been granted for this study for the period 3rd April 2024 to 2nd October 2025.

Please note the following:

Personal data: It is the responsibility of the Principal Investigator to ensure that all personal data collected during the project is managed in accordance with the University's [guidance and legal requirements](#).

Fieldwork: The University's [Safety in Fieldwork Policy](#) must be followed.

Amendments: Please notify the committee if you intend to make any amendments to the information in your ethics application as submitted at date of this approval, as all changes must receive ethical approval prior to implementation. The **amendment form** is available on the [SSH IDREC webpage](#).

We welcome feedback on your experience of the ethical review process and suggestions for improvement. Please email any comments to ethics@socsci.ox.ac.uk.

Yours sincerely

DocuSigned by:
Yolande Monger
55238B5B6383436...

Mrs Yolande Monger

Research Ethics Administrator

for

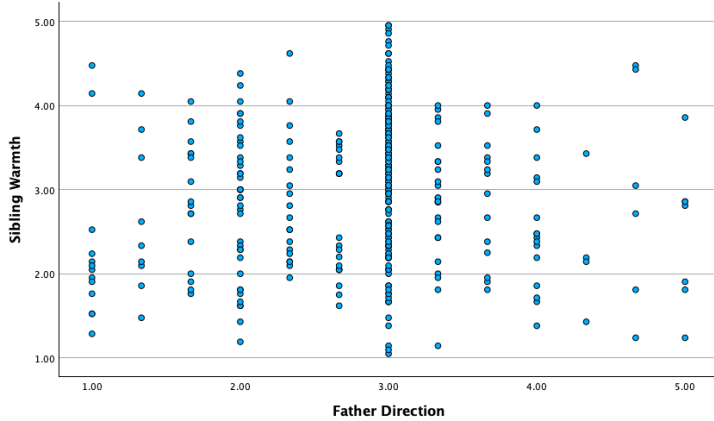
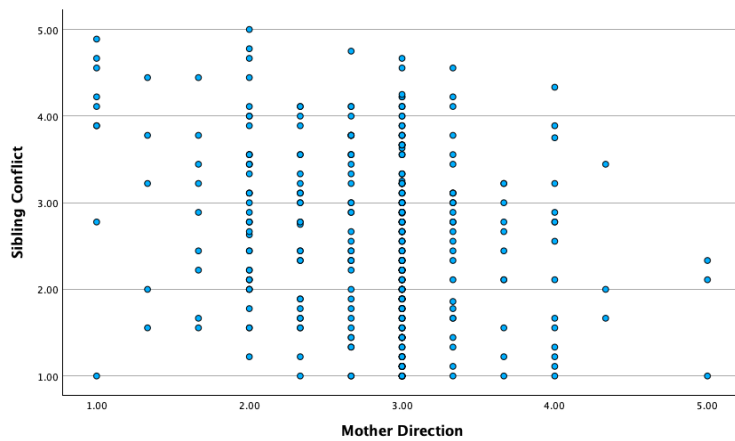
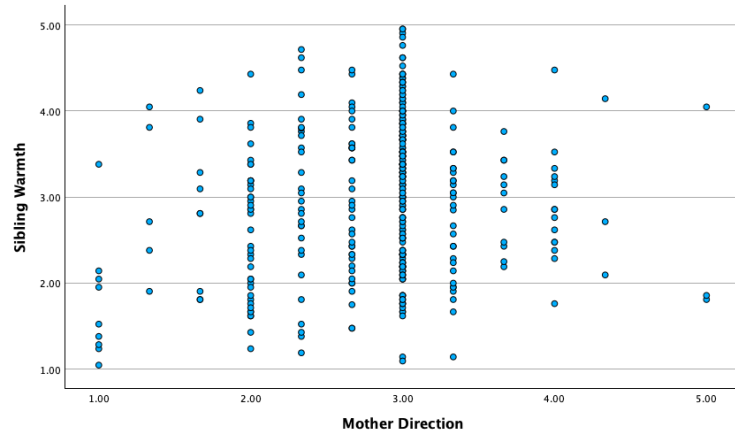
Jennifer Blaikie

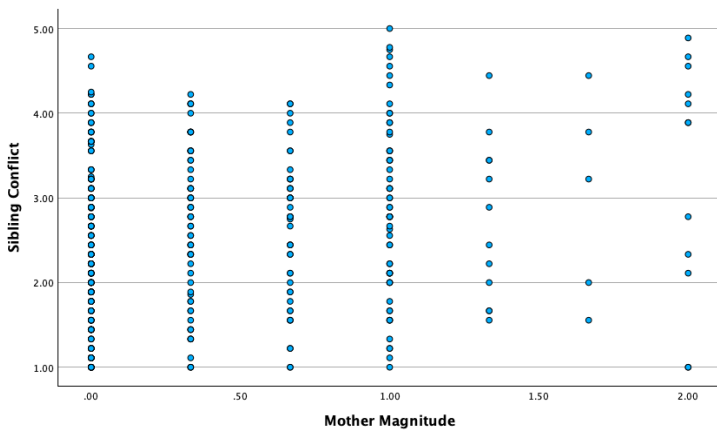
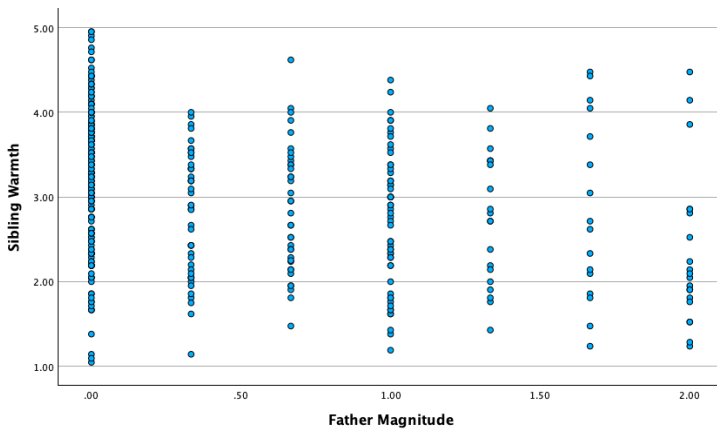
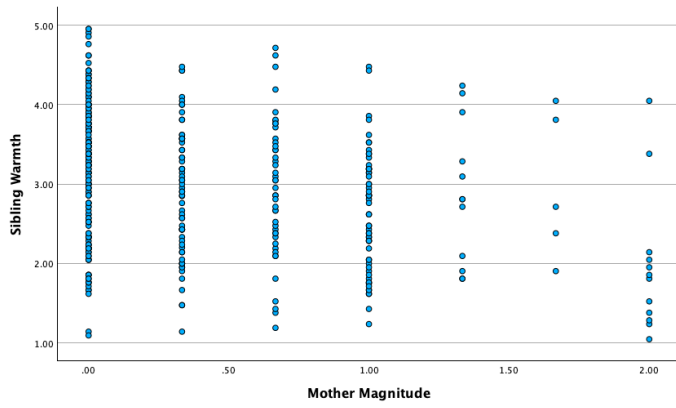
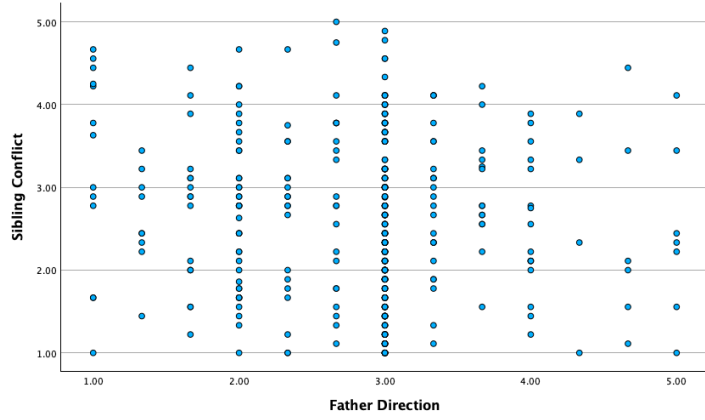
Research Ethics Manager (SSH IDREC)

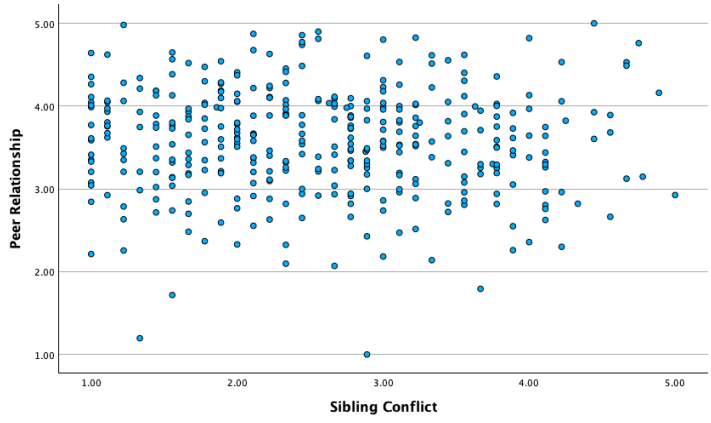
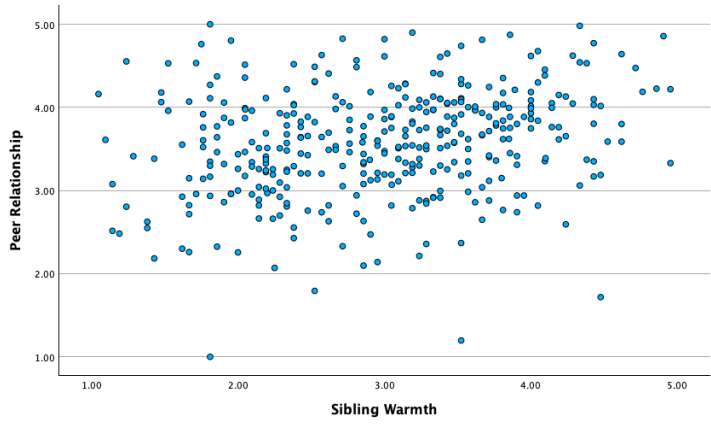
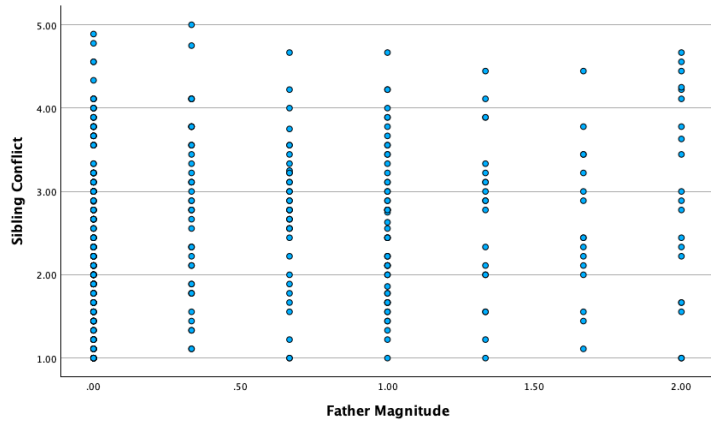
Appendix C

Assumption Check for Correlation Analysis

Scatterplot for each pair of relationship:







Appendix D

Results of the Correlation between Parental Differential Treatment and Sibling Relationships for Different Sibling-Gender Compositions

Correlation Analysis (Spearman's rho) for Children with Older Brothers (N=70, boys=36, girls=34)

	1	2	3	4	5	6	7
1. Sibling Warmth		-.19	.15	.34	-.24	-.02	.46**
2. Sibling Conflict	-.35*		.20	-.17	.08	.22	.12
3. Father Differential Treatment Direction	-.37*	.14		-.15	.52**	.36*	.19
4. Mother Differential Treatment Direction	.04	.001	.25		-.41*	-.29	.13
5. Father Differential Treatment Magnitude	-.38*	.05	-.004	-.17		.46**	-.02
6. Mother Differential Treatment Magnitude	-.30	.06	-.26	-.31	.61**		-.01
7. Peer Relationship	.57**	-.15	-.07	.16	-.33*	-.25	

*Note: Girl's correlations are on the top diagonals, and boy's correlations are on the bottom diagonals. All parameter estimates are from SPSS 29. * = $p \leq 0.05$, ** = $p \leq 0.01$.*

Correlation Analysis (Spearman's rho) for Children with Older Sisters (N=75, boys=48, girls=27)

	1	2	3	4	5	6	7
1. Sibling Warmth		-.43*	-.09	-.19	-.43*	-.48**	.52**
2. Sibling Conflict	-.34*		-.08	-.21	.28	.22	-.22
3. Father Differential Treatment Direction	-.13	.001		.25	.58**	.21	-.27
4. Mother Differential Treatment Direction	-.16	-.18	.25		.15	.02	.01
5. Father Differential Treatment Magnitude	-.44**	.18	.11	.03		.67**	-.41*
6. Mother Differential Treatment Magnitude	-.39**	.15	.22	.003	.85**		-.51**
7. Peer Relationship	.19	-.10	-.01	.05	.04	.09	

*Note: Girl's correlations are on the top diagonals, and boy's correlations are on the bottom diagonals. All parameter estimates are from SPSS 29. * = $p \leq 0.05$, ** = $p \leq 0.01$.*

Correlation Analysis (Spearman's rho) for Children with Younger Brothers (N=111, boys=47, girls=64)

	1	2	3	4	5	6	7
1. Sibling Warmth		-.22	.18	.34**	-.11	-.34**	.07
2. Sibling Conflict	-.07		-.02	-.22	-.05	.23	-.14
3. Father Differential Treatment Direction	-.32*	.08		.32**	-.44**	-.35**	.16
4. Mother Differential Treatment Direction	.18	-.32*	.19		-.28*	-.51**	-.02
5. Father Differential Treatment Magnitude	-.60**	.11	-.58**	-.36*		.42**	-.08
6. Mother Differential Treatment Magnitude	-.39**	.32*	-.34*	-.60**	.58**		-.23
7. Peer Relationship	.07	-.02	-.07	-.09	.14	-.06	

Note: Girl's correlations are on the top diagonals, and boy's correlations are on the bottom diagonals. All parameter estimates are from SPSS 29. * = $p \leq 0.05$, ** = $p \leq 0.01$.

Correlation Analysis (Spearman's rho) for Children with Younger Sisters (N=119, boys=59, girls=60)

	1	2	3	4	5	6	7
1. Sibling Warmth		-.31*	.26*	.06	-.30*	-.19	.34**
2. Sibling Conflict	-.25		-.20	-.25	.25	.33*	-.04
3. Father Differential Treatment Direction	-.02	-.14		0.16	-.79**	-.38**	.16
4. Mother Differential Treatment Direction	.19	-.02	.05		-.03	-.58**	.12
5. Father Differential Treatment Magnitude	-.10	.26*	-.71**	-.18		.32*	-.17
6. Mother Differential Treatment Magnitude	-.24	.12	-.25	-.42**	.49**		-.22
7. Peer Relationship	.26*	-.09	.03	-.09	.07	.22	

Note: Girl's correlations are on the top diagonals, and boy's correlations are on the bottom diagonals. All parameter estimates are from SPSS 29. * = $p \leq 0.05$, ** = $p \leq 0.01$.

Appendix E
Assumption Check for 2-way ANOVA

Levene's Test

Levene's Test of Equality of Error Variances^{a,b}

		Levene Statistic	df1	df2	Sig.
PeerTot	Based on Mean	1.243	3	507	.293
	Based on Median	1.107	3	507	.346
	Based on Median and with adjusted df	1.107	3	493.629	.346
	Based on trimmed mean	1.222	3	507	.301

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: PeerTot

b. Design: Intercept + Gender + Sibling + Gender * Sibling