



Callous-Unemotional (CU) Traits, Disruptive Behaviour, and Teacher-Child Interaction in Chinese Preschool Children

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Thesis submitted to University College London for the degree of

Doctor of Philosophy

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Declaration

I, Xinyi Cao, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I can confirm that this has been indicated in the thesis.

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Abstract

Conduct problems (CP) are common in early childhood and can exert a significant negative impact on children, their peers, and teachers. While abundant evidence indicates that children with CP can be subtyped based on the presence of high callous-unemotional (CU) traits, characterized by low empathy, remorse, guilt, and a lack of concern about performance, most research on CU traits in the school context has been conducted with older children and adolescents in Western countries. Therefore, the current thesis aimed to explore the links between CU traits and school environmental factors in the Chinese preschool context. This thesis comprises three studies. The first study is a qualitative study on teachers' perceptions of differences between children with CP who have high versus low levels of CU traits, particularly in response to teacher rewards, discipline, instructional methods, and the quality of teacher-child and teacher-caregiver relationships. Teachers perceived children with high CU traits as having more severe CP, poorer quality relationships with teachers and caregivers, and being less responsive to discipline. In the second study, teacher-child interactions regarding teacher use of and child responses to rewards, discipline, and instructional methods were observed during classroom activities. The findings indicated that CU traits were not related to children's responses to discipline, nor did CU traits moderate the relationship between instructional methods and children's academic engagement. However, higher CU traits predicted a greater frequency of one-to-one teacher-child interaction. The final study validated a newly developed questionnaire assessing children's responses to common classroom rewards used by teachers. This study found that teachers observed no significant difference in children's responses to different types of rewards. The measure demonstrated good reliability and validity. The findings of this thesis may aid in the development of school-based interventions aimed at promoting engagement and prosocial behaviour in children with CU traits.

Impact Statement

CP is one of the most frequently occurring mental health problems in children, and the main factor that leads to children being referred to mental health services. In addition to prediction of poor outcomes in midlife, children with CP experience many difficulties at school and bring increased teachers' stress, as well as place financial burden on the public sector, especially the education system. Therefore, it is important to understand the heterogeneity in the risk factors, presentation, developmental course, and outcomes for CP as they could help in the design and adaptation of tailored prevention and intervention programmes that are effective in reducing behavioural problems, enhancing academic performance, and improving overall well-being for these children at high risk. There is increasing evidence to suggest that CU traits can be a promising marker that designating an etiologically and clinically important subgroup of children with more severe CP who also exhibit differences in biological, emotional, cognitive and personality features compared to their peers low in CU traits.

To date, most existing research on CU traits and the impact of environmental factors, including the school context, has been predominantly conducted in Western countries and focused primarily on older children and adolescents. Conducted in the Chinese preschool context, this research expands our understanding of CU traits to a population that has been largely overlooked in prior studies. The findings suggest generalizability of the core features of CU traits, while also highlighting potential cultural and developmental differences that may influence the risk correlates of CU traits. In addition, the use of a multi-method research design in this program has enabled the acquisition of more comprehensive insights into the interrelationships between CU traits and the studied school-related variables. Specifically, the classroom observation component of this thesis provided a more objective and ecologically valid

understanding of the relationships between CU traits and child responses to rewards and discipline, offering a different perspective compared to past research that often relied on teacher and/or child reports and experimental tasks. Finally, the present studies have identified useful environmental factors in the school setting that may promote academic engagement and prosocial behaviour in children with high CU traits. Findings suggest that children high in CU traits may have similar responses to child-directed instructional methods and close teacher supervision. Teachers may need additional support and training to establish close teacher-child and teacher-caregiver relationships, as well as employ reward strategies that meet the specific needs of children with high CU traits. These findings can help in informing and guiding the development of interventions and teacher training programmes targeting childhood CP and CU traits and therefore have important practical implications.

The findings from this thesis have been published in international peer-reviewed journals and presented at international conferences and university group talks. Those findings that have not yet been published will also be submitted to international peer-reviewed journals. These efforts ensure the widespread impact of the current studies.

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Chapter 1

Literature Review

1.1 Chapter Introduction

This literature review begins with a broad overview of Conduct Problems (CP), with a specific emphasis on Callous-Unemotional (CU) traits. Children exhibiting a high level of CU traits, characterized by low empathy, lack of guilt or remorse, shallow affect, and indifference towards performance, constitute a unique subgroup within children having CP. The chapter then provides a more detailed review of conceptualizing CU traits, including their unique presentations, aetiology, correlates, treatment outcomes, and measures. The focus then narrows to the specific age group and cultural context, namely, the preschool period and Eastern nations such as China. Finally, the review presents research on the relationships between CU traits and environmental factors, especially in school settings. It explores how CU traits may impact teacher-child and teacher-parent relationships, rewards, discipline, and instructional methods, highlighting the need for further research in the Chinese preschool context to inform effective school-based prevention strategies and interventions for children with CU traits.

1.2 CP in Childhood

CP encompasses a broad spectrum of disruptive behaviours, ranging from milder oppositional behaviours like temper tantrums and yelling, to more severe forms of antisocial behaviour, such as physical aggression and destructiveness (Walker et al., 2020). In school settings, CP results in not only negative outcomes for students displaying these behaviours but also poses significant challenges for teachers working with students whose behaviour is hard-to-manage. For example, evidence shows that school-aged students with CP display academic deficits in reading, written language and mathematics (Campbell et al., 2018) and higher likelihood of either school dropout or

expulsion (Lau et al., 2023; Parker et al., 2018). In addition to academic problems, the aggressive behaviour, verbal and social skill deficits observed in children with CP make them more susceptible to peer difficulties such as peer rejection, deviant peer affiliation (Chen et al., 2015; Miller & Olson, 2000) and peer victimization (Oncioiu et al., 2023; Reijntjes et al., 2011). In turn, CP in classrooms has been identified as a primary source of teacher stress, emotional exhaustion, and burnout (Aldrup et al., 2018).

Reflecting on the profound negative impact that CP has on a large number of students and their teachers, there has been an incremental financial outlay to meet the increased requirements across criminal justice, health care, and social-service sectors (Rivenbark et al., 2018). Given the high prevalence, detrimental outcomes, and significant economic burden associated with CP, early identification and intervention are crucial. Such concerns have motivated the development of precise clinical definitions and diagnostic criteria. For example, children exhibiting severe, frequent, and persistent CP may be diagnosed with Oppositional Defiant Disorder (ODD) or Conduct Disorder (CD), with diagnostic criteria delineated in the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association [APA], 2013).

ODD refers to recurrent behaviours of defiance, disobedience, and antagonism towards authority figures like parents and teachers. ODD is often perceived as a milder disorder that serves as a preliminary stage in the trajectory towards CD, attributed to its earlier onset and less intense symptoms. However, it should be also noted that although ODD and CD tend to share common risk and protective factors, evidence supports their distinction as separate diagnoses. Not all individuals with ODD necessarily progress to CD, and not everyone diagnosed with CD has ODD. Furthermore, ODD can persist into adolescence and predicts adjustment problems in adolescence and adulthood, even when

accounting for CD. As for CD, it reflects an enduring and recurring pattern of behaviour that violates societal norms, rules, and basic rights of others more seriously and even involves illegal behaviours, which is more commonly diagnosed during adolescence (Allen et al., 2020). Different terminology has been used to describe CP, including externalising problems, disruptive behaviour and antisocial behaviour (McMahon & Frick, 2019). For the purpose of terminological consistency in this thesis, CP will predominantly be used to describe this cluster of acting-out behaviours when reviewing past research and theory. Specific terms like ODD and CD from DSM-5 will only be used when formal diagnostic categories are being referenced. The term externalising problems will be used when discussing research questions, hypotheses, data analysis and findings in this thesis that involve the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). This is to ensure clarity and precision.

1.2.1 Different Developmental Pathways of CP

While it might seem that children with CP are predisposed to poor outcomes later in life, not all follow this path and exhibit persistent CP from adolescence into adulthood. Abundant research highlights the heterogeneity among children with CP in childhood, emphasizing varied underlying causes and developmental paths leading to severe CP (Bevilacqua et al., 2018; McMahon & Frick, 2021). One taxonomy of CP that has long been recognized in research is the age of symptom onset (Moffitt, 1993; Shaw, 2013). This distinction has been reflected in the DSM-5 as well, which categorizes individuals diagnosed with CD into two subtypes: adolescent-onset and childhood-onset (American Psychiatric Association, 2013). CP in the adolescent-onset group is theorized as being a response to the “maturity gap,” which is an incongruence between biological maturation and societal roles (Moffitt, 1993; Moffitt, 2006). That is, an individual may have reached biological maturity, but societal norms (e.g., age restrictions on certain activities) or cultural expectations (e.g., milestones like marriage or completing education) might delay or prevent them from attaining

the social privileges of genuine adulthood, such as financial independence and making significant decisions. In pursuit of autonomy and independence, adolescents experiencing this maturity gap may engage in problematic behaviours, such as substance use and delinquency (Dijkstra et al., 2015; Moffitt, 2018). Therefore, it has been suggested that CP in this group is usually limited within adolescence as many individuals naturally curtail their CP, aligning with societal norms, and achieve more conventional lifestyles as they transition into social adulthood (Moffitt, 2006).

In contrast to adolescent-onset CP, the childhood-onset form emerges early in childhood, typically before the age of 10, and is related to more severe and persistent CP into midlife (Frick & Kemp, 2021; Moffitt, 2017; Moffitt, 2018). The differences between childhood-onset and adolescent-onset pathways are suggested to be attributable to children's negative dispositional factors, such as negative predisposing genetic factors and early neurocognitive characteristics. In addition, although children with early-onset CP may share some environmental risk factors with their peers in the adolescent-onset CP group (e.g., maternal schooling, family income, harsh parenting), they typically face greater exposure to these risk factors during prenatal stages and early childhood (Bevilacqua et al., 2018; Martins-Silva et al., 2024).

The correlation and interplay between innate vulnerabilities and external negative experiences significantly influences a child's development, leading to disrupted socialization and poor relationships with others, which gradually constructs a disordered personality characterized by persistent physical aggression and antisocial behaviour into midlife. Moreover, early-onset CP often signal broader psychological challenges, placing children on this path at a higher risk of facing a variety of adverse outcomes in adulthood across multiple domains, including externalizing-, attention-, thought-, and social problems (Bevilacqua et al., 2018; Frick & Kemp, 2021; Moffitt, 2017; Moffitt

2018; Sentse et al., 2017).

In recent years, with the application of new data analytic techniques, researchers have proposed that there might be another trajectory within childhood-onset CP, termed 'childhood-limited' or 'early-onset, desisting', on which some early starters may not continue their problematic behaviour, exhibiting a significant decrease in CP over later childhood and adolescence (Barker & Maughan, 2009; Bevilacqua et al., 2018; Gutman et al. 2019). Previous research has consistently found that children with childhood-limited CP share several individual and contextual risk factors with those experiencing childhood-onset CP, including poor verbal abilities, difficult temperaments, family adversity (e.g., family instability, socio-economic deprivation), maternal psychopathology, and maltreatment (Bevilacqua et al., 2018; Gutman et al., 2019; López-Romero et al., 2015; Moffitt, 2006; Moffitt et al., 2008; Odgers et al., 2007, 2008). Despite sharing common risk factors, the trajectory of childhood-limited CP differs from that of early-onset but persistent CP due to a lower range and severity of risk exposure. For example, evidence has suggested that, compared to childhood-onset, persistent CP, childhood-limited CP has a weaker association with low family income (Gutman et al., 2018), and children in the childhood-limited group are less likely to grow up in single or step-parent families, or have a depressed parent (Gutman et al., 2019).

Moreover, for children following the childhood-limited pathway, the adverse impacts of child and family risk factors lessen when they mature into adolescence, suggesting that the developmental differences between childhood-limited and childhood-onset CP may not only be attributed to the variety and intensity of risk factors but also to how long these risks persist into childhood and adolescence (Gutman et al., 2019). With the diminishing negative impacts of risk factors, it is not surprising that children in this group tend to have better outcomes in adult life than those with childhood-onset and

adolescent-onset CP. However, this does not mean these children completely overcome CP challenges with studies showing that they still face poorer educational outcomes and exhibit more aggressive behaviours in early adulthood compared to their peers on a stable low CP trajectory (Bevilacqua et al., 2018). These findings challenge the definition of childhood-limited CP that children in this group should not be indistinguishable from those of individuals with stable low levels of CP in adulthood (Moffitt 2006). Nonetheless, deepening our understanding of the various CP trajectories in early childhood and their associated risk factors may help children who display CP in early childhood to limit their problematic behaviours within a childhood-limited trajectory, potentially improving their outcomes in adolescence and adulthood.

1.2.2 Gender differences in childhood CP

It has long been suggested that boys and girls may follow distinct developmental pathways of CP in childhood, with boys at higher risk of having early and persistent CP (Keenan & Shaw, 1997). As greater prevalence and severity of CP have been identified among boys, much of the previous research on CP has primarily focused on this gender, influencing the conceptualization and prevention strategies designed for early CP (Moffitt, 2006; Shaw, 2013; Wesseldijk et al., 2018). However, this raises important clinical and etiological questions. Specifically, it remains unclear whether sex-specific diagnostic methods and treatments are more effective than general approaches, or if there are unique sex-based risk and protective factors and developmental trajectories to CP (Konrad et al., 2022).

To date, with increasing concerns regarding CP in girls, there is accumulating evidence to suggest that theories such as developmental pathways, presentations, and correlates of CP, developed from male samples, seem to be applicable to females, though requiring further revisions to address the gender differences identified during early childhood (Gutman et al., 2018; Wu et al.,

2022). Research has indicated that, similar to boys, girls have also been identified with childhood-onset CP in cohort studies conducted in Belgium (n = 682; 49.5% boys; Sentse et al., 2017) and the UK (n = 12,798; 50.5% boys; Gutman et al., 2018), albeit with lower incidence rates compared to boys.

In addition, boys and girls exhibit somewhat different patterns of developmental trajectories in childhood-onset CP (Gutman et al., 2018). Specifically, while boys on the early-onset pathway maintain overall high levels of CP from age 3, girls with severe CP at age 3 show a temporary reduction in CP between the ages of 5 and 7, then followed by an increase in CP around age 11. Moreover, boys with early-onset CP tend to desist sooner after age 3, earlier than girls, who desist around age 7. Furthermore, Gutman et al. found that there are some shared risk factors for early childhood CP across genders, such as maternal depression and smoking during pregnancy. However, their findings also highlighted gender-specific precursors, with boys on the childhood-onset pathway being more vulnerable to their own delayed development and parenting factors than girls.

1.2.3 Cross-Cultural Variations in Childhood CP

Building on the above discussion that CP in early-childhood is important in children's development in various domains across the life span, it is important to note that most prior research has been conducted in high-income, Western countries (Fairchild et al., 2019). This leaves a gap in understanding the generalizability of findings related to early risk factors and developmental trajectories of CP in low- or middle-income, non-Western countries. Initial evidence has suggested the potential difference in the prevalence of different developmental trajectories of CP across cultures. For example, although similar longitudinal patterns of CP have been identified in a large Brazilian birth cohort study (n = 3938, with CP measured at ages 4, 6, 11, and 15 years), researchers found a smaller proportion of early-onset persistent and childhood-limited CP

compared to previous studies in high-income European countries (Martins-Silva et al., 2024). This finding appears counterintuitive given that Brazil is a middle-income country, characterized by high levels of violence and significant social inequalities (Martins-Silva et al., 2024). Individuals residing in such adverse social environments may be more susceptible to encountering difficulties that contribute to the development of severe CP. Martins-Silva et al. (2024) proposed that this unexpected observation might be partially attributed to a distinct social context, yet they did not provide a detailed explanation regarding which specific cultural factors influence the prevalence of CP development trajectories in Brazil.

Similarly, another study conducted a systematic analyses of the burden of CP (i.e., age-standardized prevalence rates and estimated annual percentage change) across the globe from 1990 to 2019. It also identified notable differences between European and East Asian regions, though it did not specifically address different CP pathways (Wu et al., 2022). Wu et al. suggest that these differences might be partially attributed to cultural variations. For instance, Eastern countries like China place a high value on suppressing strong emotions and overt behaviours. This cultural norm could lead parents to have lower tolerance and adopt more strict coping strategies when managing children's externalising behaviours. Consequently, this approach may result in a lower prevalence of CP in Eastern regions compared to Western countries

While the preceding paragraphs have outlined potential variations in CP prevalence across different sociocultural environments, the importance of recognizing the generalizability of early risk factors and developmental trajectories across these contexts cannot be overlooked (Bevilacqua et al., 2018). For instance, the three CP developmental pathways, including childhood-limited, childhood-persistent, and adolescent-onset, have been observed in several countries, such as Belgium (Sentse et al., 2017), the United

Kingdom (UK) (Gutman et al., 2019), Brazil (Martins-Silva et al., 2024), New Zealand (Odgers et al., 2008), the United States (US) (Alink & Egeland, 2013), and Australia (Bor et al., 2010), with the childhood-onset persistent pathway being associated with the highest risk of adverse outcomes in adulthood (Bevilacqua et al., 2018).

Furthermore, similar early bio-psycho-social risk factors have been implicated in shaping the developmental trajectories of early childhood CP across different environments (Martins-Silva et al., 2024). An example of such a risk factor is maladaptive parenting, well-documented as a significant risk factor in the development of childhood-onset CP (Fairchild et al., 2019; Moffitt 2018). Studies across various countries and multiethnic groups have found that early harsh parenting predicts later CP, including in China (Wang & Liu, 2018), the US (Rolon-Arroyo et al., 2018), Brazil (Bauer et al., 2021), and the UK (Flouri & Midouhas, 2017). While parenting styles may vary and be interpreted differently across cultural contexts, reflecting diverse social norms and levels of acceptability, the underlying effects on children's development can be similar as long as these practices are culturally aligned. Consequently, despite potential differences in the specific practices of parenting across different cultures, if they demonstrate a similar fundamental conceptualization of parental warmth and harshness, they can have similar subsequent effects and lead to similar outcomes (Rothenberg et al., 2020).

1.3 CU Traits

Within the subgroup of children with childhood-onset CP, extensive evidence has identified a further specifier characterized by high levels of CU traits. These traits constitute a temperament dimension defined as low empathy, lack of guilt or remorse, shallow affect, and indifference towards performance (Frick et al., 2014). CU traits can be identified reliably as early as the preschool years (Bansal et al., 2020; Kimonis et al., 2006; Kimonis et al., 2016) and are viewed

as developmental precursors to the affective dimensions observed in adult psychopathy, demonstrating similar characteristics and correlates (Frick & White, 2008; Pardini & Fite, 2010; Pisano et al., 2017). Evidence shows that high CU traits in childhood are related to more chronic, aggressive, and severe forms of CP (Frick et al., 2018). With the recognition of the important role that CU traits play in the developmental pathway to severe CP, extensive studies have been conducted to explore aetiological factors underlying the development of these traits. Studies also examine the unique biological, emotional, cognitive, and personality differences, as well as treatment outcomes, in children with CP who have high levels of CU traits, in contrast to those who are low in CU traits (Frick & Myers, 2017).

On the basis of the research that has indicated unique correlates, poorer prognosis, and treatment outcomes for children with CP and CU traits, the DSM-5 has included CU traits as a specifier for CD, labelling it 'with limited prosocial emotions' (LPE) to avoid potential stigmatization linked to CU traits. For an individual to meet the criteria for the LPE specifier, they must display at least two of the following four characteristics persistently over at least 12 months and in multiple relationships and settings: 1) Lack of remorse or guilt, 2) Callous/lack of empathy, 3) Unconcerned about performance, and 4) Shallow or deficient affect. The subsequent sections will provide a review of these areas of research, along with an overview of common measures for CU traits, as well as potential research gaps in relation to developmental stages and cultural contexts.

1.3.1 Aetiology and Unique Correlates of CU Traits

Twin studies suggest that CU traits have a strong biological foundation, with CP in children exhibiting elevated CU traits being under high genetic influence but less shared environmental influence compared to children with low CU traits (Viding & Kimonis, 2018). Longitudinal studies suggest significant stability of

CU traits across childhood and adolescence (see review in Frick et al., 2014; Viding & Kimonis, 2018), which is viewed as being driven by genetic vulnerabilities leading individuals to develop an atypical neurocognitive profile compared to their peers (Viding & McCrory, 2015; Waller & Wagner, 2019). For example, CU traits are linked with significant deficits in attending, recognizing and responding to various forms of negative emotional cues in children (Frick et al., 2018; Viding & Kimonis, 2018), including decreased sensitivity to fearful and sad facial expressions (Billeci et al., 2019; Hoyniak et al., 2019), fearful vocal affect (Blair et al., 2005; Hoyniak et al., 2018) and punishment cues (Hwang et al., 2020). This reduced sensitivity to negative environmental cues aligns with cognitive findings, where children high in CU traits underestimate the likelihood of being punished for their misbehaviour and display a reward-dominant behavioural pattern, focusing primarily on rewards (Frick et al., 2014).

Negative emotional arousal (e.g., guilt) following wrongdoing is theorized as key to the development of conscience and the internalization of norms and values (Kochanska 1991, 1993, 1997). Children who experience an appropriate level of arousal when punished are more likely to understand and internalize parental guidance on acceptable behaviour. Conversely, temperamentally fearless children, displaying insufficient guilt and anxiety responses to punishment cues in situations of actual or anticipated misbehaviour, may lack the motivation to alter their behaviour to avoid such negative experiences. Therefore, punishment insensitivity, encompassing propensities such as low arousal to aversive stimuli, reduced fearfulness, impaired avoidance learning, reward dominance, and deficits in attentional control to contextual stimuli, can impede the development of moral beliefs and emotions, leading to a callous interpersonal style with a reduced sense of empathy and guilt (Fowles & Kochanska, 2000; Kochanska 1995, 1997; Pardini, 2006; Salmon & Dadds, 2003). In addition, environmental risks, including ineffective parenting (e.g., inconsistent discipline, noncontingent punishment), can exacerbate these

innate tendencies, further increasing the risk of serious violent behaviour in these children (Pardini, 2006; Salmon & Dadds, 2003).

In line with these theories, children with high levels of CU traits have been found to display a fearless temperament and exhibit elevated thrill-seeking compared to their CP-only peers (Waller & Wagner, 2019). Moreover, research indicates that children with CP and high CU traits have little concern for the suffering of victims or potential negative consequences for themselves, and they are inclined to view aggression as an effective strategy to achieve their goals such as obtaining social dominance (Pardini & Byrd, 2012; Pardini et al., 2003; Frick et al., 2014). CU traits are also associated with impaired social affiliation, including reduced motivation and pleasure from social bonding or interpersonal kindness and closeness (Viding & McCrory, 2019; Waller & Wagner, 2019). In support of this, studies have consistently found that CU traits are related to poor interpersonal relationships. For example, compared to their peers with low levels of CU traits, children with high CU traits are more likely to be both perpetrators and victims of peer bullying (Zych et al., 2019). Children with high CU traits have also been reported to have lower levels of social competence (Haas et al., 2018), peer companionship and greater peer rejection (Wagner et al., 2020; Waller et al., 2017a). Research has also found significant relationships between CU traits and deficits in early-life affiliative behaviors, such as reduced attention to the mother's face (Bedford et al., 2015), decreased physical and verbal affection towards adoptive parents (Waller et al., 2016), less eye-contact with caregivers (Bedford et al., 2017; Dadds et al., 2012; Dadds et al., 2014), and a diminished capacity for establishing warm and cooperative interactions with parents (Kochanska et al., 2013; Waller et al., 2021). Cumulatively, early deficits in affiliative rewards can become an impediment to cultivating empathy, enjoying social connections, and demonstrating caring behaviors towards others (Waller & Wagner, 2019).

Henry et al. (2018) further investigated the genetic and environmental aetiology of CU traits from 7 to 12 years of age with 662 twin pairs in Canada. Extending prior research, the study revealed that beyond genetic influences, non-shared environmental factors also play a significant role in the variance of CU traits, highlighting potential pathways for interventions tailored to children with high CU traits. This is aligned with findings suggesting that environmental factors like lower maternal sensitivity and warmth, as well as higher parental harshness, are associated with higher CU traits in children with CP (Bedford et al., 2015; Hyde et al., 2016; Waller et al., 2014; Waller et al., 2013; Waller et al., 2018). Building upon previous findings, Waller and Wagner (2019) introduced the Sensitivity to Threat and Affiliative Reward (STAR) model as a theoretical framework to elucidate the risk factors associated with CU traits. Distinct from earlier theories that solely focused on either punishment insensitivity or deficits in affiliation, the STAR model synthesizes these two factors to explain the development and manifestation of CU traits. Furthermore, it captures the dynamic interplay between neurogenetic predispositions and environmental inputs. This multifaceted approach, which emphasizes the identification of heritable, neurobiological, and environmental influences on individual variations in personality, positions the STAR model as offering a more nuanced understanding of the underlying contributors to CU traits.

1.3.2 CU Traits and Treatment Outcomes

Considering these distinct emotional, cognitive, and temperamental profiles of children with CP and high CU traits, it is not surprising that that considerable evidence from previous studies has linked CU traits with poor treatment outcomes in traditional mental health interventions based on social learning theory (Frick et al., 2014b; Hawes et al., 2014). For instance, Hawes and Dadds (2005) explored the effect of CU traits on treatment outcomes after a parent training intervention for boys (aged 4-8) diagnosed with either ODD or CD using DSM-5 criteria. Their study found that the discipline-based treatment strategies,

namely time-out, was less efficacious for boys with high CU traits than for those with low CU traits, even when accounting for parental skill in the implementation of the time-out procedure and the child's CP, which aligns with previous discussions on CU traits and their unique association with punishment insensitivity. Likewise, following the same parenting training programme, similar results have been found in another mixed-gender sample of children aged 3-9 years with ODD and comorbid symptoms like anxiety disorders, ADHD, and autism spectrum disorder. Based on reports from mothers, fathers, and teachers, CU traits were identified as a unique predictor of elevated ODD symptoms at a 6-month follow-up, irrespective of the baseline severity, demographics and number of treatment sessions (Hawes et al., 2013).

Recognizing the potentially limited efficacy of traditional treatments, and informed by advancements in the understanding of CU traits over the past decades, researchers have recently proposed that children with CP and high CU traits might benefit more from interventions specifically designed to address their unique deficits and characteristics (see review in Frick & Myers, 2017; Viding & Kimonis, 2018; Wilkinson et al., 2016). Efforts are currently underway to develop interventions involving components tailored specifically to CU traits in early childhood. For example, Somech and Elizur (2012) found that an intensive parent-training program significantly reduced CU traits and CP in 209 Israeli children aged 3 to 5 years. This program includes 14 two-hour sessions where parents engage in role plays, discussions, and receive psycho-educational instruction to learn strategies that help their children develop empathy and concern for others. Compared to a control group that received minimal intervention, children of participants in this program exhibited a significant reduction in CU traits, with these improvements sustained at a one-year follow-up.

More recently, Kimonis et al. (2019) developed a tailored intervention

specifically addressing emotional and empathic deficits linked to CU traits among preschoolers. In an open trial, 23 Australian families with preschool-aged children exhibiting high CP and CU traits participated in this 21-week programme. Results suggested significant reductions in CP and CU traits and enhancements in empathy, with medium to large effect sizes. Following that research, Fleming et al. (2022) conducted a randomized controlled trial examining the efficacy of the same tailored intervention for 3- to 7-year-old clinic-referred children with CP and high CU traits, as compared to a standard intervention without the components targeted specifically for emotion deficits, a core feature of CU traits. Consistent with prior findings, this study suggests that the intervention specifically designed for CU traits may yield superior outcomes. While the standard intervention's benefits diminished over time, improvements in CP were maintained during the 3-month follow-up period after the tailored intervention.

1.3.3 Commonly Used Measures of CU Traits

Several measures have been developed and validated to accurately assess and identify the presence of these CU traits in various populations. Early measures of CU traits in children such as the Psychopathy Checklist: Youth Version (PCL:YV; Forth et al., 2003) and the Antisocial Process Screening Device (APSD; Frick & Hare, 2001) assessed the broader construct of psychopathic traits in children and therefore only have limited number of items specifically assessing CU traits (four items in the PCL: YV and six items in the APSD). The PCL:YV, an adaptation of the Hare Psychopathy Checklist-Revised (PCL-R; Hare, 1991), is tailored for evaluating incarcerated individuals aged 12 to 18. While this interview-based instrument has demonstrated robust reliability and validity in adolescent samples (Kosson et al., 2013; Neumann et al., 2006), it has limitations. Past research has reported inconsistent findings regarding its factor structure (Cooke & Michie, 2001; Hare & Neumann, 2005), and as per its intended design, PCL:YV is largely restricted to institutional contexts. The

APSD is a 20-item behavioral rating scale designed for evaluations by teachers and parents (Frick & Hare, 2001), as well as by the children themselves (Munoz & Frick, 2007). It is applicable to both community and clinical samples. However, response options for CU traits items are constrained, as respondents are limited to three choices, ranging from 0 (not at all true) to 2 (definitely true), which can limit score variability (Kimonis et al., 2008). The small number of CU trait items, coupled with this limited scoring range, has led to unsatisfactory internal consistency for the APSD CU traits subscale in several studies (Loney et al., 2003; Poythress et al., 2006; Wang et al., 2015).

To overcome these limitations, the Inventory of Callous-Unemotional Traits (ICU; Frick, 2004) was developed to provide a more comprehensive assessment of CU traits. The ICU is a 24-item rating scale expanded from the four CU items of the APSD that most commonly loaded onto a CU traits factor in community samples (Frick et al., 2000). The best-fitting model of ICU has a bifactor structure, which includes one overarching CU factor and three subfactors: callousness, uncaring, and unemotional (Ray & Frick, 2018). This factor structure has been supported in diverse samples across age groups (from preschoolers to adults), gender, informant (self-, parent- and teacher report), and cultures (Western and Eastern nations, including China) (Frick & Ray, 2015; Frick & Myers, 2017). In particular, research on the psychometric properties of the ICU has demonstrated the reliability and validity of the teacher-reported ICU among young children (Ezpeleta et al., 2013), with the teacher-report version of the ICU more effectively distinguishing between children with high and low levels of CU traits in children and adolescents, compared to parent and self-report versions (Kemp et al., 2023). Furthermore, scores on the parent- and teacher-reported ICU were internally consistent, showing good multi-informant convergence of this scale (Kimonis et al., 2016).

However, despite the advantages of the ICU in the assessment of CU traits,

concerns regarding its factor structure have been raised, with several researchers pointing out the potential limitations of the bifactor model. For instance, the ICU's unemotional subscale has been criticized for its poor internal consistency (Hawes et al., 2014; Kimonis et al., 2008). Moreover, it exhibits low inter-correlations with the other two subscales and has weak or non-existent relationships with external criterion variables (Cardinale & Marsh, 2020). In response to these limitations and to improve the construct validity of ICU, some researchers proposed alternative factorial structures of ICU with original items or shortened forms of ICU after removing problematic items (Wang et al., 2017). For example, a two-factor model with 12 items delineated between callousness and uncaring dimensions was developed by Kimonis et al. (2016), and another two-factor model with 20 items assessing callousness and uncaring traits was proposed by Deng et al. (2016). However, there is no agreement on the best-fit ICU model among these alternative models across samples. Studies that test the structure of ICU consistently support the reliability and validity of models including an overarching general CU factor with multiple sub-dimensions, suggesting that the total ICU score can be used as an overall measure of a general CU traits factor (Cardinale & Marsh, 2020; Ray & Frick, 2018).

While the aforementioned measures are available to assess CU traits, they have established cutoff points for making clear, dichotomous decisions that could inform diagnosis and treatment planning only for older children and adolescents, but not for preschoolers (Docherty et al., 2017; Kimonis et al., 2014; Kimoni et al., 2008; Kemp et al., 2023). Given the lack of extensive research and multi-informant validation to establish comprehensive cutoff points, most existing research conceptualizes CU traits dimensionally (Frick et al., 2014; Kemp et al., 2023). To address this need, the Clinical Assessment of Prosocial Emotions (CAPE; Frick, 2013) was developed. Designed for a broader age range (3 to 21 years), the CAPE aids in categorizing individuals into clinically meaningful levels of CU traits using semi-structured interviews,

which provide more detailed information on behavioral patterns, emotional responses, and social interactions that can help in accurately identifying the presentations of CU traits in children. Notably, the CAPE aligns with the DSM-5 criteria, requiring raters to score individuals based on the four core symptoms of CU traits as delineated in the DSM-5. However, applying the LPE specifier of CD to young children should be approached with caution, as CD tends to start in later childhood (Allen et al., 2020). Despite this, the validity of CAPE has garnered initial support from studies on children from disadvantaged families in Northern England (Centifanti et al., 2019) and on Australian children diagnosed with CP (Hawes et al., 2020), indicating the potential of the CAPE as a reliable and valid tool for assessing CU traits.

1.3.4 CU Traits in the Preschool Years

While considerable research has focused on CU traits in later childhood and adolescence, there is still a relative scarcity of studies investigating these traits during the preschool years (typically ages 3 to 6 years) (Bansal et al., 2020; Kimonis et al., 2016; Pisano et al., 2017; Zumbach et al., 2021). The preschool years are a crucial phase in a child's life, with several key milestones emerging during this period, including increased development of empathy (Decety & Holvoet, 2021), and the emergence of self-conscious emotions such as shame and guilt (Nikolić et al., 2023; Vaish, 2018); both of which are core to the conceptualization of CU traits (Frick et al., 2018). Venturing beyond their family for the first time, young children experience reduced parental care and begin forging new connections with teachers and peers in preschool. This expansion of their social world provides opportunities for social interaction where they can develop and practice emotional regulation skills, critical for adapting to their new environment (Denham, 2019; Huber et al., 2019). Concurrently, advancements in executive function during this age period equip preschoolers with the ability to control impulses, manage attention, and retain information in working memory (Blankson et al., 2017), which enhances their capacity for emotional

regulation (Harrington et al., 2020). The development of these foundational skills—emotional regulation and executive functioning—is important in shaping later outcomes, setting the stage for future academic achievements, interpersonal relationships, and mental well-being (Ahmed et al., 2019; Calkins & Marcovitch, 2010; Jones et al., 2015). Considering the importance of the preschool period in child development, monitoring children’s abilities within this period becomes essential, especially as these non-normative variations in emotional and cognitive domains are closely related to CU traits (see review in Section 1.3.1).

Early detection, prevention and intervention children at high risk for severe CP is important, as intervention efforts have a greater likelihood of success while these traits are still malleable and before they escalate to more severe behavioural problems in subsequent developmental stages (Kimonis, et al., 2019; Waller et al., 2017c). With the recognition of the importance of exploring CU traits in the preschool years, a gradually increasing number of studies have begun to shed light on the early presentations, correlates and potential intervention strategies for these traits in young children. Evidence suggests that manifestations of CU behaviours can be observed and reliably measured within this period (Ezpeleta et al., 2013; Kimonis et al., 2006; Kimonis et al., 2016; Pisano et al., 2017). For example, echoing the findings from research on school-aged children and adolescents that those with high CU traits often exhibit especially severe and chronic patterns of CP, a recent meta-analysis found that early childhood CU traits also correlate significantly with more severe CP, irrespective of gender and sample type (whether clinic-referred or community-based) (Longman et al., 2016).

Several studies have also found evidence that difficulties in identifying, processing, and responding to negative emotional stimuli, a core feature of CU traits in older children. Such impairments in emotion functioning among young

children have been identified in several forms of negative emotion stimuli, including deficits in recognizing fear facial expressions (White et al., 2016), decreased attention to distressing pictures (Kimonis et al., 2016), reduced neural responses to vocal fear (Hoyniak et al., 2018), and less congruent facial emotional expressions in response to happy and sad film clips (Kimonis et al., 2023). In addition, research has also demonstrated that insensitivity to punishment can be empirically measured in children as young as three years old through experimental tasks. Furthermore, parent-reported punishment insensitivity is associated with poorer conscience development, suggesting that such insensitivity may explain the relationship between CU traits and impaired conscience development observed in early childhood (Chhoa, 2023). These findings in preschoolers mirror the developmental trajectories of CU and associated CP seen in older children, linking impaired emotional and cognitive processing to an underdeveloped conscience that manifests as a lack of empathy and guilt.

Although similarities have been observed between younger and older age groups, some differences have also been noted. Empathy is broadly defined as the ability to recognize, understand, and respond to the emotions of others (de Waal & Preston, 2017; Cuff et al., 2016). The development of empathy is crucial for acquiring self-regulation skills, promoting healthy socioemotional growth, and facilitating social learning, communication, prosocial behaviour, and successful engagement in social-affiliative processes throughout life. As infants progress to toddlers, they demonstrate progressively sophisticated emotional responses and empathic concern, manifesting through nuanced facial expressions, gestures, and vocalizations. By the age of four, children typically develop the ability to comprehend and articulate the perspectives of others, a capacity that enhances as they grow older. A child with typical development of empathy will show positive social interactions such as comfort and help offered to peers in distress (Frick & Kemp, 2021). Conversely, deficits in empathy

development are seen as a core characteristic of CU traits, which are linked to severe conduct problems (See review in Section 1.3.1). Empathy consists of two main components: affective empathy, which refers to the emotional response elicited by another's emotional state, and cognitive empathy, which involves the recognition and understanding of another's emotions and perspective. The onset of affective empathy typically precedes cognitive empathy developmentally and may motivate the development of cognitive empathy in young children (Frick & Kemp, 2021).

To minimize the confounding effects of cognitive compensations that children with cognitive deficits might develop in later years to understand others' emotions without truly feeling them, Georgiou et al. (2019) focused on 167 Cypriot preschool children aged 3 to 7 years to investigate the relationships between CU traits and cognitive and affective empathy. Their findings indicated that cognitive empathy, rather than affective empathy, was associated with CU traits, and only cognitive empathy mediated the relationship between CU traits and CP, suggesting that deficits in cognitive empathy may be more important than affective empathy in explaining CP and CU traits in preschool-aged children. These observations align with prior research and theories suggesting that children with high CU traits exhibit impairments in cognitive empathy (Dadds et al., 2009; Pardini et al., 2003), but contrast with findings from a meta-analysis by Waller et al. (2020), which reported significant relationships between CU traits and both affective and cognitive empathy.

One possible explanation is that associations between CU traits and empathy change throughout development (Frick & Kemp, 2021; Waller et al., 2020). Indeed, a study by Dadds et al. (2009), involving a large sample of 2,760 Australian children aged 3 to 13 years, categorized into four age groups (3–4 years, 5–6 years, 7–9 years, and 9–13 years), showed that the correlations between CU traits and empathy may transform over time. Specifically, their

findings indicated that while CU traits in childhood are associated with deficits in cognitive empathy for both genders, these deficits were less pronounced for boys in the adolescent group. Dadds et al. speculated that such differences among age groups may arise because children compensate for these deficits in cognitive empathy as they progress through puberty. They may either improve their understanding of others' emotions, learn to mask their deficits in empathy, or adapt by enhancing manipulative behaviours or avoiding challenging situations, thus reducing the apparent deficits in their emotional understanding.

Besides empathy, more severe aggression has also been linked to CU traits (See review in Section 1.3). Aggressive behaviours can be classified into two types based on their forms: overt aggression, characterized by direct physical actions aimed at harming others, such as hitting or pushing; and relational aggression, which involves harming others through manipulation of social relationships, for instance, by socially excluding someone (Crick, 1996; Crick & Grotpeter, 1995). Some aggressive behaviours are commonly observed during early childhood and are considered normative, forming a part of typical developmental processes. These behaviours serve as natural expressions of frustration and anger, allowing children to explore social boundaries and experiment with social interactions. Typically, these behaviours diminish as children age and acquire more sophisticated cognitive and emotional regulation skills. However, such normative disruptive behaviours become problematic when they persist across various settings, demonstrate excessive intensity, are inappropriate for the child's developmental stage, and are associated with impairments in the child's social, educational, and personal functioning (Wakschlag et al., 2007; Wakschlag et al., 2010).

In contrast to previous research, which suggests that boys with high CU traits often display overt aggression while girls show relational aggression (Marsee

et al., 2005), findings from Georgiou et al. (2019) did not indicate that CU traits was related to gender differences in types of aggression among preschoolers. This finding is also somewhat contradicted by research on overt and relational aggression among preschool children, which consistently shows that boys are more likely to engage in overt aggression than girls. However, findings on relational aggression are mixed, with some studies suggesting that girls display more relational aggression, while others find no significant gender differences (Evans et al., 2018; Shahaeian et al., 2017; Suh & Kang, 2020). These discrepancies highlight the importance of studying CU traits during the preschool years. This phase could reveal factors related to CU traits that might differ in later childhood due to physical and cognitive maturation, as well as how these traits might influence the patterns of different types of aggression.

In a prior systematic review of CU traits and CP treatment during childhood and adolescence, Hawes et al. (2014) suggested that SLT-based parent training showed enduring improvements in CU traits, especially when delivered in early childhood. Motivated by the potential malleability of CU traits and CP during this developmental stage, several emerging intervention studies, specifically those by Fleming et al. (2022) and Kimonis et al. (2019) that were discussed earlier, focus on the unique impairments and needs of young children with CP and CU traits, offering initial support for the effectiveness of early interventions. In summary, studies of CU traits during the preschool years provide initial insights into the early manifestation and developmental trajectories of these traits and their associated behaviours, as well as preliminary evidence on the effectiveness of early intervention targeting CU traits. However, it should be noted that research on CU traits in early childhood is relatively limited compared to later age groups (Bansal et al., 2020; Kimonis et al., 2016; Pisano et al., 2017; Zumbach et al., 2021). Therefore, drawing definitive conclusions from the relatively limited research in this age group is challenging. As a result, it is essential to further validate and replicate these findings while also exploring

domains that have not yet been investigated for this developmental period.

1.3.5 CU Traits in East Asia

It has been theorized that culture can impact the development of temperament by both shaping societal responses to certain temperament traits, and also by steering families and schools to nurture traits consistent with cultural values (Chen, 2018). This is exemplified by the contrasting emotional socialization processes in Western and Eastern societies. In Western individualistic cultures, the open expression of emotions is often highly valued, reflecting the cultural emphasis on individual autonomy and uniqueness. Conversely, in collectivist cultures like mainland China, emotion regulation is essential to maintain societal harmony, and emotional restraint is often associated with values that prioritize group over individual needs (De Vaus et al., 2018; von Suchodoletz & Hepach, 2021). Rooted in Confucian values that highlight the importance of societal harmony and hierarchical relationships (Chen & Chung, 1994; Sundararajan, 2020), it is possible that child behaviour that disrupts order and shows disobedience to authority figures like parents and teachers is especially unacceptable in Eastern countries and therefore these behaviours may be subject to strong disapproval and strict disciplinary actions when they occur. Additionally, self-reflection and self-criticism, manifesting emotions like shame and guilt, are valued in many Asian cultures, serving as tools to meet shared societal expectations (Aruta et al., 2021; Heine et al., 1999; Norasakkunkit, 2003). Given these culturally specific values and approaches to emotional regulations, CU traits, characterized by shallow emotions and lack of guilt, may manifest differently and be perceived uniquely across these diverse cultural contexts.

Indeed, while most research on CU traits has predominantly centred on Western populations, initial findings from Eastern nations hint at potential cultural nuances in both trait expression and risk correlates. For instance, a

systematic review by Sng et al. (2020) exploring CU traits in children and adolescents within Asian contexts identified inconsistent findings compared to what has been generally observed with Western samples, particularly in the relationships between CU traits and aggression, as well as CU traits and affiliation with deviant peers or gang membership. In the review, a prominent positive association between CU traits and CP was identified, aligning with patterns commonly observed in Western samples (see review in Frick et al., 2014; Frick & White, 2008). Nonetheless, several studies have reported inconsistencies regarding the relationship between CU traits and aggression. In addition to the overt and relational forms of aggression mentioned above, aggression has also been categorized into reactive and proactive types. Reactive aggression is characterized by emotional responses and impulsivity following provocation, often termed 'hot-blooded'. In contrast, proactive aggression is driven by calculated, goal-oriented behaviour without provocation, typically described as 'cold-blooded' (Romero-Martinez et al., 2022). A Singaporean study with 1,027 adolescents (aged 12 - 19 years) found a positive correlation between CU traits and proactive aggression, but not reactive aggression (Li et al., 2017). Similarly, research conducted in China with a sample of 501 adolescents (aged 11-15 years) observed significant associations between CU traits and both total and proactive aggression, but not with reactive aggression. Moreover, another study from Singapore among 282 children and adolescents (aged 7-16 years) found no significant relationship between CU traits and either proactive or reactive aggression (Sng et al., 2018). This is in stark contrast to previous Western research, which commonly reports a positive association between CU traits and both proactive and reactive aggression (See review in Frick & White, 2008).

Similarly, studies have produced mixed findings on relationships between CU traits and peer relationships. While previous studies conducted in Western contexts have associated CU traits with peer rejection and deviant peer

affiliation (e.g., Kimonis et al., 2004; Matlasz et al., 2022; Waller et al., 2017a), no such significant relationships were found in some studies in East Asia. By asking children to nominate their favourite classmates, Hwang et al. (2022) did not find that CU traits were significantly related to lower peer acceptance among 218 primary school children in South Korea. Hwang et al. speculated that this inconsistency may be due to South Korea's cultural values of reticence, which may influence the expression of personal preference. Consequently, South Korean children may have been less inclined to voice their preferences, leading to limited variability in the range of peer acceptance levels.

Furthermore, two studies reported no significant relationship between CU traits and deviant peer affiliation among Singaporean adolescents based on self-reported questionnaires (Ang et al., 2015; Chu et al., 2014). Although these two studies expand previous findings to a non-Western context, they did not attribute these findings to specific cultural factors. In addition, it should be noted that findings from Western studies are not conclusively consistent, with some studies showing that significant associations between CU traits and peer affiliation disappeared after controlling for behaviour problems (Haas et al., 2011; Pardini & Fite, 2010). Moreover, the discrepancies between studies may not be solely due to cultural differences but also to significant variations in informants (e.g., parents vs teachers), measurement methods (e.g., questionnaire vs nomination), and methodological approaches (e.g., cross-sectional vs longitudinal), highlighting the need for further research to understand the varied findings on CU traits and peer relationships (Hwang et al., 2022).

Moreover, Fung et al. (2009) found that Chinese parents perceived their children to display more severe CU traits than North American parents. Fung et al. suggested that this could be due to the influence of Chinese traditional cultural valuing restrained in emotion expressions, which potentially leads to

higher scores in the unemotional subscale of the ICU. Another study comparing the measurement invariance of the self-report version of the ICU between United Kingdom secondary school students and Chinese elementary school students also found systematic differences in the way children reported CU traits (Allen et al., 2021). For example, Chinese children tended to give higher ratings than UK children on the item 'I do not care about doing things well', which may reflect high expectations on achievement from Chinese parents and teachers (Chen & Lan, 1998; Li, 2017) , with Chinese children feeling like they 'do not care' as much as they should or are expected to. In contrast, UK children were more likely to rate higher on the item 'I apologize ("say I am sorry")' and item 'I do not feel remorseful when I have done something wrong'. This tendency could be attributed to the strong emphasis on the social etiquette of apologizing in the UK (Hitchings et al., 2013; Rabab'ah & Fowler Al-Hawamdeh, 2020) . The older age of the students in the UK sample might also contribute to their understanding of an apology as a tool for self-presentation, preserving social relationships and avoiding punishment after a transgression (Banerjee et al., 2010; Toney & Hayes, 2017) , even if they do not say it sincerely.

Furthermore, it should be noted that the studies reviewed so far in this chapter primarily focus on older children and adolescents. Research concerning the preschool years in East Asia, similar as studies in Western countries, is particularly scarce, pointing to a significant gap in the early developmental studies of CU traits within this cultural context. Furthermore, it should be noted that the studies reviewed so far in this chapter primarily focus on older children and adolescents. Research concerning the preschool years in East Asia, similar to studies in Western countries, is particularly scarce, pointing to a significant gap in the early developmental studies of CU traits within this cultural context. With increased awareness of this gap, researchers in this region have begun to focus on preschool ages, including validating the conceptualization and construct of CU trait measurements (Zhang & Zhu, 2023); exploring the

relationship between CU traits and individual factors such as behavioural and emotional problems (Zhang et al., 2021), and social competence (Kim & Chang, 2019); investigating related environmental factors, such as teacher-child relationships (Tan et al., 2023; Zhu et al., 2023), parental aggression (Zhang & Zhu, 2023) and maternal psychopathic traits (Zhong et al., 2020). Despite differences observed in older East Asian samples, existing limited findings from younger children in also show similarities with Western countries and older children, such as significant relationships between CU traits and reduced prosocial behaviour, increased behavioural and emotional problems (Zhang et al., 2021) and poor interpersonal relationships (Zhu et al., 2023).

In summary, while our understanding of CU traits has expanded significantly over the years, the conceptualization of these traits remains largely anchored in a Western context. Preliminary findings from Eastern studies indicate distinct manifestations and correlates of CU traits that may be attributed to cultural differences. However, it is important to recognize that due to the limited research in Eastern countries, these findings might not be as definitive as those from more thoroughly researched Western contexts. The observed discrepancies might not arise solely from cultural differences, but could also be due to study design and methodological limitations, calling for further studies in this region especially with preschool children. As China stands as a representative East Asian nation with considerable cultural influence in the region, notably through Confucianism, understanding CU traits in a Chinese context may help gain a nuanced perspective on potential cultural variations or similarities in how CU traits manifest in the context of East Asia. However, it is crucial to acknowledge the cultural diversity within East Asia and avoid overgeneralizing findings from China to other nations. Therefore, while studying CU traits in China can serve as an important step in understanding these traits in East Asia, this should be seen as part of a larger effort to explore potential cultural variations and similarities across the region.

1.4 CU traits and School Environmental Factors

Second only to the child's immediate family, school has a very influential impact on children's development. Children spend significant time at school each day, where they not only acquire academic knowledge but also develop social skills, establishing valuable bonds with peers and teachers (Aviles et al., 2006; Ungar et al., 2019). Compared to later periods of schooling, preschools play a pivotal foundational role as they often provide a child's first structured environment outside the home. Preschool lays the basis for early learning, socialization, and routines that are crucial for subsequent educational stages. As reviewed in section 1.3.4, children are developing important domains during this stage of schooling, such as the emergence of conscience-related emotions like shame and guilt. By providing education that is attuned to the natural patterns of child development in preschools, children are better equipped with the necessary knowledge and skills for the challenges of primary and middle school (Ansari, 2018; West et al., 2000). Furthermore, evidence indicates that good quality preschool education offers lasting advantages for children across diverse backgrounds, including higher educational achievement, increased incomes, better employment, and reduced socioeconomic inequality (Dietrichson et al., 2020; Melhuish, 2011; Meloy & Darling-Hammond, 2019).

Given the influential role of schools in shaping children's development, there is an increasing amount of attention being paid to school-based interventions targeting children with emotional and behavioural challenges (Patalay et al., 2017). School-based intervention programmes have several advantages to treatment provided in clinical settings. Firstly, they improve accessibility by overcoming significant barriers faced by children and families from low-income, ethnic, and racial minority backgrounds, enabling more children to access timely interventions. Secondly, these programs are generally perceived as more acceptable by families, reducing the stigma associated with a referral to

external mental health services. Additionally, through regular contact with students and their families, schools provide a unique setting for early detection and continuous monitoring of mental health issues. This enables both comprehensive interventions for all students and targeted support for those in need. Moreover, the integration of mental health services into educational policies ensures that these programs are well-supported and sustainable, promoting a holistic approach to student well-being (Sanchez et al., 2018). Indeed, initial evidence indicates that school-based intervention for CP targeting either child deficits (e.g., emotion regulation, social skills) and/or teacher-child interaction (e.g., teacher reward and discipline strategies) appear to be effective for children with CU traits (Frederickson et al., 2013; Kyranides et al., 2018), with interventions delivered in school settings seemingly showing better engagement, higher attendance and treatment completion than those in clinical settings (Kolko et al., 2009; Thurstone et al., 2024).

Despite the important role of schools in fostering academic and social development, and their potential as a valuable venue for targeted interventions for children at risk, the majority of research on CU traits and environmental factors has predominantly focused on the family context. However, increasing evidence indicates that CU traits are associated with various poor school outcomes, including more severe misbehaviour in the class, increased likelihood of both perpetrating and becoming victims of bullying (Zych et al., 2019), strained relationships with teachers (Baroncelli & Ciucci, 2020; Crum et al., 2016; Horan et al., 2016; Hwang et al., 2022), reduced school connectedness (Horan et al., 2016), and poor academic performance (Bird et al., 2019; Ciucci et al., 2014). Therefore, it is important to explore CU traits in the school environments, focusing specifically on teacher-child interactions including teacher-child relationship, classroom management strategies, instructional methods and children's responses to strengthen understanding of risk and protective factors for children with CU traits, as well as to inform factors

that are amenable to intervention in the school setting. In the subsequent sections, I will provide a more detailed review of existing studies that investigate the relationships between the aforementioned school-related factors and CU traits, with a particular focus on preschool-aged children. Due to the scarcity of research on preschoolers, findings from school-aged children will also be included to enhance our understanding of CU traits in this domain, identify gaps in the existing literature, and provide a cogent rationale for the selection of these factors as the focus of the current thesis.

1.4.1 CU traits, Teacher-Child Relationships (TCRs) and Teacher-Parent Relationships (TPRs)

Driven by an intrinsic motivation for affiliative rewards, children naturally establish attachment bonds with others from a very young age. These warm and supportive connections, particularly established early in infancy, such as mother-infant bonds, set the stage for improved socioemotional, regulatory, and interpersonal outcomes throughout development (Waller & Wagner, 2019). As children grow and journey outside their immediate home environment, teachers become additional influential adults in their lives. Teachers significantly influence children's school experiences through their sustained interpersonal relationships and the emotional climate they create in the classroom. By fostering positive interactions and offering emotional support, teachers enhance children's academic achievement, social competence, and classroom behaviour (Lippard et al., 2018). Good quality TCRs characterized by closeness, warmth, and open communication are positively associated with better child school adjustment in the early school years, enhancing children's academic motivation, achievement, social competence, peer engagement and prosocial behaviour (Ansari et al., 2020; Connell & Wellborn, 1991; Hughes & Cavell, 1999).

Moreover, a positive relationship with teachers appears to be especially

beneficial for children at risk. Evidence suggests that children with CP who foster good relationships with their teachers achieve better academic outcomes (Bulotsky Shearer et al., 2020; Howes et al., 2008). One potential explanation is that teachers can effectively buffer children from negative individual and environmental risk factors, such as early relational adversity and socioeconomic challenges, by fostering a positive emotional climate and effective classroom management, thus creating an environment where students feel safe and supported. (Nauman et al., 2023). Compared to teachers in later stages of schooling, preschool teachers may be especially important for young children due to the unique characteristics of preschool education. Preschool teachers spend considerable time with young children, and their influence extends beyond academic instruction to caring for children, significantly shaping their social, emotional, and physical development (Cheung, 2020).

Despite the importance of a positive TCR for children at risk of behaviour problems, teachers often find it difficult to establish a close relationship with children with CP (Crum et al., 2016). CP is often linked with teacher stress and burnout, resulting in conflictual TCRs (Aldrup et al., 2018; Friedman-Krauss et al., 2014; Ghanizadeh & Jahedizadeh, 2015). Studies indicate that children with CP who have poor TCRs characterised by lack of closeness and greater conflict are often treated differently by teachers compared to well-behaved peers, including receiving less positive attention for good behaviour, fewer academic engagement opportunities, more punitive discipline when they misbehave (Kourkoutas et al., 2018; Sutherland et al., 2018). Consequently, children with CP who have strained TCRs exhibit poor school performance (Shi & Ettekal, 2021) and increased likelihood of being victims or bully/victims (Marengo et al., 2018). Such poor TCRs can pose significant challenges for preschool children who are transitioning from the familiar home environment to the structured setting of preschool, while also developing foundational social and cognitive

skills (see review in Section 1.3.4). Indeed, evidence suggests that poor teacher-child relationships during preschool can significantly hinder children's development in key areas such as academic achievement (Lippard et al., 2018), social competence (Saral & Acar, 2021), and prosocial behaviour (Glüer & Gregoriadis, 2017).

Unsurprisingly, given that children with CP and CU traits typically exhibit more severe behavioural problems (Frick & White, 2008) and demonstrate reduced motivation to establish and maintain close relationships with others (Waller & Wagner, 2019), researchers have found that CU traits are closely associated with poor quality TCRs (Baroncelli & Ciucci, 2020; Crum et al., 2016; Horan et al., 2016; Hwang et al., 2022). This relationship even remains after accounting for the level of CP (Crum et al., 2016; Horan, et al., 2016), suggesting a potential unique effect of CU traits on TCRs. A qualitative study with a sample of 437 secondary school students from the UK (aged 11–14 years) found that teachers perceive poor TCRs as negatively impacting the academic motivation of children with CU traits, while viewing positive TCRs as enhancing their engagement in school tasks (Allen et al., 2018). Similarly, quantitative research has found that affiliation with teachers has a significant, unique negative effect on CU traits both cross-sectionally and longitudinally. For example, in a cross-sectional study of 695 Italian middle school students aged 11-15 years, it was found that children's reported affiliation with teachers was uniquely and negatively associated with their reported CU traits, even after controlling for confounders such as gender, age, and internalizing and externalizing problems (Baroncelli et al., 2022). Furthermore, in a longitudinal study involving 301 Italian students (mean age = 12.96 years), findings indicated that children's reported affiliation with teachers was negatively related to their reported CU traits among those with low social preference among peers over a 6-month period, whereas CU traits may not necessarily predict the quality of the TCR (Baroncelli & Ciucci, 2020). However, another longitudinal study conducted with

218 primary school students in South Korea (ages 10 to 12 years) found that children's reported CU traits predicted a decrease in their reported affiliation with teachers (Hwang et al., 2022). Hwang et al. (2022) proposed that the divergent findings may be attributed to the inherent differences between primary and middle school environments. In the primary school context, children tend to engage in more intensive interactions with their educators, whereas middle school students exhibit a trend toward increased autonomy, with reduced dependency on teachers. Considering preschool-aged children's vulnerability and need for teacher support, CU traits may also differ in their influence on TCRs in a preschool context.

However, there are few studies examining the relationships between CU traits and TCR quality within preschools, particularly in the Chinese context and how these relationships may influence child behaviour. Two recent studies in Chinese preschools have investigated the moderating effect of TCR quality on the impact of CU traits on children's emotional and behavioural outcomes. In a study with 525 left-behind children aged 3 to 6 years from rural preschools in China, teachers reported that positive TCRs can mitigate the effects of CU traits on children's emotional lability/negativity, which involves rapid and intense emotional responses and difficulties in recovering from adverse emotional reactions (Tan et al., 2023). Another study with a sample of 484 children aged 3–6 years found that parents' reports of CU traits moderated the relationship between teachers' reports of TCR and social adjustment in children, with teacher-child conflict exacerbating aggressive behaviour in children with CU traits (Zhu et al., 2023).

Beyond the TCR, another pivotal relational component that warrants attention in the context of CU traits in schools is the TPR. Effective collaboration between parents and teachers in educating and socializing children is fundamental, and high-quality parent-teacher relationships are crucial for this process. Such

relationships are built on clear, two-way communication, mutual trust, and consistent engagement, which foster a reliable and accessible partnership (Leenders et al., 2019). Evidence has emphasized that strong connections between parents and teachers can enhance parental engagement in their child's school life. Such active participation equips parents with skills and knowledge to support their child's learning at home. It offers teachers a window into parental expectations for both their children and the teachers. Positive cooperation with parents gives teachers a deeper understanding of a child's needs, strengths and weaknesses, thereby enhancing the TCR. Thus, a solid relationship between parents and teachers enables both to more effectively support the child's development (Jeynes, 2018; Hill & Taylor, 2004).

When parents and teachers collaborate and agree on academic and behavioural goals, they establish a unified support network for the child (McNeal, 1999; Lang et al., 2020; Sheridan & Wheeler, 2017). Offering consistent expectations and guidelines across home and school settings not only clarifies behavioural standards for children but also amplifies the authority and influence of both teachers and parents (Hill & Taylor, 2004; Lang et al., 2020; Sheridan & Wheeler, 2017). This harmonious relationship is associated with improved student-teacher relationships, prosocial behaviour, academic performance, emotional well-being, social competence, and reduced CP (Dearing et al., 2008; Hill & Taylor, 2004; Lang et al., 2020; Sheridan et al., 2012; Sheridan & Wheeler, 2017). In recognizing these benefits, interventions promoting positive parent-teacher relationships have been developed, with evidence for improved academic and behavioural outcomes in children (Cox, 2005; Murray et al., 2008; Sheridan & Wheeler, 2017).

As reviewed earlier in this section, teachers often find it challenging to establish a close relationship with children who have CP. Higher levels of conflict may also extend to their interactions with the child's parent, due to difficulties in

managing child misbehaviour in the classroom (Mautone et al., 2014; Mautone et al., 2015). Given that children with both CP and CU traits often exhibit more serious CP than their peers without CU traits, teachers might face increased challenges in establishing positive relationships with the parents of these children. However, the current literature has yet to examine the inter-relationships between CU traits, parent-teacher relationships and TCRs. In summary, this section has provided a comprehensive review of the existing literature concerning teacher-child and TPRs in the context of CU traits. These relationships are pivotal in influencing a child's socioemotional and academic development, especially for children who are vulnerable due to the presence of CP and temperamental risk. While existing evidence has provided valuable insights into understanding the relationships between CU traits and TCRs, to the best of my knowledge, research has yet to examine the inter-relationships between CU traits, teacher-child and teacher-parent relationships in early childhood. Therefore, this thesis will delve deeper into the relationships between CU traits, teacher-child, and teacher-parent relationships in the Chinese preschool setting.

1.4.2 CU traits, Teacher Rewards and Discipline

Rewards and punishments stand as vital instruments in children's learning, steering their behaviours toward desired outcomes. According to Skinner's model of operant conditioning (1938) and Bandura's social learning theory (1971), children adapt and refine their behaviours through both through direct experience as well as through vicarious learning (e.g., information from different sources) and the observation of others. Specifically, behaviours that are rewarded (e.g., praise, stickers, privileges) tend to be repeated more frequently, while those followed by punishment (e.g., loss of classroom points; time-out) decrease in occurrence. Influenced by these theories, reward and punishment strategies have long been a common focus of teacher training programs (Emmer & Stough, 2001). Immediate and concrete rewards, such as verbal

praise and stickers, and disciplines, such as guided compliance and time-outs, are widely used in preschool classrooms to promote children's prosocial behaviour and academic engagement (Ritz et al., 2014). These strategies play a fundamental role in early childhood education by shaping future learning outcomes and character development (Saputri & Widyasari, 2022). Indeed, recent advancements in developmental science highlight the profound sensitivity of preschool children to environmental inputs during this critical period of neurodevelopmental plasticity (Cantor et al., 2019). Given this susceptibility, rewards and punishments can be particularly effective in shaping behavioural and emotional outcomes during the early years of a child's development.

While evidence supports the use of rewards and punishment in managing children's behaviour (Bear, 2015; Landrum & Kauffman, 2013), there are ongoing debates about the effectiveness of these strategies. Critics highlight concerns over the potential adverse outcomes associated with harsh punishment (Little & Akin-Little, 2008; Maag, 2001; Valdebenito et al., 2018). Reactive and punitive strategies, especially harsh or corporal punishment such as suspension or spanking, possess notable limitations. These include undesirable negative reinforcement (e.g., children may intentionally misbehave, seeking suspension as an escape from unfavourable situations), reduced long-term effectiveness, behavioural escalation, extinction bursts, compromised academic performance, and strained TCRs (Costenbader & Markson, 1998; Bear, 2010; Little & Akin-Little, 2008; Maag, 2001; Skiba et al., 2012; Valdebenito et al., 2018).

Given these concerns about the potential harm associated with harsh punishment, many researchers advocate for the application of consistent, judicious, and milder forms of discipline, such as verbal reprimands in schools. In addition, they emphasize the implementation of alternative prevention and

reward-based strategies that prioritize the reinforcement of desired behaviours, such as establishing clear rules or rewarding children after appropriate behaviours (Bear, 2010; Cook, 2018; Maag, 2001). Past researchers have also criticized the possible detrimental effects of frequent rewards on children's intrinsic motivation (Deci et al., 1999, 2001; Deci & Ryan, 2008). Cameron (2001) later argued that rewards can be effectively used to enhance motivation in naturalistic settings, as opposed to the controlled laboratory conditions often featured in Deci et al.'s reviews. Indeed, research conducted in school settings with a sample of 10,344 US students in grades 5-12 has suggested non-harmful effects of rewards, with students reporting a significant relationship between the rewards and increased intrinsic prosocial motivation (Bear et al., 2017). Moreover, researchers emphasize the need for wise and strategic application of reward strategies. For example, rewards should be delivered in a supportive and informative manner. They should also be administered when students confront challenging tasks or those they may not be interested in. Finally, as children consistently demonstrate the targeted competencies, the frequency of such rewards should gradually be reduced (Bear et al., 2017).

In current theoretical models (Blair, 2017; Kochanska, 1993; Pardini & Frick, 2013), the term 'punishment' is conceptualized broadly, referring to a wide variety of negative stimuli ranging from mild discipline such as setting clear rules to more coercive strategies such as yelling and verbal abuse. Considering the concerns around harsh punishment and the trend of using alternative non-punitive strategies in school settings, in the following chapters, the term discipline rather than punishment will be used to highlight the non-coercive aspect of the strategies teachers use to discourage children's undesirable behaviour (e.g., time out, setting clear rules and consequences). The term reward will refer to any positive incentives that teachers use to enhance children's academic engagement and encourage appropriate behaviour in the classroom (Hoffmann et al., 2009).

Teacher rewards and discipline strategies have been shown to help teachers to effectively manage the classroom (Berger et al., 2018). However, not all children respond to these strategies in the same way. As mentioned previously in section 1.3.1, punishment insensitivity is a well-established correlate of CU traits, with evidence demonstrating that CU traits are related to reduced recognition of and responses to others' distress cues (Frick et al., 2018; Viding & Kimonis, 2018), caring less about and underestimating the likelihood of negative consequences for their misbehaviour (Frick & Myers, 2017; Frick et al., 2018; Pardini & Byrd, 2012; Pardini et al., 2003). With no or weakened conditioned association established between punishment and negative emotions such as guilt and shame, children with CP and CU traits usually fail to learn from punishment and tend to repeat their misbehaviour in future (Byrd et al. 2014; Frick & Myers, 2017; Frick et al., 2018). This pattern is not restricted to older children; similar tendencies have been observed in preschool-aged children, highlighting a reduced sensitivity to others' distress and punishment cues even at this early stage (Chhoa, 2023; Hoyniak et al., 2018; Kimonis et al., 2016; Kimonis et al., 2023; White et al., 2016).

There is also some evidence to suggest that children with CP and CU traits are more attuned to rewards, and are often described as displaying a 'reward-dominant' behavioural style (O'Brien & Frick, 1996; Fisher & Blair, 1998; Frick et al., 2003; Frick et al., 2014; Frick & Myers, 2017; Frick et al., 2018). These children typically have heightened expectations for, and place greater value on the positive outcomes of aggression, such as obtaining tangible rewards and attaining social status or dominance (Pardini & Byrd, 2012; Pardini et al., 2003; Frick et al., 2014; Frick & Myers, 2017; Frick et al., 2018). However, the findings regarding the relationship between CU traits and reward sensitivity are inconsistent. For instance, evidence from a study of 220 mothers and children in Colombia suggested that positive parenting, specifically maternal praise and

positivity, can moderate the effects of CU traits on aggression in preschool children. This indicates a possible reward-dominant behavioural style also observed in early childhood (Obando et al., 2024). Yet, another study with 78 preschool children from the US found no significant differences in responses to reward-based versus punishment-based components of evidence-based parent-training interventions targeting CPs (Ortiz et al., 2018).

Some studies have proposed that the responsiveness of these children might vary based on the type of rewards and the specific context in which they are presented. For example, while CU traits in early years are related to decreased sensitivity to affiliative social rewards such as maternal faces, eye gaze, and reciprocal smiling and warmth (Domínguez-Álvarez et al., 2021; Waller & Wagner, 2019), other studies with adolescents and older children have indicated that CU traits are strongly motivated by social rewards related to social status and dominance (Allen et al., 2016; Foulkes et al., 2014; Matlasz et al., 2022). Chhoa (2023) further investigated how young children with CU traits respond to different types of rewards, specifically social and tangible rewards through experimental tasks and parent-report questionnaires. However, the findings are mixed: experimental tasks showed no significant difference in child responses to tangible versus social rewards, whereas questionnaire findings revealed that CU traits in young children are associated with a lesser preference for parental affiliative rewards compared to tangible rewards. Additionally, in terms of contextual influences, adolescent high school boys with high CU traits in the UK exhibited reduced responsiveness to rewards compared to their peers with low CU traits when measured by computerized tasks. However, these boys with high CU traits showed increased eagerness for rewards in the presence of their peers, especially after experiencing failure in winning money during these tasks (Centifanti & Modecki, 2013).

Byrd et al. (2018) posit that the mixed findings from behavioural studies may be

due to difficulty disentangling whether findings stem from abnormalities in reward processing, punishment processing, or both. With the advanced application of functional magnetic resonance imaging (fMRI), several studies with adolescents and young adults have found CU traits are associated with neural dysfunction in reward processing, as measured by responses to geometric shapes to earn monetary rewards in monetary incentive delay tasks (Cohn et al., 2015; Veroude et al., 2016) and passive avoidance tasks (Zhang et al., 2023), which support the proposition that children with CU traits may be less responsive to rewards. Yet, similar to behavioural studies, findings in neuroimaging research remain equivocal, potentially due to differences in task design and sample characteristics (Byrd et al., 2018; Zhang et al., 2023). As such, there are ongoing discussions surrounding hypersensitivity versus hyposensitivity to reward (Byrd et al., 2014; Blair et al., 2016; Hyde et al., 2013), with additional studies needed to clarify the relationship between CU traits, reward sensitivity and the influence of individual child and contextual factors on this relationship, especially among preschool children.

Despite the potentially atypical responses of children with CU traits to rewards and discipline, which are key tools for classroom management, research exploring these relationships in school settings, with most of them focusing on older children and adolescents. Research conducted in the United Kingdom, Italy, and South Korea has found that children with CU traits are less responsive to teacher discipline (Allen et al., 2016, 2018; Baroncelli et al. 2022; Hwang et al., 2020). Moreover, consistent with findings in familial contexts that CU traits may protect against the negative impact of harsh parental punishment on CP (Hipwell et al. 2007; Oxford et al. 2003), in a sample of 218 South Korean primary school students (aged 10–12 years), Hwang et al. found that harsh teacher discipline led to decreased school engagement only for children with lower CU traits, but not for those with higher CU traits. More encouragingly, unlike previous research indicating that parents may escalate the use of harsh

punishment with children exhibiting high levels of CU traits (Hawes et al., 2011; Trentacosta et al., 2019; Waller et al. 2015, 2016, 2017b), teachers did not increase the use of harsh discipline for students with high CU traits, which was probably due to their professional training, values and standards (Hwang et al., 2020).

Findings for the relationship between CU traits and teacher rewards are also inconsistent. Qualitative interviews with high school teachers in England have revealed differing and mixed perceptions. Some teachers reported an overall reduced responsiveness to reward-based strategies in children with high CU traits, particularly with social rewards as opposed to tangible rewards. These teachers also noted iatrogenic effects, such as children using a rewarded position of responsibility to take advantage of others. In contrast, other teachers perceived that certain reward strategies, like praise given in front of the class and positive TCRs were effective in promoting academic engagement (Allen et al., 2016; 2018). Corroborating the latter group of teachers' views, an intervention study designed to emphasize teacher reward-based strategies and de-emphasize discipline-based strategies in a special education school was successful in significantly reducing both CP and CU traits (Frederickson et al., 2013). However, in a more recent longitudinal study conducted in South Korean elementary schools (Hwang et al., 2020), there was no significant moderating effect of CU traits on the relationship between rewards and academic engagement. The authors attributed this finding to the influence of collectivism that emphasizes social obligations and places less value on external rewards. In addition, this study also found that CU traits predicted less use of teacher rewards over time, suggesting that teachers may need extra support to maintain positive strategies with children with CU traits.

In conclusion, rewards and discipline serve as important tools in shaping children's behaviour in schools, but their effectiveness may vary when applied

to children with CU traits. While CU traits are generally linked to insensitivity to punishment, the relationship with reward sensitivity appears to be more complex and requires additional investigation. The existing body of research shows that parents and teachers often have different experiences when applying rewards and discipline to manage the disruptive behaviour of children with CU traits. This could be partially attributed to their training, professional responsibilities, and also potentially to cultural and contextual factors. Furthermore, despite the potential differences in rewards and disciplinary strategies used by preschool teachers and the unique characteristics of preschool environments compared to later schooling, to the best of my knowledge, no study has yet investigated how CU traits may influence children's responses to teacher-implemented rewards and discipline in preschools. Given the potential moderating role of CU traits on the effectiveness of rewards and discipline, it is crucial to understand how preschool teachers, as distinct from parents and teachers at other educational stages, respond to children with these traits and how their strategies in turn affect children's behavioural and academic outcomes.

1.4.3 CU traits and Instructional Methods

Instructional methods are classroom structures and pedagogical activities planned by teachers (Kanuka et al., 2007), which are important in enhancing child academic engagement and performance (Vaisarova & Reynolds, 2022). Teacher-directed instructional methods are grounded in behaviourist theory, which views children as passive learners influenced by external stimuli (Serin, 2018; Skinner, 1974). They focus on the step-by-step acquisition of basic skills and provide rewards for achieving pre-set goals (Kikas et al., 2014; Lerkkanen et al., 2016; Stipek & Byler, 2004). Using teacher-directed instructional methods, teachers control both the content and the structure of learning through planned activities. Common examples of this approach in preschools include circle time discussions and interactive storybook readings. During these activities,

teachers lead purposeful interactions, promote cognitive and language development with targeted feedback, and manage a structured learning environment to achieve predetermined educational goals (Kook & Greenfield, 2021). Research has indicated that teacher-directed instruction can be beneficial for preschool children, especially those from socioeconomically disadvantaged backgrounds, in fostering foundational academic skills such as literacy and mathematics by providing structured and explicit instruction that can help these students develop good study habits (Kikas et al., 2014; Vaisarova & Reynolds, 2022).

However, these methods are often inflexible, seldom adapting to individual student needs. Consequently, teacher-directed methods have been criticized for potentially undermining students' intrinsic motivation and engagement (Lerikkanen et al., 2012), therefore there is a growing trend and increasing advocacy for transitioning from teacher-directed to child-directed instructional methods in educational settings (Greaves & Bahous, 2021). Child-directed instructional methods originate from constructivist theory, whereby children are regarded as active learners of knowledge with teachers mainly facilitating students' independent exploration by offering guidance and opportunities (Cornelius-White, 2007; Mascolo, 2009; Piaget, 1973). Unlike teacher-directed instructions, child-directed instructional methods avoid delivering knowledge directly from teachers. Rather, these instructional methods encourage autonomy and effort in learning and expect children to actively engage in activities, materials and content, and construct new knowledge based on their prior experiences. In addition, the child-directed approach is more flexible, featuring teaching practices tailored to children's unique needs and interests (Lerikkanen et al., 2016; Paris & Lung, 2008; Serin, 2018; Stipek & Byler, 2004). In preschool settings, typical child-directed methods can be activities like exploration stations, guided discovery tasks, and creative play, all designed to let children spearhead their own learning experiences and have more freedom

to interact and collaborate with peers. In light of these attributes, child-directed instructional methods in early childhood are linked to immediate benefits such as improved socioemotional outcomes, including enhanced motivation, self-esteem, and reduced school anxiety, as well as better social competence and cognitive and academic skills, like literacy, numeracy, and problem-solving. Furthermore, for older preschoolers (i.e. 4 years old), more child-directed instructional methods are related to higher level of school readiness (Vaisarova & Reynolds, 2022).

Kolb (1984) posited that individual learning preferences vary, questioning whether a 'one-size-fits-all' approach can be effective for all children. This highlights the need for instructional techniques tailored to students' unique learning styles in order to optimize academic outcomes. Building on this, existing research suggests that the efficacy of different instructional methods may vary depending on specific student characteristics (Alfieri et al., 2011; Connor et al., 2004; Kiuru et al., 2012; Lerkkanen et al., 2016). While Lerkkanen et al. (2016) argued that child-directed methods are universally beneficial, enhancing academic skills for children regardless of their initial skill levels, there is contrasting evidence indicating that these methods are only effective in classrooms where students are motivated and highly skilled. On the other hand, children who are less persistent and have poor academic skills may indeed need teacher-directed instructional methods. These children, who could easily become distracted with too much freedom, often require clear directions from teachers and benefit from structured environments that employ focused exercises to reinforce their academic skills (Crosnoe et al., 2010; Kikas et al., 2014).

CU traits may be an important personal factor that explains individual variation in response to different forms of instructional methods. CU traits have been linked to poor academic performance, with this finding consistently observed

across various research designs, samples, and methods of assessment, even when controlling for CP (Bird et al., 2019; Ciucci et al., 2014; DeLisi et al., 2011; Fanti et al., 2017; Horan et al., 2016; Vaughn et al., 2011). Deficits in verbal intelligence have been theorized as a major factor that drives poor academic performance among children with CP. This impairment in verbal ability leads to difficulties in learning basic academic skills, causing children to find school stressful and reduce their engagement, which, in turn, has a detrimental impact on their academic performance and quality of TCRs (Moffitt, 1990; Rourke, 1982). However, it appears that the poor academic outcomes in children with CP and CU traits are unlikely to be attributable to deficits in verbal intelligence, as is often observed in antisocial children low in CU traits, with previous findings demonstrating that CU traits are not related to verbal ability (Allen et al., 2013; Hadjicharalambous & Fanti, 2018), non-verbal intelligence (Fanti et al., 2016), total IQ scores (DeLisi et al., 2011). Instead, current theories attribute the poor academic performance of children high in CU traits to challenges inherently linked to the features of CU traits: low academic engagement and motivation, difficulties in emotion recognition that impact their response to traditional classroom management strategies, and a higher likelihood of facing stringent disciplinary actions rather than receiving supportive and encouraging feedback from teachers (Levine et al., 2023). Emerging evidence suggests that CU traits may impact the effectiveness of instructional strategies. Specifically, children with CU traits might struggle to benefit from peer learning activities due to their diminished empathy and social competence (Bird et al., 2019), whereas close and continuous teacher attention has been shown to help these students stay engaged in their schoolwork (Allen et al., 2018).

Instructional methods are known to exert a strong influence on academic outcomes and their effectiveness appears to vary based on individual child characteristics including child temperament. Current literature on CU traits and academic performance has primarily concentrated on older children and

adolescents, indicating a potential oversight in preschool populations. There is, therefore, a compelling need to examine whether current instructional methods are adequately serving the unique learning profiles of preschool children with CU traits, given the potentially heterogeneous pathways to poor academic performance in children high in CU traits compared to those low in CU traits. In summary, this section presented the different orientations of instructional methods (teacher-directed vs. child-directed), each grounded in its own theoretical framework and offering a unique set of advantages and limitations. While teacher-directed approaches might be effective for children facing specific challenges such as socio-economic disadvantage or learning difficulties, child-directed methods offer more flexibility and can foster motivation and social skills. However, the effectiveness of both approaches may be contingent upon individual student characteristics. For preschool children with CU traits, conventional instructional methods may not be optimally effective due to their unique behavioural patterns and personality features. Considering the positive influence of appropriate, student-preferred instructional methods on children's learning motivation and engagement, investigating which instructional methods appeal to children with CU traits may help to improve their academic engagement and performance. However, there is no research formally examining how children with CU traits may respond to different instructional methods. Therefore, one of the current thesis aims is to explore relationships between CU traits and child responses to different instructional methods that are commonly used in Chinese preschools.

1.5 The Current Thesis

There is abundant evidence that within the wider group of children who have CP, the presence of CU traits distinguishes an important subgroup who show unique emotional, cognitive, affective, and personality features, as well as potentially different responsiveness to traditional treatments targeting behavioural and emotional problems. While considerable effort has been

devoted to identifying risk and protective factors in the family context, relatively fewer studies have been conducted in school settings, limiting our understanding of how CU traits may be related to school factors. Given the critical role of schools in children's academic and social development and their potential as conducive venues for interventions, exploring CU traits in the school context is important. In addition, research on CU traits in the school context has predominantly focused on Western countries and most research, including studies conducted in China, has concentrated on older children and adolescents. Therefore, the aim of the current research is to investigate CU traits in a Chinese preschool context. Considering the scarcity of research in Chinese preschool contexts, an exploratory mixed-method design was used in this PhD project (Nastasi et al., 2010). As past research on CU traits has predominantly relied on teacher reports and interview and/or questionnaire methods, this research adopted a multi-method approach, including classroom observation, to enhance the validity of its findings. This approach was designed to ensure the inclusion of insights that might be overlooked when relying on a single method, thereby reducing the risk of overconfidence in conclusions drawn from method-specific biases (Eid & Diener, 2006).

This thesis comprises three studies, each detailed in subsequent chapters following the opening chapter. In Chapter 2, teachers' perceptions of the relationships between CU traits, teacher-child and teacher-caregiver relationships, and teacher rewards, discipline, and instructional methods were explored. Thematic analysis was employed to analyse data obtained from semi-structured teacher interviews. This qualitative exploration served as a foundation for the research, offering rich and detailed information that can be used to guide the design and hypotheses of the subsequent quantitative studies. Chapter 3 is a classroom observation study that used negative binomial regression, logistic regression, and linear regression to examine the associations between CU traits and teacher rewards, discipline, and

instructional methods. This study offered objective insights into teacher-child interactions in real-time classroom settings, contrasting with and complementing the findings from the interview-based research in Chapter 2. Chapter 4 presents the development and validation of a new questionnaire designed to assess children's responses to teacher rewards via teacher-reported questionnaires. In this study, item response theory (IRT) models, exploratory factor analysis (EFA), and confirmatory factor analysis (CFA) were used to test the validity and reliability of the newly developed questionnaire. This questionnaire study compensated for the limitations of the small sample size in the classroom observation study, and the newly developed questionnaire enables scaling up the findings to a broader population for future research.

Overall, this thesis, combining qualitative interviews, quantitative classroom observations, and questionnaires, enhances our understanding of relationships between CU traits and school-related factors specifically in the Chinese preschool context. These findings have the potential to extend previous research conducted in Western countries and with older children to a Chinese context involving younger children. This extension can assist in developing age-specific and culturally sensitive intervention strategies, and in improving teacher training that helps teachers create classroom environments that are supportive and tailored to the specific needs of children with CU traits.

Chapter 2

Teachers' Perceptions of the Relationships between CU Traits, Classroom Management Strategies, Instructional Methods, Teacher-Child and Teacher-Caregiver Relationships in Chinese Preschools

In this chapter, I will describe a qualitative study exploring teachers' perceptions of relationships between CU traits and multiple dimensions of teacher-child interaction in the Chinese preschool context. Dimensions examined include responses to teacher rewards, discipline, instructional methods, teacher-child and teacher-caregiver relationships. Through semi-structured interviews with 20 teachers, the study described in this chapter aims to provide a rich, qualitative insight and a deeper understanding of CU traits in this unique context. This qualitative exploration established a crucial foundation that informed the development of precise research questions, hypotheses, and assessment measures for subsequent quantitative investigation, ensuring a comprehensive, nuanced, and contextually relevant understanding of CU traits.

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2.1 Introduction

CP poses a significant concern in schools, not only contributing to poor academic and interpersonal outcomes for children but also presenting substantial challenges for teachers due to heightened stress and burnout

(Aldrup et al., 2018; Campbell et al., 2018; Oncioiu et al., 2023). Among preschool children with CP, research highlights the presence of high levels of CU traits as delineating a specific subgroup who tend to show more severe and persistent CP in schools compared to peers with lower levels of CU traits (Longman et al., 2016). Beyond a greater severity of CP, a large body of research evidence, as summarized in Chapter 1, highlights distinct characteristics associated with CU traits among preschool children, including impairments in recognizing and responding to negative emotional cues (Hoyniak et al., 2018; Kimonis et al., 2016; Kimonis et al., 2023; White et al., 2016), deficits in cognitive empathy (Georgiou et al., 2019), punishment insensitivity (Chhoa, 2023), deficits in affiliation and heightened fearlessness and thrill-seeking (Waller & Wanger, 2019).

2.1.1 CU Traits in the School Setting

Despite the significant role of schools in children's social, emotional, and academic development (Aviles et al., 2006; Ungar et al., 2019), and the advantages of school-based intervention in accessibility, reduced stigma, and the ability to offer early detection and continuous monitoring of mental health issues (Sanchez et al., 2018), most research on CU traits and environmental factors has focused on the family context, with relatively fewer studies conducted in the school context, especially in preschools, warranting further investigation in this area. Existing research on CU traits and school factors has primarily focused on older children and adolescents, with initial evidence suggesting that CU traits are a temperamental risk factor contributing to poor social, behavioural, and academic outcomes at school (Bird et al., 2019; Crum et al., 2016; Miron et al., 2020).

2.1.2 CU Traits and Teacher Rewards and Discipline

Over the last decade, there has been increasing interest in CU traits and teacher rewards and discipline in the school setting. Qualitative research

indicated that teachers in the UK perceived high school students with high CU traits and CP to show a decreased sensitivity for social rewards (e.g., praise), while tangible rewards (e.g., sweets) were viewed as effective for children with CP regardless of their level of CU traits (Allen et al., 2018). In line with findings from parenting research suggesting that CU traits may shape parental practices in early childhood (Trentacosta et al., 2019; Waller et al., 2014), Allen et al. speculated that this reduced responsiveness to social rewards may discourage teachers from using rewards to form good quality TCRs and promote school engagement. In support of this claim, Hwang et al. (2020) found that CU traits predicted a significant decrease in the use of teacher rewards over the course of the school year in South Korean primary schools. Thus, teachers may need additional support and training to maintain use of reward-based strategies with children with CU traits and CP over time.

Contrary to the mixed findings on CU traits and reward sensitivity, studies within school settings have consistently found that children with high CU traits exhibit reduced sensitivity to teacher discipline both cross-sectionally or longitudinally in primary and secondary schools (Allen, et al., 2016; Allen et al., 2018; Baroncelli et al., 2022; Hwang et al., 2020). Lack of affective discomfort in response to discipline is theorized to impede the development of conscience through the socialization efforts of parents, teachers, or peers (Blair, 2017; Kochanska, 1993). This reduced guilt, combined with a fearless attitude towards negative consequences, means that children with CU traits are more likely to misbehave and to repeat this misbehaviour following teachers' discipline (Byrd et al., 2014; Frick & Myers, 2017; Frick et al., 2018). Some secondary school teachers mentioned that such diminished effectiveness of discipline strategies negatively impacts their confidence in their ability to manage challenging behaviour in the classroom (Allen et al., 2016). However, encouragingly, and unlike findings for parents who may escalate to harsh and coercive punishment out of frustration with the lack of responsiveness to

discipline (Dadds & Salmon, 2003; Hawes et al., 2011; Trentacosta et al., 2019), primary school teachers did not increase their use of harsh discipline over time with children high in CU traits. Teachers have increased training in preventing and managing disruptive behaviour in class, as well as a legal, ethical, and professional responsibility to avoid the use of coercive discipline (Hwang et al., 2020), which may explain the different findings from parental discipline.

Research on children's responses to teacher rewards and discipline has predominantly focused on older children and adolescents, with studies on preschool-aged children notably limited. Recently, Chhoa (2023) explored the relationships between CU traits and responses to rewards and discipline among preschool children in the UK; however, this investigation was conducted within a family context and focused on parental strategies. Chhoa found significant correlations between CU traits and a lack of sensitivity to punishment through experimental tasks and parental reports of discipline. However, findings related to the children's responses to rewards were inconsistent. While CU traits were not related to responses to tangible versus social rewards in experimental tasks, they were associated with diminished responsiveness to social rewards as reported by parents.

2.1.3 CU Traits and Instructional Methods

CU traits are also characterized by a lack of concern for performance, reflected in poor grades in primary and secondary schools (Bird et al., 2019; Horan et al., 2016). Theory has primarily highlighted low academic motivation, poor quality TCRs and reduced responsiveness to teacher rewards and discipline as mechanisms explaining the poor school performance of children with CU traits (DeLisi et al., 2011; Horan et al., 2016; Hwang et al., 2021). Recently this focus on reduced responsiveness to teacher strategies has been extended to include instructional methods. In a study of 437 secondary school students in the UK, Bird et al. found that CU traits only related to lower grades for English, Science,

and Maths. Boys high in CU traits were at higher risk for low grades in Science compared to girls, but there was no interaction between gender and subject for Maths or English. Bird et al. posited that this difference across subjects may be due to variations in learning formats, wherein Science in the UK typically involves group work, whereas Math and English more commonly rely on individual work. Therefore, boys with CU traits may not derive the well-documented benefits of peer learning and groupwork due to their reduced empathy and social competence relative to girls (Cardinale & Marsh 2017; Fanti 2013; Fanti et al. 2017). It may be also because Science emphasises sequential, activity-based learning, which may be more negatively impacted by school and classroom exclusion, which may be experienced more frequently by boys high in CU traits, leading to a poor academic performance. In a qualitative research study using the same sample, teachers reported that students with high CU traits lack motivation and typically require close supervision to keep them focused on school work (Allen et al., 2018). Thus, children with high CU traits may benefit from instructional methods that allow teachers to be highly engaged with these children. Current research on CU traits and academic performance has primarily focused on older children and adolescents. However, given that similar expressions and correlates of CU traits have been observed in preschool children, as detailed in older age groups (see review in Chapter 1, Section 1.3.2), and considering the reduced effectiveness of traditional treatments alongside increased effectiveness of treatments specifically targeting CU traits (see review in Chapter 1, Section 1.3.4), it is possible that preschoolers with high CU traits may not benefit from, or may be more sensitive to, some specific instructional methods. Nevertheless, the relationships between CU traits and responses to different instructional methods have yet to be formally investigated across all age groups.

2.1.4 CU Traits and TCR Quality

CP can lead to greater conflict between teachers and students (Aldrup et al.,

2018), and children with high CU traits usually are less motivated to form and maintain social bonds (Waller & Wagner, 2019). Teachers may, therefore, experience challenges when establishing and maintaining positive relationships with children exhibiting high CU traits. Indeed, CU traits are consistently found to be significantly related to poor TCRs in preschool, primary and secondary schools in China (Tan et al., 2023; Zhu et al., 2023), South Korea (Hwang et al., 2022), Canada (Crum et al., 2016), England (Allen et al., 2018; Roslyne Wilkinson & Jones Bartoli, 2021), and America (Horan et al., 2016). Despite these challenges, evidence also suggests that a positive TCR can act as a buffer against the development of CU traits in secondary school students (Baroncelli & Ciucci, 2020; Baroncelli et al., 2022), and the adverse impact of CU traits on children's academic, emotional, and behaviour outcomes in secondary school and preschool children (Allen et al., 2018; Tan et al., 2023; Zhu et al., 2023).

However, later longitudinal research on the bidirectional relationships between CU traits and TCR has shown mixed findings. While a study among middle school students in Italy did not find that CU traits independently predicted changes in TCRs after a 6-month period (Baroncelli & Ciucci, 2020), findings from South Korea indicated that high CU traits at the start of the academic year predicted a decrease in teacher affiliation 4.5 months later in primary school students (Hwang et al., 2022). Hwang et al. attributed these discrepant findings to the different periods of schooling, as primary school students have more frequent and intense interactions with their teachers compared to later stages of education. These results suggest that while CU traits might be significantly associated with TCRs, they might not necessarily predict the trajectory of these relationships across different educational stages, emphasizing the importance of developing interventions that are attuned to the school environment and its unique characteristics to improve their effectiveness. Considering the unique features of preschool education, where teachers are responsible not only for

academic learning but also for caregiving, and the developmental characteristics of this age stage, such as the dependency and vulnerability of young children (Cheung, 2020; Verschueren & Koomen, 2012), the relationships between CU traits and TCRs in preschools may differ from findings obtained from older children and adolescents and may impact teacher-child daily interactions including teacher use of and child responses to rewards, discipline, and instructional methods. However, research on TCRs and CU traits in preschool settings is sparse, with one study examining how TCRs impact the relationship between CU traits and children's emotional lability/negativity (Tan et al., 2023), while another investigates the effects of CU traits on the association between TCRs and social adjustment (Zhu et al., 2023). These studies offer preliminary insights into the negative correlations between CU traits and TCRs and how these relationships may adversely affect children's emotional and social outcomes, illuminating the universal challenges that children with CU traits may face in forming positive school-based relationships and suggesting the need to support teachers in building positive relationships with these at-risk children. However, they have not explored how TCRs might affect teachers' daily classroom management and teaching activities, nor have they addressed how children with CU traits might respond differently to teachers' strategies.

2.1.5 CU Traits and TPR Quality

In addition to TCR quality, CU traits may also have detrimental impacts on TPRs. Successful TPRs have significant and lasting positive effects on children's school adjustment and TCR quality (Jeynes, 2018). Even though the importance of good quality TPRs is well understood by teachers, sometimes these relationships are strained because of the challenges in working with children with CP (Mautone et al., 2015). Considering that CU traits are associated with severe CP (Frick et al., 2014) and poorer quality teacher-child (Tan et al., 2023; Zhu et al., 2023) and parent-child relationships (Waller et al.,

2021), it is likely that the teachers of these high-risk children will also have more difficult relationships with parents. This could be due to potential barriers in teacher-parent communication and collaboration, stemming from diminished parental warmth and positive involvement associated with CP in children, or primarily negative teacher-parent interactions resulting from poor TCRs and frequent CP in classrooms. However, a potential link between TPR quality and CU traits has yet to be investigated.

While research evidence supports the universality of CU traits across cultures, there is evidence for East-West differences in trait expression and correlates (Sng et al., 2020). Distinct cultural influences in East Asia are often grounded in Confucian values that emphasize societal harmony, hierarchical relationships, and emotional restraint (De Vaus et al., 2018; Sundararajan, 2020; von Suchodoletz & Hepach, 2021). These cultural values and social norms may influence the interplay between child temperament and the social environment from the micro-level (e.g., school and home environment) to the macro-level (e.g., education policy, social conditions). For example, these norms might explain why some Eastern populations report different associations between CU traits and factors such as aggression or peer relationships compared to Western samples (Li et al., 2017; Hwang et al., 2022). Moreover, cultural expectations about emotional restraint or achievement can influence parental perceptions and self-report of CU traits (Fung et al. 2009; Hwang et al., 2021).

Although understanding CU traits during the preschool period and in East Asian contexts such as China is of significant interest, most of the research on CU traits and school-related factors is confined to Western countries and has focused on older children and adolescents. As research on CU traits within Chinese preschool contexts is limited, a qualitative approach can provide depth and a detailed description of participants' feelings, views, and experiences, as well as how meanings are interpreted in a cultural context. This can help to

uncover more nuanced, contextualized information that may be important or specific to the Chinese school context (Rahman, 2020). One method that stands out for its versatility and depth is the semi-structured interview. The interactive and inductive nature of the semi-structured interviews enables researchers to accumulate in-depth and rich information within the context it occurs (Alshenqeeti, 2014) and to generate theories through exploration (Braun & Clarke, 2013). With the advantage of predetermined questions, researchers using this method can elicit clear and complete information from participants and, importantly, have the flexibility to deliver follow-up questions, probing emerging topics that were not initially anticipated (Barriball & While, 1993). Importantly, the depth of insights and rich information derived from this method can aid in identifying potential mechanisms that elucidate the links between CU traits and school factors, which may guide the design and direction of subsequent quantitative studies, as well as providing information about potential targets for teacher-delivered interventions for child CP.

To the best of my knowledge, previous qualitative research on CU traits in schools is solely conducted in Western nations with secondary school students (Allen et al., 2016, 2018). As detailed in sections 1.3.4 of Chapter 1, both the preschool years are a crucial time for child development, as the foundations for academic achievement, school-based interpersonal relationships and general well-being are established in this period. Furthermore, CU traits are associated with childhood-onset CP. Thus, early detection and intervention for these traits during early childhood might be especially beneficial, given the potential malleability of temperament and behaviour at this age. By addressing these traits proactively, practitioners, educators, and caregivers can help prevent the escalation of these traits into more severe and impairing behaviours as children grow older. Therefore, the aim of current research is to explore differences in Chinese preschool teachers' perspectives on teacher-child interaction and the quality of teacher-child and teacher-parent relationships in children with CP who

have high or low levels of CU traits via semi-structured interviews. The research questions were as follows.

1. How do teachers' perceptions of externalising problems differ for children with high versus low CU traits?

2. How do teachers manage the externalising problems of children with CU traits, and what are their views on children's response to classroom reward, discipline, and instructional strategies for children with externalising problems and high CU traits compared to those low in CU traits?

3. How do teachers' perceptions of the quality of teacher-child and teacher-parent relationships differ for children with externalising problems and high CU traits compared to those low in CU traits? How do teachers perceive the quality of these relationships in terms of their impact on the school functioning and success of children in these two groups?

2. 2 Method

2.2.1 Participants and Procedure

Preschools in China are classified at three levels according to their educational and environmental quality (Xue, 2012). Using SPSS, one school from each quality level was randomly selected for inclusion in the study via the 'Select Cases' function set to 'Random Sample of Cases'. Thus, in total, three public preschools of varying levels of educational and environmental quality were randomly selected in Shanghai, China to ensure that participants were recruited from a diverse range of schools. In China, preschools typically consist of three grades. To obtain rich and in-depth information from the interviews, only teachers from Years 2 (i.e., 4-5 years old) and 3 (i.e. 5-6 years old) were included to ensure that teachers had known their students for a sufficient length of time, as Year 1 students had just started school when data collection

commenced. Following approval from the ethics review board of the UCL Institute of Education, information and consent forms outlining the details of the study were sent to the preschool principals, all of whom gave their permission to approach teachers at their schools. In total, 22 teachers met the selection criteria of being a Year 2 or 3 teacher and being available during the set data collection week to attend an interview. To achieve data saturation, a sample size of at least 12 was estimated based on guidance on determining sample size for thematic analysis (Ando et al., 2014). However, all 22 teachers were approached to account for potential participant withdrawal. All teachers who were approached agreed to participate and provided informed written consent.

Interviews were administered in Mandarin by myself during a three-week period from November to December 2019, with one week spent in each preschool. I was trained for both the teacher and CAPE interviews by perusing reading CAPE training materials, completing courses on interviewing techniques, and engaging in practice and role plays in interview administration before the formal study interviews started. Before the research commenced, teachers were contacted through their principals and interview slots were scheduled. Teachers were interviewed before school, after school, or during breaks (depending on the teachers' preference) in a private, quiet room at their school. The researcher spent the whole day at the preschool during the data collection week to give teachers the opportunity to ask any questions related to the research.

Prior to their interviews, teachers received questionnaires assessing teacher and child sociodemographic characteristics and CU traits. Teachers were asked to complete the questionnaires at any time convenient for them during the week of data collection, but to return them by the end of the pre-arranged one-week data collection period agreed with the school and myself. At the start of the interviews, teachers were asked to report on two nominated children who displayed the most severe disruptive behaviour in their classrooms. The

decision to employ teacher nominations stemmed from the goal of identifying at-risk children within mainstream preschool environments, rather than making a formal clinical diagnosis. Given that teachers spend considerable time observing student behaviour across various settings in schools, their insights are invaluable for effectively screening non-clinical samples of children who may be at risk of mental health issues (Stensen et al., 2021). The interviewer posed the question, 'Which two children do you think display the most severe disruptive behaviour in your class?' If teachers were unsure about what qualifies as disruptive behaviour, further explanations and examples were provided. In cases where teachers perceived all children as well-behaved, or if more than two children were identified with severe disruptive behaviours, teachers were prompted to select the two who were relatively the most disruptive. The teacher then completed separate interviews for each child, one after another. Interviews lasted between 90 and 120 min ($M = 102.70$ min, $SD = 10.47$). Exclusion criteria include a diagnosis of autism, developmental delays, or any major medical disorder that substantially disrupts daily functioning in both family and school environments. Specifically, 'developmental delays' are defined as significant lags in achieving milestones in cognitive, physical, social, or emotional development as diagnosed by a healthcare professional. 'Major medical disorders' refer to conditions that require frequent hospital visits or daily medical interventions, significantly hindering regular participation in family and school activities. No teacher-nominated children were excluded based on these criteria. These exclusion criteria were designed to control for potential confounds that may explain teacher perceptions of the school functioning of children with CP and low vs high levels of CU traits.

Two teachers completed the questionnaires but not the interviews due to time constraints, resulting in a final participation rate of 91%. Teachers who withdrew did not differ from those who completed the interviews on age, gender, ethnicity, or years of teaching experience (all $ps > .05$). In sum, 20 teachers aged 26–48

years old ($M = 34.05$ years, $SD = 7.49$) reported on 40 children aged 4–6 years old ($M = 5.3$ years, $SD = 0.65$). All teachers identified their ethnicity as Chinese, most were female (90%) and their years of teaching experience ranged from 2 to 30 years ($M = 11.35$, $SD = 8.81$). Out of the 40 children nominated by teachers, 85% were boys ($n = 34$) and all were Chinese. All children lived in a two-parent family, and most were described by teachers as having a ‘moderate’ family financial condition (85%); 12.5% were reported as wealthy, and a small percentage as socially disadvantaged (2.5%).

2.2.2 Measures

Background. A brief background questionnaire gathered information about teacher age, gender, ethnicity, and years of teaching experience. At the schools’ request, information about child sociodemographic characteristics, including age, gender, ethnicity, family type, and family socioeconomic status was provided by teachers rather than parents, based on their knowledge and contact with children and their families. Parents were informed in detail by opt-out consent forms that this information would be collected from teachers, and no opt-out consent forms were returned.

Semi-structured Interview. The initial interview schedule included three sections (children’s behaviour, teacher-child interaction, TCR quality) based on past qualitative interviews targeting CU traits in secondary schools (Allen et al., 2016, 2018). Each section comprised a sequence of open-ended questions asking teachers to provide a typical example of each domain and to describe child (and teacher) behaviours in the classroom that related to each topic, for example, ‘Generally speaking, what disruptive behaviour does [target child] show?’ ‘How often does [target child] show disruptive behaviour ?’. The interviewer then probed the participant to capture more detailed information.

Prior to the formal interviews, a pilot study was conducted with seven Chinese

preschool teachers. Following teacher feedback, the interview was modified for the preschool period and to ensure its cultural relevance and sensitivity. A new section was added on TPR quality as this theme frequently surfaced in the pilot study. A section on instructional methods was also included to evaluate the claim that the poor academic performance of children with CU traits, particularly, boys, may be influenced by their reduced responsiveness to instructional methods (e.g., peer learning) known to promote engagement in typically developing children (Bird, et al., 2019). The interview questions along with corresponding research questions are presented in Table 3 and a copy of full interview schedule is attached in Appendix A.

The Clinical Assessment of Prosocial Emotions: Version 1.1 (CAPE1.1; Frick, 2013) was also administered to teachers. CAPE is a clinician rating system developed to specifically assess CU traits in a broad age range (3–21 years old). It assesses four core symptoms in line with the DSM-5 criteria for the Limited Prosocial Emotions (LPE) specifier for conduct disorder: (a) a lack of remorse or guilt, (b) callousness, (c) unconcerned about performance, and (d) shallow emotions (APA, 2013). The CAPE coding form provides an explicit prototype description for each symptom to guide ratings on a three-point scale from 0 (not descriptive or mildly descriptive) to 2 (highly descriptive). If two or more symptoms are rated 2, the target child is considered to meet the diagnostic threshold for the LPE specifier. In CAPE semi-structured interviews, each CU traits item has at least two stem questions which can only be answered with ‘Yes’ or ‘No’. These are followed by a request for examples and follow-up questions which provide more detailed information to aid interviewer ratings. The manual suggests that judgments should be based on information from multiple resources (like rating scales and interviews) and informants (such as child self-reports and parent/teacher reports). However, given that parents were not involved in the research and that preschool-aged children are too young to provide reliable and valid reports via interviews (Goodman & Melinder, 2007),

CAPE 1.1 was only administered to teachers, with their reports on ICU used as supplementary information to ensure the validity of the CAPE 1.1 ratings.

The CAPE has been shown to have good criterion validity and construct validity in several studies, for example, in a sample of 35 children (69% male, aged 5–18 years) from disadvantaged families in England (Centifanti et al., 2019) and in a sample of 85 Australian children with CP disorders (75% males, aged 3–15 years) (Hawes et al., 2020). Given that there was no available Chinese version of CAPE, the CAPE Informant Interview schedule was translated into Mandarin Chinese for this research. Two bilingual graduate students forward translated and then back translated the CAPE. The back-translated version of the CAPE was then compared with the original version of CAPE. Four Chinese preschool teachers who did not participate in the current research were invited to read the translated version to check its readability. Based on feedback from teachers, my two PhD supervisors and the two bilingual graduate students, a few ambiguous words were adjusted. For example, ‘使开心’ was changed to ‘使振作’. Although ‘使开心’ and ‘使振作’ both imply that someone was happy, ‘使振作’ indicates that the individual’s mood changed from negative to positive, consistent with the original English term ‘cheer up’ used in the CAPE. The Chinese version of CAPE was finalized and approved by the developer of CAPE, Paul Frick.

An independent trained researcher who was blind to study aims assisted with reliability checks for CAPE ratings. Twenty percent of the sample interviews ($n = 8$) were randomly selected and coded independently by the trained researcher. The intraclass correlation coefficients for CAPE scores ranged from 0.77 to 0.89, indicating good agreement (Koo & Li, 2016). Any disagreements were discussed and resolved following the independent reliability coding, with the final consensus rating used in the study analyses.

CU Traits. The Inventory of Callous-Unemotional traits (ICU; Frick, 2004, Appendix B) was also used to assess teacher report of CU traits. The ICU asks respondents to rate 24 items for the target child on a 4-point Likert scale ranging from 0 'not at all true' to 3 'definitely true'. The best-fitting model of the ICU has a bifactor structure, which includes one overarching CU traits factor and three subfactors: callousness (11 items), uncaring (8 items), and unemotional (5 items) (Ray & Frick, 2018). This factor structure has been supported in diverse samples across age groups, gender, informant, and cultures (Frick & Ray, 2015). The Mandarin translation of the ICU demonstrated good reliability and validity in Chinese preschool children (Deng et al., 2016). Alpha for the total ICU score in the current sample was .89.

Externalising Problems. The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997, Appendix B) is a 25-item rating scale consisting of five subscales: conduct problems, hyperactivity, emotional symptoms, peer relationship problems and prosocial behaviour. Teachers rate each item on a 3-point Likert scale from 0 'not at all true' to 2 'certainly true'. The sum of the conduct problems and hyperactivity subscales of the preschool version of SDQ was used to assess externalising problems (Goodman et al., 2010). The validity of the Chinese version has been demonstrated by cross-scale correlations and its ability to discriminate between typically developing children and children with ADHD (Du et al., 2008). The alpha for SDQ externalising problems was .75.

2.2.3 Data Analysis

In this study, an Analysis of Variance (ANOVA) was conducted to examine whether there were significant differences in the levels of child externalising problems among the three preschools involved in the research. Prior to conducting the ANOVA, assumptions of normality and homogeneity of variance were verified to ensure the validity of the analysis. Children were grouped by

school rather than by individual classrooms, due to the small number of children (two) reported per class and the large number of classes (16 in total) involved, which could have complicated the analysis with excessively fragmented groups. The results indicated no significant differences in externalising problems among the schools ($p > .05$), suggesting the consistency in teacher nominations of children with disruptive behaviour across different schools.

To ensure the accuracy and reliability of the data, all the interviews were audio-recorded and transcribed verbatim. Reflexive thematic analysis provides a systematic, accessible, and flexible approach to generating codes and themes, enabling researchers to produce coherent and compelling interpretations grounded in rich data (Braun & Clarke, 2019). This method aligns closely with the aims of this study, which is the first to explore CU traits, TCRs, TPRs, and both teacher usage and child responses to rewards, discipline, and instructional methods in a Chinese preschool context. The process of thematic analysis in this study adhered to the six-step approach outlined by Braun & Clarke (2006). First, I familiarized myself with the data by reading interview transcripts, during which I reviewed literature on CU traits and CP in relation to TCRs, TPRs, and children's responses to teacher strategies. This ensured that the data were coded with a sensitive awareness of the research topic, and simple notes on initial patterns were made to highlight potential key areas of interest relevant to the study's questions.

Second, initial codes were generated through a more systematic engagement with the data. The interviews were analysed using a conjoint process of deductive and inductive thematic analysis (Braun & Clarke, 2013). Potential codes were developed to address the research questions of the current study and by drawing on the literature on CU traits in the school setting. In addition to deductive codes, inductive codes that described new themes observed in the data were generated through analytic process. Codes were generated within

the explicit meaning of the data, and no interpretations were made beyond its semantic content. For example, no attempts were made to identify underlying ideologies or assumptions that were theorized as influencing teacher statements. The coding of all transcripts was performed in NVivo 11 (QSR International Pty Ltd, 2018).

Interview transcripts were coded before CAPE and ICU scores were analysed to ensure the coder was unaware of child CU status based on teacher report. According to teachers' reports on the CAPE and the ICU, 7 children (5 boys, 2 girls) aged 4–6 years old ($M = 5.00$ years, $SD = 0.58$) met the diagnostic threshold for Limited Prosocial Emotions and were designated as belonging to the high CU traits group, with the remainder of the sample forming the low CU traits group ($n = 33$). The mean score of ICU for the high CU traits group was 45.43 ($SD = 33.51$), while for the low CU traits group, it was 26.58 ($SD = 3.28$). The 7 children in the high CU traits group were nominated by 7 different teachers. The externalising problems subscale of the SDQ was used to cross-validate the accuracy of teacher nominations in identifying children displaying disruptive behaviour. The mean SDQ scores were calculated for both the high CU and low CU groups. The results revealed that the mean score for the high CU group was 13.57 ($SD = 3.77$), surpassing the cutoff for high externalising problems for Chinese preschool children (Du et al., 2008). In contrast, the mean score for the low CU group was 10.21 ($SD = 3.28$), which falls within the borderline range. This indicates teachers have ability to effectively identify children exhibiting varying degrees of disruptive behaviour, and confirm that the current study included children with above average levels of externalising problems based on teacher report. High and low CU groups were compared on demographic characteristics using chi-squared analyses for categorical variables and one-way analysis of variance for continuous variables. Given the small sample size, bootstrapping was applied to ensure the statistical robustness of the relationships. Analyses were performed using SPSS Version

26. The results indicated no significant differences in child age, gender, ethnicity, family type, or family socioeconomic status between groups (all $ps > .05$).

Third, within each group, codes were connected and clustered to form potential themes. The relationships between codes and themes were carefully examined using visual representations such as mind-maps. Codes describing the same issues were grouped together under a more abstract definition, with some codes identified as main themes while others were classified as subthemes. Themes were identified and coded based on their relevance to the research questions and theoretical significance, rather than their frequency within individual interviews or across the dataset. This method aims to capture significant insights and meaningful patterns while avoid overlooking meaningful patterns that deviated from the main story. Fourth, I reviewed these potential themes in detail and discussed them with my two PhD supervisors, refining them as necessary, for example, by combining similar themes, separating themes into overarching themes, subthemes, or discarding themes where codes were not meaningful, consistent, or coherent. Fifth, the independent trained researcher who assisted with reliability checks for CAPE also helped review and further revise the names and definitions of the refined list of themes to ensure they captured meaningful patterns that effectively told the best story of the data. We examined the relationships between overarching themes, themes, and subthemes, reaching a consensus on the themes identified in the interview data after thorough discussion, with no additional codes or themes raised.

Finally, the findings were reported. The findings were organized under overarching themes, with percentages for each theme and example quotes provided. The percentages for themes related to children's responses to instructional methods were calculated by the number of children who displayed positive or negative responses to those strategies divided by the number of

children who received those strategies in the high and low CU groups separately. Percentages for themes related to teacher-grandparent relationships were calculated by the number of children whose grandparents had good or poor relationships with teachers divided by the number of children whose grandparents were involved in children's education in each group. Percentages for other themes were calculated by the number of children who were labelled with the theme divided by the total number of children in each group.

2.3 Results

Descriptions and percentages of overarching themes, themes and subthemes for children high and low in CU traits are presented in Table 1 and Table 2, respectively.

2.3.1 CU Traits and Disruptive behaviour at School

As expected, teachers described children with externalising problems in the high CU group as displaying more intense disruptive behaviours than children with externalising problems in the low CU group in terms of both severity and frequency. Teachers reported that most children in the high CU group showed disruptive or aggressive behaviour that interfered with class functioning at least once a day (86%).

He likes to defy teachers and do things that are not allowed during class, which happens every day. His aggressive behaviour is not that bad, but still two or three times a week. For example, he likes to knock other kids down for fun when we play. (Teacher 1; Child A)

Fewer children with externalising problems in the low CU group were perceived by teachers as showing externalising problems on a daily basis (52%). For these children, teachers usually described their behaviour as being disruptive

to the class only, with no or only low-frequency aggressive behaviour.

He always chips in when I am talking, and I need to remind him not to interrupt me every day. He is naughty but also smart. I think there is no child showing aggressive behaviour in my class. They are fine. I think such behaviour is normal and acceptable. (Teacher 2; Child B)

He is usually fine. For aggressive behaviour, it only happened once in the last half year. (Teacher 3; Child C)

Teachers reported that children in the high CU traits group showed less empathy and were more likely to tease or make fun of others compared to children low in CU traits (86% vs. 27%):

If any children wet their pants, we teachers help them to change clothes in the locker room. He would come over every time, laughing and shouting something like 'Hey, look! He pissed his pants again!' (Teacher 1; Child A)

Teachers viewed children with externalising problems and high CU traits as more likely to engage in 'selfish' behaviour than children low in CU traits (86% vs 15%). These children would disregard school rules and the consequences of their aggressive behaviour for others when in pursuit of their goals:

In an art class, he wanted to decorate his work with stickers. However, there were no stickers left so he hit other kids to get the sticker he wanted. (Teacher 4; Child D)

2.3.2 CU Traits and Teacher Reward Strategies

Teachers did not view children with externalising problems and high or low CU traits as differing in their responses to rewards regardless of whether the reward

was social in nature (e.g., praise), tangible (e.g., stickers) or an interesting activity (e.g., having extra play time). Instead, rewards were viewed as effective in promoting prosocial behaviour for most children despite their CU status.

I rewarded him a flower sticker and he has been behaving very well from this morning till now. (Teacher 5; Child E)

When I praised him, he sat nicely. Stickers and class privileges also worked well as rewards, and he was always happy to receive them. (Teacher 6; Child F)

Once, when we were lining up, he became a bit disruptive because he couldn't control his behaviour. So, I asked him to act as a student teacher and help me manage the children, getting them to stop talking. He was happy to help and his own behaviour improved as well. (Teacher 7; Child G)

It seems that being praised in public was the most attractive reward strategy for children high in CU traits. All children in high CU group were described as being motivated by praise in public, including two children who were indifferent to activity and tangible rewards.

He did not care about stickers or stars, but he reacted positively when I praised him in public. (Teacher 5; Child E)

Surprisingly, teachers reported that many children with externalising problems and high CU traits (71%) desired to be well-thought of by their teachers and peers, and felt proud when rewarded in front of others.

He looked very excited and proud when I rewarded him. It felt as though he wanted to win the favour of the teachers. (Teacher 2; Child H)

It was important to reward him in front of his peers. He would become very proud and motivated. (Teacher 4; Child D)

Teachers recognized the need to find opportunities to reward children who often misbehaved and reported lowering their requirements for good behaviour for these children.

He usually did worse than others and was seldomly rewarded. For other children in my class, there was no need to reward them specifically as these requirements were easy for them to meet. However, this kid was different, I would reward him even he only behaved a little better. (Teacher 8; Child I)

2.3.3 CU Traits and Teacher Discipline Strategies

Teachers reported using a wide range of discipline strategies, varying from mild discipline (e.g., reminders), to more severe punishment (e.g., criticism). In total, eight types of discipline were recognized, including non-verbal cues (e.g., disapproving eye contact), reminders, warnings, asking children to move seats, time-out, criticism, parent notification and disqualifying children from activities or positions of responsibility (e.g., not allowed to play games or be the teacher's helper). Non-verbal cues were only implemented in response to the externalising problems of children in the low CU group (18%) while children with high CU traits were more likely to be asked to move seats (57% vs. 18%) and receive parent notification (14% vs. 6%), and slightly more likely to be disqualified from games (57% vs. 48%). The remaining discipline strategies were distributed evenly across both high and low CU groups, with teachers reporting that children high and low in CU traits had received a similar frequency of reminders (100% in both groups), warnings (100% in both groups), and time-outs (57% and 55%, respectively). Likewise, use of punishment in the form of criticism was similar across the two groups (57% and 55%, respectively).

Children with externalising problems in the low CU group were more likely to be responsive to discipline (64%), with teachers describing the typical responses of this group as displaying guilt, accepting the disciplinary measure, apologizing, and ceasing any misbehaviour.

He looked guilty when I warned him. He will say sorry and promise to never do it again. (Teacher 9; Child J)

Teachers reported that the responses of children low in CU traits to discipline were more strongly influenced by the presence of peers when being disciplined than children high in CU traits. Teachers believed that those children cared about others' opinions of them, and the high value placed on preserving their reputation could result in either a negative or positive response to discipline:

He is sensitive about his reputation among peers. Sometimes when I criticise him in front of the class, he would get embarrassed and argue back angrily. (Teacher 10; Child K)

I think he cares a lot about how others think of him and would correct his misbehaviour immediately. (Teacher 11; Child L)

In contrast, negative responses to discipline were predominantly reported in children with externalising problems and elevated CU traits (71%), who were described by teachers as displaying oppositional and/or uncaring attitudes towards all forms of discipline:

Once, I disqualified him from playing the game because his behaviour was dangerous. He swore, which hurt my feelings, and said that he would not listen to me. (Teacher 8; Child I)

It seemed that he does not care. He did not think there would be any serious consequences for him, and he did not feel bad about his behaviour. (Teacher 12; Child M)

The only strategy identified by teachers as effective for children with high CU traits was informing parents of the child's behaviour.

I told him I would talk to his father if he did not stop, and he finally apologised. (Teacher 5; Child E)

One theme referring to a lack of guilt commonly applied to the high CU group (71%). Unlike their peers with low CU traits who usually 'felt sorry' and 'knew they were wrong', teachers reported that children with externalising problems and CU traits did not feel guilty following a transgression and often refused to apologize.

He rarely felt guilty. It was quite hard to make him say sorry. (Teacher 2; Child H)

2.3.4 CU Traits and Responses to Instructional Methods

Five main types of instructional methods were identified based on teacher report of who led the class and class structure: teacher-directed activities (class-level), teacher-directed activities (group-level), peer cooperation activities, individual learning activities and one-to-one teacher-child interaction. Teacher-directed activities (class-level) was the most common method, referring to classroom-level activities such as lectures, demonstrations, and storytelling. Teachers viewed this type of instructional methods as the less effective ones for children in both CU groups, reporting that fewer children performed well in these activities, especially children high in CU traits. All

children high in CU traits were perceived by teachers as usually displaying low levels of engagement, attention, and motivation during teacher-directed activities (class-level):

He never answered my questions or followed my instructions. He did not response me even if I called his name, as he was in his own world, playing with his chair, for example, and did not listen to me at all. (Teacher 12; Child M)

The theme related to good response to teacher-directed activities (class-level) were only identified among children with low CU traits, with teachers reporting that these children showed high level of motivation, sustained focus on the activities and always engaged in opportunities provided by teachers:

He was very focused and always raised his hand, hoping me to pick up him to answer the question. (Teacher 4; Child N)

Teacher-directed activities (group-level) refer to when children in the same class were allocated to different groups and managed by different teachers. Teachers felt most children with externalising problems and high CU traits (75%) appeared to lack focus during these teacher-directed small group sessions, showing poor engagement and motivation:

He was always distracted and seldom listened to me during the group activities. (Teacher 4; Child D)

In contrast, teachers reported children with externalising problems and low CU traits (83%) responded positively to instructions during small group activities:

He was very active during small group activities. He always raised his hand to ask or answer my questions. (Teacher 13; Child O)

During teacher-directed activities, teachers tended to offer more direct guidance to help misbehaving children low in CU traits stay focused. Teachers stated that they were able to pay more attention to the disruptive children in a smaller group, and this positive attention promoted better engagement.

Group teaching was more effective for him, because I could spare him more attention since there were fewer children in my class. I kept reminding him of the class rules and asked him questions more often during the group teaching. It is unusual for him to get such chances when I teach a larger group of children. With the increased amount of attention that I gave him, it was not easy for him to become distracted. (Teacher 14; Child P)

In contrast, teachers reported that they were less likely to interact with misbehaving children high in CU even during small group work as these children seldom responded:

When I asked him questions, he either did not reply or said something irrelevant. There are many kids who was very actively in my class and wanted to answer my question, so I seldom asked him, instead, we usually gave more opportunities to those children who behaved well. (Teacher 12; Child M)

Teachers also recognised that the increased teacher-child ratio during small group work primarily benefited disruptive children low in CU traits, whereas children high in CU traits required on-going supervision by teachers on a one-to-one basis to ensure good behaviour:

He behaved the same when he was in a class or in a group. Because we have 16 kids in our group, I cannot give him all my attention. (Teacher 7; Child Q)

Usually, we would need two teachers in our class, one teaching the class and

the other would sit next to him and look after him specifically to stop his disruptive behaviour. (Teacher 5; Child E)

Peer cooperation activities are learner-centred and activity-oriented approaches (e.g., roleplaying, group tasks, and peer sharing/discussion) where teachers only provide guidance, materials, and the location. Sometimes children work in groups, at other times children can choose the activity and their partners. Teachers reported that children with externalising problems and high CU traits were more often described as 'bossy', leading to arguments and fights with their classmates than children in the low CU group (75% vs. 31%):

When he cooperated with his peers, he had to be the boss. He would argue with other kids until they gave in and made him the leader. (Teacher 4; Child D)

Individual learning activities involves children exploring independently through playing games alone, with the freedom to choose their own content and learning materials. Teachers said this teaching method successfully promoted motivation and engagement as it is based on children's interests, with most children with externalising problems displaying prosocial behaviour and high engagement regardless of their levels of CU traits (71% in high CU group; 73% in low CU group):

He was very focused during individual study. For example, he liked the game called 'Catching Small Fish' and he could play it attentively from the beginning till the end. (Teacher 15; Child R)

One-to-one teacher-child interaction refers to one-to-one teacher support or interaction with children. In the teachers' opinion, children with externalising problems and high CU traits performed as well as their low CU peers during this close style of teaching, even those who were unresponsive to other

instructional formats:

I think he performed very well under my supervision because I could constantly remind him not to be distracted and support him based on his own needs. (Teacher 2; Child H)

2.3.5 CU Traits and TCR Quality

Most teachers stated that there were both positive and negative aspects to their relationships with children identified as disruptive at school, regardless of the child's CU status. However, predominantly conflictual relationships were only reported by teachers for children with externalising problems in the high CU group. Teachers found it difficult to establish a good relationship with these children as they frequently misbehaved and disobeyed teachers' instructions:

I am quite close to other children in my class. But for him, you know, because of his poor behaviour, it is hard for me to be his friend. (Teacher 8; Child I)

More teachers reported having a close or 'friendly' relationship with children with externalising problems and low rather than high CU traits (42% vs. 14%):

We cared about one another and were good friends. He shared his daily life with me, and we were quite close. (Teacher 16; Child S)

In addition, one teacher pointed out that her poor relationship with a child in the high CU group may have led to rejection from his peers:

Other kids were watching when I was criticizing him, and then he was ostracized by the other kids, with no one being willing to work or play with him. (Teacher 8; Child I)

For children with externalising problems and elevated CU traits, interestingly, teachers did not view teacher-child quality as influencing their academic engagement or responses to rewards and discipline. Instead, teachers believed that the intrinsic attractiveness of rewards and instructional methods, coupled with the child's sensitivity to discipline, were more important in influencing their responsiveness to discipline and reward-based classroom management strategies and their academic engagement:

I think [he] only behaved well when he was very interested in the content or the organization of this activity. I would not say he performed well because he liked me. (Teacher 5; Child E)

He just wanted stickers or praise. He did not care who rewarded him at all. He was not sensitive to my disciplinary actions, and I cannot see how our relationship made any difference. (Teacher 2; Child H)

Once I tried to be nice to him, treating him as an equal and playing with him like a friend would, but it did not make any difference. He behaved as poorly as usual during the class. (Teacher 7; Child Q)

In contrast, several teachers noted that children with externalising problems and low CU traits tended to be more responsive to teacher classroom management strategies and instructional methods, showing greater engagement in classroom activities when they had a close relationship (48%):

He adored me and respected me, so he was much happier when I rewarded him compared to when the other teacher did so in my class. (Teacher 17; Child T)

There was a time we got along very well during an individual learning activity. I

communicated with him and encouraged him to share his work with me. He was very happy and became very active and focused. (Teacher 10; Child U)

2.3.6 CU Traits and Teacher-caregiver Relationship Quality

Most teachers viewed the parents of children with externalising problems and high CU traits as disengaged, rarely participating in school activities or communicating with teachers (86%).

We wanted parents to participate in school activities, but his parents never came, even for the important activities. We seldom communicated with his parents. (Teacher 12; Child M)

Only one teacher in high CU group reported frequent communication with the parents of a child in the high CU traits group. However, the teacher stated that these conversations were usually unpleasant and tense.

It was hard for me to communicate with his parents, especially with his father. His father always acted impolitely and ignored my suggestions. (Teacher 8; Child I)

This conflictual TPR then moved to the TCR.

I saw a younger version of the father in this boy. Their characters were quite similar, which of course had a negative influence on our relationship. (Teacher 8; Child I)

In addition, teachers usually felt helpless when addressing parenting issues due to insufficient communication and conflicts with these parents of high CU children. They complained that the lack of parental support, combined with parents' limited skills and knowledge in managing children's behaviours (e.g.,

spoiling children or implementing problematic reward and discipline strategies), have a negative impact on children's behaviour and schoolwork.

His parents spoiled him a lot and gave him whatever he wanted. Therefore, he wanted me to spoil him as his parents did at home, otherwise he would become angry. (Teacher 1; Child A)

It was useless to only rely on our teachers to change the kid. We needed help from his parents. (Teacher 12; Child M)

I did not think our poor cooperation helped the child's performance at school because his parents never listened to me or took my suggestions. (Teacher 2; Child H)

In contrast, good quality TPRs were reported relatively more for the low CU group (39%). Teachers reported that they agreed on how to educate their children and shared a friendly, respectful, and trusting relationship:

We shared professional knowledge and strategies with parents. Under our guidance, parents found that their children improved so they trusted and respected us more. (Teacher 18; Child V)

Most teachers who reported cooperative relationships with the parents of children with externalising problems believed that this strengthened the TCR, and promoted the child's behavioural and academic performance (71%):

If parents respect you, then their children will respect you as well. (Teacher 10; Child U)

Communicating with parents allowed me to understand the child's needs,

strengths, and weaknesses. In turn, his parents knew how to support him appropriately at home and this kid behaves much better at school now. (Teacher 14; Child W)

Teachers reported that grandparents were involved in the education of several children in both groups. Consistent with the findings for parents, teachers reported conflict and a lack of cooperation with most grandparents of children with externalising problems and high CU traits (83%):

She spoiled the kid and refused to accept my suggestions that would help the girl become more independent. Her grandma did not like me. (Teacher 12; Child M)

In contrast, teachers reported a positive relationship with most grandparents of children with externalising problems and low CU traits (67%). Grandparents who shared a positive relationship with teachers usually played an important role in enhancing the family-school relationship when parents lacked the time to work with teachers, with benefits for children's behaviour and academic performance:

After I talked to his grandmother about his problems, it was obvious that he performed better in both behavioural and academic areas. (Teacher 8; Child X)

2.4 Discussion

In this chapter, this qualitative study investigated teachers' views on differences in children with externalising problems and high versus low levels of CU traits in response to classroom management strategies, instructional methods, and teacher-child and teacher-caregiver relationship quality. In relation to the first research question, in line with previous research, the findings indicated that teachers perceived more severe, frequent externalising problems and

aggression for children with high CU traits compared to those with low CU traits (Allen et al., 2018; Frick et al., 2014). Teachers reported that children with high CU traits appeared to value the gains from aggression while displaying a lack of guilt following such behaviour and derived pleasure from the misfortunes of their peers. This is consistent with the conceptualization of interpersonal callousness and lack of guilt as core features of CU traits (Frick et al., 2014). Thus, although there appear to be differences in CU trait expression and correlates between Western and Asian contexts (Sng et al., 2020), teacher qualitative interviews reported similar core features and correlates of CU traits in Chinese preschool children to those reported by teachers in Western nations (Allen et al., 2016, 2018; Waschbusch et al., 2015).

With regard to the second research question on teacher rewards, qualitative findings indicated that teachers described children with externalising problems and elevated CU traits as being equally responsive to rewards as children with externalising problems and low CU traits. Teachers reported that children with externalising problems and CU traits were motivated by praise, particularly when praise was given in front of others, consistent with past research suggesting that the presence of peers may facilitate reward-seeking behaviour in children with CU traits (Centifanti & Modecki, 2013). In contrast with the current findings, high school teachers in the UK viewed children with CP and CU traits as less responsive to social rewards such as praise (Allen et al., 2018), and even reported unintended side effects such as gloating, boastfulness or abuse of a privilege given as a reward (Allen et al., 2016). These conflicting findings may be due to the different age groups, as adult positive attention may be a more powerful motivator in early childhood than adolescence (Hawes & Allen, 2016). Child temperament is also likely to show greater malleability early in development, potentially explaining the positive responses to rewards of children with CU traits in the current sample of preschool children relative to children of high school age.

Another potential explanation for the inconsistent findings in the current study of Chinese children to those in the UK can be traced to the cultural values of Chinese society that are deeply influenced by Confucian philosophy, where a strong emphasis is put on obedience and respect for teachers (Hu et al., 2021; Wu et al., 2018). Given this cultural context and considering that teacher preferences can impact peer relationships (Hughes et al., 2001), teacher praise could potentially promote a child's social status among peers, which is highly appealing to children with high CU traits (Foulkes et al., 2014; Pardini et al., 2003). In line with this view, teachers in this research reported that these children seem to only value the admiration of both teachers and peers in a group setting in response to rewards, but appeared indifferent to the disapproval from teachers and peers when facing discipline, a pattern consistent with the literature on CU traits and their associated low sensitivity to social affiliation (Waller & Wagner, 2019), punishment (Pardini & Byrd, 2012; Pardini et al., 2003) and the distress cues from others (Dadds et al., 2009; Kimonis et al., 2006). It also suggests that reward and punishment processes operate at least somewhat independently for children with CP and elevated CU traits.

The findings also showed that although teachers perceived all children with externalising problems to enjoy rewards, they believed they seldom had opportunities to reward children with externalising problems and CU traits because of their frequent misbehaviour. This was despite them lowering their usual standards for rewards to increase the chances for children with high CU traits to receive them. While research has suggested that the use of rewards can potentially undermine children's intrinsic motivation (Bear et al., 2017; Deci et al., 1999; Deci & Ryan, 2008), leading some teachers to resist using them (Bear, 2013), this may not apply for children with high CU traits. These children often lack motivation (Allen et al. 2018; Ciucci et al., 2014) and display a reward-

dominant behavioural style (O'Brien & Frick, 1996; Frick et al., 2003; Frick et al., 2014). Indeed, interventions that emphasize teacher rewards and de-emphasize discipline (e.g., 'Let's Get Smart'; Frederickson et al., 2013) have shown promise in reducing CU traits and behavioural problems in young children. Therefore, teachers may need additional training to recognize different temperament traits in children and to select and adapt strategies accordingly, ensuring effective behaviour management in the classroom.

For teacher discipline, consistent with the theory that CU traits are related to punishment insensitivity and fearlessness to threat (Frick et al., 2014; Waller & Wagner, 2019), teachers reported that children with externalising problems and high CU traits appeared to lack concern about negative consequences. Consistent with the findings from Allen et al. (2016, 2018), teachers in the current study also noted that some children with high CU traits displayed aggressive responses to discipline. However, theories have conceptualized CU traits as being associated with shallow affect (Frick et al., 2014), and therefore, reduced emotional expressivity and responsiveness. It is possible that such aggressive behaviour may not arise solely from CU traits but could be indicative of 'narcissistic rage' driven by narcissism, as these children might perceive discipline from teachers as a threat to their self-esteem (Krizan & Johar, 2015). Alternatively, it could be also related to the more severe CP typically observed in children with high CU traits (Frick & Dickens, 2004; Frick & White, 2008). However, neither the current study nor Allen et al.'s research measured narcissism, and given that this study is qualitative, controlling for potential confounding variables such as CP was not feasible. Therefore, further quantitative research, controlling for factors like narcissism and CP, is needed to better understand the children's responses to discipline.

In contrast to research on parenting suggesting that parents may respond to children's deceitful-calling behaviours through increased harsh discipline (e.g.,

Waller et al., 2017b), the qualitative findings indicated that teachers did not increase the severity of their discipline to manage the externalising problems of children with CU traits. A recent study in South Korean elementary schools also found no cross-sectional or longitudinal associations between CU traits and teacher harsh discipline (Hwang et al., 2020). As pointed out by Hwang et al., teachers receive professional training and therefore may maintain a higher standard in addressing student behaviours, using calm, consistent non-physical discipline. However, due to social desirability biases, teachers might depict their responses to children's misbehaviour in a way that appears more positive than they truly are. As such, further research using classroom observation could provide a more objective understanding of how teachers manage children with challenging behaviours in real-time classroom settings. While teachers in the current study did not report the use of physical punishment, they frequently reported use of criticism, although this did not differ in frequency for children with high or low levels of CU traits. This result suggests that teachers may need support to recognize which discipline strategies are helpful versus unhelpful for reducing externalising problems displayed by children regardless of their level of CU traits, and to successfully implement reward-based strategies that feature a preventive focus over discipline, which is reactive by its very nature and therefore a less optimal approach.

As for instructional methods, the qualitative findings suggested that teachers perceived children with externalising problems and high CU traits to behave differently across different types of instructional methods. In support of the suggestion that children with CU traits, particularly boys, may not benefit from peer cooperative learning due to their low empathy and social competence (Bird et al., 2019), teachers in this study reported that children with externalising problems and CU traits displayed poor engagement in cooperative peer learning activities. Teachers also reported that these children appeared to find paying attention and engaging in tasks difficult, often misbehaving during both

whole class and small group instruction. This is consistent with theory identifying low motivation and reduced responsiveness to teacher discipline as potential mechanisms explaining the link between CU traits and low grades (Bird et al. , 2019; DeLisi et al., 2011). However, based on teachers' reports, children with externalising problems and CU traits did show similar levels of engagement to their typically developing peers during interest-oriented individual learning activities or closely supervised one-to-one activities with teachers. Findings suggest that providing CU children with individualized materials and activities based on children's interests may be a promising approach to promote their academic engagement and motivation. Furthermore, teachers will need additional support to provide close supervision to children with externalising problems and CU traits to facilitate their learning. In the UK, there has been a trend towards providing more training to teaching assistants (TAs), who typically spend more time interacting with children than classroom teachers (Blatchford et al., 2007). Having well-trained staff working with children with CU traits may help to achieve better school outcomes and a positive classroom learning environment.

Finally, in relation to the third research question, consistent with previous research (Crum et al., 2016; Horan et al., 2016), teachers in this study reported poorer relationships with children with externalising problems and high CU traits, chiefly attributed to their frequent misbehaviour. Teachers reported difficulty finding opportunities to reward children with externalising problems and high CU traits. Fewer positive interactions are likely to have a detrimental influence on teacher-child closeness. Furthermore, past research indicated that greater parent involvement in school predicts more closeness and less conflict in TCRs (Dearing et al., 2008; Wyrick & Rudasill, 2009). Therefore, it is possible that teachers in this study reported having poor TCRs with children with externalising problems and high CU traits, due to either a lack of communication or poor relationships with those children's caregivers. Teachers pointed out that

poor quality TCRs also negatively impacted the peer relationships of children with externalising problems and high CU traits, in line with past research indicating that poor quality TCRs are predictive of peer rejection (Hughes et al., 2001), and that positive TCRs protect children from bullying (Elledge et al., 2016). This highlights the need to support teachers in developing good quality relationships with this high-risk group of children, particularly given evidence that children with CU traits are at greater risk for both instigating and being a victim of bullying (Fontaine et al., 2018).

Teachers in the current study viewed good quality TCRs as helpful for promoting the academic engagement of children with externalising problems and low CU traits. However, they perceived TCR quality as having little to no influence on the responses of children with externalising problems and high CU traits to their rewards, discipline, or instructional methods. This stands in strong contrast to past research on UK high school students, where some children with CP and CU traits were viewed as responding positively to classroom management strategies when a close TCR was present (Allen et al., 2018). This difference may be because teachers in the current study typically did not view themselves as having successfully formed a close relationship with children displaying both externalising problems and high CU traits. It is important to note that even though teachers reported conflict with children with externalising problems and high CU traits, most still described their relationships as having some positive aspects. Longitudinal research shows that good quality TCRs predicted decreased CU traits (Baroncelli & Ciucci, 2020) and low teacher affiliation predicted increased CU traits (Hwang et al., 2022). In addition, evidence indicates that positive TCRs can serve as compensatory factors in the associations between psychopathic traits and mental health outcomes during adolescence (Begin et al., 2023). Notably, Begin et al. emphasized that the compensatory effects of high-quality TCRs are more pronounced in early childhood. These findings suggest that interventions

promoting TCR quality appear needed, especially in early childhood to maximize their effectiveness for this high-risk group of children with externalising problems.

Current study findings indicated teachers recognised the benefits of positive teacher-caregiver relationships for children's academic, behavioural outcomes and TCR quality. For example, the only effective discipline strategy identified by teachers in high CU group was notifying parents about the child's behaviour, highlighting the influence and importance of parental involvement in managing children's misbehaviour. However, while parents of children with high CU traits could greatly benefit from teacher support as teachers perceived these parents as lacking in parenting skills, these parents typically maintain no or limited communication and poor relationships with teachers. Moreover, if teachers inadvertently convey these perceptions to parents, even indirectly, it may hinder these parents from seeking guidance or establishing open communication with teachers. Therefore, it is important for teachers to foster constructive and non-judgmental communication with these parents to encourage their involvement in promoting children's prosocial behaviour.

Interviews also revealed that grandparents were often closely involved in their grandchild's schooling. Findings indicated that teachers often experienced conflict and a lack of cooperation with grandparents of children with externalising problems and high CU traits. In contrast, grandparents of children with externalising problems and low CU traits often compensate for the absence of parents, maintaining a positive relationship with teachers, which benefited the child's behaviour and academic performance. Chinese traditional culture emphasizes collective family interests and multigenerational co-residence; thus grandparents are expected to lighten the parental burden by assisting in raising and educating grandchildren (Zeng & Xie, 2014). Furthermore, in China there is the phenomenon of children who are 'left-behind' when their parents move to

work in the city, with grandparents taking on the role of primary caregiver (Burnette et al., 2013). Thus, it is important that research in East Asian nations includes grandparents when considering school-family communication and relationships as they often play a vital role in children's schooling and daily life. The findings suggest that school-based interventions should first of all identify the child's broader caregiving team, and incorporate strategies targeting communication between teachers and caregivers to enhance school-related outcomes for children with CU traits.

The current study has several limitations which should be acknowledged. First, even though there is some evidence indicating that CU traits can occur without the presence of CP (Viding & McCrory, 2012), teachers in the current research only reported on children who showed the most severe disruptive behaviour in their class to reduce teacher assessment burden and focus on children at the greatest risk of poor school outcomes. However, this means that the current sample is less representative of all children with elevated CU traits. Teachers reported giving fewer rewards to children with CU traits, mainly due to their frequent misbehaviour; the findings regarding the frequency of teacher rewards therefore should be interpreted with caution when transferring to children with CU traits in absence of severe CP. However, these themes were less prevalent for children with externalising problems and low CU traits, and previous quantitative research has found that CU traits are significantly related to poor quality TCRs (Crum et al., 2016), reduced sensitivity to social rewards (Waller & Wagner, 2019) and punishment insensitivity (Hwang et al., 2021, Hwang et al., 2020), even when accounting for CP.

Second, evidence suggests that disruptive behaviours in children can arise from various factors, not solely CU traits but also the presence or co-occurrence of other mental disorders such as ADHD or autism (Rogers et al., 2006; Waller et al., 2015). In fact, other mental health problems such as autism may have a

similar presentation to CU traits, like appear uncaring, and co-occur with CP (Jones et al., 2010). Therefore, although the children in this study were reported by teachers from mainstream schools rather special education settings, and efforts were made to exclude children with autism, developmental delays, or physical health issues that might also cause disruptive behaviour, it remains possible that some nominated children could have clinical or subclinical levels of these conditions unrecognized by teachers. Future studies would benefit from incorporating additional parent reports and/or clinician diagnostic assessments of ADHD, autism, and other neurodevelopmental disorders to minimize potential confounding factors. Third, although the ANOVA results show no significant differences across schools in teacher reports of children's externalising problems, it is possible that there were differences within teachers or classes in how these behaviours were reported. Future research should consider increasing the number of children reported by each teacher or within each classroom to enable a more detailed analysis of group differences based on teachers and classes. However, requiring teachers to report on multiple students could increase their workload and potentially affect the quality of the data collected. A more practical approach might involve incorporating parents' reports to cross-validate teachers' assessments of disruptive behaviours

A fourth limitation is that the sample is homogeneous in ethnicity, as all participants were Chinese. Therefore, these findings may not be transferable to preschool children in other nations. However, I approached schools at differing levels of educational and environmental quality to ensure diversity and representation of different social classes. This research also had good 'information power', as teachers reported on the two children who showed the most disruptive behaviour in their classes, and I over-sampled teachers in case of participant dropout. All schools who were approached agreed to take part and the teacher noncompletion rate was low. Another limitation is that this study relied solely on teacher interview report, which is open to subjective bias,

particularly as CU traits are associated with CP and increased teacher-child conflict (Crum et al., 2016). Future research should include parent report, including parent report of CU traits and CP, to see if the child behaviour and interpersonal interactions are similar across the home and school settings. Obtaining the perspectives of parents of children with CU traits would also help to identify the reasons underlying poor TPRs and lack of communication. Finally, the study was cross-sectional, which limited its ability to investigate the directionality of the relationships between teachers' perceptions of the responses of children with externalising problems and high and low CU traits to classroom management strategies, instructional methods and teacher-child and teacher-caregiver relationships. A multi-method approach including classroom observational methods could provide an objective and ecologically valid assessment of the relationship between CU traits and teacher-child interaction in real-time. However, these findings indicate new directions for future research, highlighting teacher-caregiver relationship quality and instructional methods as additional factors that warrant consideration in theoretical models of the development and persistence of CU traits in children.

Despite these limitations, this research extends prior, predominantly Western research on CU traits in the school setting to the Chinese preschool context. Findings indicated that CU traits have a similar expression and correlates in the Chinese preschool setting to schools in Western nations, including externalising problems, insensitivity to punishment and poor school performance. However, unlike past research in UK high school settings (Allen et al., 2016; 2018), children with CU traits responded positively to teacher reward strategies. Therefore, the results highlight the importance of early identification and intervention for children with CU traits and suggest that a strong emphasis on reward strategies may be an optimal route to promoting prosocial behaviour and school engagement in these high-risk children. These findings also indicate that interventions need to extend beyond classroom management strategies to

target teacher-caregiver communication and enable schools to provide interest-based learning activities and high quality one-to-one instructional support to this unique subgroup of children who are hard to manage in the classroom.

Table 1

Overarching Themes, Themes and Subthemes for CU traits, Disruptive Behaviour and School Environmental Factors in the High CU Traits Group

Overarching themes	Theme	Sub-theme	Descriptions	Percentage of theme endorsements (children N)
CU traits and disruptive behaviour at school		Minor and low levels of disruptive behaviour	Low frequency and minor disruptive behaviour that did not disrupt classroom functioning, such as gazing into space during class; playing with fingernails.	14% (1)
		High levels of disruptive behaviour	High-Frequency and severe disruptive behaviour that disrupted classes, such as walking around; disturbing other children, temper tantrums, damaging school property, and being aggressive towards others.	86% (6)
		Lack of empathy	Teased or made fun of others.	86% (6)
		Goal-oriented	Placed a high value on their goals regardless of school rules or the negative consequences of their aggressive behaviour for others or themselves.	86% (6)
CU traits and teacher discipline strategies	Discipline types	Reminders	Teachers verbally direct children by providing reminders of expectations, for example, reminding children that they are doing something they are not supposed to be doing.	100% (7)
		Warnings	Teachers warn children to stop misbehaving or they would take action.	100% (7)
		Moving seats	Teachers move a child from one place to	57% (4)

			another. For example, moving the child with disruptive behaviour to a place close to the teacher or separating two children who keep chatting during the class.	
		Time-out	Teachers temporarily separated a child from an environment where unacceptable behaviour occurred. Often the child was asked to stand or sit in a designated space for time-out.	57% (4)
		Criticism	The teacher criticized a child, typically with a negative and/or harsh tone.	57% (4)
		Parent notification	The teacher informed parents of their children's behaviour at schools	14% (1)
		Disqualification	Teachers disqualified children from the activities they are interested in. For example, the child cannot take part in the next play activity, or the child cannot be chosen to be the teachers' helper.	57% (4)
	Negative response to discipline		Children showed an uncaring response, such as not showing negative emotions like guilt, shame, or anger, and continued to misbehave and ignore the teachers' attempts at limit setting; or oppositional responses with negative emotional and behavioural responses such as crying, shouting, being angry and/or defensive, running away, and trying to avoid punishment.	71% (5)
	Positive response to parent notification		The child ceased misbehaving after the teacher either warned of reporting or actually	14% (1)

			reported their behaviour to the parents.	
		Lack of guilt	Did not show guilt when doing something wrong and teachers perceived it was difficult for these children to say sorry.	71% (5)
CU traits and teacher reward strategies	Fewer rewards and lower requirements		Children were rarely rewarded by teachers when compared to peers and teachers lowered their standards to reward these children, increasing opportunities for them to receive rewards.	43% (3)
	Positive response to rewards		Motivated by tangible (e.g., toys), social (e.g., praise), and/or activity rewards (e.g., having extra play time). Motivation was evident by a positive emotional response, increased academic engagement and prosocial behaviour.	100% (7)
		Value teacher and peers' admiration	Children cared about what teachers thought of them, and looked proud when teachers rewarded them, especially when teachers rewarded them in front of their peers.	71% (5)
CU traits and responses to instructional methods	Negative response to instructional methods	Negative response to teacher-directed activities (class-level)	Children were distracted, passive, or disrupt the class when teachers used class-level teacher-directed instructional methods, such as lectures or demonstrations.	100 % (7)
		Negative response to teacher-directed activities (group-level)	Children were distracted or passive when teachers used group-level teacher-directed instructional methods, such as lectures or demonstrations at a group level.	75% (3 out of 4)
		Decreased interaction with misbehaving children	Teachers were less inclined to engage with misbehaving children who exhibit lack of response to their instructions	43% (3)

		Negative response to peer cooperation activities	Children showed low engagement, and did not cooperate/communicate well with peers, for example, they were bossy, argumentative or aggressive towards others when teachers used peer cooperative instructional methods, such as group learning or cooperative learning.	75% (3 out of 4)
	Positive response to instructional methods	Positive response to individual learning activities	Children were highly engaged and motivated when teachers used individual learning instructional methods, because children could choose the content and materials for studying based on their interests.	71% (5)
		Positive response to one-to-one teacher-child interaction.	Children were highly engaged, motivated, and responsive when teachers used one-to-one instructional methods, such as one-to-one tutoring, because teachers could provide close supervision with children and support children on their own needs.	100% (4 out of 4)
CU traits and TCR quality	Poor quality TCRs		Teachers viewed child's behaviour as challenging to manage; frequent conflict between teachers and children.	43% (3)
		Peer rejection	Poor TCR led to peer rejection, with peers refusing to work or play with the child who had a poor relationship with the teacher.	14% (1)
	Mixed quality TCRs		Teachers described their relationships with children as having both negative and positive features – sometimes they got along well with the child, while sometimes they felt angry and experienced conflict.	43% (3)

	Good quality TCRs		Teachers believed they shared a close and friendly relationship with children. They liked, cared and understood the children and dealt with them patiently and tolerantly when they misbehaved. The children, in turn, liked and respected the teachers.	14% (1)
	TCRs did not influence child response to teacher strategies		Teachers believed the quality of the TCR did not influence how children responded to rewards, discipline, and instructional methods. The child's individual interests and characteristics determined their behaviour in class.	100% (7)
CU traits and teacher-caregiver relationship quality	Poor quality teacher-caregiver relationships	Poor quality TPR	Teachers viewed their relationships with parents as lacking in communication and conflictual. Teachers perceived these parents to have insufficient parenting skills and rarely engaged in school activities. They had different opinions on child behaviour management with to teachers and sometimes quarrelled with teachers.	86% (6)
		Poor quality teacher-grandparent relationship	Teachers viewed their relationships with grandparents as lacking in communication and conflictual. Grandparents rarely engaged in school activities. They usually had different opinions on child behaviour management with teachers and sometimes quarrelled with teachers.	83% (5 out of 6)
		Negative influence of poor quality of teacher-	Teachers believed their poor relationship with caregivers negatively impacted children's	100% (7)

		caregiver relationships	behavioural and academic performance and TCR quality.	
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Table 2

Overarching Themes, Themes and Subthemes for CU traits, Disruptive Behaviour and School Environmental Factors in the Low CU Traits Group

Overarching themes	Theme	Sub-theme	Descriptions	Percentage of theme endorsement (children N)
CU traits and disruptive behaviour at school	Disruptive behaviour	Minor and low levels of disruptive behaviour	Low frequency and minor disruptive behaviour that did not disrupt classroom functioning, such as gazing into space during class; playing with fingernails.	48% (16)
		Middle and high levels of disruptive behaviour	Children frequently displayed moderate disruptive behaviour that disrupted classroom functioning, such as chatting, but rarely displayed severe disruptive behaviour, such as temper tantrums, damaging school property, or being aggressive towards others.	52% (17)
		Lack of empathy	Teased or made fun of others	27% (9)
		Goal-oriented	Placed a high value on their goals regardless of the school rules or the negative consequences of their aggressive behaviour for others or themselves.	15% (5)
CU traits and teacher discipline strategies	Discipline types	Non-verbal cues	Teachers use non-verbal cues, gestures or signals to engage children in instruction, give a warning, or discipline a child.	18% (6)
		Reminders	Teachers verbally direct children by providing reminders of expectations, for example, reminding children that they are doing something they	100% (33)

			are not supposed to be doing.	
		Warnings	Teachers warn children to stop misbehaving or they would take action.	100% (33)
		Moving seats	Teachers moved a child from one place to another. For example, moving the child with disruptive behaviour to a place close to the teacher or separating two children who keep chatting during the class.	18% (6)
		Timeout	Teachers temporarily separated a child from an environment where unacceptable behaviour occurred. Often the child was asked to stand or sit in a designated space for time-out.	55% (18)
		Criticism	The teacher criticized a child, typically with a negative and/or harsh tone.	55% (18)
		Parent notification	The teacher informed parents of their children's behaviour at schools	6% (2)
		Disqualification	Teachers disqualify children from the activities they are interested in. For example, the child cannot take part in the next play activity or the child cannot be chosen to be the teachers' helper.	48% (16)
	Positive response to discipline		Children accepted teachers' discipline, showed guilt, apologized, and corrected their misbehaviour.	64% (21)
	Value teacher and peers' opinion when facing discipline		Child responses to discipline were influenced by the presence of peers, due to their concern about maintaining their reputation and how	21% (7)

			they were perceived by teachers and peers	
CU traits and teacher reward strategies	Positive response to rewards		Motivated by tangible (e.g., toys), social (e.g., praise), or/and activity rewards (e.g., having extra play time). Motivation was evident by a positive emotional response, increased academic engagement and prosocial behaviour.	100% (33)
CU traits and responses to instructional methods	Negative response to instructional methods	Negative response to peer cooperation activities	Children showed low engagement, and did not cooperate/communicate well with peers, for example, they were bossy, argumentative or aggressive towards others when teachers used peer cooperative instructional methods, such as group learning or cooperative learning.	31% (8 out of 26)
	Positive response to instructional methods	Positive response to teacher-directed activities (class-level)	Children were highly engaged and very positive, for example asking questions when teachers used class-level teacher-directed instructional methods, such as lectures or demonstrations.	18% (6)
		Positive response to teacher-directed activities (group-level)	Children were highly engaged and very positive, for example asking questions when teachers used group-level teacher-directed instructional methods, such as lectures or demonstrations at a group level.	83% (15 out of 18)
		Positive response to individual learning activities	Children were highly engaged and motivated when teachers used individual learning instructional methods, because children could choose content and materials for studying freely based on their interests.	73% (24)

		Positive response to peer cooperation activities	Children cooperated/communicated well with peers and could achieve study goals when teachers used peer cooperative instructional methods, such as group learning or cooperative learning.	69% (18 out of 26)
		Positive response to one-to-one teacher-child interaction	Children were highly engaged, motivated, and responsive when teachers use one-to-one instructional methods, such as one-on-one tutoring, because teachers could provide close supervision with children and support children on their own needs.	100% (7 out of 7)
		Benefit from increased teacher-child ratio	Teachers paid more attention to children with CP when the teacher-child ratio was high, which prevented children from misbehaving.	15% (5)
CU traits and TCR quality	Good quality TCRs		Teachers believed they shared a close and friendly relationship with children. They liked, cared for and understood the child and dealt with them patiently and tolerantly when they misbehaved. The child, in turn, liked and respected the teachers.	42% (14)
		The influence of the TCRs on child response to teacher strategies	Teachers believed that the good quality TCR made the child more sensitive to rewards, discipline, and instructional methods, and more engaged in the academic activities.	48% (16)
	Mixed quality TCRs		Teachers described their relationship with the child as having	58% (19)

			both negative and positive features – sometimes they got along well with the child, while sometimes they felt angry and experienced conflict.	
CU traits and teacher-caregiver relationship quality	Good quality teacher-caregiver relationship	Good quality TPR	Parents were highly engaged in school-family cooperation. Teachers and parents had a respectful and trusting relationship, and shared goals for the child's well-being and education.	42% (14)
		Good quality teacher-grandparent relationship	Grandparents were highly engaged in school-family cooperation when parents were absent. Teachers and grandparents had respectful and trusting relationships and shared goals for the child's well-being and education.	67% (10 out of 15)
		Positive influence of good quality of teacher-caregiver relationships	Teachers believed a good quality teacher-caregiver relationship brought positive impacts on children behavioural and academic performance	36% (12)

Table 3

Research questions and corresponding interview questions

Research questions	Main interview questions
How do teachers' perceptions of externalising problems differ for children with high versus low CU traits?	<p>a) Generally speaking, what disruptive behaviours does [target child] show?</p> <p>b) How often does [target child] show disruptive behaviour (probe for each example given)?</p> <p>c) Could you please give me typical examples? Just imagine what happened in the classroom are all filmed and then please describe in detail what we can see in this video which recorded [target child]' disruptive behaviour (probe for each example given)?</p>

	<p>-What do you think are the reasons for [target child's] disruptive behaviour?</p>
<p>How do teachers manage the externalising problems of children with CU traits, and what are their views on children's response to classroom reward, discipline, and instructional strategies for children with externalising problems and high CU traits compared to those low in CU traits?</p>	<p>a) What types of reward techniques do you use to [target children]?</p> <p>b) How does [target child's name] respond when you reward them? -Why do you think s/he responded this way?</p> <p>c) What types of discipline techniques do you use to [target children]?</p> <p>d) How does [target child] respond when you discipline them? - Why do you think s/he responded this way?</p> <p>e) What types of instructional methods do you use in class</p> <p>f) How does [target child] respond when you use these instructional methods (probe for each example given) - Why do you think s/he responded this way?</p>
<p>How do teachers' perceptions of the quality of teacher-child and teacher-parent relationships differ for children with externalising problems and high CU traits compared to those low in CU traits? How do teachers perceive the quality of these relationships in terms of their impact on the school functioning and success of children in these two groups?</p>	<p>a) How would you describe your relationship with [target child]?</p> <p>b) How do you think your relationship with [target child]' influence: 1. His/her behaviour in class? 2. How well s/he engages with schoolwork? 3. How s/he responds to rewards/discipline/instructional methods?</p> <p>c) How would you describe your relationship with [target child]' parents]?</p> <p>d) What kinds of school activities do [target child's parents] engage in? -Frequency (prompt each activity mentioned by teachers)</p> <p>e) How do you think your relationship with [target child]'s parents' influence: 1. Your relationship with [target child] 2. [target child]'s behavioural performance and adjustment in school?</p>

	3. [target child] academic performance in the classroom? 4. Parents' involvement in school?
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Chapter 3

An Observational Study of the Relationships between CU Traits, Classroom Management Strategies, and Instructional Methods in Chinese Preschools

In Chapter 2, the relationships between CU traits, externalising problems, classroom management strategies, instructional methods, and both teacher-child and teacher-caregiver relationships were explored using semi-structured interviews with 20 teachers about 40 children who exhibited the most disruptive behaviours in their classes. While this qualitative study offered deep and rich insights into associations between CU traits and various school-related factors in the Chinese preschool context, qualitative research is intended to provide transferable, rather than generalizable findings due to its exploratory, descriptive and interpretative nature. Moreover, findings from teacher interviews might not fully reflect the actual teacher-child interactions in the real-world classroom due to potential teacher biases. Informed by the qualitative findings in Chapter 2, this chapter presents a classroom observation study, aiming to provide a more objective understanding of teachers and children's behaviour within the Chinese preschool environment. In particular, the focus narrows to the relationships between CU traits and three key teacher practices, rewards, discipline, and instructional methods, that are frequently used to manage children's behaviour and promote their academic engagement in classrooms.

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A classroom observation study. *Research on Child and Adolescent Psychopathology*, 1-14.

3.1 Introduction

Classroom management strategies draw on social-learning theory-based reward and discipline strategies to foster students' engagement and reduce CP in the preschool classroom (Ritz et al., 2014). While many teachers rely on these strategies to manage children's behaviour (Bear, 2015; Landrum & Kauffman, 2013), researchers have suggested that variations in temperament can affect a child's adaptation to the classroom environment, emphasizing the importance of tailored teacher strategies to address individual needs (Rothbart & Jones, 1998). In particular, children with CU traits may present unique challenges for teachers' classroom management due to their distinctive personality profile. As previously discussed in earlier chapters, CU traits are associated with a reduced sensitivity to others' distress and punishment cues in early childhood (Chhoa, 2023; Hoyniak et al., 2018; Kimonis et al., 2016; Kimonis et al., 2023; White et al., 2016). Such characteristics might hinder the development of conditioned associations between affective discomfort and discipline (Blair 1995; Waller & Wagner, 2019). Therefore, children with CU traits are not only more likely to misbehave, but they also tend to repeat misbehaviour even after being disciplined (Byrd et al., 2014; Frick & Myers, 2017; Frick et al., 2018).

The relationship between CU traits and punishment insensitivity is well-established (see review in Section 1.3.1 and Section 1.4.2). However, the relationship between CU traits and reward sensitivity remains debated due to differences in study designs, methods, and reward types (social vs. tangible) and contexts (e.g., presence of peers) (Allen et al., 2016; Byrd et al., 2018; Blair & Zhang, 2020; Centifanti & Modecki, 2013). In addition, while children with CP and low CU traits often have their academic difficulties attributed to low verbal

intelligence (Moffitt, 1990; Rourke, 1982), it has been suggested that certain instructional methods may not benefit children with CP and high CU traits as effectively as they do others, due to the challenging temperament profiles and behaviours associated with CU traits (Bird et al., 2019). Although rewards, discipline, and instructional methods play a crucial role in early childhood education, studies examining the relationships between CU traits and these strategies in preschool settings are sparse. The following sections will delve into the existing literature on CU traits and their associations with teacher rewards, discipline, and instructional methods. While the primary focus is on preschool, due to the limited research in this age group, relevant studies involving other age groups will also be included to provide a broader understanding of these relationships. Firstly, findings derived from teacher and child reports within school contexts will be examined. This will be followed by a discussion of results from various experimental tasks. Finally, studies employing classroom observation will be assessed. Throughout this review, emphasis will be placed on the methodological variations, highlighting gaps in the current body of literature that informed the research design of this chapter.

3.1.1 Findings from Teacher and Child Reports

While exploring CU traits in school contexts may provide meaningful insights into the development of effective teacher strategies, only a handful of studies have investigated relationships between CU traits and classroom management strategies, with all of them conducted in primary and secondary schools. Qualitative analysis of interviews from UK secondary school teachers found that students high in CU traits displayed uncaring and confrontational attitudes when disciplined. However, teachers' perceptions of the effectiveness of rewards for students with high CU traits were mixed (Allen et al., 2016, 2018). Expanding on these findings from older children in a Western context, the interview study in Chapter 2 adopted a comparable semi-structured interview approach with a younger age group in Chinese preschools. This study indicated that Chinese

preschool teachers felt children with externalising problems and high CU traits similarly exhibited negative responses to discipline but offered a more optimistic view on rewards, reporting that children with externalising problems and high levels of CU traits responded to rewards in the same way as their peers with low CU traits.

Although qualitative studies offer in-depth insights and detailed contextual information on relationships between CU traits and teacher rewards and discipline, they are not intended to quantify variables or test hypotheses in the same way as quantitative research. In contrast, quantitative research provides a relatively more objective interpretation of data based on statistical inference and offers a means to generalize findings to a broader population (Eyisi, 2016; Queirós et al., 2017). In their quantitative analysis using teacher- and child-reported questionnaires, Allen et al. (2016, 2018) identified significant greater insensitivity to punishment for children with high versus low CU traits. However, they found no group differences in reward sensitivity. Echoing these findings, another child-reported questionnaire study in South Korean primary schools found that CU traits moderated the association between teacher discipline and child school engagement, but not reward strategies (Hwang et al., 2020). Hwang et al. observed that teachers significantly reduced the use of rewards for children exhibiting high CU traits across the school year, yet they did not increase their use of harsh discipline. These findings align with findings from my interview chapter and with results from a United States cross-sectional teacher-reported questionnaire study on primary school children where CU traits were not related to increased disciplinary infractions at school (Willoughby et al., 2022). One exception is Ciucci et al. (2014) who found that CU traits were related to more teacher recorded formal warnings in Italian children aged 11 to 14 years. However, in contrast to the other two quantitative studies, CP were not controlled for. Moreover, it is still not clear whether teachers might use increased discipline (not necessarily harsher, but more frequent) in light of the

more severe CP associated with CU traits (Frick et al., 2014).

A subsequent child-report questionnaire study by Hwang et al. (2021) in an English secondary school also found a cross-sectional association between CU traits and insensitivity to teacher discipline. Further, their findings demonstrated that punishment insensitivity explained the association between CU traits and low academic achievement in Maths and Science. More recently, Baroncelli et al. (2022) conducted another cross-sectional study with Italian middle school students. They found that peer-estimated insensitivity to teacher discipline was uniquely related to child-reported CU traits even after accounting for gender, age, levels of CP and internalizing problems. Consistent with these findings, a study tracking the total number of minutes spent in time-out daily in preschool children found that children with high CU traits were less responsive to time-out, a commonly used discipline in evidence-based treatments for CP (Garcia et al., 2018).

In addition to teacher rewards and discipline, instructional methods are important in school life as they enhance student engagement and promote academic performance (Vaisarova & Reynolds, 2022). Researchers have surmised that lower empathy and poor social competence that accompanies CU traits may impact the effectiveness of peer cooperation learning. As such, children with high CU traits might require additional support and supervision from teachers (Allen et al., 2018; Allen et al., 2016; Bird et al., 2019). The interview study in Chapter 2 is the first to explore the relationship between CU traits and children's responses to different instructional methods. In line with the findings from Allen et al. and Bird et al., the results from the interview study showed that children in the high CU traits group engaged as effectively in one-to-one teacher-child interactions and individual learning activities as their peers with low CU traits. However, they displayed less engagement in cooperative learning as well as in teacher-directed activities in both groups and in the whole

class.

The literature on CU traits and teacher rewards, discipline and instructional methods, as reviewed to this point, has predominantly relied on either student or teacher interview or questionnaire methods. Therefore, these findings might be susceptible to subjective biases. For instance, heightened teacher-child conflict and poor quality TCRs related to CU traits might skew perceptions negatively (Crum et al., 2016). Notably, one study that recorded the timing of time-outs offers potentially more objective findings on the relationship between CU traits and teacher discipline (Garcia et al., 2018). However, it was limited to one specific discipline strategy, leaving the relationship between CU traits and the frequency and effectiveness of other common discipline strategies unexplored.

3.1.2 Findings from Experimental Tasks and Classroom Observation

Numerous experimental tasks have been developed to investigate CU traits and their relationship with responses to rewards and discipline, such as response reversal tasks (Budhani & Blair, 2005; O'Brien & Frick, 1996), risk-taking behaviour tasks (Bechara et al., 1994; Centifanti & Modecki, 2013; Gao et al., 2009), passive avoidance tasks (White et al., 2016; Zhang et al., 2023) and event-related tasks (Byrd et al., 2018) implemented through both computerized games and tangible tools. Yet, the majority of research still focuses on older children, adolescents, and adults, with only few studies conducted with preschool-aged children. Compared to questionnaires and interviews, experimental tasks offer a more objective assessment of children's behaviour and cognitive processes, which is less open to individual biases, such as those influenced by previous experience, memory or the desire to appear socially acceptable. However, the ecological validity of the rewards and punishments used in experimental tasks may be lacking, as these experimental tasks are meaningless in real-life contexts, such as eight 2-digit numbers (Vitale

et al., 2005), virtual balloons (Centifanti & Modecki, 2013), coloured shapes (White et al., 2016), and cards (Gao et al., 2009). Furthermore, offering monetary rewards as incentives (e.g., Byrd et al., 2018; Zhang et al., 2023) is not a typical practice in preschool settings (Chen, 2017; Hoffmann et al., 2009; Wu, 2013). Evidence also suggests that the responses to rewards of children with CU traits may be influenced by the presence of peers (Centifanti & Modecki, 2013).

Moreover, attachment theory elucidates how different attachment styles can shape children's responses to their caregivers (Bowlby, 1958, 1977). Consequently, it has been suggested that children's responses to praise and reprimands might be influenced by the quality of their relationship with the person delivering it, with more positive responses occurring when a good relationship is present (Owen et al., 2012). Thus, while experimental studies provide more objective insights into children's responses to rewards and punishment compared to teacher or child report, they may not adequately represent the genuine, context-sensitive interactions between teachers and children in natural educational settings.

On the contrary, observation offers a window into real-time, real-world contexts, allowing researchers to observe the occurrence of target events within their natural environments (Aspland & Gardner, 2003; Queirós et al., 2017). Classroom observations have also been widely used in educational and child developmental research to evaluate teachers' practices and student behaviour in classrooms (Pianta & Hamre, 2009; Williford et al., 2013). However, despite the usefulness of classroom observation in understanding how teacher-child interaction relates to child motivation and behaviour, only a few studies have used an observational approach to investigate CU traits and child reward and/or punishment sensitivity in school, none of which was conducted with preschoolers.

Waschbusch et al. (2007) investigated whether the presence of CU traits affected the responsiveness of children with attention deficit hyperactivity disorder (ADHD) and CP to behavioural therapy, both alone and in combination with medication. This study comprised 37 Canadian children aged 7-12 years who attended a university-based summer treatment program. Throughout the program, children received or lost points based on their behaviour. These points could be exchanged for rewards, such as privileges and honours. By observing and recording instances where children violated specific rules (e.g., not raising hands before speaking) and demonstrated targeted behaviours (e.g., complaining, helping, negative verbalizations), the researchers found that children with ADHD, CP, and CU traits exhibited more disruptive behaviour than those with only ADHD and CP when undergoing behavioural therapy alone.

Miller et al. (2014) employed a single-case series to study the treatment response of 11 children (7-11 years old) with ADHD, CP and CU traits who were also enrolled in a summer treatment program in the US. In addition to the standard treatment, Miller and colleagues introduced three modified treatments: a low-punishment version, a high-reward version, and a combined version that de-emphasized punishment while emphasizing rewards. The frequency counts of children's negative behaviours were observed and recorded during sports activity periods and time-outs. The findings indicated that the low-punishment condition elicited the best treatment response, evidenced by the lowest rates of negative behaviour. Waschbusch et al. (2020) later explored whether modified behavioural therapy, which emphasized rewards and de-emphasized punishment, was more effective for children with CU traits compared to the standard treatment in a larger sample of 46 students (7.0 - 12.6 years old). Similar to the findings of Miller et al. (2014), in which the combined treatment version was not more effective than the standard treatment, this study also found mixed results. Although both interventions were effective, the outcomes

varied for specific targeted behaviours. Some behaviours improved better under the modified intervention, while others showed no significant difference or were slightly worse compared to the standard treatment. In particular, based on the frequencies of targeted behaviours, certain disruptive behaviours in the modified treatment were either comparable to or slightly worse than those in the standard treatment. However, parental weekly ratings showed lower oppositional-defiant behaviour and lower overall problems with the modified treatment than with the standard treatment.

Although these findings offer initial evidence on child responses to rewards and punishments in school settings, the mixed results suggest the need for further research both to replicate these findings and to better understand the factors contributing to these varied outcomes. The interventions were also delivered within the unique contexts of summer schools and sports camps in the US and Canada, with trained counsellors involved to implement the treatment specifically targeting children's behavioural problems. As a result, the teacher reward and discipline strategies and teacher-student interactions in these environments may differ from those in regular classrooms, as well as from those among younger children in preschool settings.

Only one study to my knowledge has employed classroom observation to investigate the impact of CU traits on academic-related behaviours, with a specific focus on off-task behaviour. In this United States study, 138 elementary school students in first and second grades were observed during instructional time. In line with the theory that children with high CU traits have lower levels of academic motivation, findings demonstrated that children with high levels of ADHD, ODD, and CU traits exhibited more pronounced off-task behaviours in the classroom (Willoughby et al., 2022). However, this study did not investigate whether children with CU traits behaved poorly across different instructional methods, or if certain types of instructional methods would be particularly

beneficial or ineffective for children with high CU traits. Moreover, the classroom observation studies reviewed thus far have focused on high-risk children, either clinically diagnosed with conditions such as ADHD, ODD, and CD, or identified by teachers as over the risk threshold for behavioural problems. As a result, these findings may not be fully representative of or generalizable to a broader school-based population where children may exhibit milder levels of CU traits and CP.

3.1.3 The Current Research

Given the gaps identified in the existing literature, the primary objective of this study is to employ classroom observation to evaluate teacher-child interaction in real-time within mainstream Chinese preschool settings. Specifically, this study aims to examine the relationship between CU traits and the frequency of teacher use of rewards and discipline, as well as children's responses to teacher rewards, discipline, and instructional methods. Drawing from the discussions in the preceding chapters and the literature reviewed above, evidence suggests that children with CU traits may exhibit insensitivity to punishment and show mixed responsiveness to social versus tangible rewards. In addition, another type of reward, labelled as 'activity rewards', was identified as commonly used in Chinese preschools in the interview study (Chapter 2). Considering that activity rewards often include opportunities that promote children's social status, such as being the teacher's helper, as well as activities that are highly appealing to children like extra free play time, it is possible that children with CU traits may be more responsive to these forms of rewards. Such behavioural response patterns may influence the frequency and type of teacher discipline and rewards directed towards children with CU traits.

Furthermore, previous research and the findings of the interview study in Chapter 2 suggests that children with CU traits might display varying behaviour across different instructional methods and may require intense teacher

supervision. Therefore, it was predicted that 1. CU traits would be related to significantly more frequent teacher discipline (but not harsh discipline), and less frequent teacher rewards, as well as more negative child responses to discipline, less positive responses to affiliative rewards and more positive responses to tangible rewards and activity rewards. 2. The relationship between instructional methods and child academic engagement would be moderated by CU traits, such that CU traits would predict poorer engagement in teacher-directed activities, but better engagement in individual learning activities. 3. CU traits would be significantly related to more frequent teacher use of one-to-one interaction and positive responses to these interactions. 4. CU traits would be significantly related to poor peer cooperation in group activities.

3.2 Method

3.2.1 Participants

Teachers and children were recruited from two public preschools in Shanghai, China. Eight teachers (7 female, 1 male) aged between 28 and 50 years old participated ($M = 37.66$ years; $SD = 7.76$). All teachers identified as Chinese, with teaching experience ranging from 6 to 29 years ($M = 14.02$ years, $SD = 9.32$). The number of students per classroom ranged from 26 to 38 children ($M = 30$, $SD = 5.66$). In Chinese preschools, typically there are two teachers in every class, therefore, each class register was halved and the two classroom teachers were given half of the list at random and asked to complete questionnaires for these students. Four out of 120 children attending the two schools were excluded because teachers identified them as having autism, developmental delay, or a significant health problem. The final sample therefore consisted of 116 children (52% girls, $n = 62$) aged between 4 and 6 years ($M = 5.16$ years, $SD = .60$) from four different classes (two classes in each preschool). All children were Chinese, and most were living with a two-parent family ($n = 113$, including 112 original two-parent families and a step/blended family), while the remainder belonged to a single-parent family ($n = 3$). The district where the

two preschools were located has a higher GDP per capita than average in Shanghai (Xuhui District Local History Compilation Committee, 2021; Shanghai Municipal Bureau of Statistics, 2021).

3.2.2 Measures

Teacher and child demographic information. Teachers provided information on their age, gender, ethnicity, and years of teaching experience. At the schools' request, teachers, rather than parents, reported on child's age, gender, ethnicity, and family type.

CU Traits. Teacher report of CU traits was obtained using the 24-item Inventory of Callous-Unemotional Traits (ICU; Frick, 2004). Detailed information regarding this measure is provided in Chapter 2. Alpha for the total ICU score in the current sample was .87.

Externalising Problems. Teacher report of conduct problems and hyperactivity subscales of the preschool version of Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) was used to assess CP. Detailed information regarding this measure is provided in Chapter 2. The alpha for SDQ externalising problems was .72.

Classroom Observation of Children's Response to Classroom Management Strategies and Instructional Methods.

The Observed Child Engagement Scale (OCES; Rimm-Kaufman, 2005) and Social Development Lab-Kindergarten Coding System (SDL-K) (Rimm-Kaufman et al., 2007) were used to assess child behaviour and academic engagement. The coding schemes were adapted to better fit the aims of the current study and the Chinese preschool context. The original codes were modified and new codes were generated from the literature on CU traits in the school setting. (see Appendix C for a detailed description of codes and the full

coding scheme). The adjusted OCES assessed child engagement on the average score of four dimensions: engagement, self-reliance, attention, and CP (reverse scored), with peer cooperation assessed as a separate dimension. A trained graduate student and I conducted classroom observation for a minimum of ten minutes, followed by five minutes of note taking and then assigned a rating from 1 'poor' to 7 'good' performance for each dimension (Ponitz et al., 2009). The OCES has shown good internal consistency ($\alpha = .91$) and validity in preschool children (Rimm-Kaufman et al., 2009).

The adapted observation codes comprised 'context' and 'frequency' codes that were selected and modified from the SDL-K to address the current study aims. The adapted code list consisted of three main themes of codes: instructional methods, rewards, and discipline. Instructional methods included 4 main types of instructions developed from interview findings in the Chapter 2: teacher-directed activities, peer cooperation activities, individual learning activities and one-to-one teacher-child interaction. Unlike the first three instructional methods, which typically last for an entire observation window and do not usually occur simultaneously, one-to-one teacher-child interaction is often much shorter, lasting only for seconds or a few minutes, and can occur alongside other classroom activities. For instance, a teacher might interact closely with children to support their learning during whole-class teaching or individual child-led learning activities. Accordingly, one-to-one teacher-child interactions were recorded as a frequency code, while other instructional methods were logged as context codes. The observers also recorded the frequency of children's positive responses to teacher-child one-to-one instruction. Codes under the rewards and discipline themes are all frequency codes. The frequency of teachers' use of rewards and discipline was recorded, along with the frequency of children's positive responses to teacher rewards and negative responses to discipline.

Teacher harsh discipline was recorded as a subcode under the broader code of discipline and comprised less than one-fifth of all disciplinary events during observation ($n = 36$, 17.22% of all disciplinary events). The observers also coded the frequency of tangible, social and activity rewards. Teachers predominantly used social rewards ($n = 65$, 83.33% of all rewards), with few occurrences of other types of rewards ($n = 4$, 5.13% for activity rewards and $n = 9$, 11.54% for tangible rewards). Therefore, in this study, only the total frequency of teacher rewards, and the frequency of children's positive responses to social rewards will be reported.

Due to data collection taking place during the COVID-19 pandemic, observers were only permitted to stay in each classroom for one week. Therefore, I adapted the scheduling of the SDL-K to fit this observation period. Following adaptation, each target child was observed simultaneously by the two observers for a 15-minute period in total, with 10 minutes for observation using the context and frequency codes, followed by a five-minute additional period for completing the OCES ratings. Consequently, each child was observed only once, with their interactions with teachers being documented within the specific instructional method they were engaging in during the observation period. A pilot study was first conducted using videos of teacher-child interaction in Chinese preschool classrooms to ensure the feasibility and sensitivity of the adapted coding scheme, and to train the observers to an acceptable level of inter-rater reliability, pre-defined as kappa $> .80$ for categorical codes (e.g., type of instructional method), and ICCs $> .75$ for frequency codes (e.g., responses to rewards and discipline) and codes recorded on a rating scale (e.g., OCES codes) (Hallgren, 2012).

Schools and parents did not wish for classroom interactions to be filmed, therefore observational coding had to be conducted in real-time. During the pilot study, I found that a 15-minute window was sufficient for recording children's

academic engagement and one-to-one interactions with teachers. However, two challenges emerged. First, it was difficult to capture each child's response when teachers rewarded or disciplined the whole class. Second, instances of teachers administering rewards or discipline to the target child were rare within this timeframe. Therefore, any instances of rewards or discipline clearly directed towards any specific child during the observation period were recorded, regardless of whether they were the target children for that specific observation window. This enabled me and the other observer to collect data on rewards and discipline during a variety of instructional methods, to minimize the potential influence of instructional method type on the frequency of teacher rewards and discipline.

After a week-long observation in each classroom, the two observers counted and collated the instances of each child receiving rewards and discipline, as well as their responses. Unlike rewards and discipline, which were recorded whenever they occurred throughout all classroom activities in one week, children's academic engagement and one-to-one interactions with teachers were documented within the specific instructional activity they were participating in during the designated observation period. Inter-rater reliability analysis of 20% of the sample ($n = 22$) indicated strong agreement on the type of instructional method ($\kappa = .86$). Similarly, observers were consistent for the remaining codes (frequency codes; continuous data), with intra-class correlation coefficients (ICCs) ranging from .76 to 1.

3.2.3 Procedure

Once approval was obtained from the UCL Institute of Education research ethics committee, I asked for permission to approach teachers from each school's principal. All teachers who were approached agreed to participate and provided written informed consent prior to data collection. Teachers then distributed information sheets and opt-out consent forms to caregivers. Initially,

most parents refused to provide consent because they did not wish for their child to be filmed. Therefore, classroom observation was changed from video to live coding and revised information sheets and opt-out consent forms were sent out. No opt-out consent forms were returned following this new plan, and verbal assent was obtained from all children prior to the study.

This study took place in a one-month period from March to April 2021, during the middle of the spring term. Participating children were in their middle or final years of the three-year preschool period in the Chinese school system. This ensured that the teachers were well-acquainted with their students, thereby providing more valid and reliable information. Teachers completed the questionnaires within one week of receipt, prior to the classroom observation. Prior to formal academic activities, schools had an arrival session where children played freely in the classroom. Two trained observers (the graduate student and myself) arrived before this session and stayed in the classroom until school closure. To aid the identification of target children, the two observers obtained rosters with all of the children's photos. This enabled these observers to associate each child's face with their respective ID prior to formal observation. The two observers also used the arrival sessions to familiarize themselves with the children, and this time also allowed the children to adjust to the presence of the two observers. Importantly, on the first day of observation in each classroom, data collection did not commence until they were confident that the teachers and children had become accustomed to the presence of them, thus minimizing any undue influence on teachers' and children's behaviour. Before each academic activity, the observers randomly selected children in the class and agreed on the order of observation of the target children before observation commenced, to ensure that they could switch between children smoothly without interruption.

Once the target children were determined, the observers placed themselves in

a location enabling the simultaneous observation of the teachers' and target children's faces. The observers adjusted their position as necessary to sustain the visibility of both the teachers' and target children's faces. This was done while maintaining a sufficient distance from the teachers and children to prevent disturbing the class. The observers spent 15 minutes observing each target child, with a one-minute break between observation windows. The observation took place during classroom academic activities and stopped when children transitioned between activities, during snack time and when napping. At the end of each day, teachers were asked if this was i) a typical day for their classroom, and ii) a typical day for the children who had been observed. No special events were noted. The observers spent 4 - 5 days in each of the four classrooms in the two schools ($M = 4.50$ days; $SD = .58$).

3.2.4 Data Analysis

Statistical analysis was performed using StataMP 17. All teachers completed the questionnaire packs. Observation data was missing for eight children who were absent from school. During the observation period, only a subset of children received a teacher's reward, discipline, or engaged in one-to-one teacher-child interaction, and peer cooperation activities, with children who were observed but who did not experience these events coded as 'not applicable (NA)'. This resulted in sample subgroups ranging from 39 to 116 children.

Before formal data analysis, descriptive statistics for the main study variables were examined (Table 3.1). To identify multicollinearity, interrelationships between variables, I ran two-tailed Pearson correlations between normally distributed continuous variables (e.g., CU traits and externalising problems), and Spearman correlations for correlation analysis involving count variables and non-normally distributed continuous variables (e.g., teacher use of discipline and child engagement). I conducted independent samples t-tests

between normally distributed continuous variables and dichotomous variables (i.e., CU traits and gender) to test whether the main independent variables (CU traits and externalising problems) differed across demographic groups. All children in this study displayed positive responses every time they received one-to-one teacher-child interaction and social rewards. As a result, the relationships between these proposed independent variables and child response to one-to-one teacher-child interaction and social rewards were not explored further. Furthermore, as the observed occurrences of tangible rewards ($n = 9$) and activity rewards ($n = 4$) were too infrequent to be analysed, the hypotheses that CU traits would be significantly related to more positive responses to tangible rewards and activity rewards were not tested either.

Multivariate generalized linear models (GLMs) were constructed with cluster-robust standard errors to account for the fact that each teacher interacted with multiple children (McNeish et al., 2017). These models were used to investigate the relationships between CU traits and child negative responses to discipline, teacher use of rewards, discipline and harsh discipline, one-to-one teacher-child interaction, engagement, and peer cooperation. Externalising problems and demographic variables were included as controlling variables in all models. In the models examining engagement and one-to-one teacher-child interaction, instructional methods were also accounted for. This is because engagement and one-to-one teacher-child interaction were recorded within the specific instructional method that occurred during each child's set observation period, rather than across different instructional methods as for rewards and discipline.

The choice of distribution for the multi-level GLMs depended on the nature of the dependent variable. GLMs with a negative binomial distribution were used to examine the relationships between CU traits and the frequency of teacher rewards, discipline and one-to-one teacher-child interaction as these three dependent variables were count variables and were over-dispersed (Walters,

2007). To investigate whether CU traits and externalising problems influenced the likelihood of a child being recorded as NA in receiving total rewards, social rewards, total discipline, and one-to-one teacher-child interaction, four binary variables were created. Each variable respectively described whether a child received the aforementioned four teacher strategies, with '0' indicating 'no' and '1' indicating 'yes'. Given the binary nature of these dependent variables, GLMs with binomial regression and logit link (i.e., logistic regression) were employed. Logistic regression was also applied to model the proportion of instances of harsh discipline (event) to total instances of discipline (trial), as well as children's negative responses (event) to discipline (trial). GLMs with a normal distribution (i.e., multi-level linear regression) were used to explore how CU traits and instructional methods influenced child engagement and peer cooperation. I also explored whether instructional methods moderated the effect of CU traits on children's engagement by testing the interaction between CU traits and instructional method. The interaction effect between CU traits and different types of instructional methods was not tested for peer cooperation as peer cooperation can only be measured during peer cooperation activities.

3.3 Results

3.3.1 Preliminary Analyses

Table 3.1 presents descriptive statistics for the main study variables.

Table 3.1

Descriptive Statistics for the Main Study Variables

	N (children)	M (SD)	Range
CU traits	116	23.41 (10.54)	2-57
Externalising problems	116	5.90 (3.44)	0-16

Academic engagement	Teacher-directed activities	60	5.67 (1.33)	2-7
	Peer cooperation activities	39	6.21 (1.19)	1.25-7
	Individual learning activities	9	6.81 (.35)	6-7
Peer cooperation		39	5.82 (1.73)	1-7
One-to-one teacher-child interaction		108	.75 (1.14)	0-5
Positive responses to one-to-one teacher-child interaction		42	1.93 (1.05)	1-5
Teacher rewards		108	.72 (1.06)	0-6
Positive responses to social rewards		44	1.48 (.76)	1-4
Positive responses to tangible rewards		7	1.29 (.49)	1-2
Positive responses to activity rewards		4	.75 (.50)	0-1
Harsh discipline		108	.33 (.79)	0-4
Teacher discipline		108	1.94 (3.35)	0-19
Negative responses to discipline		54	.52 (1.24)	0-7

Bivariate correlations (Table 3.2) indicated that CU traits were significantly related to more severe externalising problems and poorer engagement. Externalising problems was related to younger child age, more frequent total discipline, harsh discipline and poorer engagement. Poor engagement was significantly related to more frequent teacher discipline, child negative response to discipline and poorer peer cooperation. Child negative response to discipline was also significantly related to more frequent teacher discipline and harsh discipline. Male gender was significantly related to more frequent

teacher rewards and discipline. Teacher harsh discipline was significantly related to more frequent discipline and more one-to-one teacher-child interaction. No other significant relationships were identified.

3.3.2 CU Traits, Rewards and Discipline

The multivariate logistic analysis (Table 3.3) indicated a significant relationship between child gender and the likelihood of receiving total rewards ($n = 108$), social rewards ($n = 108$), discipline ($n = 108$), and negative responses to teacher discipline ($n = 54$) while controlling for externalising problems and demographic variables. Boys were more likely to receive total rewards, social rewards and discipline, and were more likely to respond negatively to discipline. The multivariate negative binomial regressions (Table 3.4) showed that gender was significantly related to the frequency of teacher rewards and discipline after accounting for other variables, with boys receiving more frequent rewards and discipline than girls. Older children tended to receive less frequent rewards than younger ones. No other significant relationships were found between CU traits and outcomes, including teacher use of rewards, teacher use of social rewards, teacher total or harsh discipline, and child negative response to discipline.

3.3.3 CU Traits and Instructional Methods

The multivariate linear regression model results (Table 3.5) indicated that child age, externalising problems and instructional methods were significantly related to academic engagement while controlling for other variables. Younger children and children with more severe externalising problems displayed poorer academic engagement. Children had better engagement in peer cooperation and individual learning activities than children in teacher-directed activities. There was no significant relationship between CU traits and academic engagement ($n = 108$) or peer cooperation when controlling other variables ($n = 39$). To test whether CU traits moderated the effect of

instructional methods on child engagement, a model regressing child engagement on CU traits, externalising problems, instructional methods, and demographics was compared to a model with the addition of the interaction effect between CU traits and instructional methods. The addition of the interaction term did not significantly improve model fit, suggesting that CU traits did not significantly moderate the effect of instructional methods on engagement, $F(2, 7) = 1.46, p = .295$. The multivariate negative binomial regressions (Table 3.4) showed that CU traits and externalising problems were significantly related to one-to-one teacher-child interaction, with CU traits associated with more frequent interactions and externalising problems associated with less frequent interactions. No other predictors significantly influenced the likelihood of a child receiving one-to-one teacher-child interaction.

Table 3.2*Bivariate Correlations for the Demographics and Main Study Variables*

	1	2	3	4	5	6	7	8	9	10
1. Age (<i>n</i> = 116)										
2. Gender (<i>n</i> = 116)	-.03									
3. CU traits (<i>n</i> = 116)	-.003	.03								
4. Externalising problems (<i>n</i> = 116)	-.20 *	-.08	.55**							
5. Rewards total (<i>n</i> = 108)	-.14	.27**	-.08	.002						
6. Discipline total (<i>n</i> = 108)	-.12	.29**	.17	.31**	.14					
7. Harsh discipline (<i>n</i> = 108)	-.14	.17	.13	.23*	.19	.60**				
8. One-to-one interaction (<i>n</i> = 108)	-.15	.01	.06	-.03	.18	.16	0.19*			
9. Engagement (<i>n</i> = 108)	-.12	-.07	-.22*	-.26**	.08	-.24*	-.15	.05		
10. Peer cooperation (<i>n</i> = 39)	-.08	-.12	-.04	-.20	.20	-.004	.13	.16	.48**	
11. Negative responses to discipline (<i>n</i> = 54)	-.06	.11	.11	.25	.05	.44**	.50**	.06	-.30*	-.13

Note: ** $p < .01$ * $p < .05$, Pearson/point-biserial correlation coefficients and Spearman correlation coefficients were reported.

Table 3.3*Logistic Model Results for Reward, Discipline and One-to-One Teacher-Child Interaction*

	B	RSE (B)	Z	<i>p</i>	Odds Ratio
Reward (<i>n</i> = 108)					
Child age	-.46	.24	-1.94	.053	.63
Child gender	1.06	.13	8.06	<.001	2.90
CU traits	-.02	.03	-.65	.514	.98
Externalising problems	.01	.05	.24	.810	1.01
Social rewards (<i>n</i> = 108)					
Child age	-.46	.25	-1.88	.060	.64
Child gender	.88	.14	6.14	<.001	2.40
CU traits	-.02	.03	-.79	.431	.98
Externalising problems	.05	.05	.92	.356	1.05
Discipline (<i>n</i> = 108)					
Child age	-.30	.49	-.61	.544	.74
Child gender	1.29	.43	3.02	.003	3.63
CU traits	.03	.03	1.19	.235	1.03
Externalising problems	.06	.07	.85	.393	1.06
Harsh discipline (<i>n</i> = 54)					
Child age	.17	.26	.64	.524	1.19
Child gender	.23	.37	.61	.539	1.26
CU traits	-.01	.02	-.27	.786	.99

Externalising problems	-.03	.05	-.63	.530	.97
Negative responses to discipline (<i>n</i> = 54)					
Child age	-.02	.25	-.06	.949	.98
Child gender	1.10	.28	3.93	<.001	3.00
CU traits	.03	.03	1.25	.212	1.03
Externalising problems	.04	.09	.41	.679	1.04
One-to-one teacher-child interaction occurrence (<i>n</i> = 108)					
Child age	.51	.37	1.38	.169	1.66
Child gender	-.36	.39	-.91	.360	.70
CU traits	-.02	.02	-1.08	.281	.98
Externalising problems	.07	.05	1.42	.155	1.07
Instructional method 1	.35	.50	.69	.493	1.41
Instructional method 2	-.57	.86	-.66	.510	.57

Note: Male gender, the occurrence of rewards, social reward, discipline, and one-to-one teacher-child interaction = 1.

Instructional method 1 = peer cooperation activities, Instructional method 2 = individual learning activities.

The reference category for instructional methods is teacher-directed activities. RSE = robust standard error.

Table 3.4*Negative Binomial Model Results for Teacher Use of Rewards, Discipline and One-to-One Teacher-Child Interaction*

	B	RSE (B)	Z	<i>p</i>	95%CI
Reward (<i>n</i> = 108)					
Child age	-.40	.19	-2.09	.037	[-.78, -.03]
Child gender	.83	.17	4.79	<.001	[.49, 1.17]
CU traits	-.01	.02	-.92	.358	[-.05, .02]
Externalising problems	.001	.03	.02	.982	[-.07, .07]
Discipline (<i>n</i> = 108)					
Child age	-.37	.29	-1.31	.191	[-.93, .19]
Child gender	.74	.30	2.48	.013	[.15, 1.33]
CU traits	.01	.03	.42	.672	[-.04, .07]
Externalising problems	.10	.07	1.45	.147	[-.04, .24]
One-to-one teacher-child interaction (<i>n</i> = 108)					
Child age	-.56	.30	-1.85	.065	[-1.15, .03]
Child gender	-.09	.34	-.27	.786	[-.75, .57]
CU traits	.04	.02	2.25	.025	[.005, .07]
Externalising problems	-.10	.05	-2.05	.040	[-.18, -.004]
Instructional method 1	-.40	.34	-1.17	.243	[-1.06, .27]
Instructional method 2	.10	.67	.14	.885	[-1.22, 1.42]

Note: Male gender = 1, Instructional method 1 = peer cooperation activities, Instructional method 2 = individual learning activities
The reference category for instructional methods is teacher-directed activities. RSE = robust standard error. CI = Confidence Interval.

Table 3.5*Linear Regression Model Results for Child Academic Engagement and Peer Cooperation*

	B	RSE (B)	<i>t</i>	<i>p</i>	95%CI
Child academic engagement (<i>n</i> = 108)					
Child age	-.43	.15	-2.82	.026	[-.79, -.07]
Child gender	-.31	.23	-1.38	.210	[-.84, .22]
CU traits	-.01	.02	-.90	.399	[-.05, .02]
Externalising problems	-.06	.02	-2.65	.033	[-.11, -.01]
Instructional method 1	.59	.22	2.64	.033	[.06, 1.12]
Instructional method 2	1.02	.13	7.86	<.001	[.71, 1.32]
Peer cooperation (<i>n</i> = 39)					
Child age	-.69	.42	-1.67	.140	[-1.68, .29]
Child gender	-.08	.55	-.15	.888	[-1.38, 1.22]
CU traits	.01	.02	.55	.597	[-.04, .06]
Externalising problems	-.10	.07	-1.47	.186	[-.26, .06]

Note: Male gender = 1, Instructional method 1 = peer cooperation activities, Instructional method 2 = individual learning activities,

The reference category for instructional methods is teacher-directed activities. RSE = robust standard error. CI = Confidence Interval.

Instructional method was not controlled for peer cooperation as peer cooperation can only be observed during peer cooperation activities.

3.4 Discussion

This chapter investigated CU traits, teacher-child interaction (teacher rewards, discipline and instructional methods), and children's peer cooperation and academic engagement using classroom observation. Interestingly, the findings did not find a significant correlation between CU traits and gender, which contradicts existing evidence that boys exhibit higher levels of CU traits than girls, and that boys high in CU traits have more externalizing problems while girls have more internalizing problems (Fanti, 2013), which may be because the current study was conducted with younger children in a non-Western context. In addition, the findings revealed that, even after controlling for age, externalising problems, and CU traits, teachers administered more total discipline and rewards to boys compared to girls. This pattern is consistent with existing research suggesting that boys are more likely to receive both positive and negative attention from teachers. This may be attributed to gender stereotypes, such as the perception that boys are more physically active or assertive, which may prompt teachers to interact more frequently with boys (Chen & Rao, 2011).

Moreover, teachers tend to have closer relationships with girls than with boys, due to behavioural expectations and gender alignment between students and teachers (McGrath & Van Bergen, 2015). Furthermore, cultural values and traditional views on male privilege might also influence these interactions, leading to a biased distribution of teacher attention and disciplinary actions (Chen & Rao, 2011). These findings, although secondary to the main focus of this study on CU traits, highlight the potential impact of gender norms in educational settings and suggest a need for further investigation. Considering gender differences in CU traits and correlated behavioural problems, further research could explore how CU traits modify the already observed gender differences in student-teacher relationships, thereby affecting teacher practices, which can inform interventions aimed at reducing stereotype-based practices

and promote more equitable educational experiences for all students.

The hypothesis that CU traits would be significantly associated with more frequent teacher discipline was not supported, aligning with the findings of the interview study presented in the Chapter 2, as well as with previous studies in South Korea and the United States that found no significant relationship between CU traits and the frequency or severity of teacher discipline (Hwang et al., 2020; Willoughby et al., 2022). Consistent with the explanation from Hwang et al. that teachers may not use harsher discipline towards children with high CU traits due to their professional ethics, legal responsibilities and training, externalising problems were also unrelated to more frequent discipline or harsh discipline in the current study. The current study extends previous teacher-report and child-report studies by offering a more objective study of the relationship between CU traits and teacher use of discipline among Chinese preschool children, including a wide spectrum of observed discipline strategies from mild to severe disciplinary practices.

Contrary to Hypothesis 1, wherein I predicted a significant relationship between teacher use of rewards and CU traits, teachers in the current study implemented reward strategies with similar frequency for all children, irrespective of their level of CU traits. Similar to the findings for discipline, it may be that teacher training and professional ethics ensured that teachers maintained the use of reward-based strategies with children whose behaviour is difficult to manage. However, this result contrasts with Hwang et al.'s (2020) findings that CU traits were related to reduced teacher rewards at the start of the school year as well as 9 months later for South Korean children. The inconsistent findings may be due to the younger age of children in the current study compared to the Hwang et al. sample (10-12 years) given that the severity of CU traits and CP increases with child age (Kemp et al., 2019). Thus, it may be that it is easier for Chinese preschool teachers to maintain the use of reward-

based strategies given the milder expression of CU traits and associated CP in early childhood. While the age difference may explain the discrepancy with Hwang et al.'s findings, the findings of this study also contrast with those from Chapter 2, where teachers reported fewer opportunities to reward children with high CU traits in the same preschool age range. Therefore, the inconsistent findings may also be because Hwang et al. and I relied on child or teacher retrospective report of teacher rewards, which may have been influenced by mood, memory or other biases such as poor-quality TCRs, known to be related to CU traits (Horan et al., 2016). As such, children with high CU traits and teachers may perceive each other's behaviour towards them as less positive than it appears to independent observers. In addition, children and teachers might base their reports on experiences in a longer period and encompassing a broader range of contexts. In contrast, observations in the current study were limited to academic activities within the classroom, lasting only one week per classroom. They did not cover daily routines such as nap times, meals, or free play periods inside the classroom, nor areas outside it like hallways or playgrounds. These differences in data collection contexts, inherent in teacher/child reports versus classroom observation, may contribute to the discrepancies in the findings.

Furthermore, although classroom observation can provide a more objective measure of teacher use of rewards, it should be noted that these findings may also be influenced by potential social desirability bias to some extent. Despite the observers' efforts to minimize their presence, which included maintaining distance from teachers and students, avoiding any reactions to teacher behaviour (e.g., smiling, nodding or frowning), and arriving before arrival sessions and conducting a week-long observation period to allow teachers to acclimate to the observers' presence, teachers may have used more positive strategies than usual due to a desire to demonstrate their professional competence. This might be particularly relevant in the context of Chinese

classrooms, where there is a cultural emphasis on 'saving face' (mianzi) by maintaining harmony. In such contexts, teachers may modify their usual practices, employing fewer disciplinary actions and more rewards to avoid potential conflicts with students and to maintain a facade of harmony in front of external observers (Yin & Lee, 2012). This could have impacted the findings, potentially leading to more positive results than are truly reflective of their daily routines.

The hypothesis that CU traits would be related to reduced sensitivity to teacher discipline was not supported. This contrasts with theory and previous research findings that teacher and child self-reported insensitivity to discipline was related to CU traits when accounting for CP (e.g., Frick et al., 2014; Hwang et al., 2021). The mixed findings may be attributed to the different age groups studied. The preschool-aged children in the current research might have been more amenable to discipline than children in past studies attending elementary or secondary school, due to the greater malleability of child temperament in early childhood. Consistent with this explanation, parent training interventions comprising discipline and reward-based strategies delivered in early childhood achieve better outcomes for children with elevated CU traits compared to interventions delivered in middle-to-late childhood (Hawes et al., 2014). Furthermore, the positive attention of adults (parents, teachers) may exert a stronger motivational influence on behaviour in early childhood than in adolescence, when young people shift to seeking the approval of peers (Laursen & Veenstra, 2021).

In secondary school, children usually have different teachers for different subjects and therefore spend less time with a single teacher than in earlier periods of schooling. Thus, teachers in preschools have more opportunities to establish a close relationship with children high in CU traits, which may then facilitate the effectiveness of teacher discipline and reward strategies (Allen et

al., 2018). However, despite these possible explanations, teachers in the interview study presented in Chapter 2 perceived negative responses to discipline in children with high CU traits. Therefore, another possible explanation for the discrepancy could be the use of classroom observation in the current study in comparison to teacher interviews. For example, qualitative research does not aim to account for potential confounds, such as co-occurring externalising problems. It may be that teachers' perspectives were driven by comorbid externalising problems rather than CU traits, given that CU traits are related to more severe CP (Longman et al., 2016). Further research replicating the findings of the current research.

The hypothesis that CU traits would be significantly related to decreased sensitivity to rewards that are social or affiliative in nature was not tested due to the lack of variability in responses to this form of reward, with all children rated as responsive to social rewards. One possible explanation for the lack of variation could be that rewards were equally effective for all children regardless of their level of CU traits, consistent with the findings of the qualitative interview study in the Chapter 2. In past mixed methods studies in English secondary school students (Allen et al., 2016; Allen et al., 2018), quantitative results showed no relationships between CU traits and teacher or child self-reported reward sensitivity, while qualitative findings indicated that responsivity to rewards was reduced or even problematic (e.g., rewards used to boast to others or abuse of privileges). The more optimistic picture for young school children in China may be due to the higher value placed on rewards from teachers than children from Western nations due to the emphasis on respect for elders in Confucianism (Chen & Chung, 1994), the greater malleability of temperament in early childhood, or the greater power of adult positive attention in early childhood compared to adolescence (Allen et al., 2016).

However, the lack of variability in responses to social rewards may also be due

to the sensitivity of coding scheme. Child responses were divided into simple positive and negative categories, which may not have captured nuanced individual differences in reward sensitivity. Future research could benefit from developing a multi-tiered coding scheme to capture a broader spectrum of responses. Moreover, the smaller sample size for children who received social rewards ($n = 44$) within the total sample limited the ability of the study to observe a diverse range of child responses. Nevertheless, these preliminary findings can serve as a foundation to inform the design of future studies featuring larger samples. The predictions for child responses to tangible rewards ($n = 9$) and activity rewards ($n = 4$) were not tested either due to the small number of occurrences in the current study. This finding may reflect the trend in professional teacher training for social rewards over tangible rewards in China (Sun, 2008; Yu, 2018) due in part to concerns around the potential negative impact of tangible rewards on children's intrinsic motivation (Warneken & Tomasello, 2008).

Contrary to previous hypotheses that instructional methods may influence the academic performance of children with high CU traits (Bird et al., 2019; Hwang et al., 2021), the results did not support the second prediction in this research, indicating that CU traits did not affect the relationship between different types of instructional methods and children's academic engagement. Specifically, instructional methods were significantly related to academic engagement after controlling for other variables, but CU traits did not moderate this relationship. Consistent with the interview findings from Chapter 2, teacher-directed activities were the least engaging instructional method, whereas individual learning activities were the most engaging. This also aligns with previous studies which have found that children are more engaged when teaching practices are child-directed rather than teacher-directed (Lerkkanen et al., 2016; Perry et al., 2007). One potential reason for why CU traits did not alter the efficacy of instructional methods may be due to the young age of children in the

current study. Unlike the secondary school setting, preschool children are often closely supervised, and as such, teachers can prevent problematic behaviour or intervene early to ensure that children are engaged and cooperative. Another possibility is that due to covid-related restrictions on the length of the observation period, the number of children observed in each type of instructional methods was limited and uneven, with only nine children participating in individual learning activities, 39 in peer cooperation activities and 60 in teacher-directed activities, which may limit the ability of this study to detect significant effects. Therefore, further research employing a longer observation period or the use of video recording to enable more children to be rated during different types of instructional methods is needed to replicate current findings.

In line with the hypothesis 3, it was found that CU traits were significantly related to more frequent one-to-one teacher-child interaction, accounting for externalising problems and demographic variables. The results provide preliminary evidence for a unique role of CU traits in shaping one-to-one teacher-child interaction, and align with previous qualitative research presented in Chapter 2 and Allen et al. (2018)'s findings that both Chinese preschool teachers and UK secondary school teachers viewed children with high CU traits as needing close supervision. The current study extends this work through the use of classroom observation with Chinese preschool children, with findings highlighting the need for greater support for teachers of children with high CU traits. Similar to social rewards, there was a lack of variability in children's positive responses to one-to-one teacher-child interactions, with children showing a uniformly positive response to close individual supervision. This could be due to either no impact of CU traits on the effectiveness of one-to-one interaction, limitations in the sensitivity of the coding scheme, or to constraints related to sample size.

Contrary to the fourth prediction and past studies suggestion that impairments in empathy and social competence may prevent children with elevated CU traits from establishing positive relationship with peers and performing well in peer learning activities (Bird et al., 2019; Wagner et al., 2020; Waller et al., 2017a), these results indicated no significant relationship between CU traits and peer cooperation in learning activities. Rather, children even displayed a better engagement in peer cooperation activities than teacher-directed activities regardless of their CU status. One possible reason for this unexpected result could be the ample materials, physical space and monitoring provided by teachers in peer cooperative learning activities in the present study. As a result, this may have reduced the likelihood of common sources of conflict between children during peer activities, such as competition for toys. It is also possible that the more covert disruptive behaviour of children high in CU traits was not identified by observers, leading to inflated ratings of their engagement in peer cooperative activities. In the interview study detailed in Chapter 2, teachers reported that children with high CU traits were more likely to exhibit bossy behaviour, leading to conflict during cooperative learning. However, despite both studies sharing a similar Chinese preschool context, this pattern was not observed in the current study. Given that only a relatively small sample of children were observed engaging in peer cooperation activities in this study ($n = 39$), the statistically insignificant result may also be due to the possibility that children with higher levels of CU traits might not have been adequately represented in the sample. In addition, even if some of the observed children exhibited high CU traits, the limited observation time (15 minutes for each child) might not have allowed enough time to consistently capture instances of peer conflict among children with higher CU traits.

The interpretation of the current findings needs to be considered in light of study limitations. The most salient limitation is that there were only limited instances of variables assessing different types of teacher-child interaction and child

academic engagement across various instructional methods that could be measured for every child participant, particularly occurrences of children receiving tangible rewards ($n = 9$) and activity rewards ($n = 4$), and child engaging in individual learning activities ($n = 9$). More instances of the target behaviours and activities might have occurred if the study had been conducted over a longer period. However, due to the strict entry policy during COVID-19 and the requirement for live coding, data collection was limited to one week in each classroom and each child could only be observed once. Within this time frame, the observation may not have captured enough desired interactive exchanges between teachers and children to be able to detect small but significant relationships between variables. Furthermore, while rewards and discipline were assessed across various instructional methods, the number of children in the observed activities relating to academic engagement and one-to-one interaction were not evenly balanced, despite efforts to randomly select children for observation during these specific activities. Although the instructional methods were controlled when exploring academic engagement and one-to-one instruction, the uneven distribution of observed children across various academic activities may still introduce potential bias. However, the aim of this research was to explore teacher-child interaction in real classroom settings. The classroom routines were not manipulated or altered, and as such, the uneven distribution of observed children across various academic activities is reflective of the natural rhythm of classroom schedules.

The qualitative study in Chapter 2 suggested that teachers perceive some children as always being well behaved (and thus discipline is not needed), while others are perceived as rarely behaving well, and are therefore rarely rewarded. In addition, teachers identified teacher-directed activities as the most commonly used instructional methods, compared to peer cooperation and individual learning. A longer observation period therefore may not significantly increase the likelihood of receiving teacher rewards or discipline for some children or

result in similar occurrences of different academic activities, but future research is needed to determine the optimal length of the observation period to capture the desired teacher behaviours in the Chinese preschool context. English secondary school teachers reported that the disruptive behaviour of children with CU traits may be more common in the school hallways and playground due to an awareness of the reduced likelihood of detection (Allen et al., 2016). Thus, another possible approach to obtain sufficient instances of the target behaviours could be achieved by extending behaviour observation to the hallway and playground settings.

Furthermore, despite efforts to minimize their impact, the presence of observers might still influence teacher behaviour. This observer effect may lead teachers to employ more positive or socially desirable strategies than they would under unobserved conditions, potentially skewing the data towards more favourable outcomes. Nonetheless, classroom observation remains comparatively more objective than teacher-reported or child-reported methods, as it is based on real-time observation and recording, rather than relying on teachers' or children's recollections of past events.

It should also be noted that there were limitations of using cluster-robust standard errors for the current data. This method typically requires a large sample size and a large number of clusters, and the study sample was relatively small with only 8 clusters. In addition, the assumption that observations between clusters (teachers) should be unrelated may not hold for some of the dependent variables. After calculating ICCs for a third level (classroom), it was found that for teacher-child one-to-one interaction, teacher rewards, and peer cooperation, effects of individual teachers from the same classroom could be correlated. However, due to the even smaller number of clusters for classroom (4 clusters only), the analysis proceeded with cluster-robust SE adjusted for teacher level clusters. Therefore, results should be interpreted with caution and

future research should feature a larger sample size to enable more comprehensive modelling approaches. Finally, this study had a cross-sectional design, and thus cannot determine the direction of relationships between CU traits and teacher frequency of rewards and discipline, or child responses to rewards, discipline, and instructional methods. All children were Chinese and attended mainstream schools in economically developed areas, thus, findings may not generalize to children from other nations or from a socially disadvantaged background. The findings need to be replicated in a study featuring more schools to include a greater diversity of children, including those with a greater severity of CU traits and CP.

The findings of this observational study provide preliminary evidence that young children may similarly be responsive to teacher reward and discipline strategies and different forms of instructional methods regardless of their level of CU traits. This suggests that teachers can focus on implementing strategies that are effective for all children, including reward-based strategies and child-directed activities, rather than needing to adopt a personalized approach. The results paint a somewhat more optimistic picture for the responsiveness of children with CU traits in Chinese preschools to rewards, discipline, and instructional methods than previous research with children in the elementary and secondary school periods (e.g., Allen et al., 2016; Allen et al., 2018; Hwang et al., 2020). Therefore, current study findings suggest the potential importance of early identification and intervention in schools. However, the findings need to be interpreted cautiously due to study limitations and the preliminary nature of this research. Future research should employ longitudinal investigation using classroom observation methods over different periods of schooling to enable more comprehensive information to be obtained about the relationship between CU traits, classroom management strategies, and instructional formats.

Chapter 4

Assessing Child Responses to Teacher Rewards in Preschool Classrooms: The Development and Validation of the Responses to Rewards Questionnaire (RRQ)

Chapter 3 presented an observational study that explores children's responses to teacher rewards within the preschool classroom environment. While these findings provided valuable insights into the relationship between CU traits and child responses to teacher rewards, the inherent limitations of classroom observations, particularly due to the limited timeframe, made it challenging to observe ample instances of children receiving rewards. Moreover, there were even fewer observations of children receiving tangible and activity rewards, leading our findings to solely involve social rewards. Recognizing these constraints and the lack of a valid instrument that assesses children's responses to teacher rewards, this chapter aims to build upon the prior research by developing and validating a new questionnaire measuring children's responses to rewards (tangible, social, and activity) that are commonly used by teachers in preschool settings.

4.1 Introduction

A variety of rewards ranging from tangible rewards (e.g., sweets, tokens or points traded for tangible rewards) to social rewards (e.g., praise, special privileges) have been commonly used by preschool classroom teachers to encourage prosocial behaviour and academic engagement (Ritz et al., 2014). Contrary to discipline strategies which are reactive in nature (i.e., the undesirable behaviour has already occurred), rewards are proactive strategies that can prevent a child from behaving inappropriately by positively reinforcing

desirable conduct (Clunies-Ross et al., 2008; Robertson, 2020). In addition, punishment-based classroom strategies, particularly harsh punishment (e.g., exclusion), have been shown to be ineffective in the long-term and may negatively affect academic outcomes and teacher-student relationships (Little & Akin-Little, 2008; Maag, 2001; Valdebenito et al., 2018). As awareness grows about the potentially harmful effects of punishment, researchers recommend a greater emphasis on reward-based strategies to encourage children's prosocial behaviour and school engagement (Cook, 2018; Maag, 2001). To optimize the effectiveness of these strategies, it is essential to understand individual differences in children's responses to different types of rewards as (Tyler et al., 2019).

Dating back to Skinner's model of operant conditioning (1938), rewards have been identified as central to theories of learning and motivation. Bandura's social learning theory (1971) extended previous learning theories by emphasizing that children not only learn from direct experience but can also be motivated by the expectation of potential rewards through observation (Payne, 2015). Gray's reinforcement sensitivity theory (1982) further highlighted the influence of biologically based individual differences in reward sensitivity. This theory proposed a behavioural approach system (BAS) that mediates responses to appetitive stimuli, influencing approach behaviours and cognitive-affective states related to anticipatory pleasure, such as hope, excitement, and optimism.

These theoretical underpinnings have influenced the design of various school-based programmes that use reward-based strategies to modify children's behaviour (e.g., Class-Wide Function-Related Intervention Teams, Jolstead et al., 2017; School-wide Positive Behavior Interventions and Supports, Sugai & Horner, 2009; Incredible Years, Webster-Stratton & Bywater, 2019). However, despite the presence of these established theories and the widespread use of

rewards, some researchers have criticized the use of rewards, especially tangible rewards, due to evidence that they may negatively impact children's intrinsic motivation (Deci et al., 1999, 2001; Deci & Ryan, 2008). Others have argued that rewards are less likely to erode individuals' intrinsic motivation in the school context (Akin-Little et al., 2004; Cameron et al., 2001; Cameron & Pierce, 1994). Bear et al. (2017) pointed out that studies that have found harmful effects of rewards on children's intrinsic motivation have predominantly been conducted in laboratory settings where the individual offering rewards is typically unfamiliar to the student. In contrast, teachers have greater interaction with students, leading them to potentially establish positive TCRs. Furthermore, professional teacher training may include guidance on how to successfully implement reward-based classroom management strategies.

Atypical sensitivity to rewards has been identified as a risk factor for CU traits in children, contributing to poor intervention outcomes (Frick et al., 2014). While shallow emotions are a core feature of CU traits, well-established evidence primarily indicates deficient emotional recognition and responses to negative stimuli such as sadness and fear cues from others. Conversely, evidence suggesting that CU traits are associated with decreased responses to positive stimuli remains limited (Northam et al., 2020), with the relationship between CU traits and children's responses to rewards remaining controversial. Some studies found that children with CU traits may be more responsive to rewards than discipline and therefore advocate for the intensive use of reward-based strategies (Frederickson et al., 2013; Hawes & Dadds, 2005; Moul et al., 2012). On the contrary, other studies have reported a significant relationship between CU traits and reduced reward sensitivity (Centifanti & Modecki, 2013; Marini & Stickle, 2010), thereby questioning the effectiveness of reward-based strategies in managing the CP of children with CU traits.

Contrary to the prevailing notion that CU traits are linked to impairments in

experiencing guilt and remorse (as reviewed in Chapter 1), evidence suggests that individuals with high CU traits can indeed experience and express positive emotions such as happiness or pleasure. For example, studies have shown that preschool children with high CU traits exhibit more pronounced reactions of amusement or laughter during specific scenarios, such as slapstick scenes within fear-inducing segments of 'The Lion King' (Dadds et al., 2016). In addition, research indicates that CU traits do not significantly affect peer nominations in middle childhood, suggesting that peers do not perceive children with high CU traits as less happy compared to others (Ciucci et al., 2015). However, there is emerging evidence suggesting that preschool children with high CU traits may exhibit more blunted and incongruent emotional expressions when viewing positive stimuli (film clips, Kimonis et al., 2023). This hints at the possibility that children with high CU traits may display atypical emotional expressions in response to positive stimuli.

The inconsistent findings regarding reward sensitivity are difficult to interpret given study differences in sample characteristics, methods and informants (Blair & Zhang, 2020). One possible explanation for the mixed findings is the type of reward as evidence suggests CU traits are linked to reduced sensitivity to rewards related to social affiliation (Waller & Wagner, 2019) and increased sensitivity to tangible rewards or rewards that promote the child's social status or dominance (Allen et al., 2018; Foulkes et al., 2014; Pardini et al., 2003). Affiliative rewards are pleasures derived from close interpersonal relationships, characterized by warmth, affection, and care that strengthen social bonds (Waller & Wanger, 2019). These rewards typically involve emotional and relational connections between teachers and students, emphasizing the degree of emotional closeness (Hwang et al., 2022). Evidence suggests that affiliative rewards, particularly interactions and emotional expressions from significant individuals like teachers, are highly effective motivators for young children. This effectiveness is due to these rewards tapping into children's innate desire for

social approval and emotional connection and young children are particularly responsive to approval from caregivers and other significant adults (Lertladaluck et al., 2020). Typical examples of affiliative rewards in preschools include verbal affirmations from teachers, such as “Good job!” or ‘I’m proud of you!’ and gestures of positive attention and affection, like a pat on the back, a hug, or a high-five (Nekitsing et al., 2018).

In preschool, the concept of social dominance emerges as children begin to develop early understandings of social power differentials. This is often manifested through behaviours such as controlling access to toys and other resources, directing group activities, and navigating peer relationships by asserting leadership (Gülgöz & Gelman, 2017). A typical example of rewards related to social dominance in preschool could be the child gaining priorities in the classroom, such as being the teacher’s helper. This role might involve leading activities, regulating other children’s behaviour, or distributing materials, thereby enhancing their visibility and influence among peers. Furthermore, evidence suggests that closeness with teachers can enhance a child’s social standing and acceptance among peers (Gülay Ogelman, 2021). Therefore, rewards that involve affiliation with teachers, such as receiving praise from teachers in front of peers, may also promote a child’s social status. However, it should be noted that while typically developing children are inherently motivated to seek affiliative rewards, awareness of social power from a young age does not necessarily mean they all aim to achieve or maintain social dominance. That is, there is variability in how children respond to and engage with social power. For example, while some children may actively engage in behaviours that establish dominance, others might be more responsive to the permissions granted by others, indicating a range of how they might approach social power (Gülgöz & Gelman, 2017).

Despite its potential to guide school-based intervention specifically for children

with CU traits, only a few studies have examined the association between CU traits and child responses to teacher rewards. Studies have found a link between CU traits and reduced responsiveness to teacher affiliative rewards (e.g., Baroncelli et al., 2022; Hwang et al., 2022). Two studies conducted with secondary school teachers reveal mixed relationships between CU traits and child responses to different types of rewards (Allen et al., 2016, 2018). While some teachers perceived teacher praise and a positive teacher-student relationship as effective in promoting prosocial behaviour and academic engagement among students with high CU traits, other teachers reported decreased responsiveness to both tangible and social rewards. Teachers also reported unhelpful consequences of rewards, such as boasting or manipulating others to attain social dominance. Hwang et al. (2022) further conducted a longitudinal study investigating the relationship between CU traits and children's responses to general teacher rewards. The findings indicated that a greater use of teacher rewards did not predict improved school motivation or engagement regardless of child levels of CU traits. It is important to note that these studies primarily focused on middle and high school students. However, given that CU traits have been linked to early-onset conduct problems (Frick et al., 2014) and early childhood is a critical period for conscience and moral development (Knafo et al., 2008; Kochanska et al., 2002), there is a compelling need to study sensitivity to teacher rewards in young children. Indeed, evidence suggests that interventions delivered in early childhood achieve better outcomes for children with CU traits than those delivered in middle-to-late childhood (Hawes et al., 2014).

In this thesis, Chapters 2 and 3 extended previous research on the relationship between CU traits and reward sensitivity in older children to the preschool context. In Chapter 2, three main types of rewards were identified through teachers' interviews, including tangible rewards (e.g., stickers), social rewards (e.g., praise) and activity rewards (e.g., being the teacher's helper). The results

indicated that all these rewards were perceived as equally effective for children with externalising problems in both the high and low-CU trait groups. Chapter 3 examined children's responses to teacher rewards during classroom activities in preschools. In line with Chapter 2, the findings suggest that social rewards appear to be equally effective for all children regardless of their level of CU traits. However, the qualitative design of the interview study in Chapter 2 prevented the quantification of the strength of the potential relationship between CU traits and child sensitivity to teacher rewards, and did not allow for the controlling of potential confounds to the relationship between CU traits and reward sensitivity such as co-occurring externalising problems . In addition, the findings of the classroom observation study in Chapter 3 are limited to social rewards due to the few occurrences of teacher use of tangible and activity rewards during the observations. This could be attributed to difficulties in capturing enough desired interactive exchanges between teachers and children within a restricted time frame, especially since teachers may use social rewards more frequently than other types of rewards (Sun, 2008; Yu, 2018). Furthermore, the observations were confined to the classroom and did not include other settings where teachers may reward children (e.g., the playground, hallways, school excursions).

4.1.1 Existing Questionnaires on Child Responses to Rewards

Questionnaires are a quick, simple, and efficient method to assess child reward sensitivity. They can address the issue of inadequate observed target instances caused by time constraints during classroom observation as they allow teachers to report on children's behaviour over a long period of time, in relation to rewards delivered both in- and outside of the classroom at school. However, there are few existing questionnaires assessing child responses to rewards (Fefer & Shuttleton, 2016). The Behavioural Inhibition System and Behavioural Activation System (BIS/BAS) Scale (Carver & White, 1994) and the Sensitivity to Punishment and Sensitivity to Reward Questionnaire for Children (SPSRQ-

C, Colder et al., 2011) are commonly used instruments for measuring reward sensitivity in children. However, the BIS/BAS scales, while validated for preschool-aged children, are confined to self-report or parent-report formats (Vervoort et al., 2019). The SPSRQ-C has been used in self-report and teacher-report formats with adolescents (Allen et al., 2016) and parent report in preschool children (Li, 2018; Zhang & Li, 2022). However, there is no teacher-report version for preschool-aged children. A recent theoretical model, the Sensitivity to Threat and Affiliative Reward model (STAR; Waller & Wagner, 2019), which was discussed in detail in Chapter 1, proposed that CU traits arise from low sensitivity to threat and affiliation. This model led to the development of the Sensitivity to Threat and Affiliative Reward Scale (STARS) for assessing these two dimensions in individuals from preschool-aged children to young adults (Perlstein et al., 2023). Similarly, this instrument currently only features self-reported and parent-reported versions. Moreover, these questionnaires conceptualise reward sensitivity as behavioural responsiveness and approaches to positive incentives from a personality theory perspective rather than assessing children's responses to teacher rewards in everyday classroom practice.

One past questionnaire for evaluating children's responses to various rewards used by teachers in the classroom is the Child Reinforcement Survey (CRS; Fantuzzo et al., 1991). This questionnaire was designed for elementary school students which comprises 39 items categorized into 4 types of rewards: edible rewards (e.g., ice cream), tangible rewards (e.g., stickers), activities (e.g., free time for art projects) and social rewards (e.g., saying 'Good job'). Children are instructed to rate items by answering either 'I like it a little' or 'I like it a lot'. However, Fantuzzo et al. only reported on the face validity of the CRS and evidence for its internal reliability was mixed (ranging from .46 - .75 for the four reward types) and did not examine other psychometric properties such as test-retest reliability or convergent validity which are important for questionnaire validation (Ratray & Jones, 2007). In addition, CRS only had limited response

options, which may result in poor sensitivity and restrict the variability and range of scores.

Chhoa (2023) developed a parent-report Reward Preference Questionnaire (RPQ) to measure child responses to different types of parent rewards commonly featured in evidence-based parent training programmes. The findings demonstrated a two-factor structure of RPQ that contains a responsiveness to social reward factor and a responsiveness to tangible reward factor. It also showed acceptable internal consistency (responsiveness to social rewards $\alpha = 0.92$; responsiveness to tangible rewards $\alpha = 0.66$), criterion validity and six-months test-retest reliability (responsiveness to social rewards $r = .86, p < .001$; responsiveness to tangible rewards $r = .93, p < .001$). The measure in the current study was based on this measure given the similar focus on sensitivity to rewards featured in behavioural intervention programmes for child behaviour problems, designed to promote child prosocial behaviour in a real-world context. However, as this questionnaire was developed for measuring children's responses to parent rewards, it needed to be adapted to the school context due to differences in the nature of the relationship between parents and children versus teachers and students, as well as differences in the types of rewards given by teachers to children in the school context.

This study aims to validate a new questionnaire assessing children's responses to typical preschool teacher rewards. Based on the parent-report RPQ (Chhoa, 2023), the questionnaire encompasses various reward types but excludes the parent-specific reward scales and items. The content of items was instead tailored to the school setting, guided by teacher interviews from Chapter 2 and the research literature on teacher rewards. As a result, three types of rewards were included in the new questionnaire: tangible rewards, social rewards and activity rewards. Rewards play a very important role in managing children's behaviour (Hoffmann et al., 2009). The presence of CU traits distinguishes a

subgroup of children with CP who display more chronic and severe CP and atypical responses to rewards (Frick et al., 2014). Specifically, research has indicated that CU traits are related to increased sensitivity to tangible rewards and those that enhance social status or dominance (Allen et al., 2018; Foulkes et al., 2014; Pardini et al., 2003), but show decreased sensitivity to social or affiliative rewards that involve positive social interactions and bonding (Waller & Wagner, 2019). In the observation study of Chapter 3, predictions were made about children's differential responses to various reward types, but the instances of children receiving tangible and activity rewards were too infrequent to test these predictions. Therefore, in the current study, I revisit a key hypothesis from Chapter 3 regarding the association of CU traits with sensitivity to different types of rewards, while also introducing new hypotheses that are specific to the aims of this chapter (questionnaire validation): 1. the newly developed teacher-report questionnaire assessing child sensitivity to teacher rewards would have a three-factor solution: responses to tangible rewards, responses to social rewards and responses to activity rewards; 2. CU traits would be associated with increased sensitivity to tangible and activity rewards but decreased sensitivity to social rewards; 3. Sensitivity to tangible, social and activity rewards would be significantly related to lower externalising problems.

4.2 Method

4.2.1 Participants and Procedure

The participants were 28 Chinese preschool teachers (25 females; $M = 34.96$ years) reporting on 156 children (42.9% girls; $M = 5.20$ years). All teachers identified their ethnicity as Chinese, with their years of teaching experience ranging from 2 to 30 years ($M = 12.04$, $SD = 1.70$). All children were reported by teachers as Chinese, with most living in a two-parent family (98%, $n = 153$).

The data used in this study was collected at the same time as the data in the two studies described in previous chapters. Teachers who participated in the

interview study (Chapter 2) and the classroom observation study (Chapter 3) also reported on child responses to teacher rewards when completing questionnaire packs for the interview and observation studies. To measure the test-retest reliability of the newly developed questionnaire, 20 teachers from the classroom observation study reported on the child responses to rewards of 116 children two weeks after the first round of data collection. Further detailed information on the data collection procedure can be found in Chapter 2 and Chapter 3.

4.2.2 Measures

Child sociodemographic information. Teachers reported on the children's age, gender, ethnicity and family type (two-parent or single-parent family).

CU traits. CU traits were assessed using teacher report on the total score of the 24-item Inventory of Callous-Unemotional traits (ICU; Frick, 2004). Detailed information regarding this measure is provided in Chapter 2. The alpha of the total ICU score in the current sample was .88.

Externalising problems. The teachers reported on child externalising problems using the sum of the Conduct Problems (5 items) and Hyperactivity (5 items) subscales of the SDQ (Goodman, 1997; Goodman et al., 2010). Further information about this measure is provided in Chapter 2. The alpha for the SDQ externalising problems score in this study was .82.

Child responses to teacher rewards. A new teacher-reported questionnaire assessing children's responsivity to teacher rewards was developed for this research, entitled the Responses to Rewards Questionnaire (RRQ). The aim of the RRQ is not to capture children's reward sensitivity from a personality perspective, as seen in questionnaires that measure broader behavioural tendencies, preferences, and motivations related to reward sensitivity. Example

items can be from, for instance, the SPSRQ-C: 'The child enjoys being the centre of attention,' 'The child engages in risky behaviour to obtain a reward,' and 'The child often has trouble resisting the temptation to do forbidden things.' Instead, the RRQ assesses children's responses to specific, 'real-world' teacher rewards commonly used in the preschool classroom. This includes items like 'The child looks happy when you smile at him/her' and 'The possibility of receiving a tangible reward makes him/her happy (e.g., certificates, books, stickers)', which focus on the child's practical reactions to the types of rewards they usually receive in everyday school life.

The parent-report RPQ (Chhoa, 2023) was used as a prototype for designing the teacher questionnaire. The original items were revised to assess teacher-child interaction, and new items were added based on a review of the literature on teacher rewards in classrooms (e.g., Fantuzzo et al., 1991; Sun, 2008; Yu, 2018). The interview findings in Chapter 2 were also drawn upon to ensure that the new measure was suited to the Chinese preschool context. Three items examining parent affection and three items assessing time with parents were removed from the social rewards subscale of the RPQ due to their lack of relevance to teacher-child interaction. In addition, two new types of rewards, food and activity rewards, were identified and included with using specific examples. Specific examples of tangible rewards provided by the original parent-report RPQ items, such as pocket money, were substituted with other tangible rewards commonly employed by classroom teachers. Furthermore, the wording and content of the remaining original items were examined and revised to enhance their coherence and consistency across various types of rewards. For example, one original item "Your child looks happy when receiving a toy or stickers for good behaviour" was modified to "The possibility of receiving a tangible reward makes him/her happy (e.g. certificates, books, stickers)." In addition to praise, other frequently used affiliative reward strategies by teachers, including smiling and hugging, were also included as social rewards in the new

questionnaire.

The initial version of the RRQ contained 16 items, with four items assessing child responses to 1) tangible rewards, 2) social rewards, 3) food rewards, and 4) activity rewards. Following the scoring format of the RPQ, teachers rated each item of the RRQ on a 5-point Likert scale from 1 'strongly disagree', to 5 'strongly agree'. Four experienced Chinese preschool teachers who did not participate in the final research study were invited to review the items of the RRQ to evaluate the appropriateness of the wording and the types of rewards included in the questionnaire. Based on their feedback, items assessing food rewards were eliminated as the teachers pointed out that food rewards are not often used in preschools due to health and safety concerns. All other rewards covered by the questionnaire were viewed as relevant for Chinese preschool students. No additional types of reward or specific rewards were proposed to be added. As a result of the pilot feedback, the revised version of the RRQ consisted of 12 items assessing child responses to teachers' tangible, social and activity rewards (see Table 4.1).

Table 4.1

Items in the First Revision of Reward Response Questionnaire

Subscale	Item
Tangible	1. The possibility of receiving a tangible reward makes him/her happy (e.g., certificates, books, stickers).
	2. The child will complete an activity to receive a tangible reward (e.g., certificates, books, stickers)
	6. The child often does some things to get a tangible reward (e.g., certificates, books, stickers).
	9. The child enjoys receiving a tangible reward (e.g., certificates, books, stickers)
Social	3. The child looks happy when you smile at him/her.
	5. The possibility of being praised individually/in front whole class makes the child happy.
	7. Rewarding the child with a hug moves him/her to action and/or repeat proper actions.
	11. The child often does some things to receive praise from teachers in the presence of their parents.
Activity	4. The possibility of doing a fun activity makes the child happy (e.g. playing, having priority to choose toys or games, watching

cartoons, being teachers' helper)

8. The child often does some things if he/she can then do activities he/she likes (e.g., playing, having priority to choose toys or games, watching cartoons, being teachers' helper).

10. The child will complete a task quickly in order to do activities s/he is interested in (e.g., playing, having priority to choose toys or games, watching cartoons, being teachers' helper).

12. The child is happy about doing activities that s/she is interested in (e.g. playing, having priority to choose toys or games, watching cartoons, being teachers' helper).

4.2.3 Data Analysis

Data analysis was conducted using Stata and RStudio. Data on the RRQ was missing for two children in the first round of data collection and for one child in the second round of data collection (to ascertain retest reliability). This absence of data was due to three teachers not completing the RRQ, with some or all items of the questionnaire left unrated. The child with missing data in the second round was different from the children with missing data in the first round. The three teachers were from three different classrooms in three different schools. Independent samples t-tests and chi-square tests were conducted to examine if there were any systematic differences between the children with missing data and those with complete data. Non-significant results (all $ps > .05$) indicated that the missing data was unrelated to the main study variables and sociodemographic variables. Therefore, missing data was considered to be missing completely at random and listwise deletion was applied in the whole data analysis process (Kang, 2013), leading to model samples ranging from 115 to 156.

Item redundancy was checked using inter-item correlations. The results of the correlation matrix indicated that all 12 items showed higher correlations with the other items than the acceptable minimum value of .7 (De Vaus, 2004). Therefore, the item response theory (IRT) model was applied to support decision-making around item selection by evaluating the local dependency (LD) of items. An exploratory factor analysis (EFA) was conducted to evaluate the

unidimensionality assumption required for the IRT model. In line with the assumption, the analysis suggested a one-factor solution for the RRQ (please see a more detailed description of EFA below). Subsequently, the likelihood ratio statistic (G2) was used to assess local dependencies in the context of the graded response model (GRM), which is an IRT model suitable for analysing data obtained from Likert-type scales (Houts & Edwards, 2013). The open source mirt package in R was employed to fit the GRM and calculate LD indices (Chalmers, 2012).

Item selection was not solely based on the results of LD as these values are not intended for hypothesis testing but serve as diagnostic tools, providing information about items' responses to help guide item selection and should be combined with an examination of the item content (Chen & Thissen, 1997). Therefore, other considerations (e.g., breadth of item coverage) were also applied during the revision process to ensure a comprehensive and rigorous approach to item selection.

To aid in the item selection process, a one-factor confirmatory factor analysis (CFA) model was constructed using the lavaan package in R (Rosseel, 2012). Modification indices (MI) were then extracted from the CFA model to identify item pairs exhibiting high correlations between each other. The value of a MI estimates the expected decrease in the chi-square statistic (χ^2) with 1 degree of freedom, reflecting the improvement in model fit if the corresponding parameter was added and estimated freely (Hox & Bechger, 1998). An MI of 10.83 or greater indicates a significant improvement in model fit, with a χ^2 statistic at $p < .001$ (Ebesutani et al., 2010). This information was cross-validated with the high LD obtained from the GRM. A robust maximum likelihood approach was then used in CFA estimation to deal with the non-normality of the item responses in RRQ (Yuan & Bentler, 2000) and the small sample size of this study (Yilmaz, 2019).

To encompass all three types of rewards and retain an equal and sufficient number of items assessing child responses to each type of reward, only the item displaying the most adverse effect on scale reliability within each reward type (tangible, social, activity) was removed. If there was more than one problematic item for each type of reward, items were then removed iteratively and the models were re-estimated each time. Model fit statistics, including the root mean square error of approximation (RMSEA), the comparative fit index (CFI), the Tucker–Lewis index (TLI), the Akaike information criterion (AIC) and the Bayesian information criterion (BIC), were calculated and compared to determine the optimal model of RRQ. The commonly recommended cut-off values suggest an RMSEA below .06, a CFI and TLI above .95, and an SRMR below .05 indicate a good model fit, while an RMSEA below .10, a CFI and TLI above .90, and an SRMR below .10 represent an acceptable level of fit (Hox & Bechger, 1998; Hu & Bentler, 1999). Furthermore, it has been suggested that a model with lower AIC and BIC values indicates a better-fitting model (Akaike, 1974; Stone, 1979). EFA is a commonly used statistical technique for scale validation in the domains of psychology and education (Williams et al., 2010). EFA investigates latent factors that explain the interrelationships among observed variables (items) and assumes the existence of potential unique variances attributable to measurement inaccuracies or specific item effects (Norris & Lecavalier, 2010). EFA was conducted to identify the latent construct of the RRQ in the present study. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were used to test whether the data met the requirements for factor analysis (Williams et al., 2010). Kaiser's criterion (1960) (the eigenvalue greater than one) and Cattell's scree test (1966) were simultaneously used to determine factor extraction (Williams et al., 2010).

Cronbach's alpha reliability coefficient of the refined RRQ scale was computed

to test the internal consistency with the items that had been selected. A single-measurement, absolute-agreement, two-way mixed-effects intraclass correlation coefficient (ICC) was used to examine test-retest reliability (Koo & Li, 2016) with a subset of the sample ($n = 116$). To establish the criterion validity of the measure, relationships between CU traits, externalising problems, child responses to tangible rewards and social rewards were explored via bivariate correlations. Two-tailed Pearson correlations was applied between normally distributed variables (CU traits and externalizing problems) and Spearman correlations were applied to correlation analysis involving non-normally distributed variables (child responses to teacher rewards).

4.3 Results

Descriptive statistics for the sociodemographic and main study variables are presented in the Table 4.2.

Table 4.2

Descriptive Statistics on Child Sociodemographic Characteristics and Main Study Variables

Variable	N	M (SD)	Range	Skewness	Kurtosis
Gender (Male)	89	-	-	-	-
Two-parent family	153	-	-	-	-
Child age	156	5.20 (.62)	4-6	-.15	-.50
CU traits	156	25.07 (10.90)	2-59	.29	.24
Externalising problems	156	7.15 (4.08)	0-17	.32	-.15
Child responses to teacher rewards (T1)	154	37.80 (6.10)	16-45	-.83	.94
Child responses to teacher rewards (T2)	115	38.94 (5.40)	16-45	-1.05	2.68

Note. CU = callous-unemotional.

4.3.1 Item Redundancy and Item Selection

The findings obtained from the examination of LD, presented in Table 4.3, and MI, presented in Table 4.4, revealed that item 2 (i.e., ‘The child will complete an activity to receive a tangible reward (e.g., certificates, books, stickers)) and item 11 (i.e., ‘The child often does some things to receive praise from teachers in the presence of their parents’) were the most prevalent items within the highly

correlated item pairs assessing tangible rewards and social rewards respectively, and have been removed from the scale. However, when considering activity rewards, both item 4 ('The possibility of doing a fun activity makes the child happy [e.g. playing, gaining priority to choose toys or games, watching animate, being teachers' helper]') and item 10 ('The child will complete a task quickly in order to do activities s/he is interested in (e.g. playing, gaining priority to choose toys or games, watching animate, being teachers' helper)') were frequently identified within highly correlated item pairs exhibiting extreme, significant LD and MI values. Therefore, three one-factor CFA models have been constructed, with Model 1 including all 12 items, Model 2 excluding items 2, 4 and 11, and Model 3 excluding items 2, 10 and 11.

The results of the fit indices are presented in Table 4.5. Although both Model 2 and Model 3 exhibited mixed findings, with their RMSEA values and the TLI of Model 2 failing to meet the established criteria for an acceptable model fit, they displayed improved fit indices compared to Model 1. This provides evidence for the enhanced properties of the revised scale after removing the items. Moreover, the model comparison results indicated that Model 3 demonstrated superior fit statistics compared to Model 2. Considering the high RMSEA in Model 3, attempts have been made to explore further possible item selections. This has involved removing additional items with the next highest LD and MI or allowing some pairs of item residuals to be correlated in the one-factor CFA models without removing any items. However, neither of these approaches has proved effective in significantly reducing the RMSEA. Therefore, the high RMSEA could be attributed to either small sample size or data skewness. Consequently, revisions of the scale stopped and this study followed the 9-item one-factor solution for RRQ, with each type of reward having items describing reward anticipation and reward outcome and item 2, item 10, and item 11 being excluded (Table 4.6).

Table 4.3*LD Matrix for RRQ Items*

	RRQ1	RRQ2	RRQ3	RRQ4	RRQ5	RRQ6	RRQ7	RRQ8	RRQ9	RRQ10	RRQ11	RRQ12
RRQ1	-											
RRQ2	48.72**	-										
RRQ3	13.34	99.24**	-									
RRQ4	31.77**	71.91**	11.83	-								
RRQ5	22.45*	42.88**	15.52	24.72**	-							
RRQ6	17.07	94.61**	27.36*	30.86**	25.31*	-						
RRQ7	22.26 *	91.87**	19.67*	25.39**	18.11*	28.41**	-					
RRQ8	29.76**	47.67**	11.57	42.39**	27.06**	14.52	20.02*	-				
RRQ9	20.41	60.28**	18.01	47.43**	24.57 *	13.79	30.86**	22.71*	-			
RRQ10	43.97**	50.49**	18.16	41.08**	40.54**	15.63	21.45*	38.43**	38.18**	-		
RRQ11	27.78*	96.16**	23.58*	25.61*	31.60**	47.29**	30.40**	21.54*	17.46	26.05	-	
RRQ12	25.23	50.10**	12.18	42.62**	21.23	24.58	22.17*	17.68	34.26*	50.93**	25.36	-

Note. ** $p < .01$ * $p < .05$

Table 4.4*Largest modification indices for the covariance between RRQ item*

Parameter	Modification index (χ^2)	EPC
RRQ6<->RRQ7	34.01	.15
RRQ6<->RRQ11	32.58	.21
RRQ2<->RRQ11	26.26	-.25
RRQ5<->RRQ6	24.28	-.09
RRQ5<->RRQ11	23.92	-.10
RRQ1<->RRQ2	23.84	.15
RRQ4<->RRQ5	23.15	.07
RRQ4<->RRQ11	22.07	-.13
RRQ2<->RRQ3	20.09	-.14
RRQ10<->RRQ11	18.74	.13
RRQ1<->RRQ4	17.43	.07
RRQ2<->RRQ7	15.55	-.13
RRQ2<->RRQ5	14.02	.09
RRQ3<->RRQ7	13.94	.07
RRQ2<->RRQ6	13.16	-.16
RRQ5<->RRQ10	13.13	-.05
RRQ8<->RRQ10	11.91	.06

Note. This table only presents χ^2 change > 10.83, sorted from high to low.

EPC = expected parameter change values, approximate values of fixed parameters if they were added to the model and estimated freely.

Table 4.5*Model Fit Statistics for Model 1, Model 2 and Model 3.*

Model	CFI	TLI	AIC	BIC	RMSEA	SRMR
1	.85	.82	3068.03	3140.92	.18	.07
2	.92	.89	2127.77	2182.44	.16	.05
3	.93	.90	2101.71	2156.38	.15	.05

Note. Model 1 includes all 12 items, Model 2 excludes items 2, 4, 11, Model 3 excludes items 2, 10, 11.

Table 4.6*Items of the Teacher Reward Response Questionnaire – Final Version*

Subscale	Item
Tangible	1. The possibility of receiving a tangible reward makes him/her happy (e.g., certificates, books, stickers).
	6. The child often does some things to get a tangible reward (e.g., certificates, books, stickers).
	9. The child enjoys receiving a tangible reward (e.g., certificates, books, stickers)
Social	3. The child looks happy when you smile at him/her.
	5. The possibility of being praised individually/in front

	whole class makes the child happy.
	7. Rewarding the child with a hug moves him/her to action and/or repeat proper actions.
Activity	4. The possibility of doing a fun activity makes the child happy (e.g., playing, having priority to choose toys or games, watching cartoons, being teachers' helper)
	8. The child often does some things if he/she can then do activities he/she likes (e.g., playing, having priority to choose toys or games, watching cartoons, being teachers' helper).
	12. The child is happy about doing activities that s/she is interested in (e.g., playing, having priority to choose toys or games, watching cartoons, being teachers' helper).

4.3.2 Exploratory Factor Analysis

The KMO measure of sampling adequacy was .93 ($n = 154$), above the commonly recommended value of .60. Bartlett's test of sphericity was significant: $\chi^2(36) = 1289.03, p < .001$ ($n = 154$) (Fabrigar & Wegener, 2012). The satisfactory results for the KMO value and Bartlett's test indicated the suitability of the data for factor analysis. EFA showed that only one component had an eigenvalue greater than 1, which explained 87.66% of the variance and was far higher than the eigenvalues of the other components, suggesting a strong single factor in the revised RRQ (Table 4.7). Due to the extraction of only one factor, no rotation was performed. In line with the result based on Kaiser's criteria, the inspection of the scree plot also indicated that only the first component should be retained (see Figure 4.1)

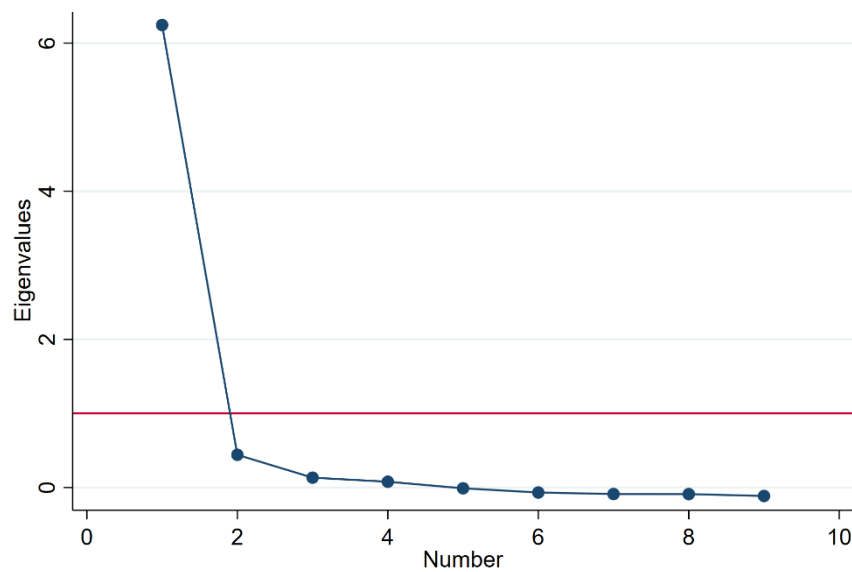
Table 4.7

Eigenvalues, Percentages of Variance and Cumulative Percentages for Factors for RRQ Items (N = 154)

Factor	Eigenvalue	% of variance	Cumulative %
1	6.24	.96	.96
2	.44	.07	1.02
3	.13	.02	1.04

Note: The sum of individual percentages of variance may not add up exactly to the cumulative percentage due to rounding.

Figure 4.1 Scree Plot Depicting Eigenvalues of Extracted Components



4.3.3 Reliability and Criterion Validity

The revised RRQ demonstrated strong internal consistency, with a Cronbach’s alpha coefficient of 0.95. Furthermore, the ICC was 0.87, with 95% confidence intervals ranging from 0.82 to 0.91, indicating good to excellent test-retest reliability. Table 4.8 presents the correlations between CU traits, externalising problems, and child responses to teacher rewards. Given the identification of a one-factor structure in the revised RRQ, separate analyses for child responses to tangible, social and activity rewards have not been conducted. Instead, the focus has shifted towards examining the relationships between CU traits, externalising problems, and the overall RRQ score. The results revealed a significant association between reduced child responses to teacher rewards and higher levels of CU traits and externalising problems at both time points, thus indicating strong criterion validity.

Table 4.8

Relationships between CU traits, Externalising Problems and Child Responses to Teacher Rewards

	CU traits (N = 156)	Externalising problems (N = 156)	Child responses to teacher rewards	
			Time 1 (N = 156)	Time 2 (N = 115)
CU traits	-			
Externalising	.58**	-		

problems				
Time 1	-.57**	-.51**	-	
Time 2	-.51**	-.49**	.86**	-

Note. CU traits = callous-unemotional traits, ** $p < .01$ * $p < .05$, Pearson or Spearman correlation coefficients were reported.

4.4 Discussion

This chapter validates a new teacher-report measure of children’s responses to reward strategies that teachers use in daily practice. This innovative questionnaire was developed from a parent-report questionnaire assessing children’s responses to different types of parental rewards (RPQ, Chhoa 2023). The items in this new measure, adapted from the RPQ and derived from the literature on teacher practice and findings from Chapter 2, covers three types of rewards commonly used in the classroom: tangible (e.g., certificates, books), social (e.g., praise, hugs), and activity-based (e.g., playing, having priority to choose toys or games). During the item selection process for the teacher-report RRQ, both LD from the IRT model and MI from the CFA model were employed to examine redundant items. For each type of reward (i.e., tangible, social, and activity rewards), items that most negatively impacted the model, marked by the highest LD or MI values, were identified and then removed.

Subsequently, three models comprising different sets of candidate items were compared using a range of model fit statistics, including RMSEA, CFI, TLI, AIC, and BIC. As a result of this process, the revised 9-item RRQ without items 2, 10, and 11 demonstrated a better model fit in comparison to both the alternative 9-item RRQ and the initial 12-item RRQ. Although the RMSEA for the finalised 9-item RRQ was above the commonly used cut-off value, neither further item removal nor the allowance of correlations among residuals significantly reduced the RMSEA, suggesting the high RMSEA may be due to a small sample size or data skewness rather than indicative of model misfit. Nevertheless, the finalised 9-item RRQ showed improved model fit when compared to the initial 12-item RRQ and demonstrated good test-retest reliability (ICC = .87) and

strong internal consistency ($\alpha = .95$) in the current sample.

Our first hypothesis proposing a three-factor structure of RRQ differentiating children's responses to tangible, social, and activity rewards was not supported, with the EFA results indicating a unifactorial solution of the questionnaire. Contrary to Chhoa's (2023) parent-report questionnaire that distinguishes children's responses to tangible and social rewards, it seems that teachers may perceive little differences in student responses across different reward types of social, tangible and activity rewards. Our finding of a single-factor structure of RRQ also stands in contrast to previous studies indicating that CU traits are related to increased sensitivity to tangible rewards (Foulkes et al., 2014; Pardini et al., 2003) and decreased sensitivity to social affiliation rewards (Waller & Wagner, 2019).

A potential explanation for this unexpected finding could reside in the nature of the context (preschool classrooms) and the individuals (teachers) delivering the reward. As authoritative figures in the classroom, teachers shape the social environment, thereby influencing peer interactions (Farmer et al., 2011). This effect could be especially pronounced in preschools, where children depend more on teacher support and guidance due to their inherent vulnerability and limited self-regulation ability (Verschueren & Koomen, 2012). Consequently, social rewards from teachers, like praise or hugs, may not only function as affiliative rewards but also as tools to boost social status. Therefore, even though children with CU traits may not be interested in forming close relationships with teachers (Waller & Wagner, 2019), they may still view teachers' social rewards as appealing, particularly in the presence of their peers, to establish social dominance (Centifanti & Modecki, 2013). In support of this, teachers from the qualitative study in Chapter 2 perceived public praise as an effective strategy for children with high CU traits, even if the child was not responsive to other types of rewards.

Unlike parents at home, who may also provide pocket money, sweets or toys as tangible rewards (Chhoa, 2023), Chinese preschool teachers tend to use stickers more frequently to reinforce appropriate behaviours (Chen, 2017; Wu, 2013). While stickers are commonly used in early education settings to encourage desired behaviours, much of the existing research on CU traits and reward dominance focuses on items with immediate practical or consumable value, such as money (e.g., Hawes et al., 2021; Lorber et al., 2011; Pardini et al., 2013) or prizes where stickers are positioned as the least desirable option, given to children who achieve the minimum point totals required (Barry et al., 2000; Frick et al., 2003). Although stickers represent teachers' acknowledgement of a child's effort, performance or desirable behaviour, their practical use is generally limited to decoration. Therefore, children with high CU traits who are typically less concerned about academic performance and inclined to pursue self-serving goals (Frick et al., 2014; Pardini & Byrd, 2012; Sakai et al., 2012) may view these stickers as less valuable than tangible rewards with immediate utilitarian value. Indeed, in a past qualitative study with high school students in the UK, a teacher commented that a student high in CU traits made fun of her use of stickers as a reward in front of the class, which then devalued their use as a reward for their peers (Allen et al., 2016).

It is also possible that despite the apparent differences in form among activity, tangible, and social rewards, they may be perceived as similar by children with CU traits in a classroom context. For instance, activity rewards such as being a teacher's helper might function similarly to social rewards like receiving public praise, as they can both be used to raise social status or to obtain dominance among peers. Indeed, previous qualitative research conducted with secondary school teachers in the UK found that children with high CU traits were perceived as indifferent to most rewards unless these rewards allowed them to flaunt their status or misuse their gained position of responsibility (Allen et al., 2016).

Therefore, these superficial differences may not significantly influence the motivational value of the rewards, leading to the lack of variation in children's responses to different types of rewards in classrooms.

In summary, factors such as peer interaction, teacher-student relationship quality, and different rewards used by teachers in the unique context of schools, as opposed to the home or laboratory setting, may influence students' perceptions of rewards, potentially obscuring the differentiation in their responses to different reward types. However, while the findings suggest a unifactorial structure of the RRQ in the current sample, it is plausible that other factor solutions, such as a three-factor structure, might emerge under different conditions or with different samples. Variations in age group, cultural background, or settings (e.g., non-educational environments) could lead to distinct responses to tangible, social, and activity rewards. For instance, Chhoa's (2023) study with parent rewards distinguished two factors in children's responses to rewards (tangible and social rewards), revealing a preference for tangible rewards over social rewards among young children with CU traits. Moreover, as children grow older, the influence of adult attention, such as positive attention from teachers, may become less impactful compared to preschoolers (Hawes & Allen, 2016). With older children turning to seek approval from their peers (Laursen & Veenstra, 2021), this shift results in differing responses to social rewards from teachers. Furthermore, in environments where tangible rewards offer greater diversity or utilitarian value, the differentiation of children's responses to various types of rewards could become more apparent.

As the EFA results indicated a single-factor solution for the RRQ, our original Hypotheses 2 and 3 regarding the relationships between CU traits, externalising problems, and different types of rewards were no longer applicable. As such, instead of analysing responses to tangible, social, and

activity rewards separately, the relationships between CU traits, externalising problems, and the overall child response to rewards were explored. Consistent with theories of learning (e.g., social learning theory; Bandura, 1971) as well as the outcomes of evidence-based programmes emphasising positive reinforcement for the modification of child CP (e.g., Incredible Years; Webster-Stratton & Bywater, 2019), our findings indicated that reduced child responses to teacher rewards were significantly related to more severe CU traits and externalising problems at both time points. This lends support to the construct validity of the RRQ and is in line with prior research suggesting that CU traits and CP are related to decreased reward responsiveness (Blair et al., 2018; Centifanti & Modecki, 2013; Matthys et al., 2013; Marini & Stickle, 2010). Our findings are also consistent with theories that identify reduced reward sensitivity as a risk factor for CU and CP (Blair, 2004, 2006; Matthys et al., 2012).

Findings in the current study contrast with findings from the interview study and the observational study described in the previous chapter of this thesis, where no significant relationship was found between CU traits and reduced reward sensitivity. These inconsistencies could be attributed to the differences in methodological approaches. For example, during interviews, the presence of the researcher might induce social desirability bias, leading teachers to depict a more favourable report of child's responses to rewards. Conversely, teachers were asked to complete the questionnaires during their free time, typically in the absence of researcher, which might yield a more authentic reflection of their views. Alternatively, considering that children with CU traits typically maintain poor relationships with teachers (Crum et al., 2016; Horan, et al., 2016), teachers could also exhibit a negative bias, thereby reporting behaviours that deviate from the child's actual conduct. While the observational approach employed in Chapter 3 may provide more objective findings than questionnaires, the small sample size of children receiving rewards, and the assessment being restricted to social rewards during the observation period may dampen the

strength of its conclusions. Therefore, further classroom observation research with a larger sample is needed to assess and replicate findings from the current research.

Continuous debate remains regarding the relationships between CU traits, CP and reward sensitivity (Blair & Zhang, 2020). It is challenging to draw strong conclusions on this topic due to considerable methodological heterogeneity between studies, including the diverse sample characteristics (e.g., age, gender, community vs clinical), assessment methods (e.g., computer-based tasks vs questionnaires), contexts (e.g., laboratory vs school settings), and conceptualisations of rewards (e.g., reward types and different phases involved in reward processing) (Byrd et al., 2014). The current study is the first to establish and validate a questionnaire assessing children's responses to teacher rewards in everyday classroom practice. This newly developed questionnaire contains specific types of rewards that teachers commonly use in preschool settings, thereby extending our understanding of the relationships between child CP, CU traits and reward sensitivity to more applied and real-world teacher-student interactions.

Although the current study did not distinguish potential child responses to different types of rewards, the single-factor structure of the RRQ still holds significant implications for intervention strategies and educational practices. Specifically, the findings suggest that preschool children may perceive all types of rewards (tangible, social, and activity) as similarly motivating. This uniform sensitivity to rewards could simplify the implementation of reward-based behavioural interventions in preschools, allowing teachers to employ a more streamlined approach to reinforcement without the need to differentiate between reward types. Such an approach could enhance the efficiency and potentially increase the efficacy and ease of use of these interventions within the classroom. Furthermore, these results underscore the importance of

considering cultural and contextual factors that influence how rewards are perceived and highlight the necessity for educational policies and teacher training programs to adapt accordingly to ensure the effectiveness of reward systems in Chinese preschools. Moreover, the development and validation of a new measure assessing overall child responses to common rewards used by teachers in the classroom may facilitate future research aimed at understanding the relationship between CU traits, CP, and child responses to teacher rewards in relation to other school and classroom environment factors, including teacher-child relationships, peer influences, and the emotional climate of the classroom

However, the results of the current study need to be interpreted with several limitations in mind. First, participants in this study were all Chinese and recruited from mainstream preschools, limiting the generalisability of the current findings to older age groups, Western school settings, or to clinical samples with more severe CU traits and CP. Future research should verify the factor structure, reliability and validity of the RRQ in older children, and in more diverse samples in different nations. Another limitation is the single-informant nature of the current research, with teachers reporting on children's CU traits, externalising problems, and reward sensitivity, which means that associations may be significant due to shared method variance. Considering the potential bias due to poor TCRs, teachers might also over-report children's CU traits, behaviour problems, and unresponsiveness to reward strategies. Future studies could employ caregiver report of these constructs, as well as experimental methods to assess child reward sensitivity to further validate the RRQ.

Third, an indicator used in the RRQ to assess children's responses to rewards involves teachers evaluating whether a child appears happy. This approach could pose challenges, as emerging evidence suggests that preschool children,

particularly those with high CU traits, may display atypical expressions of happiness (Kimonis et al., 2023). This suggests that the single-factor solution of the RRQ may arise because teachers' perceptions do not accurately reflect the true motivational value of different rewards for children, thereby underscoring the need for a child-report measurement to capture these nuances more effectively.

However, it is crucial to recognize that concerns regarding these atypical expressions may be overstated. The prevailing research on CU traits primarily points to reduced reactivity towards negative emotional stimuli, while other studies have indicated that these children do not necessarily show deficiencies in expressing positive emotions such as happiness (Ciucci et al., 2015). Additionally, the types of teacher-administered rewards in school settings differs markedly from the experimental conditions (e.g., film clips) that suggest blunter expressions of happiness among children with high CU traits. This discrepancy raises questions about the direct applicability of such findings to educational environments. Therefore, including expressions of happiness as one of the indicators in the questionnaire is justified, as it aims to provide a comprehensive assessment of children's reward sensitivity across multiple dimensions.

In conclusion, the current research described the development and validation of a new 9-item questionnaire assessing children's responses to reward strategies that teachers use in daily practice. The findings suggest a one-factor solution for the RRQ, indicating that teachers perceived children as showing similar responsiveness to tangible, social and activity rewards. The measure showed good test-retest, internal reliability and criterion validity, showing significant negative associations with CU traits and externalising problems. Future research could investigate whether the RRQ factor structure, factor loading and item interpretation remains equivalent when considering different child sociodemographic characteristics, such as age and gender. The findings

provide a practical tool for future studies on children's responses to teacher rewards, which may help guide school-based interventions promoting prosocial behaviour and school engagement.

Chapter 5

General Discussion

CU traits in school settings have garnered increased attention in the last decade, due to their significant implications for teacher-focused prevention and intervention programmes. Despite the foundational role of the preschool period for child development and potential cultural variation in the presentations and correlates of CU traits, research on CU traits in the school setting is lacking in the preschool period, and most past research has been conducted in Western nations. To address this research gap, this thesis aimed to investigate CU traits in the Chinese preschool setting, with a specific focus on the relationships between CU traits and school-related factors. In the first study (Chapter 2), qualitative interviews explored teachers' perceptions of children with externalising problems and high versus low levels of CU traits, in terms of child externalising problems, teacher rewards, discipline, instructional methods and school-based interpersonal relationships (i.e. teacher-child relationship and teacher-caregiver relationship). The second study (Chapter 3) was a classroom observation study that investigated the associations between CU traits and teacher rewards, discipline and instructional methods. In Chapter 4, item response theory (IRT) models, exploratory factor analysis (EFA), and confirmatory factor analysis (CFA) were used to validate a newly developed questionnaire measuring teacher report of child responses to teacher rewards.

In the forthcoming sections, the key findings of the three studies will be organized by central themes rather than presented on a study-by-study basis, with the aim of facilitating a clearer comparison of the findings across the studies. Following this, the contributions of these findings to theories of CU traits in the school context will be explored, with a particular focus on considerations of research design, cultural influences, and developmental

differences. Subsequently, this chapter will discuss the overall strengths and limitations of the current thesis, along with potential directions for future research aimed at deepening the understanding of CU traits in schools. Finally, the discussion will extend to the practical implications for school-based interventions and teacher classroom practice, thereby translating theoretical insights into actionable strategies in the educational setting.

5.1 Summary of Key Findings

5.1.1 Teacher Use of Rewards, Discipline and Child Responses to These Strategies

The findings from both the interview study (Chapter 2) and the classroom observation study (Chapter 3) of this thesis consistently showed that teachers in Chinese preschools did not resort to harsher discipline for children with high CU traits. This finding contrasts with those in the family context, where higher CU traits in children often elicit harsher parenting. This difference in teacher and parent practices is likely due to the professional training that teachers receive, equipping them with the knowledge and skills to maintain consistent and calm disciplinary strategies. In support of this, past studies on CU traits in schools from South Korea (Hwang et al., 2020) and the United States (Willoughby et al., 2022) also did not find a significant relationship between CU traits and the frequency or severity of school teacher discipline.

However, the findings for teachers' use of rewards revealed some inconsistencies. The interview study reported that teachers rewarded children with high CU traits less frequently compared to their typically developing peers, attributing this to the more frequent externalising problems in the former group. This is in line with a prior study in South Korean primary schools which found a significant relationship between CU traits and reduced teacher rewards. In contrast, the classroom observation study did not identify a significant relationship between the frequency of teachers' use of rewards and the level of

CU traits in children. The inconsistent findings could be due to different research design. Specifically, both Hwang et al.'s study and the study in Chapter 2 relied on child or teacher retrospective reports of teacher rewards, which may have been influenced by subjective bias, especially since CU traits are correlated with poor TCR (Horan et al., 2016).

In exploring children's responses to teacher discipline and rewards, the findings of the three studies demonstrated divergent behavioural patterns associated with CU traits. While teachers in the interview study (Chapter 2) perceived that children with externalising problems and high CU traits tended to show negative responses to discipline, the quantitative findings of the observation study did not yield the similar results, as it found no significant relationship between CU traits and insensitivity to discipline. This is probably because teachers in the interview study reported children displayed both uncaring and aggressive responses to rewards. These two response types could have counterbalanced each other in the quantitative analysis, leading to a non-significant relationship between CU traits and response to discipline. It is possible that the aggressive responses to teacher discipline observed in the interview study reflected higher CP (Frick & Dickens, 2004; Frick & White, 2008) or narcissism (Krizan & Johar, 2015), rather than just CU traits in children with high CU traits. However, the qualitative nature of the interview study limited the ability to discern whether these responses were attributable to CU traits or influenced by other confounding variables.

As for responses to rewards, teachers in the interview study reported that rewards were effective for all children regardless of CU trait levels, noting particularly the effectiveness of giving children praise in front of their peers. However, the results of the questionnaire study (Chapter 4) differed, as CU traits were significantly related to reduced responses to teacher rewards at two time points. Furthermore, this thesis also aimed to investigate whether CU traits

are related to different responses across different types of rewards (i.e., tangible, social, and activity rewards). The classroom observation study could not test the hypotheses relating to child responses to different types of rewards due to the low frequency of occurrence of rewards other than social rewards. Findings from teacher report (interviews and questionnaires) indicated that although social rewards that promote children's social status, such as public praise, may be particularly effective for children high in CU traits, there is no significant difference in child responses to different types of rewards.

5.1.2 Teacher Use of One-to-One Interaction and Child Performance in Different Types of Instructional Methods.

In line with teacher perceptions that children with high CU traits may need close and continued supervision (Chapter 2), the findings of the classroom observation study indicated that teachers tended to use more frequent one-to-one teacher-child interaction, accounting for externalising problems and demographic variables. Qualitative findings of the interview study indicated that teachers perceived children with externalising problems and high CU traits as exhibiting varying performance across different instructional methods. Specifically, these children were performed poorly in teacher-directed activities, yet they performed as well as their typically developing peers in child-directed individual learning and during closely supervised one-on-one teacher-child interactions. Consistent with the interview study findings, the observation study also found that children showed better engagement in child-directed activities compared to teacher-directed activities, and all children responded positively to one-to-one teacher-child interactions. However, findings of the observation study suggested that variations in performance across instructional methods may be due to the nature of these methods themselves and/or to child externalising problems, rather than to CU traits. After controlling for other study variables, findings indicated that both child academic engagement and externalising problems varied across different forms of instructional methods .

While bivariate correlations initially indicated a significant association between CU traits and academic engagement, this significant relationship disappeared after adjusting for other variables. Furthermore, CU traits did not moderate the relationship between instructional methods and academic engagement as expected.

5.1.3 CU Traits as a Risk Factor for Teacher-Child and Teacher-Caregiver Relationships and Their Impacts on School Outcomes

The interview study in Chapter 2 investigated teachers' perceptions regarding how TCRs and teacher-caregiver relationships differ for children high and low in CU traits, and the impact of these relationships on children's academic performance and behaviour. While teachers recognized the benefits of good TCRs in promoting children's school outcomes, they were more likely to face challenges with children exhibiting high CU traits due to their misbehaviour. It is important to note that some teachers identified positive aspects of their relationship with children with CU traits. Furthermore, while teachers often viewed their relationship with children high in CU traits as strained, this was generally not seen as influencing their academic engagement or response to rewards and discipline. In contrast, good quality TCRs were viewed as having a positive influence on the academic motivation and classroom behaviour of children with low CU traits. However, teachers did note that poor quality TCRs adversely affected children's peer relationships. For example, teachers reported that when a child was criticised in front of their peers often faced subsequent avoidance or exclusion by those who witnessed the criticism. Teachers also emphasized the importance of positive teacher-parent relationships, but tended to report conflict and/or rare communication with parents of children having high CU traits, which negatively impacted children's TCR quality, behaviour and academic performance. Whenever parents were not available to communicate with the school, grandparents were reported as stepping into the parental role, engaging in the children's school life. Similar to

the TCRs among children in the high CU traits group, teachers also viewed their grandparents of these children also often experienced conflicts or displayed little or no cooperation with teachers.

5.2 Contributions to Theories of CU Traits in the School Setting

This section will discuss contributions of these findings to existing theories.

5.2.1 Deepening Understanding of CU Traits: Extending Research from Schools in Western nations with Older Children and Adolescents to Chinese Preschools

Over the last few decades, research on CU traits has indicated that there are heterogeneous pathways for youth with CP, with CU traits demarcating a distinct subgroup of children displaying more severe and chronic CP (Frick et al., 2014). While much progress has been made in understanding the inter-relationships between CU traits and parent/family risk factors, there has been much less research in the school setting, especially in non-Western countries and in the preschool period. As a preliminary step in investigating CU traits within this relatively unexplored context, this thesis provided initial evidence that CU traits may have similar expression and correlates in Chinese preschool-aged children to those observed in children in Western nations.

Findings of the current thesis were consistent with previous research indicating that interpersonal callousness and a lack of guilt are core features of these traits in children, and are linked to the increased severity of CP (Frick et al., 2014). Teacher interviews provided detailed descriptions of the behaviours of children with CU traits in the school classroom and in the playground, illustrating their tendency to value gains from aggression, to seldom appear feeling sorry or guilty after misbehaving, and even deriving pleasure from others' distress. In addition, in line with previous studies that found that CU traits were related to problematic interpersonal relationships in schools (Allen et al., 2018; Crum et al., 2016; Horan, et al., 2016; Hwang et al., 2022), the interview study in the current thesis also found CU traits were related to poor quality TCRs. Moreover,

the findings of this thesis echoed those of studies with older children on teachers' use of harsh discipline (Hwang et al., 2020) and the need for close and continued supervision (Allen et al., 2018). The interview study and the classroom observation study showed that Chinese preschool teachers also did not increase the harshness of discipline in response to children with high CU traits. Furthermore, children high in CU traits required close supervision and more frequent one-to-one teacher-child interactions, as recognised by teachers in qualitative interviews (Chapter 2), which was further supported by observations of teacher and child behaviour in class (Chapter 3).

Beyond these similarities, some findings of the studies presented in this thesis also diverged from previous research conducted with older children and/or within the Western cultural context. Notably, some findings, such as children's responses to teacher discipline and rewards, exhibited inconsistencies even across the three studies within this thesis. These inconsistencies warrant careful consideration when interpreting findings in relation to both past studies and the current research, particularly with respect to the use of different study designs and methodological approaches, cultural influences, and developmental differences, all of which will be discussed in detail in the following sections.

5.2.2 The Potential Impact of Different Assessment Methods on Research Findings on CU traits in the School Setting.

Different measures have been used to assess CU traits and associated risk correlates, including interviews, questionnaires completed by various informants (such as teachers, self-reports, and parents), experimental tasks, and observational methods. Clearly, it is not possible to determine a superior approach among these methods, as each possesses its own strengths and limitations (Queirós et al., 2017). Thus, one cannot assert that any method is perfect for studying CU traits; rather, each measurement offers distinct insights

into the nature of CU traits and their interplay with the environmental context, and each faces unique challenges. Interviews are effective in yielding in-depth insights and detailed contextual information, which are crucial for research on CU traits and school-related factors, given the limited number of studies conducted within the school setting to date. However, as discussed in Chapter 3, qualitative interviews do not aim to quantify variables, making it challenging to isolate the effects of CU traits from other potential confounding factors, such as externalising problems or a poor quality TCR. For instance, teacher interviews in Chapter 2 suggested that CU traits influenced children's academic engagement across different instructional methods. Specifically, children in the high CU traits group performed comparably to their low CU peers in child-directed activities, such as individual learning activities and one-on-one interactions with teachers, but displayed poorer engagement in teacher-directed activities. However, in the observational study, when controlling for other potentially confounding variables such as externalising problems, neither a significant relationship between CU traits and academic engagement nor a moderating effect of CU traits on the relationship between instructional methods and academic engagement was found. However, it is also possible that the conflicting findings are due to the small sample size and limited observation window in the classroom observation study.

Questionnaires have been the most commonly used assessment tool in studies on CU traits in the school setting. Questionnaires are quick and cost-effective to administer and score, making them suitable for collecting quantitative data (Duckworth & Yeager, 2015). However, self-report measures such as interviews and questionnaires require respondents to integrate information from past memories across different contexts, and therefore, they inevitably involve subjective biases (Duckworth & Yeager, 2015). For instance, reports from teachers and children may be influenced by halo effects. This means that global evaluations could skew teachers' and children's judgments or ratings of specific

qualities or traits (Nisbett & Wilson, 1977). Consequently, teachers and students may provide more negative ratings towards each other than is actually the case, especially since CU traits have been linked to poor quality TCRs. For example, in the interview study described in Chapter 2, teachers reported using fewer rewards for children with high CU traits. In contrast, the observational study presented in Chapter 3 revealed that teachers actually maintained the same frequency of rewards regardless of the children's CU trait levels. However, classroom observation was limited to a narrow window of time due to its resource-intensive nature, whereas questionnaires enable the assessment of teacher-child interaction over longer time periods and during a wide range of different instructional methods. Another example of inconsistent results of different studies included in the current thesis can be found in interview study findings (chapter 2), where teachers perceived themselves as less likely to interact with children with high CU traits due to their less frequent responses to teachers' instructions. However, contrary to these perceptions, observational study findings revealed that teachers actually engaged in more frequent one-to-one teacher-child interactions with children who have high CU traits. Once again, this may be due to the presence of externalising problems or a poor quality TCR, or it may be due to reactivity effects during the classroom observation, leading teachers to interact more with children they may usually avoid due to their unique characteristics and/or comorbid CP.

Reports from teachers and children may also be influenced by social desirability biases, where responses are skewed more positively to portray respondents in a more favourable light, rather than accurately reflecting their behaviour or relationships (Nederhof, 1985). For instance, findings on the relationship between CU traits and reward sensitivity differed for the interview and questionnaire studies. This divergence could be attributed to the context in which the responses were given. Teachers, when interviewed in the presence of the researcher, might have portrayed a more favourable view of reward

effectiveness for children high in CU traits, compared to potentially more candid responses when completing a questionnaire anonymously.

An alternative approach to teacher and child report is the use of experimental tasks. Observing children through performance during experimental tasks decrease the possibility of their responses being influenced by confounding variables and do not rely on subjective judgements from teachers or children, providing a more objective assessment of children's cognition and behaviour (Duckworth & Yeager, 2015). However, experimental tasks lack ecological validity, as they often do not fully mirror real-life contexts and typical teacher-child interactions in classrooms. The incentives used in tasks, such as virtual balloons (Centifanti & Modecki, 2013), coloured shapes (White et al., 2016), and monetary rewards (Cohn et al., 2015), are far removed from the practical and meaningful experiences or activities children encounter in schools (see Chapter 3 for a more detailed discussion). This discrepancy raises questions about the applicability of experimental findings to everyday educational scenarios. It may help explain the inconsistent findings in the current thesis, where teachers reported little difference in effectiveness across reward types (as discussed in Chapters 2 and 4), contrasting with previous studies using computer-based experimental paradigms that found that CU traits were associated with increased responsiveness to tangible rewards (O'Brien & Frick, 1996; Frick et al., 2003), but decreased responsiveness to social rewards (Chhoa, 2023). However, it should be noted that even within studies using experimental tasks, the findings on the relationship between CU traits and reward sensitivity is mixed, which may be due to differences in task design and sample characteristics (Byrd et al., 2018; Zhang et al., 2023)

Classroom observation enables the observation of children and teachers' behaviour in real classrooms, offering a more ecologically valid perspective on how CU traits may influence teacher-child interactions (Aspland & Gardner,

2003; Queirós et al., 2017). However, as noted in Chapter 3, the classroom observation study in this thesis has its limitations, particularly in terms of being restricted to specific locations, and for a limited duration of time, with pandemic restrictions on data collection meaning that not all children could be observed in all instructional contexts. On one hand, the non-significant relationships found between CU traits and punishment insensitivity, which contrast with previous research (see review in Section 1.3.1 in Chapter 1), might be attributed to the classroom observation study more accurately capturing how children actually respond to teacher discipline, as opposed to teacher and child report that may open to subjective bias, or due to the greater ecological validity of observation relative to experimental tasks. On the other hand, this result could also be due to the limited observation time in the classroom observation study, possibly resulting in insufficient occurrences of children receiving teacher discipline to have the power to detect a significant effect. Furthermore, observation in the current thesis was confined to the classroom setting during academic activities. Children high in CU traits may receive more frequent teacher discipline and/or exhibit different responses in other school environments, such as the hallways or playground, which were not captured in this study.

Overall, the current thesis found some consistencies across studies, including no significant relationship between CU traits and increased frequent or severity of teacher discipline (Chapter 2, 3), the need of intensive teacher supervision for children with CU traits (Chapter 2, 3), no difference in child responses to different types of teacher rewards (Chapter 2, 4). However, there were also mixed findings on the relationship between CU traits and academic engagement across different instructional methods (Chapter 2, 3), the frequency of teacher use of rewards and one-to-one teacher-child interaction (Chapter 2, 3), as well as the direction of child responses to rewards (Chapter 2, 4). In conclusion, the mixed findings indicated the complex interplay between

CU traits and reward sensitivity in educational contexts, which contributed the ongoing debate in the literature regarding CU traits and the relationship between CU traits and reward sensitivity (Byrd et al., 2014; Blair & Zhang, 2020) by deepening our understanding of how different research designs may influence research outcomes. Therefore, the current thesis suggested the need for more studies employing multi-informant, multimethod approaches in educational settings, incorporating observation of teacher-child interaction across different learning contexts and expanding from the classroom to school hallways and playgrounds.

5.2.3 East-West Cultural Variation in the Manifestation and Correlates of CU Traits

The conceptualization of CU traits has predominantly been through a Western lens, with assessment measures developed based on Western samples, raising concerns about the applicability and interpretation of these measures in non-Western cultures. Personality traits, especially traits that are considered a deviation from social and moral norms, might be expressed and perceived differently across cultures. In contrast to the individualism of Western cultures, where loosely connected social networks and a focus on self-care predominate (Hofstede, 1980), Eastern cultures, especially Chinese, emphasize collectivism and the Zhongyong thinking style, valuing tightly-knit social units like families and placing a strong emphasis on harmony through considering others' perspectives and compromising during conflicts (Shou et al., 2021; Yao et al., 2010). Reflecting these cultural values, there are suggestions that personality frameworks should incorporate indigenous Chinese concepts such as Harmony, Face, Renqing (interpersonal relations), and family orientation, instead of solely relying on the individual-oriented attributes that are typical of Western models of personality (Cheung et al., 1996; Yang, 2006).

Cultural distinctions on studies on CU traits in Western and East Asian nations are evident in empirical research. Studies from East Asian contexts indicate potential cultural influences on the relationship between CU traits and risk correlates including aggression, and peer affiliation (Hwang et al., 2022; Sng et al., 2020). Child aggressive and antisocial behaviour is a common correlate of CU traits in Western samples, to the point that these constructs are often used to validate new measures of CU traits (Ezpeleta et al., 2013; Frick et al., 2014; Frick & White, 2008; Kimonis et al., 2016). However, a recent systematic review found that CU traits was not consistently related to aggression in Asian children (Sng et al., 2020). Moreover, systematic differences have been found in parental and child report of CU traits using the ICU (Allen et al., 2021; Fung et al., 2009), highlighting potential cultural variation in the perception and measurement of these traits in Western and East Asian nations. When reporting on CU traits, teachers and parents use a frame of reference that is inherently shaped by the social norms and values of their specific cultures, therefore resulting in 'reference bias' in their judgments (Duckworth & Yeager, 2015). However, findings from teacher interview in the present study speak to the universal nature of CU traits in children, with teachers identifying children high in these traits as exhibiting similar features, behaviours and correlates to teachers in Western nations (e.g., Allen et al., 2016; Allen et al., 2018), such as a lack of empathy, low guilt, comorbid externalising problems, bullying of peers, and insensitivity to punishment. While China has a strong cultural influence in East Asia, there is also heterogeneity across this region, with each East Asian nation having its own unique culture and norms, potentially explaining discrepant findings.

The current thesis also found that cultural factors may shape the school experiences of children with CU traits in Chinese preschools. As previously mentioned, the question of whether CU traits are associated with hyperactive or hypoactive sensitivity to rewards remains a topic of ongoing debate (Byrd et

al., 2014; Blair & Zhang, 2020). Besides the different measures used to assess reward sensitivity, another plausible explanation for the mixed findings observed in various studies could be the different types of rewards assessed. Reduced sensitivity to affiliative rewards has been frequently linked to CU traits and theorized as a key factor in the development and stability of these traits over time (Waller & Wagner, 2019). An interesting finding of the current thesis contrasts with theory and past research (Waller et al., 2013; Waller & Wagner, 2019), is that children with CU traits responded positively to social rewards (Chapters 2 and 3), and their responses to social rewards did not differ from their responses to other types of rewards (Chapter 4). Influenced by Confucian values that emphasize respect for elders and obedience to authority (Chen & Chung, 1994; Hu et al., 2021; Wu et al., 2018), social rewards from teachers, such as praise or hugs, may not only serve as affiliation rewards, but also be seen as effective tools for enhancing children's social status among peers. Considering that children with CU traits are highly motivated by rewards that promote social dominance (Allen et al., 2018; Foulkes et al., 2014; Pardini et al., 2003), findings of the current thesis suggest that social rewards could potentially be effective for these children in Chinese classroom settings.

In addition, past research has suggested that CU traits may be associated with poorer peer relationships and reduced benefits from peer cooperative learning due to a callous interpersonal style and poor social competence (e.g., Bird et al., 2019; Kimonis et al., 2004; Waller et al., 2017a). Contrary to the expectation of negative impact of CU traits on peer interactions, but in line with the study conducted in South Korea that found no significant relationship between CU traits and peer acceptance (Hwang et al., 2022), the current thesis similarly indicated no relationship between CU traits and peer cooperation. As previously mentioned, collectivism and Zhongyong thinking style in Chinese culture may explain why children with CU traits in the current study did not show a significantly less peer cooperation. That is, the emphasis on group harmony

and willingness to compromise in disagreements could potentially override the typical pattern of peer interaction difficulties often observed in children with CU traits in Western contexts.

Another example illustrating the importance of cultural factors in shaping school experiences is the observed role of grandparents in children's education. As collectivism values the interests of the family unit, Chinese grandparents frequently step in as primary caregivers, especially in cases where parents are not available, such as when children in rural areas are 'left behind' when parents move to cities for work. This thesis is the first to identify the close engagement of grandparents in children's schooling in the context of CU traits research in schools. This finding suggests that recognizing culturally distinct factors can identify additional resources and support systems, which can be harnessed to promote the well-being and academic success of children with high CU traits. In summary, past research and the findings of the current thesis reveal possible cultural variations in the correlates of CU traits, demonstrating the importance of integrating cultural considerations in research, as this may identify additional risk factors as well as protective or promotive factors that might otherwise be overlooked in more culturally homogenous studies.

5.2.4 The Potential Influence of Different Developmental Stages and Periods of Schooling on Findings on CU Traits in Schools

Early childhood is a particularly important period as it lays the foundation for several key developmental areas. These include an enhanced ability to understand others (Kostelnik et al., 2009), improved affective perspective-taking (Colwell & Hart, 2006), emotion regulation (Cole et al., 1994), and the emergence of emotions such as shame and guilt (Kostelnik et al., 2009), which are critical to the development of conscience (Kochanska et al., 1993). Child temperament tends to be more malleable during early childhood due to the rapid developments in these key areas in this period. Therefore, early

identification and intervention for CU traits may be especially effective at the preschool age. Early detection and intervention may also help prevent the potential escalation of these traits into more severe CU traits and behavioural problems in later developmental stages (Hawes et al., 2014; Kemp et al., 2019; Kimonis et al., 2019; Waller et al., 2017c). However, despite the value of investigating CU traits in early childhood, the majority of existing research has focused on older children and adolescents. Considering the distinct features of different developmental stages, the presentation and correlates of CU traits in younger children may differ from those observed in studies with older children and adolescents. For instance, unlike findings in older children that linked overt aggression to boys with high CU traits and relational aggression to girls with high CU traits (Marsee et al., 2005), no significant relationship has been identified for CU traits and gender differences in types of aggression among preschool children (Georgiou et al., 2019). In addition, findings of another study indicated that the significant association between CU traits and cognitive empathy deficits in boys was observed in early childhood but diminished during adolescence (Dadds et al., 2009).

The findings of the current thesis suggested that different developmental stages may account for inconsistent findings with past studies. Contrary to earlier studies which indicated that teacher rewards, particularly social rewards, may not be effective for children with high CU traits (Allen et al., 2016, 2018; Hwang et al., 2021), and that CU traits could be associated with a reduced use of teacher rewards in older children (Hwang et al., 2020), this thesis found that children responded positively to teacher rewards (Chapters 2 and 3) and teachers were observed maintaining a similar frequency of rewards for all children, irrespective of their CU traits status (Chapter 3). Therefore, positive, reward-based strategies may be particularly effective for these high-risk children when addressing classroom behaviour in preschools. Moreover, while previous theories have associated CU traits with reduced punishment

sensitivity (Frick et al., 2014), the classroom observation study in this thesis found no such significant relationship. The greater malleability of children's temperaments during early childhood, combined with the more potent role of adult attention at this developmental stage (Hawes & Allen, 2016), likely contributes to the more positive findings on the effectiveness of teacher strategies in the current thesis. However, it is crucial to acknowledge that the interview study (Chapter 2) did find teachers viewing children with high CU traits displaying insensitivity to teacher discipline, thus the inconsistent findings may not be solely due to age differences but may also be due to different assessment methods, as discussed in Section 5.2.2.

In addition to the distinct developmental characteristics of different age groups, variations across different schooling stages may also influence the manifestation and correlates of CU traits. For example, unlike in secondary schools where children typically have different teachers for each subject, preschool classrooms usually have fixed teachers (often two teachers per classroom in Chinese preschools). This arrangement allows preschool teachers to spend more time with the children, thereby facilitating the development of closer teacher-child relationships, which may also contribute to a better child responses to teacher rewards and discipline. Moreover, preschool children, due to their inherent vulnerability and limited self-regulation abilities, often depend more on teacher support and guidance (Verschueren & Koomen, 2012). Preschool teachers provide children with close supervision, which enables teachers to prevent problematic behaviour or intervene early to ensure children's engagement and cooperation. These unique features of the preschool context may explain the lack of significant associations between CU traits, academic engagement, and peer cooperation in the current thesis (Chapter 3). In conclusion, the findings of the current thesis highlight the importance of considering age-specific and context-specific factors in future research to enrich our understanding of CU traits in the school setting.

5.3 Limitations and Future Directions

In previous Chapter 2, 3 and 4, I presented specific limitations pertaining to each study within this thesis. This section aims to synthesize the overarching limitations that are common across these studies, as well as to propose potential directions. First, all studies employed a cross-sectional design. This means that the direction of relationships between constructs is unknown. For example, the current findings indicate a significant relationship between CU traits and an increased frequency of one-to-one teacher-child interactions, it remains unclear whether CU traits lead to changes in teacher practice, or vice versa. Intuitively, it may appear that the more severe CP in children with CU traits result in more frequent teacher intervention. However, considering the evidence of a bidirectional relationship between CU traits and parental practices in family contexts (Hawes et al., 2011; Trentacosta et al., 2019; Viding et al., 2009; Waller et al., 2012), it is possible that a similar reciprocal dynamic may exist between CU traits and teacher practices. Future research should use a longitudinal design to investigate the direction and change in relationships between CU traits and school-related factors across different periods of schooling, from early childhood onwards.

In addition, as summarized in the Section 5.1.1, the findings for children's responses to rewards in the current thesis were mixed. The interview study suggested a generally positive impact of rewards, and the observation study indicates potential positive responses to social rewards. In contrast, the questionnaire study found that CU traits were associated with significantly reduced reward responsiveness. While the observational study aimed to offer a more objective insight into this relationship, its small sample size and limited observation window limited its ability to determine the relationship between CU traits and sensitivity to different types of rewards due to the low frequency of occurrence of rewards that were non-social in nature. However, given trends in

teacher training to emphasize praise and other forms of social rewards and to minimize or avoid the use of tangible rewards, current thesis findings may simply reflect the reality of reward-based classroom management strategies in the current Chinese preschool context. Given the varied findings across methods, a multi-method approach could be helpful in providing additional information on the relationship between CU traits and reward sensitivity.

Furthermore, teachers and parents were not comfortable with filming teacher-child interaction, which meant that coding had to be conducted live. This meant that the coding scheme may not have been able to capture more nuanced or subtle responses to rewards or other aspects of teacher-child interaction. In addition, since filming was not permitted, researchers had to be physically present in the classroom to conduct live coding. Despite efforts to minimize observer influence on teachers' behaviour, the presence of observers in Chinese classrooms could still lead to social desirability bias. Teachers might employ more positive strategies than usual to demonstrate professional competence and maintain harmony, a cultural emphasis in China known as 'saving face' (mianzi) (Yin & Lee, 2012). This adjustment in behaviour could skew results, making the findings appear more positive than typical daily routines truly reflect. Research and consultations with parents and teachers about how to address their concerns about videorecording classroom interactions would be useful and enable more fine-grained coding schemes. Extending the research period in each classroom in future studies may also be beneficial, as it would give teachers and children more time to become familiar with and adjust to the presence of observers, potentially leading to more natural behaviours.

The second limitation of this thesis is the potential for single-informant bias. Despite efforts to observe teacher-child interactions in the classroom, the assessment of CU traits and externalising problems across the three studies

and both the interview and questionnaire studies were solely based on teacher reports. This reliance on a single informant for data collection could lead to biased results, given that children's behaviours can be context-dependent, manifesting certain emotional or behavioural problems only in specific environments (Richardson & Day, 2000). Another limitations of relying on teacher report in the interview and questionnaire studies is that teachers may not be fully aware of covert CP that are nonconfrontational in nature, such as stealing or lying, and therefore may not accurately perceive or report children's CP (Frick et al., 2009). Besides, the presence or co-occurrence of other mental disorders such as ADHD or autism can contribute to disruptive behaviours (Rogers et al., 2006; Waller et al., 2015). Other mental health problems like autism may also present similarly to CU traits (Jones et al., 2010). Therefore, although efforts were made to exclude children with autism, developmental delays, or physical health issues that might introduce bias in the findings, it remains possible that some children in the current research could have clinical or subclinical levels of these conditions that were not recognized by teachers. Moreover, in the interview study, although teacher reports of child externalising problems have been examined across schools, there could be variations among teachers or within individual classes. Future studies might benefit from increasing the number of children each teacher reports on, which would allow for an analysis of variations at the teacher and classroom levels. Nevertheless, asking teachers to report on multiple students might increase their workload, which could, in turn, impact the reliability of the data collected.

Furthermore, different informants who play different roles in children's lives (e.g., fathers vs. mothers, or parents vs. teachers) may each perceive and report distinct aspects of a child's behaviour, which could lead to divergent assessments of the target variables (Renk, 2005). Unfortunately, although this thesis intended to include parents as participants, nearly all parents approached refused to participate, leading to a revision of the research plan

and a reliance solely on teacher report. Future research could offer incentives for parental participation to encourage parental involvement and potentially incorporate additional parent reports and/or clinician diagnostic assessments of ADHD, autism, and other neurodevelopmental disorders to minimize potential confounding factors and cross-validate the teacher reports

Given that children with high CU traits may exhibit atypical expressions of happiness, teacher reports on the RRQ might not fully capture the true motivational values of different rewards, especially for items that require teachers to assess whether a child appears happy. However, considering that research predominantly shows that CU traits are related to deficits in negative emotions more than positive ones, these concerns might be overstated. Similarly, future research should also consider children's perspectives as a critical component of understanding CU traits and CP in different contexts. While interviews with young children tend to have low reliability, experimental tasks and observation paradigms (e.g., temptation tasks) have been used to assess different forms of CP in young children, as well as punishment insensitivity (Briggs-Gowan et al., 2014; Chhoa, 2023) and reward sensitivity (Chhoa, 2023; Wagner et al., 2023). If discrepancies between children's self-perceptions of happiness and its recognition by teachers are confirmed, revising the wording of items in the RRQ may be needed. Incorporating parental reports and child experimental and/or observational methods could have offered a more complete picture of the children's behaviour and reduced the risk of shared-method variance.

The final limitation of this thesis is the homogeneity of the sample. All participants were Chinese and recruited from mainstream preschools in Shanghai, China. This uniformity in cultural background calls for careful consideration when extending the findings to different cultural contexts, particularly in light of potential cultural influences on the expression and

correlates of CU traits (Sng et al., 2020). Additionally, only including children from mainstream preschools means that it is likely that the severity of CU traits and CP is lower compared to those in clinically referred children or children attending special education schools. Moreover, the applicability of these findings to various stages of schooling also warrants careful consideration due to the differences in the nature and intensity of teacher-child interaction at each stage, as well as differing expectations for child behaviour and level of independence in learning. Finally, although preschools varying in teaching quality and environmental standards were included in this research to enhance the sample's diversity, all being located in Shanghai, an economically prosperous city (Shanghai Municipal Bureau of Statistics, 2021), might limit the applicability of the findings to economically disadvantaged regions. For example, while the current study identified a unifactorial structure for the RRQ, different samples or contexts, such as variations in age, culture, or settings, might reveal a multifactorial structure like a three-factor model distinguishing tangible, social, and activity rewards. Therefore, future research should aim to include a more diverse sample in terms of socioeconomic status and ethnicity to enrich our understanding of CU traits in educational settings.

5.4 Strengths of the Thesis and Practical Implications for Schools and Teachers

Despite its acknowledged limitations, this thesis had several notable strengths. Firstly, it adopted a multi-method approach, including interviews, classroom observations, and questionnaires. By using an exploratory mixed-method approach, the thesis provided a comprehensive, nuanced, and contextually relevant understanding of CU traits while mitigating biases inherent in single-method research (Eid & Diener, 2006). A particularly innovative aspect of this thesis was its pioneering use of classroom observation to investigate children's responses to teacher rewards, discipline, and instructional methods in real-time classroom settings. This extended beyond previous research that

predominantly relied on teacher and child reports or experimental tasks, offering more objective and ecologically valid insights into teacher-child interactions. Although the findings from the observation study were preliminary and needed to be interpreted with caution, they could inform the design of future classroom observation studies of CU traits in school settings. Future studies could benefit from employing a more nuanced coding system that expands beyond basic positive and negative categories to encompass a broader range of emotional and behavioural responses. Additionally, extending the observation period and expanding the observational scope to include areas outside the classroom, such as hallways and playgrounds, could yield more comprehensive insights into how CU traits influence teacher-child interactions across different school environments. Furthermore, if feasible, utilizing video recordings instead of live coding could enhance the precision of data analysis, allow for a more detailed coding scheme, and reduce the observer effect by eliminating the need for observers to be physically present in the classroom.

Secondly, this research explored the relationship between CU traits and multiple dimensions of teacher-child interaction within a Chinese preschool context, a relatively uncharted area. This investigation enriched the understanding of CU traits with consideration of cultural and developmental differences. Thirdly, this thesis was the first to investigate the relationship between CU traits and instructional methods. It expanded the existing body of research on teacher-student interactions beyond the realms of rewards and discipline, introducing instructional methods as a potential protective factor to buffer the negative impacts of CU traits on children's school outcomes

With the strengths discussed above, the findings of this thesis have practical implications for promoting effective classroom management and instructional methods, as well as informing school-based interventions designed to help teachers to better understand and respond to the challenges associated with

CU traits in the preschool setting. Although findings on reward sensitivity were mixed in the current thesis, findings of the interview study (Chapter 2) and observation study (Chapter 3) suggested that teacher reward-based strategies are effective for children with CU traits. While the classroom observation study in the current thesis found that teachers applied rewards consistently across children regardless of their level of CU traits, the interview study indicated that teachers perceived themselves as having less chance to reward children with high CU traits due to their general poor performance. Therefore, teachers might need additional training to identify and acknowledge positive behaviours or improvements in children with high CU traits, as well as adapting a more inclusive reward strategies, ensuring that their teaching practices are equitable and sensitive to the unique needs of these children.

Notably, the finding that teachers do not perceive significant differences in children's responses to different types of rewards supports the use of a unified reward system (Chapter 4). This can simplify design and implementation of reward-based interventions, making it easier for teachers to employ a consistent approach across all students with both high and low CU traits. Moreover, the findings also suggests that environmental factors, such as teacher-child relationship, the presence of peers and the types of rewards used by teachers, could have diminished the perceived differences in the motivational value of social versus tangible rewards for children with high CU traits in Chinese preschools. For example, publicly praising a child in front of their peers has been identified as the most effective rewards for children with high CU traits, while common tangible rewards in preschool, such as stickers, may be less appealing to these children. This suggests that teachers might employ more social rewards, such as leadership roles or public acknowledgements, which could be more motivating and better suited to these children's needs. Therefore, future research is needed to understand how characteristics of rewards and the context they are delivered in influence

children's perceived values of rewards, which can help teachers to tailor their strategies to effectively meet the needs of these high-risk children.

Previous studies suggested that the pathways leading to poor academic performance in children with CP may differ based on whether or not they exhibit CU traits (DeLisi et al., 2011; Horan et al., 2016), with one proposed factor attributing to poor academic performance in children with high CU traits being the type of instructional method. However, this thesis did not find a significant relationship between CU traits and academic engagement or peer cooperation, nor a significant moderation effect of CU traits on the relationship between instructional methods and academic engagement, after controlling for other variables (Chapter 3). Instead, the findings from both the interview and classroom observation studies indicated that interest-oriented individual learning activities were universally engaging, benefiting all children regardless of their CU traits. These findings suggest offering child-directed instructional methods and close supervision could be effective measures to enhance child academic engagement. Schools could offer professional development workshops focused on child-directed teaching strategies and effective supervision techniques. Curriculum designers are encouraged to integrate elements that allow for student choice, such as project-based learning, to foster engagement. Additionally, school policymakers should support these approaches by ensuring that policies facilitate flexible teaching methods and provide the necessary resources for their implementation.

While teachers recognised the need for close supervision, and used more frequent one-to-one teacher-child interactions with children high in CU traits, they also expressed challenges in providing close supervision due to the practical constraints of managing a classroom with many students. Therefore, teachers may need additional support, possibly in the form of teaching assistants or more feedback on efficient strategies for close supervision to

effectively cater to children with CP and CU traits. Furthermore, with the advancement of Artificial Intelligence in education, intelligent tutoring systems have been developed that can adapt to the individual needs of learners (Chen et al.,2020). This technology can assist teachers in providing customized support to students who require additional help. More encouragingly, although some studies have linked CU traits with poorer treatment outcomes (Hawes et al., 2013; Hawes et al., 2014), the findings of the current thesis provide initial evidence that teachers might not need to rely on highly individualized instructional methods specifically for children with CU traits. Instead, they can use instructional methods that are broadly effective for the entire classroom, such as child-directed instructions (Lerkkanen et al., 2016; Perry et al., 2007), which not only simplifies classroom management but also ensures that all children, including those with CU traits, are engaged and supported in their learning. For schools and intervention developers, these findings advocate for inclusive educational programs that focus on broad efficacy rather than specialized strategies. This could lead to more scalable practices and foster a more cohesive learning environment, reducing potential stigma or isolation of students with CU traits.

Despite the clear benefits of positive TCRs and teacher-parent relationships in enhancing children's school outcomes, the current findings indicated that teachers often had poor relationships with children who exhibited high CU traits, as well as with the parents or grandparents of these children. Thus, fostering positive TCRs and TPRs can be a potential component for interventions targeting children with CU traits. Importantly, this thesis has identified that grandparents are also involved in children's schooling in Chinese preschools. This suggests that school-based interventions in Chinese preschools should also include grandparents in the caregiving team of a child, and communication with grandparents should not be overlooked.

In summary, this thesis has clear practical implications for school-based interventions and teacher practices, including emphasis on reward-based classroom management strategies, child-directed instructional methods, and potential focus of interventions on teacher-child relationship quality and teacher-caregiver communication and cooperation. All of these factors may contribute to establish a supportive and effective learning environment, thereby enhancing prosocial behaviour and academic engagement in children with CU traits. However, it should be noted that these findings are derived from studies conducted in Chinese preschools, which are characterized by specific cultural norms such as a high value placed on respecting teachers, and preschool teachers play a role that extends beyond education to include caregiving responsibilities. These factors may differ significantly from those in other cultural contexts or later educational stages, such as primary and secondary schools. Therefore, when applying these findings to different settings, it is crucial to consider specific cultural norms and developmental stages, emphasizing the importance of tailoring the design and implementation of strategies to the unique context of different educational environments.

5.5 Conclusions

This thesis has explored CU traits and their relationship with school-related factors, including teacher use of rewards, discipline, instructional methods, and child responses to these strategies, as well as teacher-child and teacher-caregiver relationships in a Chinese preschool context. Through a multimethod approach, including being the first study to use classroom observation to assess child responses to classroom management strategies, this research has shed light on the complex relationships between CU traits and various school environmental factors. Specifically, findings for teacher use of rewards and child responses to rewards and discipline were mixed, highlighting the importance of a multiple-methods in obtaining a more comprehensive understanding of CU traits. This thesis is the first to formally test the relationship between CU traits

and instructional methods, with promising findings suggesting that child-directed instructional methods and one-to-one teacher-child interaction may be helpful for children with CU traits, thereby have potential in helping preschool teachers to promote academic engagement in children high in CU traits.

A key contribution of this work is its extension of existing research from older children and adolescents in schools in Western nations to the Chinese context with younger children, a relatively uncharted area in CU traits research. This shift enriches the empirical base that current theoretical frameworks draw on and also offers practical implications for teacher training, classroom management, and the development of intervention programs tailored to the needs of children with high CU traits in early education settings. The findings from this thesis also suggested that future research investigating these relationships using multi-informant, multi-method longitudinal research design with diverse samples. They also highlight the importance of incorporating cultural, developmental, and methodological considerations in educational psychology research. In conclusion, this thesis not only deepens our understanding of CU traits in school environments but also serves as a foundation for ongoing research and informs enhancements in teaching practices, thereby making meaningful contribution to the well-being and development of these children with high CU traits.

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Appendix A: Interview Schedule

Introduction and Scene Setting:

Thank you very much for agreeing to be interviewed to be part of my research project. The purpose of this interview today is to explore how children with behaviour problems behave in school, how they respond to classroom management strategies, and how teachers get along with these children and their parents.

Your responses will be confidential. Depending on the amount of information that you are happy to provide, the interview should take no longer than approximately 120 minutes.

The first section asks about children's disruptive behaviours in the classroom.

- **Description of disruptive behaviour** (explain disruptive behaviour to teachers if it is needed: e.g. temper tantrums, interrupting class, aggressiveness)
 - a) Generally speaking, what disruptive behaviours does [target child] show?
 - b) How often does [target child] show disruptive behaviour (probe for each example given)?
 - c) Could you please give me typical examples? Just imagine what happened in the classroom are all filmed and then please describe in detail what we can see in this video which recorded [target child]' disruptive behaviour (probe for each example given)?
 - What do you think are the reasons for [target child's] disruptive behaviour?

● **CU traits: Clinical Assessment of Prosocial Emotions (CAPE 1.1)**

Informant Interview

Introduction: I am going to ask you about _____ emotions and how he/she gets along with other people. I am going to ask you to answer most of these questions with either a “yes” or a “no” answer. However, if you would like to tell me more about an answer, please do so. Also, please try to be as accurate and honest as possible in trying to answer the questions.

1)Lack of Remorse and Guilt

1. Does _____ seem to feel bad or guilty if he/she does something wrong or if he/she hurts someone? Yes / No

Please give some examples of this:

If no: a. Is this how he/she is most of the time and with most people? Yes / No

b. Has he/she been like this for a long time; that is, for at least a year?

Yes / No

c. Can you think of anytime recently, say over the past month, when he/she has felt bad or guilty about something? Yes / No

If yes: Please describe this:

Go to #2.

If yes: d. Does he/she only feel bad or guilty if he/she is caught doing something wrong and is going to be trouble? Yes / No

If yes: Please give some examples of this:

2. Does _____ easily admit to being wrong; that is, does he/she accept

responsibility for his/her actions and apologize to people he/she has hurt?

Yes / No

Please give some examples of this:

If yes, go to #3.

If no: a. Is this how he/she is most of the time and with most people? Yes / No

b. Has he/she been like this for a long time; that is, for at least a year? Yes / No

c. Can you think of a time recently, say over the past month, when he/she has admitted to being wrong or apologized to someone he/she has hurt? Yes / No

If yes: Please describe this:

2) Callous-Lack of Empathy

3. Does _____ seem to care and be concerned about the feelings of others? Yes / No

Please give some examples of this:

If yes, go to #4.

If no: a. Is this how he/she is most of the time and with most people? Yes / No

b. Has he/she been like this for a long time; that is, for at least a year? Yes / No

c. Would you describe _____ as seeming cold and callous? Yes / No

If yes: Please give some examples of this:

d. Can you think of anytime recently, say over the past month, when he/she seemed concerned about the feelings of others? Yes / No

If yes: Please describe this:

4. Does _____ make fun of or tease other people in ways that hurt their feelings? Yes /No

Please give some examples of this:

If no, go to #5.

If yes: a. Is this how he/she is most of the time and with most people? Yes / No

b. Has he/she been like this for a long time; that is, for at least a year?

Yes / No

c. Would you describe _____ as being mean or cruel? Yes / No

If yes: Please give some examples for this:

5. Does _____ do nice things for other people, even if there is nothing in it for him/herself, like trying to cheer someone up? Yes / No

Please give some examples of this:

If yes, go to #6.

If no: a. Is this how he/she is most of the time and with most people? Yes / No

b. Has he/she been like this for a long time; that is, for at least a year?

Yes / No

c. Can you think of anytime recently, say over the past month, when

he/she has done something nice for someone? Yes / No

If yes: Please describe this:

3)Unconcerned about Performance

6. Does _____ seem to care about how well he/she does at school, work, or in other important activities? Yes / No

Please give some examples of this:

If yes, go to #7.

If no: a. Is this how he/she is most of the time and with most things? Yes / No

b. Has he/she been like this for a long time; that is, for at least a year? Yes / No

c. Can you think of anytime recently, say over the past month, when he/she felt really bad because he/she didn't do something well? Yes / No

If yes: Please describe this:

7. Does _____ try his/her best and work hard at most things? Yes / No

Please give some examples of this:

If yes, go to #8.

If no: a. Is this how he/she is most of the time and with most things? Yes / No

b. Has he/she been like this for a long time; that is, for at least a year? Yes / No

c. Does he often blame others if he doesn't do well in something rather than take responsibility for his/her poor performance? Yes / No

If yes: Please give some examples of this:

- d. Can you think of anytime recently, say over the past month, when he/she worked really hard on something that required a lot of effort?

Yes / No

If yes: Please describe this:

4) Shallow or Deficient Affect

8. Does _____ show his/her feelings and emotions openly to others?

Yes / No

Please give some examples of this:

If no: a. Is this how he/she is most of the time and with most people? Yes / No

- b. Has he/she been like this for a long time; that is, for at least a year?

Yes / No

- c. Can you think of anytime recently, say over the past month, when he/she has shown a lot of emotion? Yes / No

If yes: Please describe this:

Go to #9.

- If yes: d. Does he/she only show emotions when he/she gets in trouble or doesn't get his/her way? Yes / No

Please give some examples of this:

- e. When he/she shows feelings and emotions, do they seem real, sincere, and genuine? Yes / No

Please give some examples of this:

- f. When he/she shows feelings and emotions, is this only when he/she can benefit, like looking sad to avoid getting in trouble or looking mad to get what he/she wants? Yes / No

Please give some examples of this:

9. When something bad happens to someone else, does he/she seem genuinely upset?

Yes / No

Please give some examples of this:

If yes, interview complete.

If no: a. Is this how he/she is most of the time and with most things? Yes / No

b. Has he/she been like this for a long time; that is, for at least a year?

Yes / No

c. Can you think of anytime recently, say over the past month, when something bad happened to someone and he/she seemed upset?

Yes / No

If yes: Please describe this:

The next section focuses classroom management strategies, including rewards, limit settings well as instructional methods. I am going to ask a few questions about what kinds of strategies do you use in classroom and how does [target child] responses to them.

● **Classroom Management Strategies**

- a) What types of reward techniques do you use to [target children]?
- b) How does [target child's name] respond when you reward them?
-Why do you think s/he responded this way?

- c) What types of discipline techniques do you use to [target children]?
- d) How does [target child] respond when you discipline them?
- Why do you think s/he responded this way?
- e) What types of instructional methods do you use in class

f) How does [target child] respond when you use these instructional methods (probe for each example given)

- Why do you think s/he responded this way?

If teacher doesn't mention items below, then probe:

1. How does [target child] respond to direct instruction, lectures, train and practice independently/in groups, and whole - group instruction (**traditional instructional methods**: teacher - and/or subject - centred principles; teachers use formally structured routines in accordance with curriculum requirements)

2. Why do you think s/he responded this way?

-Probe for each example given

3. How does [target child] respond to your questions, independent learning/searching and discussion activities (**cognitive - constructivist instructional methods**: teachers consider students' needs and challenges, scaffolding and guiding their learning)

-Probe for each type of questions given (e.g. open-questions, ask questions in front of the whole class, only ask questions to the [target child])

-Generally speaking, does [target child] initiate questions?

If yes, please give a typical example

4. Why do you think s/he respond to you this way?

-Probe for each type of questions given

5. How does [target child] respond to you during group activities/cooperative learning? (**social - constructivist instructional methods**: These practices value the construction and interpretation of knowledge through an active relating of new information and skills to previous

knowledge and experience in collaboration among students. Teachers establish problem - solving situations within a group of learners)

6. Why do you think s/he responded this way?

-Probe for each example given

g) How does [target child] respond to your feedback

h) Why do you think s/he responded this way

i) How does [target child] perform in play activities

j) Why do you think s/he performs this way?

k) Generally speaking, what kinds of instructional methods do you think are most effective/ineffective to [target child]?

-Why

In this section, I am going to ask you a few questions about teacher-child relationship, parents-child relationship and the impact of these relationships on children's performance in the class.

● **Teacher-Child Relationship**

a) How would you describe your relationship with [target child]?

b) How do you think your relationship with [target child]' influence:

1his/her behaviour in class?

2how well s/he engages with schoolwork?

3how s/he responds to rewards methods?

4how s/he responds to discipline methods?

5how s/he responds to instructional methods?

● **Teacher-Parent Relationship/Interaction**

- c) How would you describe your relationship with [target child' parents]?
- d) What kinds of school activities do [target child's parents] engage in?
 - Frequency (prompt each activity mentioned by teachers)

- e) How do you think your relationship with [target child]'s parents influence:
 - 1>Your relationship with [target child]
 - 2.[target child]'s behavioural performance and adjustment in school?
 - 3. [target child] academic performance in the classroom?
 - 4. Parents' involvement in school?

That's all. Thank you for sparing your precious time answering my questions. Is there anything you'd like to add? Please do let me know if you have any concerns, comments or questions.

Appendix B: Questionnaires

Sociodemographics Questionnaire:

Teacher:

1. Gender Male

Female

2. What is your age? _____ (years old)

3. How long have you been teaching? _____ (years)
_____ (months)

4. How would you describe your ethnicity? _____

Child (reported by teachers):

1. What is the gender of this child? Male

Female

2. What is the age of this child? _____ (years old)

3. How would you describe this child's ethnicity?

4. How would you describe the family structure of this child?

original two-parent family

step/blended family

single-parent family

5. Does this child have any mental illness, autism, developmental delay, or other diseases that severely affect family or school life?

Yes (Please stop filling out the questionnaire for this student)

No (Please continue to fill out the following questionnaire)

Inventory of Callous-Unemotional Traits Instructions: Please complete the background information above. Then read each statement and decide how well it describes the student. Mark your answer by circling the appropriate number (0-3) for each statement. Do not leave any statement unrated	Not at all true	Somewhat true	Very true	Definitely True
1. Expresses his/her feelings openly.	0	1	2	3
2. Does not seem to know "right" from "wrong".	0	1	2	3
3. Seems motivated to do his/her best in structured activities.	0	1	2	3
4. Does not care who he/she hurts to get what he/she wants.	0	1	2	3
5. Feels bad or guilty when he/she has done something wrong.	0	1	2	3
6. Does not show emotions.	0	1	2	3
7. Does not care about being on time.	0	1	2	3
8. Is concerned about the feelings of others.	0	1	2	3
9. Does not care if he/she is in trouble.	0	1	2	3
10. Does not let feelings control him/her.	0	1	2	3
11. Does not care about doing things well.	0	1	2	3
12. Seems very cold and uncaring.	0	1	2	3
13. Easily admits to being wrong.	0	1	2	3
14. It is easy to tell how he/she is feeling.	0	1	2	3
15. Always tries his/her best.	0	1	2	3
16. Apologizes ("says he/she is sorry") to persons he/she has hurt.	0	1	2	3

17. Tries not to hurt others' feelings	0	1	2	3
18. Shows no remorse when he/she has done something wrong.	0	1	2	3
19. Is very expressive and emotional.	0	1	2	3
20. Does not like to put the time into doing things well.	0	1	2	3
21. The feelings of others are unimportant to him/her.	0	1	2	3
22. Hides his/her feelings from others.	0	1	2	3
23. Works hard on everything.	0	1	2	3
24. Does things to make others feel good.	0	1	2	3

Strengths and Difficulties Questionnaire (Conduct problems Scale,
Hyperactivity scale)

Instructions: For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain or the item seems daft. Please give your answers on the basis of the child's behaviour over the last six months or this school year	Not True	Somewhat True	Certainly True
1. Restless, overactive, cannot stay still for long	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Often has temper tantrums or hot tempers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Generally well behaved, usually does what adults request	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Constantly fidgeting or squirming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Often fights with other children or bullies them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Easily distracted, concentration wanders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Often lies or cheats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Thinks things out before acting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Steals from home, school or elsewhere	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Sees tasks through to the end. good attention span	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix C: Observation Protocol

Instructions:

To better fit our research aims, these codes were adapted from The Observed Child Engagement Scale (OCES; Rimm-Kaufman, 2005) and Social Development Lab-Kindergarten Coding System (SDL-K) (Rimm-Kaufman et al., 2007), as well as derived from literature on CU traits in the school setting. Coding will take place during the class in the classroom only, not during recess or gym, for example. Stop coding in the classroom when children are in transition, snack time, or nap given that during these periods we probably could not observe teachers' instructional methods. If half the class has left the room to engage in another activity, such as split reading groups, then this time is considered "observable." Prior to coding, position yourself in the room. It is encouraged to find an observation place that you can see the faces of the teacher and children. It is likely that we may need to reposition ourselves as the day progresses to see the faces of certain children as they move about the classroom. However, it all depends on whether our presence distract children or not. Try to be invisible to teachers and children so that we will not disrupt the class.

To Bring:

- Printed scheduling tools
- Coding forms
- Copy of the coding protocols
- Stopwatch
- Child rosters

Scheduling:

Each target child (TC) should be observed using adapted SDL-K for a 10-minute chunks of time, called *blocks*. Both teachers and children codes will be observed and coded in one block. Each block of SDL-K observation is always followed by a five-minute block of additional observation for the OCES. The scheduling tool should be used to keep track of blocks of observation and shows that all blocks of SDL-K observation are odd-numbered, while all blocks of Child Global Codes are even-numbered. The scheduling tool should always end with an even-numbered block, ensuring that every block of SDL-K coding has a corresponding even-numbered Child Global rating. The OCES should be rated for each child observed. The two observers will observe the same target child and teacher in the classroom at the same time, which ensures reliability of observation data.

Definitions for Observation Codes

To better fit the research aims, these codes were adapted from The Observed Child Engagement Scale (OCES; Rimm-Kaufman, 2005) and Social Development Lab-Kindergarten Coding System (SDL-K) (Rimm-Kaufman et al., 2007), as well as derived from literature on CU traits in the school setting.

Revised OCES codes:

Engagement:

The engagement dimension evaluates a child's active involvement in tasks and instructions, reflecting both intensity and persistence. Highly engaged children are frequently involved in opportunities offered by teachers, showing marked enthusiasm for, and concentration on tasks. Conversely, children with low engagement scores may exhibit aimless wandering in class, engage in activities that do not fit with the teachers' agenda or sit at their desks without engaging in any activities.

Self-reliance:

The self-reliance dimension assesses the extent to which a child displays autonomy, responsibility, and personal initiative. Self-reliant children take control of their own learning, show resilience in the face of challenges, seek adult assistance only after using their own resources, and take the lead in activities or problem-solving with peers. Children low in self-reliance may tend to follow rather than lead. They may lack confidence, exhibit passivity, seek

help for even minor challenges before attempting tasks, and await instructions before initiating any actions.

Attention:

The attention dimension captures the degree to which children exhibit sustained, focused, and direct attention to ongoing classroom activities. Children with high levels of attention consistently concentrate on classroom tasks and show little or no distraction in response to other classroom events. In contrast, inattentive children are easily distracted or engaged in activities other than planned classroom activities (e.g., fidgeting, playing with their clothes), and need frequent prompting and redirecting from teachers to maintain focus.

Disruptive behavior:

The disruptive behavior dimension evaluates overall child disruptiveness in the classroom. Children with high disruptive behavior scores may violate classroom rules or frequently interrupt classroom proceedings, such as calling out inappropriately, annoying others and chatting to peers when it is not allowed. Children with low disruptive behavior scores are generally compliant, cooperative and adhere to classroom rules. These children may be inattentive at times, but they remain quiet and do not disturb others in the classroom.

Peer cooperation:

The peer cooperation dimension evaluates the degree to which children positively engage with others during peer cooperative learning activities. Children with high scores on peer cooperation show pronounced sociability and

enjoyment in peer interaction. These children adeptly cooperate and negotiate with their peers to complete group tasks. Conversely, children scoring low on this dimension may display negative engagement with their peers, including conflict, domineering behavior, and drawing inappropriate attention to themselves.

Revised SDL-K codes:

Teacher-directed activity (context code):

Teacher-directed activities refer to instructions where the teacher decides on the content, pacing, and structure of learning, such as skill-and-drill practices. These activities can be conducted in a whole-class format, led by one teacher, or in smaller groups guided by multiple teachers.

Peer cooperation activity (context code):

Peer cooperation activities, such as role-playing, group tasks, and peer sharing/discussion, are child-directed nature and emphasize on peer collaboration in either small groups or pairs. In these activities, teachers take on a more supportive role, providing guidance, materials, and space, rather than leading the activity directly. The structure of these activities can vary; at times, teachers allocate children into groups or pairs with assigned tasks. Alternatively, in a more flexible format, children are given the autonomy to choose tasks based on their own interests and select their group members or partners for pair work.

Individual learning activity (context code):

Individual learning activities are highly children-directed. These activities allow children the freedom to choose their learning materials and engage in self-directed learning and personal exploration. Children in individual learning activities may choose a book from the classroom library and read it at their own pace, work on individual art projects or played alone with different materials in exploration centers in the classroom.

One-to-one teacher-child interaction (frequency code):

One-to-one teacher-child interaction involves a teacher providing close supervision and personalized guidance to an individual child. For example, during a teacher-directed activity, a teacher might approach a child who is having difficulty with learning task and provide tailored instruction. In a peer cooperation activity, if a child is socially withdrawn, the teacher might engage in a one-on-one conversation to encourage participation. During individual learning activities, such as individual reading, a teacher might discuss the pictures in the book with the child to enhance their comprehension and stimulate their imagination. To avoid overlap with reward and discipline codes, instances where teachers give rewards or discipline to individual children are not considered or coded as one-to-one teacher-child interaction in the current research.

Positive response to one-to-one teacher-child interaction (frequency

code):

A positive response to one-to-one teacher-child interaction is characterized by active engagement in the interaction. This can be demonstrated through adherence to teacher instructions, responsiveness to the teacher's prompts or questions, and an evident interest in the activity or topic at hand. Positive emotional responses, such as smiling, can also be indicative of a positive response to the interaction.

Reward (frequency code):

This code refers to the use of positive reinforcement to encourage desirable behaviors. Rewards can be tangible, such as stickers, or social, such as praise and hugs. They can also be activity rewards, such as extra play time or being the teacher's helper. Each reward should be coded with its specific type.

Discipline (frequency code):

This code refers to strategy used to correct or manage inappropriate or disruptive behaviors. This can include strategies such as disciplinary cues (e.g., "you have to stop talking"), move person (e.g., timeout), move object (e.g., the teacher takes away the box of crayons that the child was breaking.), loss of privileges and criticism.

Harsh discipline (frequency codes):

Harsh discipline is a subcode under the code "discipline". It refers to overly punitive discipline that can negatively impact a child's self-esteem and emotional well-being. This includes actions such as yelling, belittling, using a

stern and intimidating tone of voice, or making harsh criticism about the child rather than their behavior. For instance, a teacher might express disappointment in a way that shames or embarrasses the child, such as saying 'Stop crying like a baby!'

Positive response to rewards (frequency code):

Children expressing enjoyment and appearing motivated by rewards were coded as positive responses to rewards. This could be demonstrated, for instance, by a child displaying a cheerful demeanor upon receiving a reward, showing increased interest in the task at hand, or improving their performance or will complete classroom tasks in anticipation of a reward.

Negative response to discipline (frequency code):

Children who do not comply with behavioral requests, or who display indifferent or aggressive attitudes towards discipline, are coded as exhibiting negative responses. For instance, a child might ignore a teacher's request, continue engaging in disallowed activities, or refuse to carry out actions as instructed by the teacher. Negative responses can also manifest as crying, verbal aggression, or other forms of disruptive behavior.

End of the day: Was this a typical day?

1. Ask the teachers, to what degree was this a typical morning for their classroom? If it was not a typical morning, why not? Does the teacher have any explanation for this?
2. Do you have any reason to think that this was not a typical morning for the TCs? If so, why not? For which TC was the day unusual?

Observation Scheduling

Date:

Class:

School:

Coder:

C/T.ID	Block	Minutes						comment
T: C:	1	10	SDL-K					
	2	5	C. Global					
T: C:	3	10		SDL-K				
	4	5		C. Global				
T: C:	5	10			SDL-K			
	6	5			C. Global			
T: C:	7	10				SDL-K		
	8	5				C. Global		
T: C:	9	10					SDL-K	
	10	5					C. Global	
T: C:	11	10	SDL-K					
	12	5	C. Global					
T: C:	13	10		SDL-K				
	14	5		C. Global				
T: C:	15	10			SDL-K			
	16	5			C. Global			
T: C:	17	10				SDL-K		
	18	5				C. Global		
T: C:	19	10					SDL-K	
	20	5					C. Global	

Date _____ Block _____
Child ID _____ Teacher ID _____ Coder ID _____

Context

Teachers present/interacting:

One regular teacher only Two regular teachers together Changed main
teacher Other

Type of Instructional methods:

- Teacher-directed activity (class-level)
- Teacher-directed activity (group-level)
- Individual learning activity
- One-to-one teacher-child interaction

Contingency/Event	Comments

Rating sheet

Self-Reliance	1	2	3	4	5	6	7	NA
Attention	1	2	3	4	5	6	7	NA
Engagement	1	2	3	4	5	6	7	NA
Disruptive Behavior	1	2	3	4	5	6	7	NA
Cooperative with Peers	1	2	3	4	5	6	7	NA

Scoring Criteria for OCES

Self-Reliance

	1,2,	3,4,5	6,7,
Personal initiative	passive, appears to follow the lead of classmates or seek assistance of adults.	Usually self-directed in a highly structured classroom, but not in situations that require initiative.	Self-directed in both highly structured and less structured classrooms. Appears to anticipate next steps in learning.
Self-regulation	Often non-compliant. May have difficulty managing self, responsibilities and materials May make multiple inappropriate bids for attention.	Manages self, responsibilities and materials with support in a structured classroom.	Manages self, materials and responsibilities even in less structured or challenging classroom environments.
Autonomy	Constantly looks towards teacher for affirmation or	Works well on own in a highly structured	Works well on own in highly structured and

	direction. May appear off task in less structured classrooms	classroom. Only asks for assistance occasionally/ when appropriate.	unstructured classroom settings. Seeks adult guidance only after using own resources. Takes charge of own learning.
Persistence	May stay focused on an easy task, but when faced with a challenge, will show frustration and abandon task.	Exhibits moderate effort and focus during teacher directed task. May appear frustrated but continues with task.	Exhibits high and sustained level of effort and focus. Tolerates frustration but continues with task unphased.

Attention

	1,2	3,4,5	6,7
Attention level	Appears to have difficulty becoming engaged in the topic at hand or may have fleeting attention to the teacher sanctioned activity. Appears off task. May be involved in an activity other than the one at hand.	Shows good attention most of the time, but moderate to poor attention some of the time. Attentive when instruction is interesting, may show wandering attention when instruction is less interesting. May generate another activity to attend to if instruction is not interesting. Attention level may be moderate throughout (showing	Consistently tuned in to what teacher is doing. Shows intense focus on whatever task is at hand.

		intermittent attention toward the lesson or major activity) or may be high most of the time occasional long periods of inattention.	
Sustained level of attention	Attention is fleeting. May be looking around, attending to other objects, staring into space or may create their own diversions.	Attention is moderate in length; longer in situations where material is interesting.	Shows sustained focus on the main activity of the classroom.
Response to intrusions	May try to distract others. Focuses attention on distraction.	Responds to intrusions to attention; gives intrusions moderate attention but returns to task at hand.	Likely to show little to no distraction in reaction to other events of the classroom and resists intrusions to attention.

If you are unsure if the child is really paying attention because s/he is looking at the task, teacher, etc. but you cannot tell exactly what the child is doing, code the midpoint of the scale (4). There should be no reason to code “not applicable” for this code.

Engagement

1,2	3,4,5	6,7
Seldom engaged in classroom learning but may show engagement in activities not sanctioned by teacher. Shows no interest in teacher activities.	Moderately on task to classroom activities, but occasionally the child shows less interest and may engage in behaviors that are incompatible with those offered by the teacher. May show intermittent engagement—go in and out of engaged	Always engaged in opportunities offered by the teacher. Visible enthusiasm, concentration and focus on classroom activities. Actively engaged in classroom learning if the class setting permits. In a highly teacher

	states throughout the session—or may show high levels of engagement most of the time but with long gaps of off task behavior at occasional points in the session.	directed classroom a child high on engagement is leaning forward to see the teacher/ activity and volunteering information whenever the opportunity may arise.
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There should be no reason to code “not applicable” for this code.

Disruptive Behaviour

1,2	3,4,5	6,7
<p>Child cooperates with teacher and peers. Follows classroom rules and is generally compliant.</p> <p>May be inattentive, but this does not disrupt the flow of the classroom.</p> <p>May be reprimanded (down-regulated once or twice) but this was not disruptive to the class.</p>	<p>May show a couple of brief instances that disrupt the classroom; these may involve two or more teacher reprimands or behaviors that annoy other children.</p> <p>Shows evidence of pushing up against the limits of the classroom.</p> <p>Sometimes disruptive behavior goes unnoticed by the teacher; however, it may distract other children in the classroom</p>	<p>Inappropriate, does not follow classroom rules, annoys others, calls attention to self.</p> <p>Inappropriate behaviors include: calling out, making odd noises, talking or singing to self, laughing inappropriately, clowning around, challenging teacher authority/ talking back, ignoring teacher directions/ noncompliant behavior, making faces, or talking to peers.</p> <p>Receives multiple teacher reprimands under typical conditions.</p>

There should be no reason to code “not applicable” for this code.

Cooperation with Peers

	1,2	3,4,5	6,7
Behavior with peers	Engages peers negatively or in	Moderately cooperative or	Highly sociable, chatty and

	an aggressive confrontational manner: being bossy, obstructing the play of others, trying to control or dominate a group learning activity.	neutral engagement of peers.	playful Frequently make bids to other children for social play and conversation
Sociability	<p>Appears to not get along with classmates.</p> <p>May try to impose their agenda on peers.</p> <p>Work alone and refuse to cooperate with peers even if teachers arrange partners for them</p>	<p>Peer interactions are not negative, but child's shows little or no special enjoyment or pleasure interacting with peers.</p> <p>Need teachers to arrange them partners to work with, otherwise they may work alone or retreat if refused by peers</p>	Appears to be very prosocial in interactions with classmates.

We only focus on peer interactions in GLCD activities. If there is no GLCD activities happen during the observation, the code would be N/A.