Social emotions and social functioning in Chinese deaf and hard-of-hearing and hearing preschoolers

Li, Z.

Chapter 1

GENERAL INTRODUCTION

Emotions can serve survival needs and social functioning. Basic emotions such as anger, fear, disgust, happiness, from an evolutionary perspective, are related to the motivations and behavioral reactions that provide individuals with generalized solutions to survival-relevant challenges (e.g., de Waal, 2008; Levenson, 2011). Neuroscientific research has further identified distinguishable neuro-circuitry and pathways for some basic emotions, indicating that basic emotions are innate, hardwire attributes rooted in the human nature (e.g., Bernhardt & Singer, 2012; LeDoux, 2000; 2009). Comparatively, social emotions, such as shame, guilt, pride, and empathy, are a spectrum of emotions serving primarily social functioning, as these emotions regulate one's social behaviors in accordance with the social expectations (Tangney et al., 2007). In other words, social emotions can only be acquired through social experiences, as individuals must understand the social norms before experiencing the corresponding social awareness and emotions (Tracy & Robins et al., 2004).

Social emotions may also be distinguished from basic emotions by their neural mechanisms: social emotions may involve complex social/cognitive functioning, which arise from the coordination and coupling of different brain regions (e.g., Decety, 2015; Lamm et al., 2011; Singer & Lamm, 2009). As social norms vary from culture to culture, social emotions can manifest as different social behaviors and psychological processes in different cultural contexts, therefore, latent cultural impact should always be taken into account when studying social emotions (Li et al., 2023; Takamatsu et al., 2021). In especially child psychology, social emotions are considered a series of key predictors of children's social-emotional development: children's acquisition of social emotions relies on socialization and social learning; and their manifestations of social emotions further contribute to predicting their social competence, internalizing and externalizing behaviors (e.g., Li et al., 2020; Rieffe et al., 2010; Tsou et al., 2021).

Despite the great amount of research on social emotions among adolescents and adults, empirical findings on the development of social emotions of preschool children are scarce (Broekhof et al., 2021; Da Silva et al., 2022; Netten et al., 2015). Furthermore, the development trajectories of social emotions are largely unexplored in non-Western cultures and among preschool children with limited social learning opportunities. This knowledge is crucial so that early interventions, education, and support can be provided to children at the earliest stage. To this end, our research focused on Chinese deaf and hard-of-hearing (DHH) preschoolers and aimed to examine how children's hearing loss may impact their developmental trajectories of social emotions - specifically for moral emotions (shame, guilt, pride; **Chapter 3**) and empathy (**Chapter 5**) - during preschool years. Considering the restricted access to social interactions due to hearing loss, DHH children could encounter more difficulties in their early development of social emotions, which may further affect their psychosocial functioning (Calderon & Greenberg, 2011; Tsou et al., 2021). Moreover, given the lack of measurement tools for social emotions in China, validation studies were conducted first to pave the way for our longitudinal exploration (**Chapter 2** and **4**). Below we introduce our topics in greater detail.

PART I – Deaf and Hard-of-Hearing Children; the Situation in China

Hearing loss (HL) usually refers to a hearing threshold higher than 26 decibels (dB). More specifically, moderate hearing loss is often defined as a threshold between 40 dB and 70 dB in one's better ear, while a hearing threshold of 26-40 dB is deemed mild hearing loss. Typically, a hearing threshold higher than 70 dB is considered severe or profound hearing loss; and the most extreme example of hearing loss is total deafness

(Misurelli & Litovsky, 2015). Hearing loss(es) can occur in one ear (unilateral hearing loss), or both ears (bilateral hearing loss). In general, an individual with certain degrees of hearing loss will be recognized as deaf and hard-of-hearing (DHH) individuals.

Notably, a large proportion of DHH children worldwide have received hearing rehabilitation or intervention such as a hearing aid (HA) and/or a cochlear implant (CI), as assistance tools (Brahdham & Jones, 2008; De Raeve & Lichtert, 2012). The hearing aid is a portable device installed inside the auditory canal, which amplifies the volume of sounds in natural environments; and a CI electrically stimulates the auditory nerve, bypassing the damaged part of the ear. Importantly, hearing loss may negatively affect children's social participation. Challenges to participating with peers and others cannot be solved completely with the assistance of HAs or CIs (Calderon & Greenberg, 2011; Korver et al., 2010). Research showed that DHH children might still experience extra difficulties following verbal speeches and conversations, especially in circumstances where loud background noises or interferences are present (Misurelli & Litovsky, 2015). Especially in busy social environments, children using CIs can miss out on verbal cues when their attention is not highly focused on the speakers, or when multiple people are speaking. The auditory information that DHH children acquire is often partial/distorted, for example, due to poor acoustic conditions in the places where they are (Calderon & Greenberg, 2011; Leibold & Buss, 2013).

One of the consequences of these factors negatively influencing DHH children's social participation is children's challenges with incidental learning. Through observing others' social behaviors, overhearing conversations, watching films, reading books, and other means by which a culture conveys its messages, children pick up different social behaviors to replicate or practice them, gradually becoming aware of social standards and others' perspectives (Tangney et al., 2007). Moreover, through incidental learning

children also acquire knowledge and understanding of often implicit cultural norms and values, important for the subsequent development of social emotions (Dirks et al., 2020; Eisenberg et al., 1998; Hintermair, 2006).

The prevalence of hearing loss in China and the governmental policy

On a global scale, the prevalence of hearing loss among children is around 34 million (WHO, 2024). China, as a populous country with a population of 1.4 billion, faces great challenges regarding the prevalence of hearing loss and deafness especially among its younger generation. To date, out of the 220 million children in China, approximately 4.6 million children have experienced some sort of hearing loss (2.11%) (Yun et al., 2017). Annually, approximately 150 thousand Chinese infants are born with moderate to severe hearing loss, taking up 1.5% of the national newborn population (Gong et al., 2018). Given the prevalence of hearing loss caused by pervasive sensory impairment, detection, diagnosis (e.g., genetic tests, hearing screening tests), and early rehabilitation and intervention are crucial to lowering the disability rate in children, and safeguarding the social-emotional development of DHH children (Chen et al., 2013; Lü et al., 2011).

A policy supporting the national screening program on newborn infants' hearing was implemented in China in June 2009 (Wen & Huang, 2023). This initiative allows newborns to be screened for hearing abnormalities within 48 hours after their birth. In most cases, Chinese infants are born in local hospitals where they take screening tests instantly. In some special cases, infants are not eligible to receive the screening tests immediately after birth, then they are required to take the tests within 42 days. If infants do not pass the initial screening, they receive another round of screening checks within 42 days. For children who do not finally pass the screening tests, they receive diagnoses

of hearing loss from specialists. All these tests must be carried out by professionals who are eligible to work in public hospitals or hearing rehabilitation centers. Therefore, the hearing screening program enables early identification and treatment of hearing loss for DHH children, and as a result, in recent years a large proportion of DHH children have access to early interventions.

When children are diagnosed with hearing loss, they will then be introduced to suitable treatments, such as a hearing aid (HA) trial, or a pre-cochlear implant (CI) test. A team of medical doctors, therapists, audiologists, and psychologists conduct a series of examinations to evaluate what type of assistance may be needed for each child (Ding et al., 2009). The parents and teachers of the DHH children are also included in making the final decisions: life quality and school performance will be taken into consideration in determining the type of treatment that their child receives. For cochlear implantation, preoperative assessment and postoperative rehabilitation are planned before operations (Deep et al., 2019).

According to governmental reports, in most of the Chinese provinces, the costs for HA or CI treatment are fully covered by public health insurance. In other provinces, the expenses of HA or CI treatment are compensated to varying degrees, depending on the financial status of the local governments (Jiang et al., 2019). Currently, more than 80% of Chinese children aged under six years who have moderate-to-severe hearing loss are equipped with HA/CI. In addition to medical treatment, hearing rehabilitation has been extensively developed in recent years: over 800 hearing rehabilitation centers were established in China, offering comprehensive aural-verbal rehabilitation programs for DHH children. The governmental and societal support greatly improved the hearing status and language development of DHH children in China (e.g., Chen et al., 2019; Wen & Huang, 2023).

The China Rehabilitation Research Center for Hearing and Speech Impairment

The longitudinal data of this thesis (**Chapter 3** and **5**) were collected on both DHH and typically hearing (TH) preschoolers recruited from the China Rehabilitation Research Center for Hearing and Speech Impairment (CRRCHSI). The CRRCHSI is a national-level research center that offers rehabilitation programs and early interventions, aimed at helping children with hearing loss develop and improve listening and speaking skills to communicate effectively via spoken language.

In CRRCHSI, there are different classes for preschool children with different hearing conditions. The CRRCHSI has an affiliated kindergarten hosting both TH and DHH preschool children. TH children receive regular preschool education in the center. As for DHH children, depending on their hearing abilities, they are assigned to different classes consist of DHH children who receive rehabilitation/early interventions. In some of these classes, children have mild-moderate hearing loss and their language develops relatively well. For these children, the center aims to prepare them for further study in mainstream elementary schools. In some other classes, DHH children have more severe hearing loss, hence the teachers devote more time/efforts to one-on-one interactions to safeguard their language development, and to adjust to each child's different learning paces. These arrangements aim at establishing clear goals for children's rehabilitation and creating an inclusive environment to encourage DHH children to interact with their peers, which social participation is crucial to their socialization.

During one-on-one interaction with children, teachers focus on training DHH children's listening skills to allow them to capture information in verbal communication.

At a relatively later stage, teachers assist children in developing their verbal expression skills. During the rehabilitation program, sign language is not a part of the instructional language while spoken language is the only focus (Li et al., 2017).

Additionally, DHH children attend regular lessons and speech therapy sessions. Group activities are an important part of their daily routines: peer interactions could facilitate both children's language development and socialization, and thus creating an inclusive environment is greatly emphasized in the teachers' course designs. Teachers encourage DHH children to actively participate in various social activities, where DHH children can practice their communication skills and learn social knowledge during the interaction with their peers. Parents are also highly involved in rehabilitation programs, where they learn how to communicate with their children at home by involving them in family activities such as story-telling or chatting.

In general, DHH children spend one year on average in CRRCHSI. After one year, the teachers evaluate on children's hearing conditions and language abilities, thus providing suggestions about whether the DHH child can be admitted to the mainstream schools, or that the DHH child needs special education.

PART II – Social Emotions and Their Development in Preschool Children with and without Hearing Loss

Moral Emotions

Moral emotions are elicited when an individual evaluates his/her personal attributes and behaviors in light of the social norms or anticipation of others' perspectives (Tangney et al., 2007; Tracy & Robins, 2004). Shame and guilt are moral emotions with negative

emotional valence, which arise when an individual focuses on the self and views his/her personal attributes and self-related behaviors in a negative way. The attribution of the cause of an event (antecedent) differentiates between shame and guilt, and these causal attributions differ on three major dimensions: globality (global/specific), controllability (controllable/uncontrollable), and stability (stable/unstable) (Tangney & Dearing, 2002; Tracy et al., 2007; **Figure 1** illustrates the self-evaluative process).

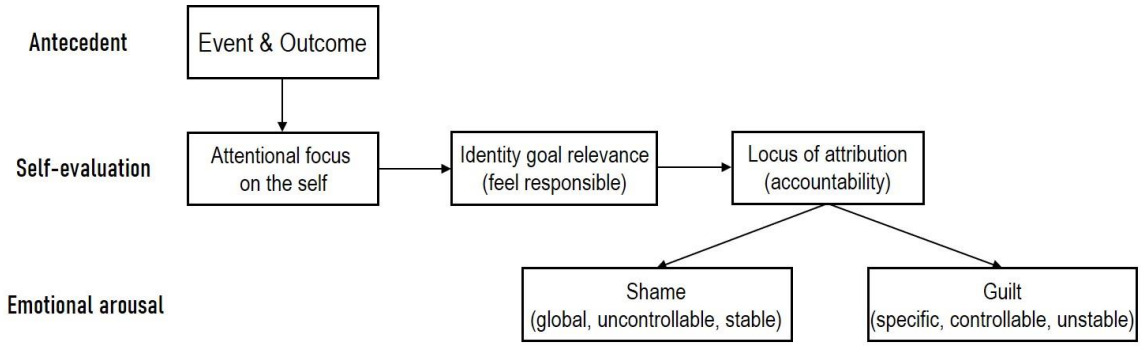

Figure 1. The self-evaluation and attribution that lead to shame/guilt

Global, uncontrollable, and stable attributions will likely lead to shame, whilst specific, controllable, and unstable attributions may elicit guilt (Tracy et al., 2007). For instance, when a student fails an exam, the failure on the exam serves as an antecedent that triggers a negative evaluation. If the student attributes the failure to the global self (e.g., "I am a bad student"), he/she would feel ashamed. In this case, the student blames one's core self (global); also, a person's personality and ability cannot be improved in a short duration (stable), he/she can also feel helpless in the situation (uncontrollable). However, if the student attributes the failure to a more specific cause (e.g., "I was not prepared for the exam"), he/she would feel guilty. Due to that misbehaviors are specific, and amendable (temporary), he/she may be motivated to apologize and compensate for his/her inappropriate behaviors (controllable).

Corresponding to the different attributions, shame and guilt may be associated

with different reaction tendencies. Shame feelings are often painful, as one's global self is depreciated. Individuals may also feel helpless when feeling shame, as the causes of shame are stable and uncontrollable (e.g., personality traits). Therefore, individuals tend to withdraw and escape from social environments, and avoid further social contact by feeling ashamed (Tangney et al., 2007). Prior findings show that the frustration and social avoidance caused by shame contribute to low self-esteem, negative ruminations depression and anxiety (e.g., Fergus et al., 2010; Gruenewald et al., 2004). Furthermore, in some cases, the undeniable pain and humiliation experienced in shame feelings can antagonize individuals, driving them to externalize the blame and anger toward others. This so-called "shame-rage" often results in hostility and aggression, which can disrupt these individuals' social relationships, making them more susceptible and vulnerable to bullying (Bennett et al., 2005; Malti & Krettenauer, 2013; Stuewig et al., 2010).

Guilt is often deemed as more socially and emotionally adaptive. As guilt arises from the regret/remorse for misbehaviors, it is less devastating to the global self and is more controllable. Individuals would feel urged to apologize and compensate for their wrongdoings when feeling guilty (Tangney et al., 2007). Thus, guilt serves the function of regulating social behaviors and rectifying conduct problems. Prior research shows that the proneness of experiencing guilt is related to fewer aggressive behaviors, more prosocial behaviors, and higher relationship qualities (Da Silva et al., 2022; Mazzone et al., 2016). Notably, especially in Western societies, shame often leads to much more negative behavioral outcomes than guilt, which can be a cultural variance (Broekhof et al., 2018; Da Silva et al., 2022).

Pride is another moral emotion that is relevant to one's psychosocial functioning. Unlike shame and guilt, pride arises from a positive evaluation of one's self-image and self-related behaviors. For instance, when an individual achieves a goal, he/she could

experience a proud feeling, as an accomplishment positively contributes to a good self-image. The positive feelings of pride therefore increase the individual's self-esteem and facilitate his/her prosocial behaviors. Empirical research indicates that pride is related to better social competence and more prosocial behaviors in children (Da Silva et al., 2022; Ross, 2017).

The Development of Moral Emotions in Preschool Years

Moral emotions develop in the social context (Tangney et al., 2007). Children may need to acquire several cognitive abilities before experiencing moral emotions: (1) a (basic) sense of self-awareness, as a prerequisite of self-evaluation; (2) internalized knowledge of moral norms and prevailing social values; (3) a perspective-taking ability that enables children to anticipate how one's personal attributes are viewed in others' eyes (Tracy et al., 2007).

Firstly, children's self-awareness emerges during their second year of life, when they start to recognize themselves in a mirror, becoming able to display self-referential facial expressions and verbal statements (Thompson, 2006). Such a basic sense of self-awareness allows children to feel responsible for their social behaviors so that their self-evaluations can be elicited in certain social situations. Secondly, children learn social knowledge and internalize social norms throughout their childhood, which allows them to understand which behaviors are accepted as socially appropriate and which behaviors are viewed by society as undesirable so that they can evaluate their social behaviors in light of the social expectations. From the age of one, children begin to switch their attention from "the inner world" to "the outer world". Via observing others' expressions and overhearing conversations, they learn about how behaviors and personal attributes

are evaluated and judged in a social context (Lagattuta & Thompson, 2006). At the age of three, children develop an ability to reflect on their own behaviors, which prepares them for moral attributions and judgments (Daniel et al., 2014). Thirdly, to experience moral emotions, children must also anticipate how their personal attributes are viewed in others' eyes. For example, shame and guilt involve negative emotional reactions (e.g., fear, embarrassment) as one's personal traits or behaviors are viewed negatively, and negative self-evaluations are highly dependent on the anticipation of others' (implicit) perspectives. Thus perspective-taking abilities, known also as Theory of Mind (ToM), is also one prerequisite for experiencing moral emotions (Tangney et al., 2007). Children's perspective-taking abilities emerge when they start to realize that individuals' behaviors are driven by certain intentions, and their perspective-taking skills continue developing during their childhood and adolescence, corresponding to their socialization process (Broekhof et al., 2015).

Empirical evidence on children's moral development is in line with the findings for the abovementioned factors. As children's socialization and cognitive development go on, they become increasingly capable of moral reasoning and attribution: children will become able to evaluate a certain situation as morally right or wrong and attribute corresponding moral emotion to the target person (Chaparro et al, 2013; Daniel et al., 2014). Children's moral development is also evident in the increasing accuracy of their moral judgments. For example, at five years of age, children no longer attach positive emotions to the victimizers in a "happy victimizing task", and instead show sympathy to the victims (e.g., Gummerum, et al., 2010; Gummerum et al., 2016). In other words, children's reactions to moral situations become more and more similar to those of adults after acquiring the necessary cognitive skills. Several studies showed that preschoolers manifested more frequent and intense shame and guilt as they grew older, which might

be a concomitant phenomenon of children's socialization and cognitive development (Gummerum et al., 2010; Mazzone et al., 2018). Children also manifest more pride in the form of self-referential statements, facial expressions, or body gestures as they grow older (Ketelaar et al., 2015; Tangney et al., 2007).

DHH children encounter many obstacles in their socialization due to restricted access to social learning (Tangney et al., 2007), which places them at a disadvantage in acquiring knowledge and understanding of social norms and values at the same level as their hearing peers (de Villiers & de Villiers, 2014). Empirical research shows that DHH children display lower levels of perspective-taking abilities, compared to their TH peers (Broekhof et al., 2015; González et al., 2007; Ketelaar et al., 2012). These difficulties may further affect the development of moral emotions. Prior findings indicate that DHH children manifest lower levels of shame, guilt, and pride as compared to their TH peers (Ketelaar et al., 2015). These differences could be observed as early as the preschool years and seem to be maintained throughout childhood (Broekhof et al., 2018; 2020; 2021). However, to date, longitudinal research following the changes in moral emotions among DHH children over the preschool years is still lacking.

Empathy

Empathy is another type of social emotion that guides individuals to navigate through their daily routines, as it facilitates social interactions and promotes prosocial behaviors (Decety & Jackson, 2006). Empathy, in general, refers to the capability to vicariously experience others' feelings and to react altruistically to others' emotional expressions (Rieffe et al., 2010). Empirical research shows that, overall, empathy is associated with various aspects of children's psychosocial functioning, such as better social competence

and emotion regulation, fewer internalizing and externalizing behaviors (e.g., Neumann, et al., 2016; Rieffe et al, 2010). Empathy is, accordingly, deemed as "a social glue" for stimulating and strengthening interpersonal interactions (De Waal, 2008).

Although some prior studies conceptualized and operationalized empathy as a unidimensional construct, an increasing number of recent studies show that empathy is a complex construct that comprises distinct dimensions (Baron-Cohen & Wheelwright, 2004; Rieffe et al., 2010). Supporting evidence may come from validation studies: some widely-used questionnaires, such as the "Interpersonal Reactivity Index" (Davis, 1980), and the "Jefferson Scale of Empathy" (Hojat et al., 2018), show that empathy comprises at least affective and cognitive components.

To date, limited research has examined the empathic development in preschool years. The questionnaires typically used to measure empathy in adults are not suitable for young children, because the life experiences explored in adult questionnaires do not apply to young children. Furthermore, the theoretical model/framework of many of the current in-use empathy questionnaires does not capture the development of empathy in early childhood. Hoffman's (1987) *empathy model* is amongst the first to describe how empathy develops in the preschool years, which establishes a theoretical foundation for developing instruments to assess empathy in young children. In theory, three levels of empathy are distinguished in the early stages of development (these "levels" described by Hoffman are more like different "components" or "dimensions") (Hoffman, 1987).

Emotion Contagion

"Emotion Contagion" (or "affective empathy") is the basic level of empathy. It refers to the extent to which an individual could be affected by other's emotional expressions.

Emotion contagion originates from the process where the newborns generate emotional arousal as an innate/instinctive response to others' emotional expressions, which may consist of non/sub-conscious mimicries of others' facial, vocal, and bodily expressions (Bernhardt & Singer, 2012). Neuropsychological findings have suggested a possibility that such an emotional mimicking is equivalent to the activation of the "Mirror Neuron System (MNS)" (Decety & Lamm, 2009; Bernhardt & Singer, 2012). Meanwhile, it is demonstrated by observational studies that already in infancy, we can observe that when a child cries in a room, other nearby children will also be affected and thus follow crying. Based on the findings from multiple research fields, de Waal (2008) thus concluded that emotion contagion is the foundation of empathy, which initializes and induces empathic reactions towards the emotional person.

Emotion contagion is essential to inhibiting children's aggression (Rieffe et al., 2010; Tampke, et al., 2019). When a child feels others' pain and discomfort, he/she is unlikely to continue acting aggressively. Contrarily, if the child is insensitive to others' emotional expressions, he/she could act aggressively and callously, as often observed in children with conduct disorders (e.g., Broekhof et al., 2018; Waller et al., 2020). However, too much emotion contagion may be a psychological burden for children. As children are constantly exposed to various emotional stimuli in their daily routines, they need to develop regulation abilities/strategies to avoid being emotionally overwhelmed. Manifesting excessive emotion contagion can be a sign of children lacking regulation abilities, which puts them at high risk of developing internalizing symptoms, such as anxiety and depression (Rieffe et al., 2010). Accordingly, the development trajectory of emotion contagion should in principle, decrease by age. As children acquire higher cognitive abilities when they grow older, they will be more capable of regulating their emotional arousal to mitigate the negative effects caused by contagious emotions (Li et

al., 2023; Rieffe et al., 2010).

According to existing findings, no group difference between DHH and TH children has been found regarding their manifestations of emotion contagion. Emotion contagion decreases in DHH and TH preschoolers alike, as they grow older and become more capable of regulating emotional arousal (Ketelaar et al., 2015; Tsou et al., 2021).

Attention to Others' Feelings

"Attention to Others' Feelings", as the second level of empathy, emerges in children's second year of life (Hoffman, 1987). As shown by past studies, toddlers develop a sense of self-awareness at the age of one, which allows them to distinguish others' emotional arousal from their own. This self-other distinction is in fact a developmental milestone for young children because when children realize that the arousal they experience is an emotional reaction triggered by others' emotions, they could temporarily suppress their own idiosyncratic desires and re-allocate their attentional resources to the social world (Rieffe et al, 2010). Such a switch of attention and perspective views from "self-focus" to "outward focus" may alleviate children's emotional distress caused by the contagious emotions of others, and it also motivates children to engage in social interactions which provides them more opportunities for incidental/social learning (Broekhof et al., 2018).

Longitudinal studies reveal that children's attention to others' feelings increases throughout the preschool years, accompanied by their socialization process (Tsou et al., 2021). Moreover, preschoolers who pay more attention to others' feelings are perceived by parents and teachers as more socially competitive (Bandstra et al., 2011; Da Silva et al., 2022). Presumably, the attentional switch from the self to the outer world speeds up the pace for children to understand the intrinsic causes of others' implicit perspectives,

allowing the cognitive components of empathy to develop, which in turn facilitates their development of social competence (Netten et al., 2015).

Attention to others' feelings is also affected by children's socialization, and thus DHH children may have disadvantages in this regard due to limited social participation and fewer opportunities of incidental learning (Caldwell & Nittrouer, 2013). To the best of our knowledge, only one longitudinal study has explored this topic, finding that DHH preschoolers showed a greater increase in attention to others' feelings compared to their TH peers (Tsou et al., 2021). Possibly, DHH children experience delays in earlier stages but catch up with their TH peers later in the preschool period (Tsou et al., 2021). Current research does not especially examine the attentional component of children's empathy development, leaving this topic largely unexplored.

Prosocial Behaviors

The shift of "inward attention" to the "outer and social world" would pave the way for preschoolers to act altruistically in a social context to relieve other's distress. "Prosocial behaviors" therefore, forms the third level of empathy. To initiate prosocial motivations, children have to attend to others' emotions and perspectives instead of focusing on their own thoughts or feelings. On top of that, children need to understand others' intentions, desires, or beliefs (i.e., theory of mind, ToM) to take action to relieve others' distress. However, although young children start to acquire an awareness to act pro-socially, they are often (cognitively) confused in social situations and cannot always distinguish their desires from the desires and needs of others (Hoffman, 1987). In other words, preschool children may still struggle to effectively respond to others' emotions, and their prosocial attempts do not always meet the criterion for "altruistic behaviors" (Rieffe et al., 2010).

Yet, when children grow older, their prosocial behaviors increase in quality and quantity, which is a direct consequence of their development of cognitive abilities (Li et al., 2020; Tsou et al., 2021). Indeed, prior research observed spontaneous prosocial behaviors in preschoolers, which took the forms of sharing, helping, or comforting attempts (Beeler-Duden et al., 2022; Zahn-Waxler et al., 1992). This means that already in the preschool years, children's altruistic motives can be embodied in concrete behaviors (Flook et al., 2019). More recent studies show that preschoolers' prosocial behaviors also contribute to better social competence, fewer internalizing and externalizing behaviors (Donohue et al., 2019; Salerni & Caprin, 2022; Tsou et al., 2021).

"Prosocial behaviors" is another empathic level largely affected by socialization and social learning. According to recent empirical research, DHH children show fewer prosocial behaviors than their TH peers (Netten et al., 2015; Tsou et al., 2021). Tsou et al., (2021) argued that the delay manifested by DHH children upon prosocial behaviors can be attributed to inadequate perspective-taking and a lack of empowerment to take actions in social contexts. Note, however, although the group difference persists over the preschool period, TH and DHH children show the same development trajectory by manifesting more prosocial behaviors as their age increases (e.g., Netten et al., 2015; Takamatsu et al., 2021; Tsou et al., 2021). Moreover, the associations between prosocial behaviors and psychosocial functioning are similar in TH and DHH children: prosocial behaviors contribute to better social competence, fewer internalizing and externalizing behaviors in both TH and DHH preschoolers (Chao et al., 2015; Netten et al., 2015). Yet, longitudinal findings on young children's empathic development are still scarce, and future studies are needed to deepen our understanding of this topic.

PART III - Research of Social Emotions in China: Across Cultural Contexts

It should be noted that most studies on social emotions have focused on children living in Western countries. Yet, culture may affect children's social-emotional development. Cultures shape how children understand moral norms and influence how they interact with others. The Hofstede (1980) theory for cross-cultural studies suggests that typical Western cultures are deemed as individualistic-oriented, whilst typical Eastern cultures are deemed as collectivistic-oriented. The different cultural orientations/norms lead to different psychological effects: Western individuals tend to be more independent from each other, prioritizing personal success over group interests; and Eastern individuals tend to be more interdependent and value group cohesion over personal goals (Tsai et al., 2006). Hence, the expressions of pride may be considered more positive in Western cultures as pride reinforces one's self-confidence and highlights one's individual value, whereas shame is deemed more negative in Western societies than in Eastern societies because shame depreciates/devalues the global self and leads to feelings of frustration and humiliation (Broekhof et al., 2018). However, shame may not be as maladaptive in Eastern societies as in Western societies, as in the Eastern cultural contexts, shame can facilitate the reflection on one's own behaviors and suppress his/her personal desires to focus more on others' needs, which benefits group harmony and cohesion (Wang et al., 2020; Wong & Tsai, 2007).

As our current knowledge of moral emotions is primarily derived from research on Western samples, it is widely acknowledged that experiencing emotions of pride and guilt is socially adaptive, whereas the proneness to experiencing shame is related with more internalizing and externalizing symptoms (e.g., Broekhof et al., 2020; Drummond

et al., 2017; Stuewig et al., 2015). However, research based on East-Asian individuals suggests otherwise. For example, research on South-Eastern Asians reveals that shame contributes to self-improvement during a negative self-evaluation (e.g., Bagozzi, et al., 2003; Cole et al., 2006; Heine, 2002). It is also found in Chinese individuals that shame can contribute to prosocial behaviors in certain social contexts (Wang et al., 2020). Note, however, aside from the few studies suggesting adaptive functions of shame in Eastern societies, most studies on Chinese samples show similar findings to prior studies based on Western individuals, indicating that shame is related to more internalizing behaviors (e.g., Lee et al., 2016; Shao et al., 2020; Wu et al., 2021; Zhong et al., 2008). These inconsistencies in empirical findings suggest that more attention should be paid to the moral development of Chinese children.

Cross-cultural research demonstrates cultural variances in experiencing and expressing empathy as well. East-Asian individuals are shown to be more affected by contagious emotions: they experience more personal distress by witnessing someone in distress, as compared to their Western counterparts (Atkins et al., 2016). Possibly, such variance could be attributed to the variances in cultural norms and values: East Asians tend to be more interdependent and focus more on others' feelings; also, group harmony is greatly emphasized in East-Asian cultures, thus expressing negative emotions is often viewed as disruptive in these cultures (Matsumoto et al., 2008). As a result, East Asian individuals are sensitive to others' negative emotional expressions, and these negative expressions often lead to high personal distress in them (Markus & Kitayama, 1991).

Taken together, prior research suggests that the development of social emotions in Chinese children differs from what is typically observed in children from Western societies. Conducting research on social-emotional development in a sample of Chinese children can contribute new insights, which can enhance our understanding of potential

cultural variances.

Another important issue to consider is that current studies about social emotions are mostly conducted in Western social/cultural contexts, using questionnaires or other methods developed in these countries. Yet, fewer studies have been focusing on Chinese children, and this disparity in research could be partially attributed to the lack of valid assessment tools specifically designed for Chinese children. Validating questionnaires used in Western preschoolers within Chinese contexts is the promising first step toward studying the developmental trajectories of social emotions in Chinese (DHH) preschool children.

The Aim and Structure of this Dissertation

This thesis examines the impact of hearing conditions (DHH/TH) on the development of social emotions in preschool children within the Chinese social context. It starts with two studies on moral emotions, where a parent-report questionnaire designed to assess moral emotions for preschoolers was first validated in Chinese preschoolers (**Chapter 2**) and then used to examine the developmental trajectories of moral emotions in DHH and TH preschool children in China (**Chapter 3**). Next, two studies were conducted to explore the development of empathy. Similarly, a parent-report questionnaire for the assessment of empathy was validated beforehand in Chinese preschoolers (**Chapter 4**) and then applied to Chinese DHH and TH preschool children to study the development of empathy over the preschool years (**Chapter 5**).

In particular, **Chapter 2** presents our validation research on the Moral Emotion Questionnaire (MEQ). The MEQ is a parent-report questionnaire originally designed to measure shame, guilt, and pride in Dutch preschoolers. In this chapter, our study tested the psychometric properties of the MEQ when applied to Chinese preschool children,

and examined the associations between shame, guilt, pride, and children's psychosocial functioning. **In Chapter 3**, using the Chinese version of MEQ validated in **Chapter 2**, we further investigated the development trajectories of shame, guilt, and pride over the preschool years. By collecting two waves of longitudinal data in Chinese DHH and TH preschool children, we investigated the impact of children's hearing impairment on the developmental trajectories of shame, guilt, and pride, and assessed the contribution of these developmental trajectories to (predicting) children's psychosocial functioning. **Chapter 4** introduces our validation research on the Empathy Questionnaire (EmQue), which is a parent report for measuring three distinct empathic levels for preschoolers (i.e., Emotion Contagion, Attention to Others' Feelings, and Prosocial Behaviors). This validation research tested the psychometric properties of the Chinese version of EmQue and also examined the concurrent relations between empathic levels and children's psychosocial functioning. In **Chapter 5**, we investigated the developmental trajectories of the three distinct empathic levels (as measured by the EmQue) across the preschool years. Two waves of data were collected on both Chinese DHH and TH preschoolers to evaluate how hearing loss affected preschool children's development of empathy. The over-time effects of empathic development on children's psychosocial functioning were also examined. **Chapter 6** summarizes, and discusses our key findings and limitations, and also talks about the implications of these findings, providing suggestions for future research.

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