

Investigating the Correlates of the Leftward Cradling Bias in Young Boys and Girls

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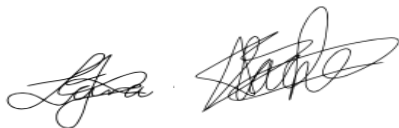
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Abstract

The leftward cradling bias (LCB) refers to the human tendency to cradle an infant to the left side of the body midline with the intention to soothe (Harris, 2010; Salk, 1960). Research on this phenomenon among males is both scarce and inconsistent, with limited research suggesting a reduced bias among males. Recent explanations posit that the LCB is facilitated by the right hemisphere's specialised role in emotion processing (Manning & Chamberlain, 1991; Sieratzki & Woll, 2002). Given that such right hemispheric lateralisation is present in both males and females, the LCB should manifest across gender. This research investigated the prevalence of the LCB across gender in 63 male and female children, aged 6 to 8 years, with the secondary aim of investigating the relationship between the LCB and parent-reports of their child's empathy. A hierarchical multiple regression analysis was used to investigate four potential correlates of the LCB, namely gender, callous-unemotional traits, affective empathy, and the interaction between gender and affective empathy, respectively. As hypothesised, gender did not significantly predict the LCB, undermining the assumption that the LCB is reduced among males. In fact, 71.90% of the male participants cradled to the left. Additionally, parent-report empathy measures did not predict the LCB, thereby lending itself to a need for further exploration into the relationship between such social relating and communication mechanisms and the LCB.

Keywords: leftward cradling bias, neurotypical children, right hemispheric lateralisation, social communication

The rearing of offspring represents a fundamental period for investigating caregiver-infant interactions. The phenomenon of social positioning biases has been the subject of research for decades, with previous studies collectively establishing a general leftward cradling bias among the human population (see Harris, 2010). The leftward cradling bias (LCB) refers to the human preference to cradle an infant to the left side of the body midline with the intention to soothe the infant (Harris, 2010; Salk, 1960). Since its initial discovery by Salk (1960), several early explanations have been proposed, all of which lack empirical support. Current explanations suggest that the LCB is facilitated by the right hemisphere's specialised role in emotion processing (Manning & Chamberlain, 1991; Sieratzki & Woll, 2002). It is suggested that cradling assists in the facilitation of optimal caregiver-infant interactions, which includes communicating, monitoring and regulating emotions (Sieratzki & Woll, 2002). Most recently, research has emerged to further this understanding, positing an innate mechanism linked to the right hemisphere's role in emotion processing, more specifically, a social relating mechanism (Fleva & Khan, 2015; Pileggi, Malcolm-Smith, & Solms, 2014).

The LCB phenomenon has been consistently observed in 60% to 80% of human females across cultures and also in some primate species (Manning & Chamberlain, 1990; Morgan, Hunt, Sieratzki, Woll, & Tomlinson, 2018; Richards & Finger, 1975; Saling & Bonert, 1983; Saling & Cooke, 1984; Van der Meer & Husby, 2006). Notably, the phenomenon has been relatively unexplored in male populations, with limited research reporting lower prevalence in males compared to females (De Château, 1983; Forrester, Davis, Mareschal, Malatesta, & Todd, 2018; Turnbull & Lucas, 1991). Furthermore, research investigating the LCB in male populations has mostly attributed its emergence to increased caregiving experience, and consequently, increased age (Bourne & Todd, 2004; Bundy, 1979).

Exploring the correlates of the LCB in a sample where this bias is argued to be reduced should provide valuable insights into the underlying mechanism of this phenomenon. Furthermore, such an investigation will aid in providing a richer understanding of caregiver-infant relationships, bonding and the implications thereof.

Prevalence of the LCB

To date, the LCB has been reported in 60% to 80% of females across various cultures and historical periods (De Château, 1983; Finger, 1975; Harris, Spradlin, & Almerigi, 2007; Richards & Finger, 1975). Evidence suggests that the propensity to cradle to the left among young girls arises early in development (Saling & Bonert, 1983). This leftward preference for

non-functional cradling (i.e., cradling with the intention to soothe) appears to be specific to the act of holding an infant, the facsimile of an infant (i.e., a life-sized doll), or an imaginary infant (Van der Meer & Husby, 2006). Furthermore, the LCB is shared by species genetically related to humans, such as chimpanzees and gorillas (Manning & Chamberlain, 1990; Van der Meer & Husby, 2006). This suggests that the LCB is an innate behaviour that comes about without conscious awareness. However, the historical focus on female samples does not discount the presence of the same behaviours in males, which is yet to be fully investigated.

The general assumption that males do not exhibit the LCB, or at least exhibit a less pronounced LCB, persists. The handful of studies which have investigated the LCB in male samples have produced conflicting evidence. For example, several studies have collectively suggested a weaker tendency among young males (e.g., De Château, 1983; Forrester et al., 2018; Turnbull & Lucas, 1991), while others have demonstrated an equal tendency across gender (Herdien, 2018; Pileggi et al., 2014). Although the LCB has been largely reported as less pronounced in males, its presence has thusfar been suggested to correspond with increased caregiving experience, and as such, increases in age (Bourne & Todd, 2004; Bundy, 1979). This insufficient research and the inconsistency in its findings provide fertile ground for further exploration into the prevalence of the LCB among young males.

Evidently, the LCB is a universal human tendency that is well-established in adult females, but is questionable in males, particularly young males. This tendency has only been found reduced among samples with Autism Spectrum Disorder (ASD) or those high on autistic traits, and there is some conflicting evidence that anxiety and depressive disorders may disrupt the LCB (Fleva & Khan, 2015; Malatesta, Marzoli, Rapino, & Tommasi, 2019; Pileggi et al., 2014; Reissland, Hopkins, Helms, & Williams, 2009; Sieratzki & Woll, 2002; Vauclair & Scola, 2009; Weatherill et al., 2004). Ultimately, an investigation of the LCB and its potential correlates within these sample serves to aid our understanding of this phenomenon and its underlying mechanisms.

Early Explanations

Despite numerous attempts to establish the underlying mechanisms of the LCB, an adequate explanation for this phenomenon is lacking. A prominent early explanation, proposed by Salk (1960), hypothesised that the tendency to cradle to the left was attributed to the soothing effect of the maternal heartbeat, which is more detectable on the left side of the chest. However, this theory has since been dismissed, as it is argued that the heartbeat is audible on both sides of the cradler's chest (see Harris, 2010).

A second influential explanation, the handedness hypothesis, posited that the LCB could be explained by the evolutionary advantage of handedness (Huheey, 1977). This theory assumes that, due to the universal dominance of right handedness, most caregivers cradle an infant to the left to keep their right hand free for other tasks (Van der Meer & Husby, 2006). However, the handedness hypothesis has since been discredited as an adequate explanation for the LCB. Specifically, while handedness has been associated with what is referred to as functional cradling (i.e., cradling while you are doing something else; Van der Meer & Husby, 2006), it fails to explain instances of non-functional cradling (i.e., cradling with the intention to soothe) - the cradling phenomenon under review (Bourne & Todd, 2004).

Cerebral Explanations

Evidently, the underlying mechanism of the universal LCB has fuelled much debate. However, a contemporary explanation implicates a cerebral lateralisation of function in terms of the right hemisphere's specialised role in the perception and expression of emotions (Manning & Chamberlain, 1991). Such a cerebral explanation suggests that the LCB is functionally underpinned by optimal emotion processing, and in turn, the facilitation of symbiotic caregiver-infant interactions. Stemming from this cerebral explanation, the monitoring hypothesis asserts that the positioning of an infant's head to the left of a cradler's visual field (i.e., left hemi-space) advantages emotionally charged visual and auditory information to the right hemisphere of the brain for processing and monitoring (Manning & Chamberlain, 1991; Sieratzki & Woll, 2002). This ultimately serves as a direct avenue for somato-affective feedback. Specifically, it is suggested that the right hemisphere predominantly subserves the perception of facial emotions, and that such emotions are more vividly expressed on the left side of the face (Bourne & Todd, 2004; Sieratzki & Woll, 2002; Vauclair & Donnot, 2005). Moreover, a left-ear and thus right hemisphere advantage for perceiving auditory emotions allows for processing speech prosody, both aspects of which precipitate optimum caregiver-infant connections (Donnot, 2007). The cerebral explanation for the LCB involves the perception of the infant's emotional state in terms of the reciprocal relationship between the caregiver and infant. Therefore, a leftward cradling preference is likely to influence caregiver-infant relationships, social communication and relating.

The Leftward Cradling Bias and Relating

Recent LCB research has extended the right hemisphere hypothesis by focusing on the more primitive aspects of the right hemisphere's role in emotion processing. Since the LCB is an innate mechanism that appears to emerge without conscious awareness, evident in its manifestation in primate species (Manning & Chamberlain, 1990; Van der Meer & Husby,

2006), it follows that the underlying mechanism of the LCB could be linked to innate primitive right hemisphere processes. Supporting this argument, recent research has demonstrated an absence of the LCB in children and adults diagnosed with ASD, a condition characterised by impaired interpersonal, emotional and social functioning (Fleva & Khan, 2015; Pileggi et al., 2014). Since the LCB is absent within this population that have known impairments in social and emotional relating capacities, it seems plausible that the LCB is associated with these innate social-emotional abilities, which are mediated by the right hemisphere (Pileggi et al., 2014). The association between the LCB and social-emotional relating abilities are supported by Forrester and colleagues (2018), who report that neurotypical children who demonstrated a leftward cradling preference obtained significantly higher mean social ability scores compared to right cradlers.

The caregiver-infant interaction consists of an exchange of reciprocal signals, including sounds, touches and facial expressions, that function to arouse caregiver behaviour (Huggenberger, Suter, Reijnen, & Schachinger, 2009). Thus, the above findings align with the monitoring hypothesis, in which the rapid identification of affective signals, facilitated by right hemisphere processes, is argued to hold the potential for social development and bonding (Forrester et al., 2018; Huggenberger et al., 2009; Sieratzki & Woll, 2002; Vauclair & Donnot, 2005).

The importance of the cerebral processes that underpin optimal caregiver-infant interactions are demonstrated in research investigating those with a reduced ability to engage in reciprocal affective communication with their infants, specifically, those individuals with affective symptoms, such as anxiety and depression (Malatesta et al., 2019; Reissland et al., 2009; Weatherill et al., 2004). Such psychological conditions appear to bear a dominant effect on such individuals' cradling-side preferences to the extent that the infant's early social development may be influenced as a result of the mother's affective state (Malatesta et al., 2019; Reissland et al., 2009; Vauclair & Scola, 2009; Weatherill et al., 2004). These findings suggest that social communication mechanisms mediated by the right hemisphere influence the formation of optimal caregiver-infant relationships, and in turn, the early social development of the infant.

Consequently, recent studies have investigated the LCB in relation to mechanisms of social relating, suggesting that the LCB is a result of an innate psychobiological process hinged upon the human instinct to relate to others (Pileggi et al., 2014). Evidently, mechanisms eliciting a caregiver's processing of affective signals function to enhance the formation of optimal caregiver-infant relating, and consequently, serve as beneficial for

infant development. This is accounted for by the proposed innate function of the right hemisphere's dominance for social attachment and communication behaviours (Manning & Chamberlain, 1991).

Although research is contradictory, studies have suggested that mechanisms of social communication, such as empathy, differ across gender, such that females express empathic capacities to a greater extent than males (Christov-Moore et al., 2014; Landazabal, 2009; Mestre, Samper, Frías, & Tur, 2009). When assessing gender differences on empathy questionnaires, research has collectively found that females score higher than males (Mestre et al., 2009; Rueckert & Naybar, 2008). However, Eisenberg and Lennon (1983) found that differences in empathy favouring females may be accounted for by demand characteristics inherent in self-report measures, whereby females succumb to the social expectations of increased empathic responses. In contrast, more recent literature has found evidence for a biological basis for such gender differences in social communication mechanisms, with Rueckert and Naybar (2008) finding that females exhibit greater right hemisphere activation than males in relation to empathy tasks. However, such findings were only partially supported. The study suggested that reported cerebral differences in empathy may not be attributed to overall differences in social communication or empathic capacities between males and females, so much as the tasks or situations designed to elicit such empathy (Rueckert & Naybar, 2008). It is also possible that empathic ability does not differ across gender, but rather, that the expression thereof differs according to the motivation to behave empathically (Klein & Hodges, 2001).

It is thus important to note that social communication mechanisms are lateralised to the right hemisphere of the brain across gender, as it appears that males and females do not differ in terms of right hemisphere involvement in the perception and expression of emotions (Rueckert & Naybar, 2008). Furthermore, studies investigating gender differences in empathy have assessed more higher-order processes, as opposed to the more innate processes that are implicated in recent explanations of the LCB. If it is innate, then a leftward cradling preference should be present in both males and females.

Through an exploration of the current trends in LCB research, it is clear that the literature has primarily focused on investigating this tendency among female samples. In addition, current literature has predominantly centred around older samples, which has simultaneously excluded younger individuals, as well as positioned caregiving experience as a determinant of the LCB in males (Bourne & Todd, 2004; Bundy, 1979). However, since, emotion processing mechanisms are lateralised to the right hemisphere of the brain across

gender, the LCB is expected to appear early in development among both males and females, irrespective of prior caregiving experience (Bourne & Todd, 2004; Forrester et al., 2018; Huggenberger et al., 2009; Manning & Chamberlain, 1991; Saling & Bonert, 1983; Vauclair & Donnot, 2005). Ultimately, if the LCB is an evolved behaviour associated with the right hemisphere's role in social relating, its presence among males can be expected.

Rationale, Aims and Hypotheses

Early findings from research on the LCB conducted between the 1970s and early 1990s have collectively formed the basis for two assumptions: (1) that males do not cradle to the left to the same extent as females, and (2) that caregiving experience facilitates the emergence of this bias in males (Bourne & Todd, 2004; Bundy, 1979). These assumptions have borne considerable influence on the samples that have been recruited for subsequent research in this field, thereby resulting in the exclusion of male samples and preventing an opportunity to better understand the underlying mechanism(s) facilitating the LCB.

The current consensus for the LCB suggests that the bias is rooted in the right hemisphere's specialised role in emotion processing (Bourne & Todd, 2004; Huggenberger et al., 2009; Manning & Chamberlain, 1991; Vauclair & Donnot, 2005). If this holds true, one would expect the LCB to manifest across gender, as the function of emotion processing is lateralised to the right hemisphere of the brain in both males and females. Moreover, recent research has suggested a similar prevalence of the LCB between male and female samples across age, while additionally demonstrating the presence of the LCB regardless of caregiving experience (Fleva & Khan, 2015; Herdien, 2018; Pileggi, Malcolm-Smith, Hoogenhout, Thomas, & Solms, 2013; Pileggi et al., 2014; Scola & Vauclair, 2010). Investigating the LCB in young males can therefore enhance the understanding of this phenomenon's underlying mechanisms.

This research investigated the prevalence of the LCB across gender in young children and investigated the relationship between affective empathy and the LCB. While the primary aim was to investigate the prevalence of the LCB among neurotypical male children, it was essential to recruit a female control group, so as to compare our findings across gender. Furthermore, more recent research has indicated that the LCB is not contingent on higher intellectual functioning, but rather, might be facilitated by the right hemisphere's role in innate social communication and relating mechanisms (Fleva & Khan, 2015; Pileggi et al., 2013; Pileggi et al., 2014). A secondary aim subsequently emerged to further our understanding of the LCB as a mechanism for social communication. Here, we aimed to

correlate the LCB with measures associated with social communication, relating and empathy, namely affective empathy (i.e., the capacity for emotional relating and mimicry) and callous-unemotional traits (i.e., patterns of behaviour including a lack of empathy, shallow affect and a general disregard for others – essentially the inverse of affective empathy). Informed by recent research, the following hypotheses were proposed:

H₁: The leftward cradling bias will be present in both boys and girls aged 6 to 8 years.

H₂: Higher affective empathy scores will be associated with increased leftward cradling.

H₃: Higher callous-unemotional trait scores will be associated with decreased leftward cradling.

Method

Design and Setting

The study employed a correlational design, including four potential predictors of cradling bias, namely, gender, callous-unemotional traits, affective empathy, and the interaction between gender and affective empathy. The outcome variable, cradling bias, was established by the participants' cradling side preference across four separate trials of the cradling task.

The study was conducted at the participants' respective schools in a quiet room. Three private mainstream primary schools located in the Cape Town area, specifically, in Vredehoek, Sea Point and Constantia, participated in this study.

Participants

A total of 73 participants, aged 6 to 8 years (Grade 1 and 2 students), were initially recruited to participate in this study. Participants were recruited from three private mainstream primary schools located in the Cape Town area, specifically, in Vredehoek, Sea Point and Constantia, via convenience sampling.

Ten participants were excluded as they did not meet the eligibility criteria or did not return the follow-up documents necessary for inclusion. Specifically, two participants were excluded due to a diagnosis of anxiety disorder and a current prescription of psychiatric medication, whereas eight participants were excluded as they did not return the follow-up documents. Therefore, the final sample consisted of 63 participants: 32 males and 31 females. Ethnicity was not taken into account when recruiting participants, as the LCB is not a culture-specific phenomenon (Richards & Finger, 1975; Saling & Cooke, 1984).

Eligibility criteria. Only the data of the 63 children who successfully completed the pretend play tasks (described in measures below) were included in the study, as the ability to engage in pretend play is a necessary requirement for the cradling task. Exclusion criteria included a history of head injury, infantile meningitis or both, as well as the diagnosis of any neurological condition(s). Additionally, psychological diagnoses, namely, anxiety and depression, also resulted in exclusion. Previous or current prescription of psychiatric medication also ensured exclusion. Since psychological and neurological conditions, particularly anxiety and depression, have been found to influence cradling bias, such variables were controlled for through exclusion (Malatesta et al., 2019; Reissland et al., 2009; Vauclair & Scola, 2009; Weatherill et al., 2004).

Power analysis. An a priori power analysis, using G*Power software with set parameters of Cohen's $f = .20$, $\alpha = .05$, and desired power = .80, proposed that a sample size of 65 participants would yield sufficient statistical power for hierarchical multiple regression analysis (Faul, Erdfelder, Lang, & Buchner, 2007). We recruited an adequate number of participants (73 participants), however, given the exclusion criteria, the sample size was slightly underpowered, with a sample size of 63.

Measures

Parent-report measures.

Demographic questionnaire. Parents/legal guardians completed a basic demographic questionnaire (Appendix A). This questionnaire asked for demographic information (e.g., age, gender) for both caregiver and child as well as social and medical information concerning eligibility criteria (e.g., a diagnosis of neurological conditions, depression and/or anxiety disorder).

Callous-Unemotional Screening Device (CUSD). The short-form of the CUSD (Appendix B) was employed as a parent-report measure of child callous-unemotional traits. The CUSD is a revised combination of the *Antisocial Process Screening Device (APSD)*; Frick & Hare, 2001) and the *Strengths and Difficulties Questionnaire (SDQ)*; Goodman, 1997). The questionnaire consists of nine items designed to identify a child's temperament in terms of callous-unemotional traits (e.g., "Is your child concerned about other people's feelings?"). These traits are demonstrated to be inversely related to empathy and emotional distress, specifically the affective component thereof (Barker, Oliver, Viding, Salekin, & Maughan, 2011). Both the *APSD* and the *SDQ* have reported high predictive validity among Western European and American populations (Goodman, Ford, Simmons, Gatward, & Meltzer, 2000; McMahon, Witkiewitz, & Kotler, 2010). The use of this screening device

among South African school children has yielded an alpha coefficient of .66 (Malcolm-Smith, Woolley, & Ward, 2015). Due to the short length of the scale used in this screening device, this alpha coefficient demonstrates adequate reliability in this context.

Questionnaire of Cognitive and Affective Empathy (QCAE). An adapted parent-report version of the QCAE (originally a self-report questionnaire; Appendix C) was employed as a measure of affective empathy traits in children. The questionnaire consists of 31 statements prompting a yes or no response, on a scale with anchors of *Strongly Disagree*, *Disagree*, *Agree*, or *Strongly Agree*. The QCAE is designed to assess the child's capacity for cognitive and affective empathy, the latter of which is of most interest to this study. The affective empathy dimension consists of 12 items (e.g., "My child gets very upset when he/she sees someone cry"). The QCAE has demonstrated good reliability and validity internationally (Di Girolamo, Giromini, Winters, Serie, & De Ruiter, 2019; Liang et al., 2019; Reniers, Corcoran, Drake, Shryane, & Völlm, 2011). Previous research in South Africa using this scale has yielded an alpha coefficient of .88, demonstrating high reliability in this context (Louw, 2014).

Child measures.

Cradling bias task. This task assessed non-functional cradling bias (i.e., cradling for the purpose of soothing an infant). The cradling task was imaginary (i.e., no doll was used) to eliminate potential gender stereotypes associated with playing with dolls. The imaginary nature of the task was not expected to influence the findings, as the LCB emerges irrespective of the method used to measure it (Forrester et al., 2018; Morgan et al., 2018; Van der Meer & Husby, 2006).

Each participant completed four separate trials of the cradling task. This avoided potential statistical biases and thus verified the consistency of each participant's preferred cradling side. The researcher mimicked the neutral cradling position (i.e., no bias in visual gaze), ensuring no holding side preference was suggested. For each trial, participants were asked to imitate the act of holding an infant that he/she wants to sooth or put to sleep. This was followed by the following prompt from the researcher: "Imagine that you are holding a baby in this position. Will you put it to sleep? Can you show me how you would hold the baby?" Once the child demonstrated this action, the researcher asked the child: "Can you look at the baby's face?" at which point the researcher noted the child's cradling side. Cradling bias was determined by recording the participant's dominant cradling side observed across the four trials, according to the child's visual field in which the imaginary baby's face lay.

Pretend play tasks. As the cradling bias task relied on the ability to engage in pretend play, it was critical to control for this ability. Participants were asked to engage in four pretend play tasks that served as a control for the cradling bias task in terms of pretend play abilities. All tasks were gender-neutral so as to eliminate the confounding effect of any stereotypical behaviours. The tasks included (1) brushing hair, (2) watering a plant, (3) brushing teeth and (4) pouring a glass of water. Participants had to complete all four of these tasks successfully to pass, and in turn, be included in the study.

Handedness. Participants' handedness was established by recording (1) the hand used to complete each pretend play task (four in total), (2) the hand used to sign the assent form and (3) as indicated by their parent/legal guardian on the demographic questionnaire. All such measures of handedness were consistent for each participant, as they presented the same dominant hand across all three measures.

Procedure

Once ethical approval was granted from the Research Ethics Committee of the University of Cape Town's Department of Psychology (Appendix D), permission was obtained from school principals to recruit participants from three private mainstream schools in the Cape Town area. Parents/legal guardians were provided with hard copy study information forms (Appendix E) and informed consent forms, (Appendix F) which were distributed to them via their children. Once consent was given, parents were sent the demographic questionnaire, QCAE and CUSD forms to complete, either in hard copy or via email depending on their preference. Completion of these forms was expected to take no longer than 30 minutes.

The researchers then liaised with teachers regarding suitable times for assessment of child participants. On the day of assessment, participating children agreed to participate using an assent form (Appendix G) which was verbally conveyed to them. All participating children were able to verify their agreement to participate in writing on the assent form.

The sequence of tasks administered occurred as follows: one pretend play task was administered in between each of the four cradling bias task trials. The order of pretend play tasks was counterbalanced to prevent carry over effects. Altogether, this took no longer than 15 minutes of each participant's time.

Ethical Considerations

Ethical approval. The Research Ethics Committee of the University of Cape Town's Department of Psychology granted ethical approval for this study (Appendix D).

Consent, voluntary participation and confidentiality. As minors were included as participants of the study, consent was obtained from parents/legal guardians. The consent form detailed the purpose and procedure of the study and emphasised the voluntary nature of participation and the right to withdraw participation at any time without repercussions. Participants were additionally guaranteed confidentiality of their data, in that only the researcher and supervisors had access to the data. All hard copies have been stored in locked filing cabinets, and all electronic data was password protected on a computer. In order to ensure confidentiality, participants were assigned a number to code their identities and thus none of their personal information has been disclosed, nor will their results be linked back to them. The assent form articulated the same information to the child.

Risks and benefits. No foreseeable risks were associated with this study. In terms of benefits, children were able to choose five stickers from a pool of stickers as a token of appreciation for their participation, regardless of whether they opted to withdraw participation during the course of the research.

Debriefing. Once the data was collected and analysed, a debriefing letter was sent to the participating schools and participants' parents, which included an outline of the study and expressed thanks for participation. Here, they were provided with a description of the purpose of the research and were given a summary of the research findings.

Data Analysis

All statistical analyses were computed using IBM SPSS Statistics (version 26), with a significance threshold default of 0.05. Basic descriptive statistics were calculated. Cradling bias was coded as a numerical variable. For each trial of the cradling task, -1 was coded where the participant cradled to the left, and +1 where the participant cradled to the right. Thus, the degree of cradling bias ranged from -4 to +4, with -4 representing consistent leftward cradling and +4 representing consistent rightward cradling. Inconsistent leftward cradling was coded as -2, whereas inconsistent rightward cradling was coded as +2. A score of 0 represented no cradling bias. Chi-squared analyses were executed on categorical data (e.g., handedness), and the appropriate parametric and/or non-parametric tests were run on the continuous data.

The main analysis utilised a theoretically derived model for hierarchical multiple regression analysis. The potential predictors of cradling bias were entered into the model as follows: gender, callous-unemotional traits, affective empathy scores, and the interaction between gender and affective empathy. The interaction between gender and affective empathy was included in the model as some research suggests potential gender differences in

this trait, specifically, that females exhibit greater empathic capacities than males (Christov-Moore et al., 2014; Landazabal, 2009; Mestre et al., 2009). Thus, there were a total of four predictors for cradling bias in the regression analysis.

Results

Sixty-three children between the ages of 6 and 8 years (Grade 1 and 2 students) participated in this study. Sample characteristics are presented in Table 1. The majority of participants were right-handed, reflecting the distribution of handedness found in the general population (Annett, 1970). An independent samples t-test revealed that there was no significant difference in cradling bias between male and female participants, $t = -1.65$; $p = .105$. As can be seen in Table 1, there were no significant differences in *Affective Empathy* or *Callous-unemotional Trait* scores across gender. Male participants scored marginally higher on *Affective Empathy* than female participants, however, this difference was not significant, $t = -1.6$, $p = .094$. This finding is contrary to our expectation, as literature suggests that females exhibit higher affective empathy when compared to males (Christov-Moore et al., 2014; Landazabal, 2009; Mestre et al., 2009). As expected from a normative sample, both male and female participants yielded relatively low *Callous-unemotional Trait* scores ($M = -9.75$; $SD = 2.23$).

Table 1.
Sample Characteristics

Characteristic	Group			Significance	
	Male ($n = 32$)	Female ($n = 31$)	Total ($n = 63$)	t/x^2	p
Age (years) $M (SD)$	7.20 (0.71)	7.23 (0.62)	7.21 (0.66)	0.15	.879
Cradling Bias ^a Right: No Bias: Left $M (SD)$	9: 0: 23 -1.67 (3.41)	13: 1: 17 -0.32 (3.83)	22: 1: 40 -0.98 (3.66)	-1.65	.105
Handedness Right: Left	29: 3	29: 2	58: 5	0.54	.765
Affective Empathy $M (SD)$	18 (6.44)	17.71 (5.81)	17.85 (6.08)	0.24	.814
Callous-unemotional traits $M (SD)$	-10.20 (2.31)	-9.32 (2.1)	-9.75 (2.23)	-1.70	.094

^aThis data has been calculated categorically and continuously, and the significance is related to the continuous data.

Overall, participants exhibited a leftward cradling bias (63.50%). This finding is consistent with the general consensus of literature on the LCB among females, which collectively posits that 60% to 80% of human females cradle to the left of the body midline (De Château, 1983; Finger, 1975; Harris et al., 2007; Richards & Finger, 1975). Notably, 71.90% of males exhibited the LCB, while only 54.80% of females demonstrated this preference (see Figure 1).

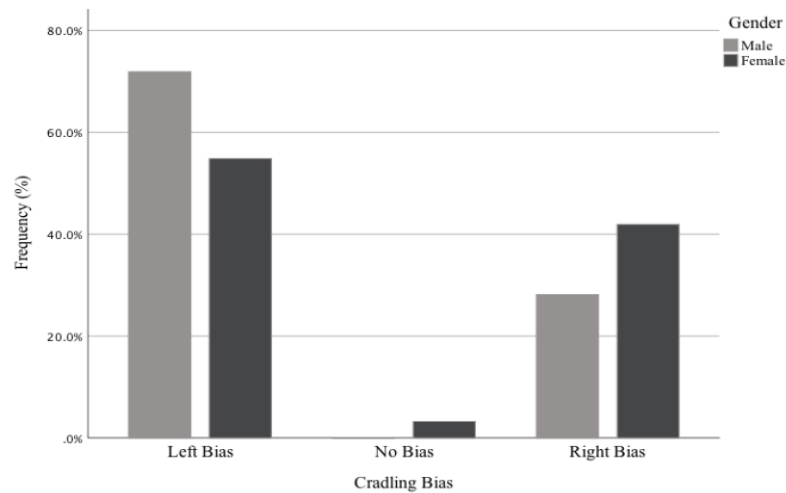


Figure 1. Comparison of left and right cradling bias across gender.

A theoretically-derived hierarchical multiple regression model was used to investigate the relationship between four potential predictors and *Cradling Bias* (Table 3). *Gender* was entered into the model first, as previous research collectively suggests that this variable is associated with cradling side, specifically, that females cradle to the left to a greater extent than males (DeChâteau, 1983; Forrester et al., 2018; Turnbull & Lucas, 1991). Handedness would subsequently be a logical inclusion in the model, however, since only five participants were left-handed, any correlation found between handedness and cradling bias would likely be a product of this skewed distribution of handedness and cradling bias. Age would also be a logical inclusion in the model, as literature suggests the possibility of a relationship between cradling and prior caregiving experience among males, such that with increased age comes increased caregiving experience (Bourne & Todd, 2004; Bundy, 1979). However, given the lack of variability in our narrow age band of 6 to 8 years, age was not included as a predictor. *Callous-unemotional Traits* was entered next, followed by *Affective Empathy*, as our hypotheses upheld that such empathy measures would be negatively and positively associated with the LCB respectively. While there may be issues of multicollinearity between these predictors, tolerance suggests that this is not an issue. The interaction between *Gender* and

Affective Empathy was entered last into the model, as there was an expected difference across gender in terms of affective empathy (Christov-Moore et al., 2014; Landazabal, 2009; Mestre et al., 2009). Here, different levels of gender (i.e., male or female) were expected to mediate the association between *Affective Empathy* and *Cradling Bias*.

None of the potential predictors were associated with *Cradling Bias*. Only two significant intercorrelations were found, specifically between *Callous-unemotional Trait* scores and *Affective Empathy* scores ($r = -.44$; $p < .001$) and between *Gender* and *Callous-unemotional Trait* scores ($r = .21$; $p = .047$). The correlation between the *Callous-unemotional Trait* and *Affective Empathy* measures was expected given that these measures pertain to a similar construct, namely, affective empathy (Table 2). Those who scored higher on *Callous-Unemotional Traits* scored lower on *Affective Empathy*.

The hierarchical multiple regression analysis revealed that none of the predictors were significantly associated with *Cradling Bias*, $F(4, 62) = 1.12$, $p = .358$, $r^2 = .07$. Notably, *Gender* did not significantly predict *Cradling Bias*, $F(1, 62) = 2.71$, $p = .105$, $r^2 = .04$ (Table 3).

Table 2
Pearson Correlation Matrix Among Predictors

	Gender	CUSD Score	QCAE Score	Gender*QCAE Score
Bias	.21	-.02	-.08	-.10
Gender		.21*	-.03	-.001
CUSD Score			-.44*	.02
QCAE Score				-.09

* $p < 0.05$

Table 3
Coefficients for Predictors in Hierarchical Multiple Regression Model

Model	Predictors	R ²	B	SE B	β	t	p
1	Gender	.04	1.49	.91	.21	1.65	.105
2	Gender	.05	1.59	.93	.22	1.70	.242
	CUSD Score		-.10	.21	-.06	-.48	
3	Gender	.06	1.65	.94	.23	1.76	.306
	CUSD Score		-.20	.24	-.12	-.83	
	QCAE Score		-.08	.09	-.13	-.90	
3	Gender	.07	1.65	.94	.23	1.76	.358
	CUSD Score		-.20	.24	-.12	-.85	
	QCAE Score		-.08	.09	-.14	-.97	
	Gender*QCAE Score		-.14	.16	-.11	-.88	

Discussion

We investigated the prevalence of the LCB in male and female children aged 6 to 8 years to determine whether the tendency to cradle to the left exists in male samples. We found that 63.50% of our participants cradled to the left, a finding which corresponds with previous research conducted among female samples (i.e., 60% to 80%; De Château, 1983; Finger, 1975; Harris et al., 2007; Richards & Finger, 1975). Interestingly, descriptive statistics demonstrated that a leftward preference was more pronounced in our male subsample than our female subsample. Overall, our findings indicated that gender did not significantly predict cradling bias. This contradicts the long-held assumption that females exhibit this bias to a greater extent than males (De Château, 1983; Forrester et al., 2018; Turnbull & Lucas, 1991).

We also correlated the LCB with measures associated with social communication, relating and empathy, namely affective empathy (i.e., the capacity for emotional relating and mimicry) and callous-unemotional traits (i.e., patterns of behaviour including a lack of empathy, shallow affect and a general disregard for others). As recent explanations of the LCB have implicated the right hemisphere's specialised role in innate social communication and relating, we expected high affective empathy, as well as low callous-unemotional traits, to be associated with an increased leftward cradling preference (Fleva & Khan, 2015; Pileggi et al., 2013; Pileggi et al., 2014). However, the findings were not congruent with our hypotheses, in that neither affective empathy nor callous-unemotional traits were found significant in predicting cradling side.

As gender did not significantly predict the LCB, our research is in line with the current right hemispheric explanation of this phenomenon. This current consensus posits that the LCB is underpinned by the right hemisphere's specialised role in emotion processing, and that the function of emotion processing is lateralised to the right hemisphere of the brain in both males and females (Bourne & Todd, 2004; Huggenberger et al., 2009; Sieratzki & Woll, 2002). The absence of an association between gender and the LCB furthermore contradicts the notion that males exhibit a weaker leftward cradling tendency compared to females (DeChâteau, 1983; Forrester et al., 2018; Turnbull & Lucas, 1991). In demonstrating that the LCB emerges regardless of gender, this research is in line with the understanding that the LCB is an evolved behaviour mediated by right hemisphere processes that emerge in both males and females. These findings lend themselves to the recent understanding of the LCB as a primitive mechanism facilitated by the right hemisphere's role in social communication (Fleva & Khan, 2015; Pileggi et al., 2013, 2014).

Our secondary hypotheses were based on recent understandings of the LCB as a mechanism of social communication, mediated by the right hemisphere's specialised role in emotion processing. We investigated the plausibility of an explanation posed by recent research, which links the LCB to innate social communication and relating mechanisms (Fleva & Khan, 2015; Pileggi et al., 2013; Pileggi et al., 2014). However, the findings were not congruent with our hypotheses, in that such affective empathy measures were found non-significant in predicting cradling side. While the findings of our primary hypothesis are consistent with the current understanding of the LCB as an innate mechanism facilitated by the right hemisphere's specialised role in emotion processing, the rejection of our secondary hypotheses suggests otherwise (Manning & Chamberlain, 1991; Pileggi et al., 2014; Sieratzki & Woll, 2002). Such findings call for further exploration into the relationship between the LCB and innate social communication mechanisms.

As our sample consisted of young children aged 6 to 8 years, who, given their age, were unlikely to have prior caregiving experience, our research controlled for caregiving experience in its design. Note that we do not equate age with prior caregiving experience, however, it is unlikely that prior caregiving experience is present in our young sample. The study's design controlled for this because previous research has suggested that increased caregiving experience is associated with an increased tendency to cradle to the left among males (Bourne & Todd, 2004; Bundy, 1979). Since our sample exhibited a general LCB, it suggests that this tendency arises early in development, and is thus not likely associated with prior caregiving experience, particularly among males. Our narrow age band, however, meant

that we could not investigate the role of age in predicting the LCB. However, as prior caregiving experience was ostensibly absent within this young sample of predominantly leftward cradlers, it tentatively suggests that males exhibit a leftward cradling preference early in development, and that such a behaviour arises regardless of prior caregiving experience (Fleva & Khan, 2015; Herdien, 2018; Pileggi et al., 2013; Pileggi et al., 2014; Saling & Bonert, 1983; Scola & Vauclair, 2010).

Overall, this research illustrated that the LCB is present in males and females, and tentatively suggests that it is prevalent in a sample that is unlikely to have prior caregiving experience (i.e., young boys and girls). Furthermore, this research supports the current explanation that cradling preference is facilitated by the right hemisphere's specialised role in emotion processing, and in doing so, contributes to current literature on this phenomenon. It appears that the universal human tendency of the LCB arises early in development, regardless of gender. However, the association between the LCB and innate mechanisms of social communication and relating (i.e., affective empathy) warrant further investigation.

Limitations and Directions for Future Research

The results obtained are representative of a sample of 63 participants. As power analysis proposed a sample size of 65 participants, our study was slightly underpowered. Consequently, the small sample size may have functioned as a limitation in our research. In order to overcome this and obtain more generalisable conclusions, future research on this phenomenon should recruit a larger sample.

Furthermore, our study relied on a relatively small age band of children aged 6 to 8 years (Grade 1 and 2 students). This narrow age band represents insufficient variability in terms of investigating the role of age in predicting the LCB. Although prior caregiving experience was ostensibly absent within this narrow age band of children, and was thus controlled for in our research design, an investigation of caregiving experience as a predictor of the LCB would need to sample across a wider age range in order to draw meaningful conclusions. As such, research attempting to compare the LCB across age bands, and in so doing, establish its association with caregiving experience, could expand their age band and ideally adopt a longitudinal design to investigate if the degree of this bias increases with increased caregiving experience.

A considerable limitation identified in our study was the use of parent self-report measures in evaluating the participants' callous-unemotional traits and affective empathy. In general, self-report measures are susceptible to social desirability biases and differences in interpretation, and are thus inherently unobjective (Randall & Fernandes, 1991). While self-

report measures are in and of themselves biased, parent self-report measures pertaining to their child introduce a variety of additional problems (Lagattuta, Sayfan, & Bamford, 2012). The construct of affective empathy is difficult to interpret for another person, a factor which is further clouded when attempting to assess that of your own child. The lack of objectivity associated with parent self-report measures suggests that this form of evaluating affective empathy and its counterpart, callous-unemotional traits, may not be the most accurate and suitable instrument to measure this construct, specifically within this population. This may have accounted for the finding that the affective empathy measures were not significant in predicting the LCB as the scores derived from these measures were likely inconsistent. Given the nature of empathy and that is it something that is considered socially desirable, it is likely that parents were overcompensating in their scoring. Thus, future research should direct attention toward the development and implementation of more direct, physiological measures of affective empathy, such as a measure of facial mimicry (Hatfield, Bensman, Thornton, & Rapson, 2014). Furthermore, although empathy, social relating and attachment are highly correlated, perhaps a more precise measure of social relatedness and attachment should be utilised and correlated with the LCB.

Overall, the prevalence of the LCB should be further investigated among male samples. Furthermore, attention should be directed toward a further exploration of the LCB with regard to innate social relating mechanisms and their facilitation of optimal caregiver-infant interactions. Importantly, future research should be founded upon innate cerebral explanations of the LCB, in which the right hemisphere mediates social and emotional communication processes.

Conclusion

In light of the paucity of research investigating the LCB among male samples, this research contributes to the understanding of the LCB among males, specifically, young males. The findings of this study support our primary hypothesis that gender is not a significant predictor of the LCB. In light of this finding, this research extends the current understanding of the LCB as an evolved behaviour underpinned by right hemispheric lateralisation of emotion processing, given that such emotion processing is lateralised to the right side of brain in both males and females. It additionally undermines the long-held assumption that females cradle to the left to a greater extent than males, or in other words, that males exhibit a weaker tendency in leftward cradling. Despite our narrow age band, the absence of prior caregiving experience in our young sample tentatively suggests that the LCB is not associated with this

variable. It appears that our primary hypothesis provides evidence for an explanation of the LCB that is inherently innate, one which arises early in development regardless of gender.

Our secondary hypotheses proved less conclusive. The measure of affective empathy and its inverse, callous-unemotional traits, were found non-significant in predicting the LCB. This finding does not lend itself to the recent explanation of the LCB, which implicates the right hemisphere's role in innate social communication and relating. However, this may be accounted for by the inherent social desirability and interpretation biases associated with self-report measures, specifically, those used by parents to assess their own children. This may have compromised the objectivity and accuracy of the scores derived from these measures. Future research should thus place emphasis on the development and use of more physiological and objective measures of affective empathy. It should be noted that, although constructs of affective empathy, social communication and relating are highly correlated, perhaps more direct measures of the latter should be employed when investigating the association between the LCB and social communication mechanisms. In doing so, future research could establish a clearer understanding of the relationship between social communication abilities and the rearing of offspring.

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Appendix A
Demographics Questionnaire

Date: _____

DEMOGRAPHIC QUESTIONNAIRE

Child's Information:

Name: _____

School: _____

Age: _____

Date of Birth (dd/mm/yy): _____

Sex (circle one): Male / Female

Home language: _____

Handedness (circle one): Left / Right / Ambidextrous

Number of siblings: _____

Number of **older** siblings: _____

Does your child have any experience looking after his/her younger siblings or other young children? Yes / No

Please answer the following additional questions, and be assured that this information will remain confidential.

1. Has your child ever experienced a head injury (e.g., being hit on the head, falling and hitting his/her head)? Yes / No

If yes, did your child lose consciousness as a result of the head injury?: Yes / No

2. Has your child ever experienced/received a diagnosis of any of the following:

a. Neurological conditions (e.g., epilepsy, meningitis, cerebral palsy, Tourette's syndrome, brain tumour, Autism Spectrum Disorders): Yes / No

If yes, please specify: _____

- b. Memory problems/difficulties: Yes / No

If yes, please specify: _____

- c. Problems with his/her vision and/or hearing: Yes / No

If yes, please specify: _____

- d. Depression and/or anxiety: Yes / No

If yes, please specify: _____

- e. Has your child ever experienced learning difficulties such as dyslexia or attention-deficit/hyperactivity disorder (ADD/ADHD)?: Yes / No

If yes, please specify: _____

- f. Is he/she currently taking any prescription medication?: Yes / No

If yes, please specify: _____

- g. Has your child every been diagnosed with a social disorder (e.g., conduct disorder or oppositional defiant disorder)?: Yes / No

If yes, please specify: _____

- h. Has your child ever had a communication disorder? (e.g., having problems with understanding or producing speech, slow vocabulary, difficulties recalling words or problems with producing sentences appropriate for his/her age: Yes / No

If yes, please specify: _____

Parent Information:

Please answer the following questions, and be assured that this information will remain confidential.

1. Who is completing this questionnaire? (circle one):

Mother / Father / Grandparent / Legal guardian / Other: _____

2. What is the total monthly income of the household in which you live (i.e., from all sources)? (circle the appropriate income range)

0 – 5000 / 6000 – 15 000 / 16 000 – 25 000 / 26 000 – 35 000 / 36 000 – 45 000 /
46 000 – 55 000 / 56 000 – 65 000 / more than 65 000

3. What is your highest level of education?

What is the highest grade you have completed? _____

Did you complete a tertiary degree? If yes, please specify: _____

4. Parental employment: What is the occupation of:

Mother: _____

Father: _____

Legal guardian: _____

Material and financial resources (please circle yes or no):

Which of the following items, in working order, does your household have?

Items	Yes	No
1. A refrigerator or freezer	Yes	No
2. A vacuum cleaner or polisher	Yes	No
3. A television	Yes	No
4. A music system (radio excluded)	Yes	No
5. A microwave oven	Yes	No
6. A washing machine	Yes	No
7. A DVD player	Yes	No

Which of the following do you have in your home?

Items	Yes	No
1. Running water	Yes	No
2. A domestic	Yes	No
3. At least one car	Yes	No
4. A flushing toilet	Yes	No
5. A built-in kitchen sink	Yes	No
6. An electric stove or hotplate	Yes	No
7. A working cell phone	Yes	No

Do you personally do any of the following?

Items	Yes	No
1. Shop at supermarket?	Yes	No
2. Use any financial services such as bank account, ATM card or credit card?	Yes	No
3. Have an account at retail store?	Yes	No

Appendix B
Callous-Unemotional Screening Device

Please complete all questions: The response options for each question are 0 = not at all true; 1 = sometimes true; 2 = definitely true			
My child/ This child	0 = not at all true	1 = sometimes true	2 = definitely true
1. Is concerned about other people's feelings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Feels guilty if s/he does something wrong	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Breaks promises	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Shares with other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Is helpful if someone is hurt, upset or ill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Is kind to younger children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Volunteers to help others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Is disobedient to adults	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Is inconsiderate of other people's/children's feelings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix C
Questionnaire of Cognitive and Affective Empathy

People differ in the way they feel in different situations. Below you are presented with a number of characteristics that <i>may or may not apply to your child</i> . Read each characteristic and indicate how much you agree or disagree with the item by selecting the appropriate box. Answer quickly and honestly.		Strongly agree	Slightly agree	Slightly disagree	Strongly disagree
1.	My child sometimes finds it difficult to see things from another’s point of view.				
2.	My child is usually objective when he/she watches a film or play, and doesn’t often get completely caught up in it.				
3.	My child tries to look at everybody’s side of a disagreement before he/she makes a decision.				
4.	My child sometimes tries to understand his/her friends better by imagining how things look from their perspective.				
5.	When my child is upset at someone, he/she will usually try to “put him/herself in the person’s shoes” for a while.				
6.	Before criticizing somebody, my child tries to imagine how he/she would feel in their place.				
7.	My child often gets emotionally involved in his/her friends’ problems.				
8.	My child is inclined to get nervous when others around him/her seem nervous.				
9.	People my child is with have a strong influence on his/her mood.				
10.	It affects my child very much when one of his/her friends seems upset.				
11.	My child often gets deeply involved with the feelings of a character in a film, play, or novel.				
12.	My child gets very upset when he/she sees someone cry.				
13.	My child is happy when he/she is with a cheerful group and sad when others are glum.				
14.	It worries my child when others are worrying and panicky.				
15.	My child can easily tell if someone else wants to enter into a conversation.				
16.	My child can quickly pick up if someone says one thing but means another.				
17.	It is hard for my child to see why some things upset people so much.				
18.	My child finds it easy to put him/herself in somebody else’s shoes.				
19.	My child is good at predicting how someone will feel.				
20.	My child is quick to spot when someone in a group is feeling awkward or uncomfortable.				
21.	Other people tell my child he/she is good at understanding what others are feeling and what others are thinking.				

22.	My child can easily tell if someone else is interested or bored with what he/she is saying.				
23.	Friends talk to my child about their problems as they say that my child is very understanding.				
24.	My child can sense if he/she is intruding, even if the other person does not tell him/her.				
25.	My child can easily work out what another person might want to talk about.				
26.	My child can tell if someone is masking their true emotion.				
27.	My child is good at predicting what someone will do.				
28.	My child can usually appreciate the other person's viewpoint, even if he/she does not agree with it.				
29.	My child usually stays emotionally detached when watching a film.				
30.	My child always tries to consider the other person's feelings before he/she does something.				
31.	Before my child does something, he/she tries to consider how his/her friends will react to it.				

Appendix D
Ethical Approval

UNIVERSITY OF CAPE TOWN



Department of Psychology

University of Cape Town Rondebosch 7701 South Africa
Telephone (021) 650 3417
Fax No. (021) 650 4104

16 April 2019

Dr L. Pileggi
Department of Psychology
University of Cape Town
Rondebosch 7701

Dear Dr Pileggi

I am pleased to inform you that ethical clearance has been given by an Ethics Review Committee of the Faculty of Humanities for your study, *Investigating the Prevalence and Correlates of Leftward Cradling Bias across Age and Gender*. The reference number is PSY2019-013.

I wish you all the best for your study.

Yours sincerely

A handwritten signature in cursive script, appearing to read 'Lauren Wild'.

Lauren Wild (PhD)
Associate Professor
Chair: Ethics Review Committee

Appendix E

Parent/Guardian Information



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

Pretend Play Research

Dear Parent(s)/Guardian(s)

You are invited to participate in a research study investigating children's ability to engage in pretend play tasks, such as brushing their teeth, watering some plants, and how they interact with an imaginary baby. We are particularly interested in their pretend interactions with an imaginary baby. This study focuses on social understanding, empathy, and bonding among children. Approximately 100 children aged 5 to 8 years (50 boys and 50 girls) and their parents/primary caregivers will participate in this study. **You and your child are invited to take part in the study.**

Tasks administered to your child will include pretend-play tasks such as holding a baby, watering a plant, brushing their teeth, and brushing their hair. If you and your child agree to participate in the study, your child will be seen for a maximum of 15 minutes at his/her school, and you will be required to complete an additional two questionnaires aside from a basic demographics questionnaire. We ask that you indicate whether you prefer to receive these questionnaires electronically (via email) or in hard copy on the consent form herewith. These additional two questionnaires will take you roughly 15 minutes to complete.

There are no risks to your child through participating in this research, and in fact, we anticipate that children will find this quite enjoyable. However, if your child does become upset, she/he may withdraw at any point. Your child will receive some stickers of his/her choice for participating. Even if he/she chooses to withdraw, your child will still receive these stickers. We would like to emphasise that participation in this study is entirely voluntary, and will not affect your child's education.

If you would like your child to participate in the study, please complete the demographic questionnaire as well as the consent form provided. Please answer all the questions as accurately and truthfully as possible. We understand that some of this information may be sensitive, but be assured that all information will be kept strictly confidential.

Should you have any questions or queries about the research or your participation, please do not hesitate to contact the researchers Ashlee Blacher or Lara Levetan, or their supervisors listed below.

Thank you for your participation.

Researchers:

Ashlee Blacher
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Lara Levetan
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Appendix F
Consent Form

CONSENT FORM

I hereby consent to my child's participation in this study.

Child's name: _____

Signature of parent/guardian: _____

Date: _____

I hereby consent to my participation in this study.

Parent/guardian's name: _____

Signature of parent/guardian: _____

Date: _____

Contact number: _____

Email: _____

If consent is given for participation, please indicate whether you would like to receive the two additional questionnaires via email or in hardcopy (circle one): Email / Hardcopy

Appendix G**Assent Form****UNIVERSITY OF CAPE TOWN
DEPARTMENT OF PSYCHOLOGY****Assent Form**

Hello! We want to tell you about a research study we are doing. A research study is a way to learn more about something. We would like to find out more about how people behave when doing certain tasks.

If you agree to join this study, you will be asked to do some play tasks like watering a plant, brushing your teeth, pouring a glass of water, kicking a ball, and holding a doll.

This will take less than 20 minutes. If you get tired, we can take a break at any time.

You do not have to join this study. It is up to you. No one will be angry with you if you don't want to be in the study. You can also join the study and change later if you want to stop.

When we are all done, we will give you 5 stickers!

If you sign your name below, it means that you agree to take part in this study.

Participant's Signature/Name: _____

Researcher signature: _____ Date: _____