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### Abstract

Alexithymia has been linked to reduced emotional awareness and increased aggression. One line of evidence suggests that authoritarian parenting contributes to the development of alexithymia. To elucidate the relationship between experienced parenting style, alexithymia and aggression the Parental Authority Questionnaire, the Toronto Alexithymia Scale and the Buss-Perry Aggression Questionnaire were administered to a group of emerging adults. Current findings show a positive relationship between: i) authoritarian parenting style and alexithymia, ii) alexithymia and aggression, iii) authoritarian parenting style and aggression. This study also found that paternal authoritarian parenting predicted alexithymia and aggression when controlling for maternal authoritarian style, but not the other way round. In addition, alexithymia mediated the relationship between paternal authoritarian parenting and aggression when controlling for maternal authoritarian style suggesting that elevated alexithymia which is likely to be a consequence of authoritarian parenting, especially when it is practiced by a father, contributes to increased aggression in adulthood.

*Keywords:* parenting style, alexithymia, aggression, authoritarian parenting, emerging adults

### Relationship between Alexithymia, Parenting Style and Aggression in Emerging Adults

Alexithymia is a personality construct characterized by impaired capacity to communicate and identify emotions and a propensity to engage in externally oriented thinking (Bagby, Parker, & Taylor, 1994). Recent findings suggest that alexithymia is a continuous personality trait distributed across the general population (Keefer, Taylor, Parker, & Bagby, 2017; Parker, Keefer, Taylor, & Bagby, 2008) with ~10% scoring high on this personality construct (Franz et al., 2008; Mattila et al., 2010) and some studies suggesting elevated alexithymic traits in males compared to females (Mattila et al., 2010; Lane, Sechrest, & Riedel, 1998). Alexithymia has also been linked with reduced empathy (e.g. Bird et al., 2010; Grynberg, Luminet, Corneille, Grèzes, & Berthoz, 2010), impaired ability to process emotions displayed by others (Cook, Brewer, Shah, & Bird, 2013; Grynberg et al., 2012), and difficulties in emotion regulation (da Silva et al., 2017; Swart, Kortekaas, & Aleman, 2009). Furthermore, elevated levels of alexithymia have been linked to a wide array of disorders ranging from depression (Honkalampi, Hintikka, Tanskanen, Lehtonen, & Viinamäki, 2000) and anxiety (Kumar, Avasthi, & Grover, 2018) to substance use disorder (Haan et al., 2014), pathological gambling (Toneatto, Lecce, & Bagby, 2009) and internet addiction (Mahapatra & Sharma, 2018) suggesting that individuals on the high end of the alexithymic spectrum suffer from increased psychological distress and employ maladaptive strategies to regulate their emotions.

When it comes to the etiology of alexithymia one line of evidence suggests that childhood family environment may contribute to its development (Montebarocci, Codispoti, Baldaro, & Rossi, 2004; Thorberg, Young, Sullivan, & Lyvers, 2011). Specifically, according to attachment theory the level of attunement of the caregivers to the infant's manifestations of affect shapes the child's ability to organise and regulate emotions and contributes to the

development of the internal working model of attachment which serves as a blueprint for future relationships (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969, 1988). Consequently, a positive family environment which supports the development of healthy emotion regulation strategies, where emotional expression is promoted and parent-child linguistic exchanges allow children to develop the ability to cognitively represent emotions (Lemche, Klann-Delius, Koch, & Joraschky, 2004; Pellerone, Formica, Lopez, Migliorisi, & Granà, 2017) typically results in the formation of secure attachment and healthy emotional development (Berenbaum & James, 1994; Besharat & Shahidi, 2014). On the other hand, insensitive or harsh caregiving which leads to the development of insecure attachment and where emotional expression is constrained and mentalization and effective management of emotions is not promoted leads to deficient emotional development (Berenbaum & James, 1994; Pellerone et al., 2017). Specifically, children who are discouraged from exploring and communicating emotions show deficient affective mentalisation capacity (Bateman & Fonagy, 2004), reduced ability to regulate emotions (Manzeske & Stright, 2009; Tani, Pascuzzi, & Raffagnino, 2018) and elevated alexithymia (Montebarocci et al., 2004; Pellerone et al., 2017). They also often resort to maladaptive strategies such as suppressing emotions or exaggerating emotional displays when distressed (Magai & Hunziker, 1993). Harsh parenting can also lead to ambivalence and discomfort in experiencing emotions later in life (Fukunishi, Sei, Morita, & Rahe, 1999), and deficient emotion regulation in adulthood (Tani et al., 2018). In line with this, it has been found that parenting which is characterised by high control and low care, which according to Baumrind's typology is categorized as an authoritarian parenting style (Baumrind, 1967), has been linked to increased alexithymia which persists into adulthood (Fukunishi et al., 1999; Kooiman et al., 2004; Thorberg et al., 2011).

Moreover, deficient parenting and attachment insecurity have been found to be a risk factor for the development of externalizing problems (Fearon, Bakermans-Kranenburg, Van IJzendoorn, Lapsley, & Roisman, 2010). Specifically, authoritarian parenting style has been associated with increased aggression in children (e.g. Braza et al., 2015 et al., Casas 2006) and emerging adults (Fossati et al., 2009; Little & Seay, 2014), who are in the developmental phase between late adolescence and early adulthood (Arnett, 2001). During this transitional period young people strive for independence but are usually still dependent on their parents for financial and emotional support (Nelson & Barry, 2005; Tanner & Arnett, 2009). Consequently, emerging adults tend to experience a variety of issues including externalising problems, especially when their need for autonomy is restricted by psychologically controlling parents (Hoeve et al., 2009; Roman, Human, & Hiss, 2012; Tu, Lee, Chen, & Kao, 2014). Interestingly, permissive parenting style has also been linked to aggression. It is believed that children raised by permissive parents, who are responsive but do not monitor their children's behaviour and do not set any boundaries (Baumrind, 1967), are unable to regulate their negative emotions presumably because they are not provided with opportunities to reflect on their behavior which ultimately leads to elevated levels of aggression (Kawabata, Alink, Tseng, van Ijzendoorn, & Crick, 2011).

Furthermore, alexithymia has also been associated with increased aggression which is likely to reflect impoverished emotional awareness and a limited ability to employ effective emotion regulation strategies whereby individuals with elevated levels of this personality construct resort to aggression as ways of dealing with psychological distress (Evren et al., 2015; Winter, Spengler, Bempohl, Singer, & Kanske, 2017). The association between alexithymia and aggression has also been proposed to stem from reduced ability to mentally represent affective states (Bateman & Fonagy, 2004; Fossati et al., 2009; Lemche et al., 2004). This is especially interesting in light of reports suggesting that alexithymia is linked to

an overreliance on avoidant coping such as e.g. alcohol abuse (e.g. Coriale et al., 2012) and experiential avoidance, which reflects an unwillingness to experience negative thoughts and emotions (Panayiotou et al., 2015). While these strategies might be effective ways to provide short-term relief from psychological distress when used habitually they often lead to exacerbation of negative affect (e.g. Gardner & Moore, 2008). This is consistent with studies showing that people on the high end of the alexithymic spectrum experience more psychological distress and increased negative emotions compared to those with less severe alexithymia (e.g. Kumar et al., 2018), and research demonstrating a link between increased negative affect and aggression especially when accompanied by deficient emotion regulation (e.g. Donahue, Goranson, McClure, & Van Male, 2014). As such the absence of cognitive resources necessary to represent, understand and manage distressing emotions accompanied by increased level of negative affect may predispose individuals with elevated alexithymia to aggression (Farah, Ling, Raine, Yang, & Schug, 2018; Velotti et al., 2016).

The aim of the present study was to further elucidate the relationship between experienced parenting style, alexithymia, and aggression in emerging adults. Specifically, based on the existing literature it was hypothesized that individuals who score high on alexithymia would display increased levels of aggression and report their parents to show authoritarian parenting style. It was also hypothesized that those individuals who report their parents to display authoritarian and permissive parenting styles would score high on aggression. Lastly, given the existing relationship between alexithymia and authoritarian parenting style (e.g. De Panfilis et al., 2003), between alexithymia and aggression (e.g. Winter et al., 2017), and between authoritarian parenting style and aggression (e.g. Hentges, Shaw, & Wang, 2018), this study also sought to establish whether alexithymia (assessed with the Toronto Alexithymia Scale; Bagby et al., 1994) mediates the relationship between authoritarian parenting style (assessed with the Parental Authority Questionnaire; Buri, 1991)

and aggression (assessed with the Buss-Perry Aggression Questionnaire; Buss & Perry, 1992) by examining all three constructs in a group of young adults recruited among university students.

## Method

### Participants

The sample population of the current study comprised students from James Cook University in Singapore. A priori power analysis revealed that suggested sample size was 172 participants in order to obtain statistical power at 0.95 level (*Effect size*  $f^2 = 0.15$ ,  $\alpha = 0.05$ ). In total 195 participants took part in this study. However, six were excluded due to incomplete answers on some of the questionnaires, two were removed due to being outside of the emerging adulthood age range, and 10 outliers were identified and removed prior to data analysis. This resulted in 177 remaining participants comprising 66% ( $N=117$ ) females and 34% ( $N= 60$ ) males. The age of the participants ranged from 18-29 years old ( $M = 22.09$ ,  $SD = 2.03$ ). There were eight participants who indicated that they were raised only by their mother, two indicated that they were raised only by their father, and the remaining 167 were raised by both parents. The majority of the participants recruited were Singaporean, 82% ( $N= 145$ ), 4.5% ( $N= 8$ ) were Indonesian, 4% ( $N= 7$ ) were Indian and the rest were either Malaysian, Chinese, Korean, Vietnamese, Kazakh, Filipino, or Myanmarese. The vast majority of participants 77% ( $N= 137$ ) reported their ethnic background to be Chinese, followed by Indian 10.7% ( $N= 19$ ) and the rest included ethnicities such as Malay, Caucasian, Indonesian and others.

### Materials and Procedure

**Demographic questionnaire.** A list of questions regarding participants' demographic information such as age, gender, ethnicity, and nationality was employed in this study.

**Toronto alexithymia scale (TAS-20).** The TAS-20 is a 20-item self-report scale and is the most commonly used measure of alexithymia (Bagby et al., 1994). It consists of three subscales: difficulty identifying feelings (DIF), difficulty describing feelings (DDF), and externally oriented thinking (EOT) style. The first scale, DIF measures difficulties in identifying and distinguishing between feelings and bodily sensations. It consists of seven items; such as e.g. “When I am upset, I don’t know if I am sad, frightened, or angry”. The second scale, DDF measures difficulties in describing feelings. It consists of five items; such as e.g. “It is difficult for me to find the right words for my feelings”. The third scale EOT measures a cognitive style that shows a preference for the external details of everyday life. It consists of eight items; such as e.g. “I prefer to just let things happen rather than to understand why they turned out that way”. For each of the items, participants were asked to indicate how well the statement applies to them by selecting a number from 1 (strongly disagree) to 5 (strongly agree). Five items were reversed scored. The scores of three subscales were added to produce a total alexithymia score. Participants’ scores can range from 20-100 with a higher scores indicating higher levels of alexithymia. Although the TAS-20 can be used to derive a cut off score of 61 in order to classify individuals as alexithymic, there has been broad consensus among researchers that alexithymia is a personality trait with stable characteristics that can be placed along a continuum (e.g. Keefer et al., 2017; Mattila et al., 2010), hence, in this present study, alexithymia is considered as a continuous variable. The test-retest reliability of the TAS-20 in the original study was .77 ( $p < 0.01$ ) and good convergent and discriminant validity was demonstrated in samples of university students (Bagby et al., 1994). Furthermore, the internal consistency for individual subscales was .80 for DIF; .76 for DDF; .71 for EOT; and .86 for the total scale (Boyle, Saklofske, & Matthews, 2015). In this study only the total scale was used which showed good internal consistency of .84.



**Buss–Perry aggression questionnaire (BPAQ).** The BPAQ is a four-factor questionnaire consisting of 29 items (Buss & Perry, 1992). The BPAQ assesses aggression through four subscales: physical aggression (PA), verbal aggression (VA) anger (A), and hostility (H). The first scale, PA, consists of nine items; such as e.g., “Once in a while I can’t control the urge to strike another person”. The second scale, VA, consists of five items; such as e.g. “When people annoy me, I may tell them what I think of them”. The PA and VA measures the instrumental or motor component of behaviours such as hurting or harming others physically or verbally. The third scale, A, consists of seven items; such as e.g. “I sometimes feel like a powder keg ready to explode”, it measures physiological arousal and preparation for aggression. The fourth scale, H, consists of eight items; such as e.g. “I sometimes feel that people are laughing at me behind my back”, it measures the cognitive component of behaviour such as feelings of ill will and injustice. For each of the items, participants were told to select the answer from a 5-point Likert scale ranging from 1 (extremely uncharacteristic) to 5 (extremely characteristic) to indicate how well the statement applies to them. Two items were reverse-scored. The questionnaire is made up of 29 items, yielding a minimum total score of 29 points and a maximum score of 145 with higher scores reflecting greater levels of aggression. Test-retest reliability of BPAQ has been found to range from .72 (anger and hostility) to .80 (physical aggression) (Maurelli, Dreer, Ronan, & ProQuest (Firm), 2014). Furthermore, the total BPAQ scale ( $\alpha = .89$ ) and the individual subscales have been reported to have good internal consistency (VA: .72, PA: .85, A: .83, and H: .77) (Gallagher & Ashford, 2016). The BPAQ has been found to have good construct validity (Ronan, Dreer, & Maurelli, 2014). In this study only the total scale was used which showed high internal consistency of .86.

**Parental authority questionnaire (PAQ).** The PAQ (Buri, 1991) draws on Baumarind’s (1967) parental style classification, which distinguishes among permissive (e.g.,

few demands or limits placed on children), authoritarian (e.g., highly controlling parenting emphasizing obedience), and authoritative (e.g., clear limit-setting, complemented by warmth, mutual respect, and flexibility). It consists of 30 items which tap into these three different parenting styles. The permissive scale, consists of 10 items; such as e.g., “As I was growing up, my mother/father seldom gave me expectations and guidelines for my behaviour”. The authoritarian scale, consists of 10 items; such as e.g., “As I was growing up my mother/father did not allow me to question any decision she/he had made”. The authoritative scale, consists of 10 items; such as e.g., “As I was growing up, once family policy had been established, my mother/father discussed the reasoning behind the policy with the children in the family”. Participants were asked to indicate how well each item describes them by selecting a number from 1 (strongly disagree) to 5 (strongly agree). The potential range of scores for each of the three subscales is 10 to 50, with higher scores indicating greater use of the particular parenting style. All scales have previously demonstrated good internal consistency (Kenney, Lac, Hummer, Grimaldi, & LaBrie, 2015). The PAQ is psychometrically sound and has demonstrated high content, discriminant, and criterion validity (Buri, Louiselle, Misukanis, & Mueller, 1988; Klein, O’Bryant, & Hopkins, 1996). In this study all scales used in the analysis had good internal consistency, for mother: Permissive; .78, Authoritarian; .87, and for father: Permissive; .79, Authoritarian; .87. Participants were asked to complete one PAQ relating to their father’s parenting style and another that relates to their mother’s parenting style. Participants who were raised by only one parent completed only one questionnaire which was relevant to them.

### **Procedure**

This study was approved by the JCU Human Research Ethics committee and was conducted online using Qualtrics and the SONA platform. Prior to commencing the experiment, participants were shown information about the study and asked to indicate

whether they consent to participating in this project by clicking one of two options (Yes, I consent to participating in this study or No, I do not consent to participating in this study). Participants had to indicate that they had agreed to participate in the study before they were allowed to proceed further. Subsequently, participants were asked to provide their demographic information and complete the questionnaires which included the TAS-20, BPAQ, two PAQ (one pertaining to the mother and the other pertaining to the father). For the PAQ, participants were given four options: (1) I don't have parents/didn't grow up with them, (2) I was raised only by my mother, (3) I was raised only by my father and, (4) I was raised by both parents. This was to ensure that participants raised by only one parent or did not grow up with them did not have to answer questions which were not relevant to them. Several participants who indicated they were brought up by both parents completed only one PAQ questionnaire pertaining only to one parent. Their data was included in the analysis. The study took approximately 30-40 minutes to complete and participants were rewarded with SONA credits for their participation.

## **Results**

All data handling and analyses conducted in the present study were performed using IBM SPSS version 23.

### **Data cleaning and assumption evaluation**

The normality of the data was assessed by examining normal Q-Q plots, detrended Q-Q plots, and skewness and kurtosis values. The linearity and homoscedasticity of the data was assessed by examining the scatterplots. This revealed that the study variables were homoscedastic and normally distributed. Outliers greater than 3 standard deviations from the mean (10 in total) and six participants who had incomplete answers on some of the questionnaires and two who were outside of the emerging adulthood age range were removed from the analysis resulting in a final sample of 177 participants.

### Correlational Analyses

Bivariate correlations were conducted in order to examine whether there is a relationship between the variables of interest. As can be seen in Table 1, there was a positive correlation between mother's authoritarian style and alexithymia ( $r(175) = .269, p < .01$ ) and father's authoritarian style and alexithymia ( $r(146) = .291, p < .01$ ), thus supporting the hypothesis that parental authoritarian practices are positively related to alexithymia. Secondly, a positive correlation was found between alexithymia and aggression ( $r(177) = .513, p < .01$ ), which was also in line with our prediction. Furthermore, in line with our hypothesis there was a positive correlation between aggression and mother's authoritarian style ( $r(175) = .180, p < .05$ ) and between aggression and father's authoritarian style ( $r(146) = .206, p < .05$ ). Lastly, contrary to our prediction there was a non-significant correlation between mother's permissive style and aggression ( $r(175) = .112, p > .05$ ) and between father's permissive style and aggression ( $r(146) = .055, p > .05$ ) (Table 1).

### Mediation Analyses

Based on the correlational results the mediation analysis using the PROCESS macro (Hayes, 2013) was employed to test whether alexithymia mediates the relationship between paternal authoritarian parenting style and aggression, while statistically controlling for the maternal authoritarian style, and vice versa. Prior to conducting mediation analyses, additional assumptions were evaluated. This showed that the Mahalanobis distance did not exceed the critical  $\chi^2$  for  $df = 3$  ( $\alpha = .001$ ) of 16.27 for any variables in the data file, indicating that multivariate outliers were not of concern. Following, relatively high tolerances ( $>.9$ ) and VIF ( $<2$ ) for all the predictors in the regression model indicated that the data was free of multicollinearity.

**Mediation analysis for father.** Mediation analysis using bootstrapping with bias-corrected confidence estimates using model 4 was employed to examine whether alexithymia

mediates the relationship between paternal authoritarian parenting style and aggression while controlling for maternal authoritarian parenting practices which was included in the model as a covariate. Ninety-five percent confidence interval of the indirect effect was obtained with 5000 bootstrap samples. As can be seen in Figure 1a, paternal authoritarian parenting style significantly predicted alexithymia ( $b = .24$ ,  $t(141) = 2.99$ ,  $p < .005$ ) while controlling for mother's authoritarian parenting which was not found to be a significant predictor of alexithymia ( $b = .16$ ,  $t(141) = 1.95$ ,  $p > .05$ ). Alexithymia was found to significantly predict aggression ( $b = .49$ ,  $t(140) = 6.48$ ,  $p < .001$ ). There was also an indirect effect of the paternal authoritarian parenting style on aggression ( $b = .17$ ,  $t(141) = 2.08$ ,  $p < .05$ ) while holding mother's authoritarian parenting constant ( $b = .07$ ,  $t(141) = .92$ ,  $p > .05$ ). This effect was eliminated when controlling for alexithymia and maternal authoritarian parenting style, resulting in the direct effect of paternal authoritarian parenting style on aggression being statistically non-significant ( $b = .05$ ,  $t(140) = .70$ ,  $p > .05$ ). Bootstrap confidence interval further shows that paternal authoritarian parenting style influences aggression indirectly through alexithymia while holding mother's authoritarian parenting constant ( $b = .12$ , CL [.02; .24]). These results suggest a mediating role of alexithymia on the relationship between paternal authoritarian parenting style and aggression while statistically controlling for mother's authoritarian parenting style.

**Mediation analysis for mother.** Mediation analysis using bootstrapping with bias-corrected confidence estimates using model 4 was employed to examine whether alexithymia mediates the relationship between maternal authoritarian parenting style and aggression while controlling for paternal authoritarian parenting style which was entered into the model as a covariate. Ninety-five percent confidence interval of the indirect effect was obtained with 5000 bootstrap samples. As seen in Figure 1b, maternal authoritarian parenting style did not significantly predict alexithymia ( $b = .16$ ,  $t(141) = 1.95$ ,  $p > .05$ ) when controlling for father's

authoritarian parenting style which was found to be a significant predictor of alexithymia ( $b = .24$ ,  $t(141) = 2.99$ ,  $p < .005$ ). The model also revealed that alexithymia significantly predicted aggression ( $b = .49$ ,  $t(140) = 6.48$ ,  $p < .001$ ). There was no indirect effect of maternal authoritarian parenting style on aggression ( $b = .07$ ,  $t(141) = .92$ ,  $p > .05$ ) when controlling for father's authoritarian parenting style which was found to have an indirect effect on aggression ( $b = .17$ ,  $t(141) = 2.08$ ,  $p < .05$ ). In line with this the direct effect of maternal authoritarian parenting style on aggression when controlling for alexithymia and father's authoritarian parenting style was statistically non-significant ( $b = .00$ ,  $t(140) = .01$ ,  $p > .05$ ). Bootstrap confidence interval further shows that maternal authoritarian parenting style does not influence aggression indirectly through alexithymia while holding father's authoritarian parenting constant ( $b = .07$ , CL [-.01; .17]). These results suggest that alexithymia does not mediate the relationship between maternal authoritarian parenting style and aggression while statistically controlling for father's authoritarian parenting style.

### Discussion

The purpose of this study was to elucidate the relationship between experienced parenting styles, alexithymia, and aggression in emerging adults recruited among university students in Singapore. The current findings revealed a positive relationship between maternal and paternal authoritarian parenting style and alexithymia which is consistent with previous literature suggesting that elevated parental overprotection and reduced care, both of which are characteristics of authoritarian parenting, are associated with increased alexithymia (Kooiman et al., 2004; Thorberg et al., 2011). This finding is also consistent with attachment theory which states that the relationship between a child and a primary caregiver informs the working models of interpersonal and emotional functioning which in case of deficient caregiving can lead to insecure attachment formation and multifaceted impairment in emotional functioning (Ainsworth et al., 1978; Bowlby, 1969, 1988). Linguistic exchanges

are believed to play a key role in the development of effective emotional functioning, by means of obtaining feedback from the caregivers regarding the adequacy of experienced/expressed emotions and ways to regulate them (e.g. Taylor et al., 1997). As such, current results are in line with previous findings suggesting that authoritarian parenting where verbal exploration and sharing of emotions is suppressed is likely to lead to deficient emotional awareness and alexithymia (Lemche et al., 2004; Pellerone et al., 2017).

Furthermore, a positive relationship between alexithymia and aggression found in this study is consistent with existing literature documenting an association between alexithymia and different indices of aggression across various populations. For instance, alexithymia has been associated with 1) maladaptive anger expression in violent psychiatric outpatients (Hornsveld & Kraaimat, 2012); 2) higher trait aggressiveness and anger expression in substance-dependent patients (Payer, Lieberman, & London, 2011); and (3) impulsive aggression in a community sample (Fossati et al., 2009). These results are also in line with suggestions that maladaptive forms of aggression are associated with a diminished ability to understand and verbalise emotions (Konrath, Novin, & Li, 2012) and that individuals with elevated alexithymia may resort to aggression as means of dealing with emotional distress resulting from the lack of emotional insight and emotion regulation skills (Strickland, Parry, Allan, & Allan, 2017).

In line with prior research which shows that authoritarian parenting is associated with behavioural problems such as aggressiveness (Hoeve et al., 2009; Roman et al., 2012; Tu et al., 2014) current study revealed a positive relationship between maternal and paternal authoritarian parenting style and self-reported aggression among emerging adults. As such current findings are consistent with research in this area suggesting that the relationship between deficient caregiving and aggression persists into adulthood (Hentges et al., 2018; Nelson, Coyne, Swanson, Hart, & Olsen, 2014).

The present study also suggests that alexithymia is an important transmission mechanism between authoritarian parenting style and aggression. Specifically, obtained results suggest that while parenting characterised by excessive control and lack of warmth is correlated with increased levels of aggression in emerging adults, this relationship is mediated by alexithymia, which is likely to be a consequence of experienced authoritarian parenting practices (e.g. Kooiman et al., 2004). Importantly, this was found to be true only for the authoritarian parenting style displayed by a father. Specifically, alexithymia mediated the relationship between paternal authoritarian parenting style and aggression while controlling for maternal authoritarian parenting but not the other way round. In addition, mother's authoritarian parenting did not significantly predict increased alexithymia or aggression when taking paternal authoritarian style into account, whereas father's authoritarian parenting was a significant predictor of both alexithymia and aggression when controlling for mother's authoritarian style.

Although the vast majority of research in the area is predominantly focused on maternal parenting style (Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000; Simons & Conger, 2007) current results are in line with several studies which found that paternal but not maternal authoritarian parenting practices including psychological control are linked to increased relational aggression in children (Nelson & Crick, 2002; Nelson, Hart, Yang, Olsen, & Jin, 2006) and to relational and overt aggression in emerging adults (Little & Seay, 2014). In addition, a recent longitudinal study which assessed paternal and maternal psychological control simultaneously by employing a regression analysis found that only fathers' psychological control significantly contributed to externalising and internalising problems in adolescent children (Lansford, Laird, Pettit, Bates, & Dodge, 2014) further emphasising the paternal role in children's behavioural and emotional development. Moreover, a recent meta-analysis of 48 studies reported that authoritarian parenting style



displayed by fathers but not mothers was associated with increased aggression in children (Kawabata et al., 2011).

When it comes to the unique contribution of paternal and maternal parenting style to alexithymia the results are mixed. For instance, some studies indicate that authoritarian parenting characteristics such as paternal overprotection (Kooiman, Spinhoven, Trijsburg, & Rooijmans, 1998) and lack of paternal warmth (De Rick & Vanheuele, 2006) are positively associated with alexithymia. However, the results of a recent meta-analysis suggest that while this may be the case, the link between low maternal care, overprotection and alexithymia was found to be stronger as indicated by larger effect sizes particularly in non-clinical samples (Thorberg et al., 2011). However, it is of note that this study employed a correlational analysis, and as such it is not clear if these results would hold if the other parent's authoritarian style was taken into account. Specifically, correlational results in the current study also show a strong association between maternal and paternal authoritarian parenting style and alexithymia, and only by statistically controlling the contribution of each parent's authoritarian practices was it possible to establish that the impact of paternal authoritarian style on alexithymia and aggression is much more pronounced than that of mothers'. These results are also interesting in light of studies suggesting that higher proportion of fathers compared to mothers tend to employ strategies characteristic of an authoritarian style (Nelson, Padilla-Walker, Christensen, Evans, & Carroll, 2011; Russell et al. 1998; Simons & Conger, 2007) and the fact that our sample consisted primarily of Singaporean participants of Chinese ethnicity where fathers often tend to be regarded as more powerful than mothers (Shek, 2001).

Contrary to our prediction no association between permissive parenting style and aggression was found. This is also inconsistent with previous findings in the field (Braza et al., 2015; Casas et al., 2006). This result may possibly be accounted for by the cultural

differences in parenting practices experienced by participants in this study. Specifically, the majority of the participants in this study were Singaporean of Chinese ethnicity and existing literature suggests that Chinese parents seldom practice permissive parenting in favour of authoritarian or authoritative parenting (Chan, Bowes, & Wyver, 2009). Indeed in this study permissive parenting style was also reported to the least extent compared to authoritarian and authoritative parenting practices. As such any relationship between permissive parenting style and aggression would be difficult to detect.

Furthermore, although recent findings suggest that contemporary Chinese parents tend to favour authoritative style over the traditional authoritarian upbringing (Li & Xie, 2017), the latter style is still commonly practiced among Chinese ethnic groups (Kim, 2013; Xu et al., 2005; Zhou, Eisenberg, Wang, & Reiser, 2004) due to the belief that firm governance of the child reflects care and involvement rather than parental insensitivity, which is how it is perceived in the Western culture, suggesting that the perception of parenting practices is culture-specific (Chao, 1994). However, current findings suggest that this parenting style is linked to negative consequences including alexithymia and increased aggression in young (predominantly) Singaporean Chinese adults who took part in this study. These findings are also in line with existing literature suggesting that authoritarian parenting is linked to negative consequences not only in the Western context but also among Chinese ethnic groups including negative emotional developmental outcomes (Li & Xie, 2017), high dispositional anger (Zhou et al., 2004), and increased aggression (Chen, Dong, & Zhou, 1997; Nelson et al., 2006).

As the current study was cross-sectional and based on self-report questionnaires it was not possible to make any causal inferences. It is therefore vital that future investigations corroborate current findings by employing other methods of data collection such as behavioural observation, interviews, third-party reports and longitudinal research. It is also

likely that other factors not accounted for in this research may contribute to or mediate the relationship between parenting style and aggression. As such more research is needed to gain more insight into this complex relationship. Another limitation of this study is that it is not clear whether these findings based on primarily Singaporean participants of Chinese ethnicity would also be reflective of individuals with the same ethnic background from different regions such as mainland China, Hong Kong, or Taiwan, or whether these findings would generalize to individuals of different ethnic and cultural backgrounds.

Despite these limitations current results contribute to the growing body of literature suggesting a relationship between parental practices and their consequences for emotional development and functioning. They also suggest that ethnicity and culture may affect the replicability of previous findings in this area based on research conducted in a Western context. As such future research should focus on cross-ethnic and cross-cultural comparisons to expand our understanding of parenting practices and their impact on children's social, emotional, and behavioural development within diverse groups of individuals. The present study also suggests that it is not the authoritarian parenting style per se that accounts for increased aggression in young adults, but rather alexithymic traits which are likely to be a consequence of authoritarian upbringing, especially of paternal authoritarian parenting practices. As such interventions aimed at reducing aggression should focus on targeting the core deficits associated with alexithymia such as the difficulties in identifying and describing emotions and impoverished affective mentalisation. Moreover, as the authoritarian parenting practices are likely to contribute to the development of alexithymia, which in turn has been linked to a multitude of negative consequences including increased aggression, the findings of the present study have potentially important implications for parenting programs which should focus on educating parents about the importance of communicating emotions and meeting the emotional needs of their children in order to ensure healthy functioning later in

life. Finally, our findings highlight the importance of assessing how both mothers and fathers impact their children's development while controlling each parent's contribution to the emotional and behavioural outcomes.

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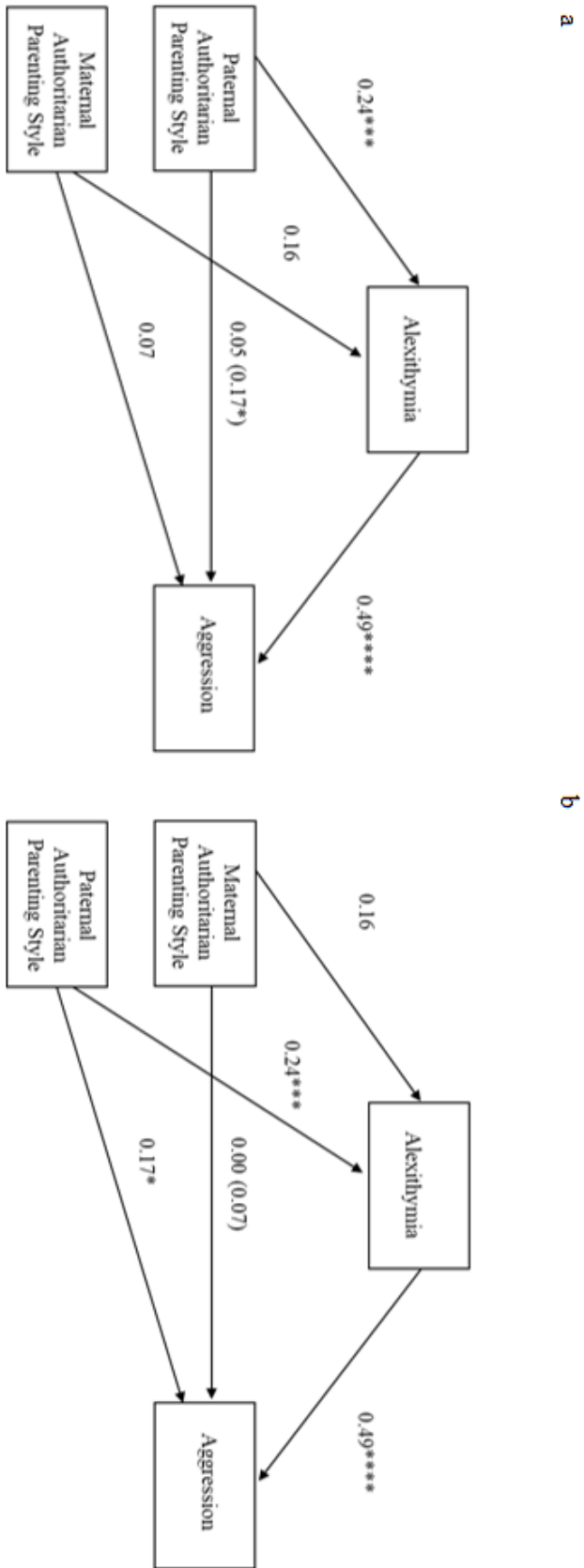


Figure 1.

a) The mediating role of alexithymia on the relationship between father's authoritarian parenting style and aggression while controlling for mother's authoritarian parenting style.

b) The mediating role of alexithymia on the relationship between mother's authoritarian parenting style and aggression while controlling for father's authoritarian parenting style.

Notes. \*\*\*\*p<.001, \*\*\*p<.005, \*\*p<.01, \*p<.05; the figure shows unstandardized beta coefficients.

Table 1

*Pearson's Correlation Coefficients between Alexithymia, Aggression and Authoritarian Parenting Style (Mother and Father) and between Aggression and Permissive Parenting Style (Mother and Father).*

Domains	Alexithymia	Aggression	Authoritarian (Mother)	Authoritarian (Father)	Permissive (Mother)	Permissive (Father)
Alexithymia	1	.513***	.269***	.291***	-	-
Aggression	.513***	1	.180*	.206*	.112	.055
Authoritarian (Mother)	.269***	.180*	1	.301***	-	-
Authoritarian (Father)	.291***	.206*	.301***	1	-	-
Permissive (Mother)	-	.112	-	-	1	.495***
Permissive (Father)	-	.055	-	-	.495***	1

*Notes.* \*  $p < 0.05$ , \*\*\*  $p < .001$