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Research article

The role of strengths in anger and conduct problems in maltreated adolescents

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ABSTRACT

Despite multi-type maltreatment, some individuals demonstrate positive adaptation and continue to develop in a healthy way. A multitude of strength factors have been linked to adaptive functioning and resilience, but this has not been adequately examined in maltreated adolescent's psychosocial functioning. This study sought to examine the role of strengths such as having talents/interests, family relationships, educational support, the role of the recognition and application of these strengths, and the role of multi-type maltreatment on anger control and conduct problems. One hundred and thirty participants (61 males; 69 females) aged 13–19 years old were rated using the Singapore version of Child and Adolescent Need and Strengths (CANS) tool. The results revealed that certain strengths were associated with anger and conduct problems, but the recognition and application of strengths emerged as a consistently significant predictor for both outcomes. Hence, to understand and apply one's strengths may be equally as important as merely possessing those strengths. This study extends current understanding of the importance of strengths with a group of maltreated adolescents in an Asian context. Adopting a person-centered and strengthbased approach will further enhance the effectiveness of interventions and improve outcomes for maltreated adolescents living in residential care.

1. Strengths and maltreatment

Systematic reviews examining childhood maltreatment and adversity reveal that a multitude of strength factors (e.g., individual, family, and community) are linked to adaptive functioning (Afifi & MacMillan, 2011; Khanlou & Wray, 2014; Noltemeyer & Bush, 2013). Adaptive functioning can occur despite multi-type maltreatment (MTM) (Collin-Vézina, Coleman, Milne, & Daigneault, 2011), which refers to experiencing more than one type of maltreatment (Higgins & McCabe, 1998). This has been shown to result in maladaptive outcomes which tend to persist into adolescence (Trickett et al., 2011) and across the lifespan (Hahm, Lee, Ozonoff, & Van Wert, 2010; Norman, Byambaa, Butchart, Scott, & Vos, 2012). Fergus and Zimmerman (2005) noted that at-risk adolescents may possess multiple assets (e.g., individual-level protective factors such as competence and efficacy) and have access to multiple resources (e.g., contextual and environmental influences such as family support and community services) which can enable them to achieve better outcomes.

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1.1. Role of strengths as protective factors

Strengths shift the attention from problems (deficits) in maltreated individuals towards proficiency, assets, skills, and internal resources. According to Epstein (1999), children's emotional and behavioral strengths may be conceptualized as skills and competencies under five domains, namely, (i) *interpersonal strengths*; (ii) *affective strengths*; (iii) *family involvement*; (iv) *school functioning*; and (v) *intrapersonal strengths*. Lyons, Uziel-Miller, Reyes, and Sokol (2000) found that strengths predicted success in the reduction of risk behavior for children and adolescents living in residential placements. Likewise, Oswald, Cohen, Jenson, and Lyons (2001) further showed that strengths mitigated the negative impact of risk behaviors such as harm to self and others.

At an individual level, the opportunity to engage in sport, art, music and hobbies enhances functioning and well-being in adolescence (Gilligan, 1999). The pleasure of engagement and the satisfaction of mastery serve to build the adolescent's self-esteem, pro-social behavior, supportive relationships and social integration. Babiss and Gangwisch (2009) found that sports participation protected adolescents from depression and suicidal ideation by increasing their self-esteem and social support.

At the family-level, studies have shown that parent functioning and responsiveness have a positive influence on child outcomes. Children who were exposed to interpersonal intimate partner violence (IPV) had fewer adjustment problems if their mothers used warm and effective parenting (Graham-Bermann, Gruber, Howell, & Girz, 2009). In contrast, more severe behavioral problems were observed in children exposed to IPV if their mothers were depressed. Overall, parent functioning can influence child adjustment, which can be examined via proxies such as internalizing and externalizing problems. Sexually abused adolescent females, who had fewer conflicts with their mothers, reported greater interpersonal trust in relationships, more active coping, and less drug use (Daigneault, Hébert, & Tourigny, 2007). In addition, maltreated adolescents who perceived greater emotional support from their caregivers reported lower levels of depression and better self-esteem one year after sexual abuse discovery (Rosenthal, Feiring, & Taska, 2003). Parental responsiveness has been found to be negatively associated with adolescents' problem behavior (Li et al., 2011), as well as depression and substance abuse (Bond, Toumbourou, Thomas, Catalano, & Patton, 2005).

At the community level, studies have shown that greater school engagement was associated with higher levels of well-being and a lower likelihood of delinquency (Tyler, Johnson, & Brownridge, 2008). In addition, students who reported higher perceptions of teachers' support were more likely to stay engaged in school (Klem & Connell, 2004) and had fewer misconduct incidents (Schmidt, 2003).

Compared to social support from parents and teachers, perceived peer support protected victimized children from depressive symptoms (Tanigawa, Furlong, Felix, & Sharkey, 2011). Given that social withdrawal and isolation are common depressive symptoms, the availability of supportive peers who offered help in problem-solving, healthy appraisals of stress and a sense of care, likely influenced the victim's coping ability and psychosocial adjustment. Positive peer relationships were also related to adaptive outcomes for maltreated children (Schultz, Tharp-Taylor, Haviland, & Jaycox, (2009)). In their longitudinal study, Powers, Ressler, and Bradley (2009) found that perceived social support from friends protected maltreated girls from adult depression.

1.2. Anger and conduct problems in maltreated children

Past research has demonstrated that maltreated children have elevated levels of anger and a higher risk of developing emotional dysregulation (Cole, Martin, & Dennis, 2004), compared to non-maltreated children (Robinson et al., 2009). Difficulties in regulating negative emotions, which indicates barriers to "monitoring, evaluating and modifying emotional reactions" in order to reach one's goal (Thompson, 1994, p. 27), could result in misreading social cues and responding inappropriately in social situations. Invariably, this adversely affects one's interpersonal relationships and quality of life.

Anger has been associated with internalizing symptomology such as depression and anxiety (Koh, Kim, & Park, 2002). Difficulties regulating anger can maintain or exacerbate depression and anxiety, thereby resulting in increased emotional distress, and impaired social functioning (Berenbaum, Raghavan, Le, Vernon, & Gomez, 2003). A meta-analysis by Aldao, Nolen-Hoeksema, and Schweizer (2010) showed that emotional regulation strategies across different psychopathology groups (e.g., depression and anxiety) were related to different levels of psychopathology. Maladaptive cognitive emotional strategies (e.g., rumination, avoidance, and suppression) were linked with more psychopathology whereas adaptive strategies (e.g., acceptance, reappraisal, and problem solving) were linked with less psychopathology. Hence, it is important to understand the pathways to improve anger management and increase emotional regulation.

Anger issues have been found to be associated with higher levels of externalizing problems in children (Zeman, Shipman, & Suveg, 2002) and adolescents (Silk, Steinberg, & Morris, 2003). In a sample of maltreated children, Teisl and Cicchetti (2008) showed that poor emotional regulation accounted for aggression and disruptive behavior. Maltreated children are more likely to lack the skills to manage their negative emotions. This may also be due to the lack of opportunities to learn adaptive emotional regulation from their parents. In a longitudinal study, Conger, Neppl, Kim, and Scaramella, (2003) found that anger and aggressive behavior was transmitted across generations. Hence, it is important to understand antecedents of externalizing problems in maltreated adolescents to inform interventions for better outcomes.

1.3. Trauma exposure and child welfare research in Singapore

To date, there is a paucity of research in trauma exposure and child welfare in Singapore. Singapore is an independent island-state in South East Asia with a total population of 5.6 million (Singapore Department of Statistics, 2016), where the Ministry of Social and Family Development (MSF) has statutory responsibilities to protect children from abuse and neglect under the Children and Young Persons Act (2003). Children are placed in foster care or voluntary children's homes (VCHs) when placement within kinship care or within family is not possible. Most VCHs are supported by community resources to provide relevant educational, recreational, and mental health services to residents. These facilities are somewhat different from the institutional care in other countries, which typically cater to children with severe emotional or behavioral dysregulation. For example, children requiring out-of-home care are more likely to be placed in foster care than institutional care in the United States of America and Canada, whereas children requiring out-of-home care in Singapore are more likely to be placed in residential care rather than foster care. Between 2010 and 2014, 2247 children were admitted into VCHs, and 409 children were placed in foster care. Children in out-of-home care in Singapore have a lower prevalence of behavioral and emotional needs than children in other countries, and these children are more similar to a general child welfare sample in North America than residential care samples in these countries (Liu et al., 2014; Liu et al., 2016).

Liu et al. (2016) found that 63% of a large-scale out-of-home-care sample ($N = 721$) in Singapore had experienced at least one interpersonal trauma, with neglect (34%) and physical abuse (31%) being most prevalent. Children with multiple interpersonal trauma exposure (35%) were significantly older, more likely to be female, and had a higher number of life functioning, behavioral, and emotional, as well as risk behavior needs compared with children with no previous trauma. More relevant to the current study, Sim, Li, and Chu (2016) found that the protective effects of high strengths against the impact of child maltreatment were apparent at baseline in both residential and foster care, despite clear differences in children's profiles across placement types. However, these initial benefits appeared to persist somewhat for children in foster care but seemed to diminish in more restrictive, residential settings. This warrants further investigation in children with more similar profiles across a period of time. Furthermore, a study of 1750 children known to Child Protection Services (CPS) in Singapore (Li et al., 2014) indicated that the overall percentage of CPS re-entry (i.e., due to further concerns of abuse or neglect) is 10.5%, with risk factors such as being older than 2 years of age, having a history of neglect, a larger family size, lower household income, and maternal unemployment.

1.4. Present study

The present study hence recognizes the importance of strengths in mitigating the negative effects of maltreatment, and seeks to test several hypotheses on applied strengths, and anger control and conduct problems within the Singapore child welfare system. In particular, it seeks to examine the role of strengths on multiple levels as known in a developmental ecological-systems framework (Benzies & Mychasiuk, 2009; Bronfenbrenner, 1977). The variables examined range from the individual level of having talents/interests and educational support, to the family level of having good family relationships. The authors also recognize that to have strengths per se is not sufficient; it may be equally or more important that the adolescent recognizes these strengths and uses them in relevant situations for healthy development and growth. Thus, the individual's recognition and application of strengths, which the authors have termed "Applied Strengths" in the present study, is also examined. The two outcome variables of interest in the current study are Anger Control Problem and Conduct Problem. The role of strengths on these two outcomes would provide a deeper understanding of adolescents' emotional and behavioral functioning, and the type of support that can reduce the negative impact of maltreatment. Additionally, the current study examines the impact of MTM through a Maltreatment Composite score and its interaction with the various strengths.

In particular, three hypotheses were tested:

Hypothesis 1. Anger Control Problem and Conduct Problem would be significantly associated with the strengths measured: Talents/Interest, Family Relationships, Educational Support and Applied Strengths, and with Maltreatment Composite.

Hypothesis 2. Talents/Interest, Family Relationships, Educational Support, Applied Strengths and Maltreatment Composite would be significant predictors of adolescents' Anger Control Problem and Conduct Problem.

Hypothesis 3. The strengths of Talents/Interest, Family Relationships, Educational Support, and Applied Strengths would have a moderating effect on the relationship between Maltreatment Composite and Anger Control Problem, and the relationship between Maltreatment Composite and Conduct Problem.

2. Method

2.1. Participants

A convenience sample of one hundred and thirty adolescents (46.8% male; 53.2% female) from 11 identified Voluntary Children's Homes (VCHs) in Singapore was included in the present study. The participants were involved with the Rehabilitation and Protection Group, Ministry of Social and Family Development (MSF), and met inclusion criteria for (i) history of

maltreatment (e.g., neglect, physical, and emotional abuse); (ii) non-Juvenile Arrest cases; and (iii) residing in a VCH between March 2012 and February 2013. The age of the participants ranged from 13 to 19 years ($M = 15.1$, $SD = 1.58$, $Mdn = 15$), with 79.2% between 13 and 16 years old and 20.8% between 17 and 19 years old. Information regarding the ethnicity of the participants and their duration of stay in the VCHs was not available. The term "maltreated adolescents" hereafter refers to adolescents with a history of maltreatment as indicated by caseworker assessment.

2.2. Ethics

Ethical approval was obtained through an ethics review panel within the Ministry of Social and Family Development, and the Human Research Ethics Committee of James Cook University.

2.3. Measure

The Child and Adolescent Needs and Strengths (CANS) instrument was developed by Lyons (2009) and has been used for effective assessment, planning, outcome-monitoring and decision-making in more than 30 states in the United States of America (Lyons, Weiner, & Lyons, 2004; Winters et al., 2005). The Singapore version of CANS was adapted for the child welfare population by a team of professionals in consultation with the developer of CANS. As MSF is the main statutory body in charge of child protection and welfare, and CANS has been rolled out within MSF, CANS can be considered to be widely used with this population in Singapore.

The Singapore CANS version was designed to identify key needs and strengths of children and adolescents. It consists of seven domains (i.e., Life Domain Functioning, School, Child Behavioral and Emotional Needs, Trauma, Child Risk Behavior, Strengths, and Identified Long-term Caregiver). Each CANS item can be quantitatively rated on a four-point scale which translates into different action levels to guide case management and service provision (i.e. "0" indicates no evidence of a need; "1" indicates mild need requiring monitoring; "2" indicates a moderate need requiring action and "3" indicates a severe need requiring immediate or intensive action). The ratings of Talents/Interest, Family Relationships, Educational Support and Applied Strengths were recoded in the analysis such that a rating of '3′ indicated a higher level of strength. For Applied Strengths, this indicated that the youth was able to recognize and use his/her strengths to promote healthy development and problem solving while a rating of '0′ indicated that the youth failed to recognize his/her strengths and is therefore unable to utilize them.

Currently, the CANS is widely used in many child welfare systems in the United States to support decision making, quality improvements and outcome tracking (Lyons, 2004; Lyons, Weiner, & Lyons, 2001). Several studies have established the measurement properties of the CANS (Chor, McClelland, Weiner, Jordan, & Lyons, 2012; Epstein et al., 2011Epstein, Bobo, Cull, & Gatlin, 2011; Lyons et al., 2004). These studies have established CANS as a clinical assessment tool with high field reliability even at the item level, such that individual items may be examined in data analyses (Anderson, Lyons, Giles, Price, & Estle, 2003). There is also evidence for its predictive validity (Park, Epstein, Jordan, Mandell, & Lyons, 2009) as well as concurrent validity, whereby CANS domain scores have been demonstrated to correlate with other established child assessment scales such as the Child and Adolescent Functional Assessment Scale (CAFAS) and the Child Behavior Checklist (Lyons, 2009). The correlation between CANS and CAFAS is 0.63 ($df = 247$, $p < 0.001$) (Lyons et al., 2011).

The validity and reliability of Singapore CANS for measuring the needs and strengths of Singaporean children in public care was reported by Heng and Liu (2014). In another paper, good reliability for the Singapore CANS was also demonstrated where the intraclass correlation coefficients (ICCs) between caseworkers and researchers were between 0.79 and 0.89 (Liu et al., 2014). Further research using the Singapore CANS was reported in a recent paper by Sim et al. (2016).

For this study, a total of nine items from the Singapore CANS were selected to investigate the impact of multi-level strengths (i.e., personal, family and school). Three items from the Trauma domain were selected (e.g., Neglect, Physical Abuse and Emotional Abuse). Anger Control and Conduct Problems were selected from the Child Behavioral and Emotional Needs domain. Finally, four items from the Child Strengths domain were selected (i.e., Resilience, Talents/Interest, Family Relationships and Educational Support). The CANS item "Resilience" was re-termed as "Applied Strengths" in this study as the authors perceived that resilience may be too broad a concept to be defined by a singular measurement item. Inter-rater reliability checks on the CANS ratings were conducted.

2.3.1. Multi-type maltreatment. To consider the cumulative effect of neglect and different types of abuse, a Maltreatment Composite score (akin to Multi-type maltreatment) was obtained by computing the mean of the sub-types of maltreatment (i.e., Neglect, Physical, and Emotional abuse). This procedure was in line with previous research (Sesar, Zivcic-Becirevic, & Sesar, 2008). The score for the Maltreatment Composite ranged between 0 and 3, where higher scores indicated greater severity.

2.4. Procedure

Approval was sought from MSF to release the de-identified retrospective CANS data for this study. Any identifying information was removed and replaced with a number code. Between September 2012 and February 2013, a team of CANS-certified research assistants (RAs), staff from MSF and the Children's Home rated the CANS items for each participant.

Table 1
Descriptives of predictors.

	Total Sample($N = 130$)	*Males*($n = 61$)	*Females*($n = 69$)
	M (*SD*)	*M* (*SD*)	*M* (*SD*)
Maltreatment Composite	1.03 (0.63)	0.94 (0.62)	1.11 (0.64)
Neglect.	1.07 (0.97)	0.89 (0.84)	1.23 (1.05)
Physical Abuse	1.12 (1.00)	1.05 (1.04)	1.19 (0.97)
Emotional Abuse	0.91 (0.95)	0.82 (0.97)	0.99 (0.93)
Talents/Interest	1.94 (0.88)	2.02 (0.81)	1.87 (0.94)
Family Relationships	1.54 (0.92)	1.39 (0.95)	1.67 (0.87)
Educational Support	2.28 (0.62)	2.21 (0.64)	2.33 (0.61)
Applied Strengths	2.13 (0.76)	2.10 (0.72)	2.16 (0.80)

Note: Comparisons across age and gender for all variables were non-significant.

The scoring was based on information from multiple sources (e.g., interviews with adolescents and family, teacher reports, and case files). The inter-rater reliability between research assistants (RAs) and caseworkers for the CANS ratings was 0.81; and inter-rater reliability among RAs was 0.78. The completed ratings for the CANS were uploaded by the MSF research team (from March 2012 onwards) and were extracted from the web-based Singapore CANS system on 2 March 2013.

2.4.1. Statistical analyses. The data was analyzed using the Statistical Package for Social Sciences (SPSS) software Version 22. Descriptive statistics were employed to compare the means and distribution of all the variables, as well as age and gender differences in the sample. All variables were found to be normally distributed except for the outcome variables of Anger Control and Conduct Problems. Anger Control Problem had a skewness of 1.24 ($SE = 0.21$) and kurtosis of 0.83 ($SE = 0.42$), while Conduct Problem had a skewness of 1.74 ($SE = 0.21$) and kurtosis of 2.13 ($SE = 0.42$). A log transformation was applied to the data but normality of data was not achieved. Hence, Anger Control and Conduct Problems were coded into binary variables. Due to small cell counts (<5) in the more severe categories, these outcome variables were recoded into '0' which indicated no problem of Anger Control or Conduct Problems and '1' which indicated having Anger Control or Conduct problems.

To understand the associations of the strengths measured with the outcome variables, a series of *t*-tests were first conducted to test if the means of Maltreatment Composite, Applied Strengths, Talents/Interest, Family Relationship and Educational Support were significantly different between groups (e.g. with and without Anger Control Problem).

Next, two logistic regressions were conducted to determine the variance that the predictors (i.e., Maltreatment Composite, Applied Strengths, Talents/Interest, Family Relationships and Educational Support) could explain for Anger Control and Conduct Problems (criterion variables). Lastly, two moderated regressions were conducted with three standardized predictors (i.e., Centered Applied Strengths, Centered Maltreatment Composite, and Applied Strengths × Maltreatment Composite interaction). The interaction term was first centered and then multiplied. The criterion variables were Anger Control and Conduct Problems.

3. Results

3.1. Descriptive statistics

The means and standard deviations of Maltreatment Composite, Applied Strengths, Talents/Interest, Family Relationships, and Educational Support are presented in Table 1. The means for Neglect, Physical and Emotional abuse were in the mild range, ranging from 0.82 to 1.23 (highest score of "3" indicates most severe level). The *t*-tests and correlational analyses revealed gender and age differences were non-significant across the variables in the sample.

A series of *t*-tests were conducted comparing the means of the variables above by the categories (No Problem vs With Problem) of the outcome variables of Anger Control and Conduct Problems. 40% ($n = 52$) of the sample were found to have Anger Control Problem and 25% ($n = 32$) had Conduct Problem.

Levene's Test for equality of variances revealed non-significant estimates for tests except for the *t*-test of Talents/Interests by Conduct Problem. Non-significant estimates indicated that the variability in the two conditions were similar. For the exception, Satterthwaite approximation was employed for the unequal group variances.

Table 2 shows the results for the outcome of Anger Control Problem. The mean scores of all the strength variables were higher for those with no problem as compared to those with problems, though only the mean difference in Applied Strengths, $t(128) = 4.78$, $p < 0.01$ was significant. Family Relationships was found to be a significant predictor based on its *p*-value but this finding was not corroborated by the confidence interval, hence indicating that this finding may not be robust.

Table 3 shows the results for the outcome of Conduct Problem. An examination of the mean scores revealed a similar pattern to the analyses done with Anger Control Problem; those with Conduct Problem had higher mean scores of Maltreatment Composite and lower mean scores on the various Strengths. Mean differences in Talents/Interest, $t(128) = 2.33$, $p < 0.05$, Educational Support, $t(128) = 2.99$, $p < 0.01$, and Applied Strengths, $t(128) = 4.01$, $p < 0.01$, were found to be significant.

Table 2
Comparison of Maltreatment Composite and Strengths by Anger Control Problem.

	No Anger Control Problem (n = 78)		With Anger Control Problem (n = 52)		Mean difference	95% CI for mean difference	t	df
	M	SD	M	SD				
Maltreatment Composite	0.98	0.62	1.12	0.66	−0.14	−0.36 −0.09	−1.21	128
Talents/Interest	2.01	0.86	1.83	0.90	0.19	−0.12 to 0.50	1.18	128
Family Relationships	1.67	0.95	1.35	0.84	0.32	0.00–0.64	1.98*	128
Educational Support	2.33	0.55	2.19	0.72	0.14	−0.08 to 0.36	1.27	128
Applied Strengths	2.37	0.61	1.77	0.83	0.60	0.35–0.85	4.78**	128

Note: $^{*}p < 0.05$, $^{**}p < 0.01$.

Table 3
Comparison of Maltreatment Composite and Strengths by Conduct Problem.

	No Conduct Problem (n = 98)		With Conduct Problem (n = 32)		Mean difference	95% CI for mean difference	t	df
	M	SD	M	SD				
Maltreatment Composite	0.99	0.62	1.17	0.68	−0.18	−0.43–0.08	−1.37	128
Talents/Interest	2.05	0.80	1.59	1.01	0.46	0.06–0.85	2.33*[S]	128
Family Relationships	1.60	0.92	1.34	0.90	0.26	−0.11–0.63	1.39	128
Educational Support	2.37	0.53	2.00	0.80	0.37	0.12–0.61	2.99**	128
Applied Strengths	2.28	0.67	1.69	0.86	0.59	0.30–0.88	4.01**	128

Note: $^{*}p < 0.05$, $^{**}p < 0.01$.
[S] Satterthwaite approximation employed due to unequal group variances.

Table 4
Logistic Regression Analyses.

Predictors	Criterion Variables	B	OR	95% CI
Maltreatment Composite	Anger Control Problem	0.97	1.10	[0.59, 2.05]
Talents/Interest		−0.08	0.99	[0.62, 1.58]
Family Relationships		−0.30	0.74	[0.48, 1.15]
Educational Support		−0.24	0.78	[0.39, 1.57]
Applied Strengths		−1.14	0.32**	[0.18, 0.58]
Maltreatment Composite	Conduct Problem	0.20	1.22	[0.61, 2.44]
Talents/Interest		−0.37	0.69	[0.42, 1.16]
Family Relationships		−0.18	0.84	[0.50, 1.39]
Educational Support		−0.81	0.45[a]	[0.20, 1.00]
Applied Strengths		−0.89	0.41*	[0.22, 0.77]
Maltreatment	Anger Control Problem	0.16	1.17	[0.63, 2.18]
Applied Strengths		−1.21	0.30**	[0.16, 0.54]
Interaction (Maltreatment × Applied Strengths)		0.26	1.30	[0.56, 3.00]
Maltreatment	Conduct Problem	0.27	1.30	[0.63, 2.69]
Applied Strengths		−1.04	0.35**	[0.19, 0.65]
Interaction (Maltreatment × Applied Strengths)		0.17	1.19	[0.50, 2.80]

Note: $^{**}p < 0.01$, $^{*}p < 0.05$, $^{a}p < 0.10$

3.2. Logistic regressions

Two logistic regressions were conducted to test if Maltreatment Composite and the strengths of Talents/Interest, Educational Support, Family Relationships and Applied Strengths were predictive of the outcome variables, Anger Control Problem and Conduct Problem. Table 4 shows the results of the logistic regressions.

3.2.1. Anger control problem. A test of the full model against a constant only model was statistically significant, indicating that the predictors as a set reliably distinguished between those who had and those who did not have Anger Control Problem (Chi-square = 23.53, $df = 5$, $p < 0.01$). Nagelkerke's R^2 of 0.22 indicated a relationship between prediction and grouping. The Wald criterion demonstrated that only Applied Strengths emerged as a significant predictor ($B = -1.14$, $SE = 0.31$, $OR = 0.32$). The odds ratio showed that when Applied Strengths was raised by one unit, there was 68% less likelihood that the individual had Anger Control Problem.

3.2.2. Conduct problem. A test of the full model against a constant only model was also statistically significant (Chi-square = 23.18, $df = 5$, $p < 0.01$). Nagelkerke's R^2 was at 0.24. Interestingly, Applied Strengths again emerged as a significant predictor ($B = -0.89$, $SE = 0.32$, $OR = 0.41$). This indicated that for each increase in one unit in Applied Strengths on a 4-point scale, there was 59% less likelihood of Conduct Problem. Additionally, Educational support was also found to be significant ($B = -0.81$, $SE = 0.41$, $OR = 0.45$). Hence when Educational Support increases by a unit, there was 55% less likelihood of having Conduct Problem.

3.3. Moderation analyses

Thus far, only Applied Strengths was a significant predictor of Anger Control and Conduct Problems. Moderation analyses were subsequently conducted to ascertain if the relationship between Maltreatment Composite and the outcome variables were dependent on Applied Strengths. Mean centered scores were calculated for both Maltreatment Composite and Applied Strengths, and an interaction term was computed from the centered scores. These were then entered into logistic regressions with the outcome variables. The results of the moderated logistic regressions are shown in Table 4.

3.3.1. Anger control problem. The results of the moderated regression model in predicting the variance of the adolescents' Anger Control Problem from the predictors only showed a significant main effect of Applied Strengths ($B = -1.21$, $SE = 0.30$, $OR = 0.30$, $p < 0.001$), but no effect for the interaction term (i.e., Maltreatment Composite x Applied Strengths).

3.3.2. Conduct problem. Similar results were found for Conduct Problem. There was a significant main effect of Applied Strengths ($B = -1.04$, $SE = 0.32$, $OR = 0.35$, $p < 0.001$) but the interaction term was not significant.

These results showed that Applied Strengths was not a moderator of the effect of multi-type maltreatment on Anger Control or Conduct Problems, but the main effect of this variable seemed to be consistently significant across all analyses.

4. Discussion

In response to Hypothesis 1, the findings of this study confirm that strengths are inversely associated with conduct problems of maltreated adolescents. The findings show that higher educational support and having talents/interest are associated with lower levels of conduct problems.

Singapore has always placed a high value on education as it is recognized to be a key driver in changing developmental trajectories. Therefore, huge amounts of resources are being pumped into the schools to help those who struggle academically to progress and maximise their potential. This educational support will also be important to prevent and reduce conduct problems in future. However, the development of talents and interests has not been given as much prominence. Promoting talents and interest is in line with past research (Gilligan, 1999; Tyler et al., 2008) whereby spending time in activities related to their talents, hobbies and interests not only gives adolescents pleasure and satisfaction but importantly, the sense of mastery, competency and achievement also serve to promote self-esteem (Gilligan, 1999). More recently, Trainor, Delfabbro, Anderson, & Winefield, (2010) showed that leisure activities were linked to better psychological well-being such as higher self-esteem, and more life satisfaction. In summary, efforts to cultivate adolescents' talents/interests can potentially enhance self-esteem and buffer against conduct problems. Future research can consider if this has a protective effect against academic failure, early school dropout, delinquency, substance abuse and recidivism in adulthood.

Interestingly, the findings revealed that although possessing individual strengths is important for anger control and conduct problems, the individual's capacity to recognize his or her own strengths and to apply them for healthy development and problem-solving appeared to be as important because it consistently surfaced as a significant finding for internalizing and externalizing problems. In response to Hypothesis 2, only Applied Strengths, which refers to this capacity to know one's own strengths and to use them, was found to be predictive of the two outcome variables. This finding may indicate that having a strength and learning to apply this strength are different processes which need to be investigated further. Adolescents possess affective strengths and self-regulatory processes and their capability to tap into them at the necessary moments may enable them to successfully regulate their anger and conduct when needed. The current study primarily considers adolescents' capacity to understand and apply their strengths, and may have overlooked cognitive processes such as attentional and cognitive biases (Romens & Pollak, 2012) or maladaptive cognitive strategies such as rumination (Aldao et al., 2010). These cognitive factors could interfere with adolescents' thinking, planning and effective problem solving when they attempt to regulate their anger. Dishion and Connell (2006) also showed that motivated attention processes are closely linked to emotional and behavioral regulation, with self-regulation moderating the relationship between peer deviance and anti-social behavior.

It is important to note that while having strengths and the capacity to apply them is crucial, in line with a more holistic concept of resilience, external resources are equally essential in providing a conducive environment for individuals to navigate themselves towards healthy development (Fergus & Zimmerman, 2005).

Lastly, in response to Hypothesis 3, there was no moderating effect found in the current study. Despite this, the predictive capacity to apply one's strengths remained consistently strong in its impact on anger control and conduct problems.

4.1. Implications

This study extends current understanding of the importance of strengths with a group of maltreated adolescents in an Asian context (Fergus & Zimmerman, 2005; Lee, Cheung, & Kwong, 2013; Olsson, Bond, Burns, Vella-Brodrick, & Sawyer, 2003). The association of different factors with the different outcomes suggests that adopting a "*one-size-fits-all*" strength-based approach to intervention may not yield optimal outcomes for adolescents with a history of maltreatment. It is therefore important for interventions to be person-centered during this developmental phase.

The current findings identify the recognition and application of strengths as a key protective factor associated with anger control and conduct problems for maltreated adolescents. It highlights the need for clinicians and case workers to invest more resources and time in building the strengths of maltreated adolescents, and helping them to recognize and apply their identified strengths in appropriate situations. Adolescents with identified strengths who are not using them would require help to apply them to promote adaptive functioning, whereas those with no identified strengths would need a longer intervention period to identify, cultivate and learn how to use their strengths in real-world settings. Identifying these target groups for intervention can inform how limited resources in the social work field can be better distributed.

The findings also point to the benefits of investing financial resources in developing adolescents' talents and interests (e.g., sports, arts, and music) as a protective factor against conduct problems. Encouraging the development of talents and interests will likely enhance adolescents' self-esteem and reduce the risk of psychopathology (e.g., depression and anxiety) during adolescence and adulthood. Likewise, it is important to continue allocating resources to strengthen family relationships and educational support, as these will also help to buffer against anger control and conduct problems.

The above suggestions are important consideration for policy makers as they can potentially serve to reduce economic burden on society in the long term. Reducing the risk of maladaptive functioning such as anger control and conduct problems will serve to improve adolescents' overall mental health, well-being and quality of life.

4.2. Limitations

There are several limitations in this study. First, the study relied on retrospective CANS data, which did not account for possible confounding variables (e.g., self-esteem, optimism, and peer support). Second, the school was identified as an important community support outside the adolescents' family; however, the inclusion of other school-related factors such as peer support and involvement in extra-curricular activities would also have been helpful in the analysis. The impact of other community support (e.g., neighbors, religious groups and sports clubs) was not taken into account in this study. Relatedly, it is acknowledged that data on ethnicity and the duration of stay at VCHs were not available. These factors may have played a part in the process of building strengths in some way. Finally, maladaptive cognitive process was not considered in the analysis and this may be a significant driver of adolescents' thinking and problem solving in the context of anger regulation.

4.3. Future research

Given the paucity of research in the field of strengths, there is a need for more research to examine (i) new and developmentally appropriate protective factors (e.g., use of social media as a form of social support); (ii) the dynamic interplay of individual factors such as optimism and locus of control; as well as other external factors (e.g., community groups related to talents and interest); and (iii) possible cognitive-behavioral processes that are linked to healthy development and outcomes despite early adversities during early, middle and late adolescence. Future studies can also consider cultural perspectives; for example if strengths are expressed differently in various cultures and hold varying functions. The *Child and Youth Resilience Measure* (Liebenberg, Ungar, & Van de Vijver, 2012) is an example of a tool which seeks to be culturally sensitive. Lastly, in order to examine the long-term effects of strengths and their impact on psychological well-being (e.g., self-esteem), and the role of strengths in adolescents' transition to young adulthood, longitudinal designs should also be encouraged.

References

Afifi, T. O., & MacMillan, H. L. (2011). Resilience following child maltreatment: a review of protective factors. *Canadian Journal of Psychiatry*, *56*(5), 266–272.

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: a meta-analytic review. *Clinical Psychology Review*, *30*(2), 217–237. http://10.1016/j.cpr.2009.11.004

Anderson, R. L., Lyons, J. S., Giles, D. M., Price, J. A., & Estle, G. (2003). Reliability of the child and adolescent needs and strengths—Mental Health (CANS-MH) scale. *Journal of Child and Family Studies*, *12*(3), 279–289. http://10.1023/A:1023935726541

Babiss, L. A., & Gangwisch, J. E. (2009). Sports participation as a protective factor against depression and suicidal ideation in adolescents as mediated by self-esteem and social support. *Journal of Developmental & Behavioral Pediatrics*, *30*(5), 376–384. http://10.1097/DBP.0b013e3181b33659

Benzies, K., & Mychasiuk, R. (2009). Fostering family resiliency: a review of the key protective factors. *Child & Family Social Work*, *14*(1), 103–114. http://10.1111/j.1365-2206.2008.00586.x

Berenbaum, H., Raghavan, C., Le, H. N., Vernon, L. L., & Gomez, J. J. (2003). A taxonomy of emotional disturbances. *Clinical Psychology: Science and Practice*, *10*(2), 206–226. http://10.1093/clipsy.bpg011

Bond, L., Toumbourou, J. W., Thomas, L., Catalano, R. F., & Patton, G. (2005). Individual, family, school, and community risk and protective factors for depressive symptoms in adolescents: a comparison of risk profiles for substance use and depressive symptoms. *Prevention Science*, *6*, 73–88. http://10.1007/s11121-005-3407-2

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, *32*(7), 513–531. http://10.1037/0003-066X.32.7.513

Chor, K. H. B., McClelland, G. M., Weiner, D. A., Jordan, N., & Lyons, J. S. (2012). Predicting outcomes of children in residential treatment: a comparison of a decision support algorithm and a multidisciplinary team decision model. *Children and Youth Services Review*, *34*(12), 2345–2352. http://10.1016/j.childyouth.2012.08.016
Cole, P. M., Martin, S. E., & Dennis, T. A. (2004). Emotion regulation as a scientific construct: methodological challenges and directions for child development research. *Child Development*, *75*(2), 317–333. http://dx.doi.org/10.1111/j.1467-8624.2004.00673.x
Collin-Vézina, D., Coleman, K., Milne, L., Sell, J., & Daigneault, I. (2011). Trauma experiences, maltreatment-related impairments, and resilience among child welfare youth in residential care. *International Journal of Mental Health and Addiction*, *9*(5), 577–589. http://10.1007/s11469-011-9323-8
Conger, R. D., Neppl, T., Kim, K. J., & Scaramella, L. (2003). Angry and aggressive behavior across three generations: a prospective, longitudinal study of parents and children. *Journal of Abnormal Child Psychology*, *31*(2), 143–160. http://10.1023/A:1022570107457
Daigneault, I., Hébert, M., & Tourigny, M. (2007). Personal and interpersonal characteristics related to resilient developmental pathways of sexually abused adolescents. *Child and Adolescent Psychiatric Clinics of North America*, *16*(2), 415–434. http://10.1016/j.chc.2006.11.002
Dishion, T. J., & Connell, A. (2006). Adolescents' resilience as a self-regulatory process. *Annals of the New York Academy of Sciences*, *1094*(1), 125–138. http://10.1196/annals.1376.012
Epstein, R. A., Bobo, W. V., Cull, M. J., & Gatlin, D. (2011). Sleep and school problems among children and adolescents in state custody. *The Journal of Nervous and Mental Disease*, *199*(4), 251–256. http://10.1097/NMD.0b013e3182125b6d
Epstein, M. H. (1999). The development and validation of a scale to assess the emotional and behavioral strengths of children and adolescents. *Remedial and Special Education*, *20*(5), 258–262. http://10.1177/074193259902000501
Fergus, S., & Zimmerman, M. A. (2005). Adolescent resilience: a framework for understanding healthy development in the face of risk. *Annual Review of Public Health*, *26*, 399–419. http://10.1146/annurev.publhealth.26.021304.144357
Gilligan, R. (1999). Enhancing the resilience of children and young people in public care by mentoring their talents and interests. *Child and Family Social Work*, *4*, 187–196. http://10.1046/j.1365-2206.1999.00121.x
Graham-Bermann, S. A., Gruber, G., Howell, K. H., & Girz, L. (2009). Factors discriminating among profiles of resilience and psychopathology in children exposed to intimate partner violence (IPV). *Child Abuse & Neglect*, *33*(9), 648–660. http://10.1016/j.chiabu.2009.01.002
Hahm, H. C., Lee, Y., Ozonoff, A., & Van Wert, M. J. (2010). The impact of multiple types of child maltreatment on subsequent risk behaviors among women during the transition from adolescence to young adulthood. *Journal of Youth and Adolescence*, *39*(5), 528–540. http://10.1007/s10964-009-9490-0
Heng, M., & Liu, D. (2014). Reliability and validity of the child and adolescent needs and strengths (CANS) tool in Singapore. In *9th international conference on child and adolescent psychopathology*.
Higgins, D. J., & McCabe, M. P. (1998). Parent perceptions of maltreatment and adjustment in children. *Journal of Family Studies*, *4*(1), 53–76.
Khanlou, N., & Wray, R. (*2014*). A whole community approach toward child and youth resilience promotion: a review of resilience literature. *International Journal of Mental Health and Addiction*, *12*(1), 64–79. http://10.1007/s11469-013-9470-1
Klem, A. M., & Connell, J. P. (2004). Relationships matter: linking teacher support to student engagement and achievement. *Journal of School Health*, *74*(7), 222. http://10.1111/j. 1746-1561.2004. tb08283.x
Koh, K. B., Kim, C. H., & Park, J. K. (2002). Predominance of anger in depressive disorders compared with anxiety disorders and somatoform disorders. *Journal of Clinical Psychiatry*, *63*, 486–490.
Lee, T. Y., Cheung, C. K., & Kwong, W. M. (2013). Resilience as a positive youth development construct: a conceptual review. *Journal of Alternative Medicine Research*, *5*(1), 39–50. http://10.1100/2012/390450
Li, D., Chu, C. M., Ng, W. C., & Leong, W. (2014). Predictors of re-entry into the child protection system in Singapore: a cumulative ecological-transactional risk model. *Child Abuse & Neglect*, *38*(11), 1801–1812. http://dx.doi.org/10.1016/j.chiabu.2014.08.017
Li, H., Martin, A. J., Armstrong, D., & Walker, R. (2011). Risk, protection, and resilience in Chinese adolescents: a psycho-social study. *Asian Journal of Social Psychology*, *14*, 269–282. http://10.1111/j.1467-839X.2011.01356.x
Liebenberg, L., Ungar, M., & Van de Vijver, F. (2012). Validation of the child and youth resilience measure-28 (CYRM-28) among Canadian youth. *Research on Social Work Practice*, *22*(2), 219–226. http://10.1177/1049731511428619
Liu, D., Chu, C. M., Neo, L. H., Ang, R., Tan, M. Y. L., & Chu, J. (2016). Multiple trauma exposure and psychosocial functioning in Singaporean children in out-of-home care. *Psychological Trauma: Theory, Research, Practice, and Policy*, *8*(4), 431–438. http://10.1037/tra0000098
Liu, D., Tan, M. Y. L., Lim, A. Y.-Y., Chu, C. M., Tan, L. J., & Quah, S. H. (2014). Profiles of needs for children in out-of-home care in Singapore: school performance, behavioral and emotional needs, as well as risk behaviors. *Children and Youth Services Review*, *44*, 225–232. http://10.1016/j.childyouth.2014.06.019
Lyons, J. S. (2004). Redressing the emperor: improving our children's public mental health system. *Greenwood Publishing Group*.
Lyons, J. S. (2009). Communimetrics: a communication theory of measurement for human services. *Springer Science & Business Media*.
Lyons, J. S., Uziel-Miller, N. D., Reyes, F., & Sokol, P. T. (2000). Strengths of children and adolescents in residential settings: prevalence and associations with psychopathology and discharge placement. *Journal of the American Academy of Child & Adolescent Psychiatry*, *39*(2), 176–181. http://10.1097/00004583-200002000-00017
Lyons, J. S., Weiner, D. A., & Lyons, M. B. (2004). Measurement as communication. the child and adolescent needs and strengths tool. In M. Mariush (Ed.), *The use of psychological testing for treatment planning and outcome assessment* (vol 2) (3rd ed., vol 2, pp. 461–476). Mahwah, New Jersey: Lawrence Erlbaum Associates, Inc.
Lyons, J. S., Weiner, D. A., & Lyons, M. B. (2011). Measurement as communication outcomes management: The child and adolescent needs and strengths (CANS). In M. E. Maruish (Ed.), *The Use of Psychological Testing for Treatment Planning and Outcomes Testing* (Volume 2) (pp. 461–476).
Noltemeyer, A. L., & Bush, K. R. (2013). Adversity and resilience: a synthesis of international research. *School Psychology International*, *34*(5), 474–487. http://10.1177/0143034312472758
Norman, R. E., Byambaa, M., De, R., Butchart, A., Scott, J., & Vos, T. (2012). The long-term health consequences of child physical abuse, emotional abuse, and neglect: a systematic review and meta-analysis. *PloS Medicine*, *9*(11), e1001349. http://dx.doi.org/10.1371/journal.pmed.1001349
Olsson, C. A., Bond, L., Burns, J. M., Vella-Brodrick, D. A., & Sawyer, S. M. (2003). Adolescent resilience: a concept analysis. *Journal of Adolescence*, *26*(1), 1–11.
Oswald, D. P., Cohen, R., Jenson, C. E., & Lyons, J. S. (2001). Child strengths and the level of care for children with emotional and behavioral disorders. *Journal of Emotional and Behavioral Disorders*, *9*, 192–199.
Park, J. M., Epstein, R., Jordon, N., Mandell, D. S., & Lyons, J. S. (2009). Predictors of residential placement following a psychiatric crisis episode among children and youth in state custody. *American Journal of Orthopsychiatry*, *79*(2), 228–235. http://10.1037/a0015939
Powers, A., Ressler, K. J., & Bradley, R. G. (2009). The protective role of friendship on the effects of childhood abuse and depression. *Depression and Anxiety*, *26*, 46–53. http://10.1002/da.20534
Robinson, L. R., Morris, A. S., Heller, S. S., Scheeringa, M. S., Boris, N. W., & Smyke, A. T. (2009). Relations between emotion regulation, parenting, and psychopathology in young maltreated children in out of home care. *Journal of Child and Family Studies*, *18*(4), 421–434. http://10.1007/s10826-008-9246-6
Romens, S. E., & Pollak, S. D. (2012). Emotion regulation predicts attention bias in maltreated children at-risk for depression. *Journal of Child Psychology and Psychiatry*, *53*(2), 120–127. http://10.1111/j.1469-7610.2011.02474.x
Rosenthal, S., Feiring, C., & Taska, L. (2003). Emotional support and adjustment over a year's time following sexual abuse discovery. *Child Abuse & Neglect*, *27*(6), 641–661. http://dx.doi.org/10.1016/s0145-2134(03)00104-2
Schmidt, J. A. (2003). Correlates of reduced misconduct among adolescents facing adversity. *Journal of Youth and Adolescence*, *32*, 439–452. http://10.1023/A:1025938402377
Schultz, D., Tharp-Taylor, S., Haviland, A., & Jaycox, L. (2009). The relationship between protective factors and outcomes for children investigated for maltreatment. *Child Abuse & Neglect*, *33*(10), 684–698. http://10.1016/j.chiabu.2009.04.004

Sesar, K., Zivcic-Becirevic, I., & Sesar, D. (2008). Multi-type maltreatment in childhood and psychological adjustment in adolescence: questionnaire study among adolescents in Western Herzegovina Canton. *Croatian Medical Journal*, *49*(2), 243–256 [http://10.3325/cmj.2008.2.243].
Silk, J. S., Steinberg, L., & Morris, A. S. (2003). Adolescents' emotion regulation in daily life: links to depressive symptoms and problem behavior. *Child Development*, *74*(6), 1869–1880.
Sim, F., Li, D., & Chu, C. M. (2016). The moderating effect between strengths and placement on needs of children in out-of-home care: a follow-up study. *Children and Youth Services Review*, *60*, 101–108. http://10.1016/j.childyouth.2015.11.012
Singapore Department of Statistics. (2016). *Population trends 2016. retrieved december 23 2016.* , from. http://www.singstat.gov.sg/docs/default-source/default-document-library/publications/publications_and_papers/population_and_population_structure/population2016.pdf
Tanigawa, D., Furlong, M. J., Felix, E. D., & Sharkey, J. D. (2011). The protective role of perceived social support against the manifestation of depressive symptoms in peer victims. *Journal of School Violence*, *10*, 393–412. http://10.1080/15388220.2011.602614
Teisl, M., & Cicchetti, D. (2008). Physical abuse, cognitive and emotional processes, and aggressive/disruptive behaviour problems. *Social Development*, *17*(1), 1–23.
Thompson, R. A. (1994). Emotion regulation: A theme in search of a definition. In N. A. Fox (Ed.), *The development of emotion regulation, Monographs of the Society for Research in Child Development* (59) (pp. 25–52).
Trainor, S., Delfabbro, P., Anderson, S., & Winefield, A. (2010). Leisure activities and adolescent psychological well-being. *Journal of Adolescence*, *33*(1), 173–186. http://10.1016/j.adolescence.2009.03.013
Trickett, P. K., Negriff, S., Ji, J., & Peckins, M. (2011). Child maltreatment and adolescent development. *Journal of Research on Adolescence*, *21*(1), 3–20. http://10.1111/j. 1532-7795.2010.00711.x
Tyler, K. A., Johnson, K. A., & Brownridge, D. A. (2008). A longitudinal study of the effects of child maltreatment on later outcomes among high-risk adolescents. *Journal of Youth and Adolescence*, *37*(5), 506–521. http://10.1007/s10964-007-9250-y
Winters, M. C., Collett, B. R., & Myers, K. M. (2005). Ten-year review of ratings scales, VII: Scales assessing functional impairment. *Journal of the American Academy of Child and Adolescent Psychiatry*, *44*, 309–338. http://10.1097/01.chi.0000153230.57344.cd
Zeman, J., Shipman, K., & Suveg, C. (2002). Anger and sadness regulation: predictions to internalizing and externalizing symptoms in children. *Journal of Clinical Child and Adolescent Psychology*, *31*(3), 393–398. http://10.1207/S15374424JCCP3103_11