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Positive Psychology Intervention to Alleviate Child Depression and Increase Life Satisfaction: A Randomized Clinical Trial

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Abstract

Purpose: The study aims to examine the effectiveness of a positive psychology group-based intervention program, incorporating elements of hope and gratitude, in decreasing depression and increasing life satisfaction among primary school students in Hong Kong. Method: A total of 68 children, with the Depression score of Chinese Hospital Anxiety and Depression Scale from 9 to 11, were randomly assigned to the intervention and control groups. An eight-session intervention group-based program was conducted in five primary schools. Results: Participants of the intervention groups showed a significant decrease in depression and significant increase in life satisfaction, partially mediated by hope and gratitude, after the intervention when compared with those of the control groups. Discussion: As positive psychology intervention teaches children ways to increase their positive cognition, emotions, and behaviors, it may help children cope with current emotional problems and enhance their capability to deal with future stress and adversities.

Keywords: positive psychology, hope, gratitude, depression, children, intervention, life satisfaction

Child depression has become a serious public health concern, which affects about 1–2% of prepubertal children (Costello et al., 1996). Chinese children experience an equal, or even higher, level of depression in comparison to their Western counterparts. One survey with 1,598 children aged 7–11 in Hong Kong showed that the overall prevalence of internalizing problems, that is, depression and anxiety, in children was 11.40% (Siu, 2006). Early onset depression increases the risk for subsequent depressive episodes in adolescence and adulthood (Weissman et al., 1999). Child depression also plays a role in the development of anxiety disorders, conduct disorders, and substance use disorders in later developmental periods (Cheng & Myers, 2005; Seligman & Ollendick, 1998).

Research on positive psychology intervention has proliferated. Positive psychology interventions are ‘‘treatment methods or intentional activities that aim to cultivate positive feelings, behaviors, or cognitions, rather than fixing negative or pathological feelings, thoughts and behaviors’’ (Sin & Lyubomirsky, 2009, p. 468). Positive feelings, behaviors, and cognitions, for example, hope, gratitude, optimism, and resilience, to name a few, are regarded as psychological resources (Hobfoll, 2002). In addition to nourishing psychological resources and increasing well-being, positive psychology intervention is an option for treating mental disorders such as depression (Seligman, Steen, Park, & Peterson, 2005). A meta-analysis revealed that positive psychology interventions were effective for enhancing well-being (mean effect size ¼ .29) and ameliorating depressive symptoms (mean effect size ¼ .31; Sin & Lyubomirsky, 2009). The findings were impressive, given that many of these interventions were brief and self-administered activities.

The first objective of the current study was to assess the efficacy of a positive psychology program for preventive intervention (Mrazek & Haggerty, 1994) for depression in Chinese

children. The study was conducted in Hong Kong, China, with a sample of primary school students (aged 9–11). Hope (Snyder, 1994) and gratitude (McCullough, Emmons, & Tsang, 2002), two psychological resources, were chosen as the major themes of this intervention program. There is now an accumulating body of evidence on the effectiveness of hope and gratitude intervention (e.g., Berg, Snyder, & Hamilton, 2008; Froh, Kashdan, Ozimkowski, & Miller, 2009). Hope and gratitude intervention not only builds up human strengths of hope and gratitude but also contributes to greater life satisfaction and lower depression (e.g., Emmons & McCullough, 2003; MacLeod, Coates, & Hetherton, 2008).

This study assessed the efficacy of a positive psychology intervention for children. Until the past few years, research on positive psychology intervention has mostly been conducted on adult populations. However, research on the effects of positive psychology intervention for children begins to accumulate. Previous studies demonstrated that children of late childhood or early adolescents derived an array of emotional benefits from hope and gratitude intervention (e.g., Froh et al., 2009; Marques, Lopez, & Pais-Ribeiro, 2011). Positive psychological factors have been found to provide a platform for children to face challenges and strive for flourishing (Roberts, Brown, Johnson, & Reinke, 2002), which suggests the potential effectiveness of positive psychology intervention in preventive intervention of child mental health problems.

The second objective of this study was to assess whether the effects of the hope and gratitude intervention on life satisfaction and depressive symptoms were mediated by hope and gratitude that are enhanced by the intervention. Although positive psychology intervention is found to be an effective treatment for depression, there is scant literature on how it works. Mediation analysis is a strategy to identify variables that mediate the relationship between

treatment and outcome (Kazdin & Nock, 2003). Only one study has examined the mediation effect of gratitude for the relation between gratitude intervention and positive affect (Emmons & McCullough, 2003). Continuing this emerging line of inquiry, the present study evaluated whether hope and gratitude altered by the hope and gratitude intervention mediated the effects of the intervention on depressive symptoms and life satisfaction.

Hope Intervention, Hope, Depression, and Life Satisfaction

Hope is defined as a human strength manifested in the capacities to (a) set specific goals with appropriate difficulty level (goal), (b) develop several specific strategies to attain a goal (pathway), and (c) mobilize and maintain the motivation in goal pursuit process (agency; Snyder, 1994). Using the key word of ‘‘hope intervention’’ or ‘‘hope therapy’’ to search in PsycINFO from 2000 to 2014, we identified 10 published studies (Berg et al., 2008; Cheavens, Feldman, Gum, Michael, & Snyder, 2006; Duggleby et al., 2007; Feldman & Dreher, 2012; Klausner, Synder, & Cheavens, 2000; MacLeod et al., 2008; Marques, Lopez, et al., 2011; Rustøen, Cooper, & Miaskowski, 2011; Rustøen & Hanestad, 1998; Wilson et al., 2010). All of the studies adopted Snyder’s (1994) definition of hope and designed intervention protocols to improve goal setting and planning skills, foster hopeful thinking, and enhance goal pursuit activities. All studies except one (Wilson et al., 2010) showed that the experimental group reported significant increases in hope (e.g., Berg et al., 2008, Cheavens et al., 2006; Rustøen & Hanestad, 1998) and in other positive outcomes such as purpose in life, self-esteem, and subjective well-being (Cheavens et al., 2006; MacLeod et al., 2008) as well as significant decreases in negative outcomes such as psychological distress and depression (e.g., Berg et al., 2008; Klausner et al., 2000; Rustøen et al., 2011), as compared to the control groups. Most studies explained the finding by suggesting that increases in hope, as a result of the hope intervention, should explain significant changes in

other outcome variables (e.g., Berg et al., 2008; MacLeod et al., 2008). However, this assumption is never explicitly tested.

The present study aimed to test the hypothesis that the increase in hope, altered by the hope intervention, should predict lower depression and greater life satisfaction following intervention. In addition to the intervention research discussed above, a negative association between hope and depression (e.g., Chang & Desimone, 2001; Kwon, 2000) as well as a positive association between hope and life satisfaction were reported by previous studies (Bailey, Eng, Frisch, & Snyder, 2007; Gilman, Dooley, & Florell, 2006). Moreover, hope is found to be a significant predictor of fewer depressive symptoms in a longitudinal study (Arnau, Rosen, Finch, Rhudy, & Fortunato, 2007). As most findings are correlational in nature, it remains to be seen whether hope coexists with or actually predicts changes in depressive symptoms and life satisfaction.

Gratitude Intervention, Gratitude, Depression, and Life Satisfaction

Gratitude is defined as a disposition or as an emotional state resulting from recognition of future, contemporary, or previous benefits received (McCullough et al., 2002). Using the key word of ‘‘gratitude intervention’’ or ‘‘gratitude therapy’’ to search in PsycINFO from 2000 to 2014, we identified 10 published evaluations of gratitude interventions (Chan, 2010; Emmons & McCullough 2003; Froh et al., 2009; Froh, Sefick, & Emmons, 2008; Mart´ınez-Mart´ı, Avia, & Herna´ndez-Lloreda, 2010; Otake, Shimai, Tanaka-Matsumi, Otsui, & Fredrickson, 2006; Rash, Matsuba, & Prkachin, 2011; Seligman et al., 2005; Sheldon & Lyubomirsky, 2006; Watkins, Woodward, Stone, & Kolts, 2003). Activities of gratitude intervention adopted in these studies were counting blessings, writing letters of gratitude, and keeping gratitude journals. All of the studies showed that gratitude intervention can enhance positive

affect and life satisfaction (e.g., Froh et al., 2008, 2009; Sheldon & Lyubomirsky, 2006) and reduce negative affect or depression (e.g., Seligman et al., 2005).

Emmons and McCullough (2003) investigated whether gratitude exerted a causal effect on depression and well-being in a gratitude intervention. Their findings showed that gratitude completely mediated the effects of the gratitude intervention on positive affect. Emmons and McCullough's (2003) finding is echoed by findings of some nonintervention research which showed a positive association between gratitude and subjective well-being (Wood, Joseph, & Maltby, 2008). Gratitude has been found to be negatively related to depressive symptoms (Lambert, Fincham, & Stillman, 2012); gratitude was also reported to be a significant predictor of fewer stress and depression (Wood, Maltby, Gillett, Linley, & Joseph, 2008). It is yet unknown whether gratitude mediates the effects of the gratitude intervention on depression and life satisfaction. The present study inquired whether life satisfaction can be increased and depressive symptoms can be decreased by increasing children's level of gratitude.

Outcome-Mediation Model

This study combined elements of hope and gratitude intervention to design a positive psychology intervention program for Chinese children. This section describes the hypothesized pathways of intervention change, including (1) direct effects on outcomes (i.e., depressive symptoms and life satisfaction) and (2) indirect effects on both outcomes mediated by changes in positive attributes (i.e., hope and gratitude).

Depressive symptoms and life satisfaction are the two primary outcomes presumably related to the hope and gratitude intervention. Deficit-oriented intervention focuses on ameliorating

depressive symptoms. As a result, patients may no longer suffer from depression but still have a low sense of well-being (Karwoski, Garratt, & Ilardi, 2006). In contrast, positive psychology intervention that aims to identify positive traits and promote positive experiences, facilitates people to move beyond the point of "not feeling depressed" to the flourishing level (Layous, Chancellor, Lyubomirsky, Wang, & Doraiswamy, 2011).

The enhanced positive attributes of hope and gratitude are hypothesized to mediate the effects of the hope and gratitude intervention on changes in depressive symptoms and life satisfaction. On one hand, hope and gratitude interventions, as reviewed above, have been evidenced to result in enhanced hope and gratitude. On the other hand, the enhanced hope and gratitude are hypothesized to lead to lower depression and greater satisfaction following the intervention. We draw on key resources theories (e.g., Thoits, 1994) to suggest that hope and gratitude are two key resources that facilitate the development and use of other resources to meet stressful demands and achieve favorable outcomes. Previous research has shown that gratitude can enhance positive emotions, foster adaptive coping to negative events, and strengthen one's social network (Watkins et al., 2003). We also know that hopeful thinking and behaviors lead to positive emotions (during and after goal pursuit), higher self-esteem, and greater academic and social competence (Snyder, 2002; Snyder et al., 1997). Hence, children with increased hope and gratitude following the intervention are expected to experience higher life satisfaction and lower depression.

Figures 1 and 2 depict the direct and mediated intervention effects. It is hypothesized that a hope and gratitude intervention program will result in (1) increases in the hypothesized mediators (i.e., hope and gratitude), (2) changes in the targeted outcomes (i.e., fewer depressive symptoms and greater life satisfaction), (3) fewer depressive symptoms as

mediated by increases in hope and gratitude over and above direct intervention effects on depressive symptoms, and (4) greater satisfaction as mediated by increases in hope and gratitude over and above direct intervention effects on life satisfaction.

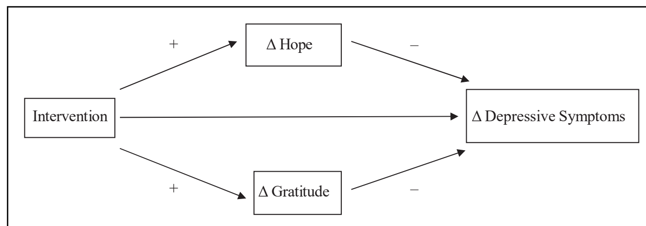

Figure 1. Effects of the hope and gratitude intervention on depressive symptoms with the proposed mediators.

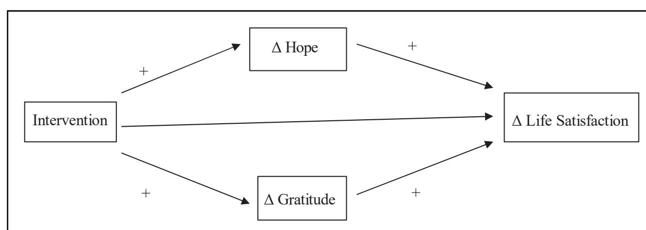

Figure 2. Effects of the hope and gratitude intervention on life satisfaction with the proposed mediators.

Method

Recruitment and Randomization

With the assistance of a social welfare agency, participants were recruited from five primary schools in Hong Kong. A total of 447 primary school students from Grade 4 to Grade 6 filled in the Chinese version of the Hospital Anxiety and Depression Scale (HADS; Leung, Ho, Kan, Hung, & Chen, 1993). Seventy-seven students (17.22%) who scored 9–11 on the subscale of depression were invited to face-to-face interviews with the social workers for the purpose of understanding the children's physical and psychological conditions. Opinions are divided regarding the optimum cutoff value for HADS-D. A study using Chinese version of HADS (Yang, Ding, Hu, Zhang, & Sheng, 2014) suggested that the score range of 9–11 was appropriate for identifying marginal or probable clinical cases. As this study aimed to apply positive psychology in preventive intervention of child depression, only students of marginal cases were selected and recruited. Nine students who have psychiatric problems or suicidal tendencies were excluded and were referred to educational psychologists or psychiatrists. Randomization was completed by a research assistant who has no other study responsibilities, using computer random number generators. Within each school, half of the potentially eligible participants were randomly selected to the experimental group and the other half to the control group. As a result, within each school, there is one experimental group (consisting of 6–8 participants) and one control group (consisting of 6–8 participants). In total, 34 children were randomly assigned into the experimental condition and 34 children into control condition. The participant flowchart was presented in Figure 3. The intervention groups and control groups had matched demographic characteristics (Table 1). There were no dropouts over the duration of the intervention program.

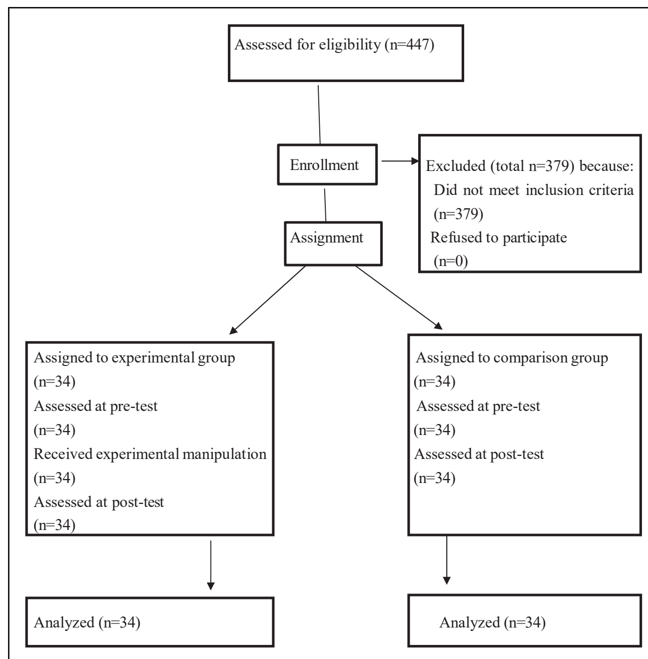

Figure 3. Flow of participants in the study.

Table 1. Sociodemographic Information for Intervention and Control Groups in Total.

	Intervention			Control			
Variable	*N*	*M* (or %)	*SD*	*N*	*M* (or %)	*SD*	t or w^2
Male (%)	34	57	NA	34	50	NA	0.44
Age (years)	34	10.5	1.53		10.3	2.10	0.56
Years of living in Hong Kong	34	8.00	2.91	34	8.69	2.35	−0.78
Number of siblings	34	1.08	0.95	34	1.35	1.01	−1.27
Living with both parents (%)	34	57	NA	34	60	NA	3.85

Ethical Review

Ethics approval was obtained from the Research Ethics Committee of the affiliated university before the study was implemented. It is the university's policy that all research involving human subjects should be submitted for ethical review. The first author completed the checklist of ethical guidelines for research involving human subjects. One example item of the checklist is whether the study involves participants who do not possess the capacity to provide valid informed consent to participate in the study. As this study involves children under 18 years, parental consents in a written form were sought. Both parents and students were ensured that their participation was voluntary and would in no way relate to their grades at school.

Therapist

A therapist having prior training and practical experiences in administering positive psychology interventions ran the groups. Consistency of the program implementation was ensured under the guidance of a program protocol and the supervision of the first author, an associate professor specialized in positive psychology, who oversaw the intervention program by acting as a consultant for the whole project.

Experimental Condition

Setting. Children randomized to the experimental group were offered eight-session hope and gratitude intervention delivered in the group format. The group met once a week after the normal class schedule. Each session of the group lasted for around 90 minutes.

Content. The intervention program, ‘‘Live a Positive Life,’’ aimed to enhance hope and gratitude in children in order to reduce their depressive symptoms and increase their life satisfaction. The program integrated key elements from hope and gratitude intervention and incorporated play and group work strategies with the children. Specifically, the intervention program emphasized (1) training goal-setting skills, (2) cultivating a sense of agency, (3) facilitating design of different pathways to achieve the goal, (4) promoting self-gratitude, and (5) acknowledging and encouraging the expression of gratitude to others.

Each session could be roughly divided into three parts. In the first part, approximately 10 minutes were catered for reviewing homework and discussing the participants’ application of what they have learned in the previous week. The second part, approximately 60 minutes in length (including a 10-minute break), was dedicated to activities and discussions under the specific theme of hope or gratitude. Finally, the last 10 minutes of each session were used to

recap key points of the session and discuss the homework assignment for the next week. Homework was designed to encourage participants to practice what they have learned in their daily life situations. A brief description of each session is outlined in Table 2.

Table 2. Session Plans of the Positive Psychology Intervention Program for Children.

Session	Themes	Purpose	Brief Description
1	Introduction	The purpose of the first session was to familiarize the group members with one another, develop mutual consent on the group rules, and formulate goals to be achieved in this group.	Participants chose goals that they would like to accomplish within the group and noted them down on the first page of the portfolio. In the later sessions, the counselor would review with the participants their progress in completing the goals and record this on the portfolios.
2	Setting goals	The second session aimed to help children understand the importance and skills of goal setting.	Participants shared stories on how successful people set goals for themselves. Participants filled out the worksheets by choosing their goals for study, family, and interpersonal relationships. The worksheets were randomly put into several paper boxes stuffed with filling materials. Participants searched for their own worksheets under the guidance of the counselor.
3	Exploring pathways	The third session aimed to help children to formulate different pathways to achieve their goals, especially when confronting with obstacles in goal achievement.	Participants filled out the worksheets of possible goal-blocking obstacles. The worksheets were folded into paper planes and were flown to the other side of the room. Each child picked up another child's paper plane and helped the group member formulate solutions to the obstacles.
4	Cultivating agency	The fourth session was intended to help children acquire agency toward achieving goals.	Participants took turns to tap the balloon and spoke aloud their presumably achieved goals (e.g., I scored first in the examination; I won the running race). Participants were verbally guided to close their eyes and imagine taking each step in setting goals, identifying pathways, motivating themselves to overcome the obstacles, and achieving the goals. Participants then drew their images during the meditation exercise.
5	Appreciating self	The goal of the fifth session was to promote self-understanding and self-appreciation among the children.	Each participant used body language to show his or her own strengths for others to guess what they were. Participants shared how these strengths influenced their daily lives.
6	Appreciating others	The sixth session aimed at helping children to understand the concept of gratitude and how it can be put into practice.	Participants were paired up. For each pair, one wore an eye patch and was led by the other around a room full of barriers (e.g., desks and chairs). When finished, the one with the eye patch was interviewed to tell how his or her partner assisted him or her in overcoming the barriers. Participants shared words of appreciation and things they were thankful for to other group members during the experiential exercise.
7	Expressing gratitude	The seventh session aimed to help children identify others' strengths and to develop a habit of being grateful.	Each participant invited another group member to think of one object that best represented himself or herself. Then, they took turn to guess others' strengths. Participants shared and discussed ways to express gratitude to others.
8	Summary	The goal of eighth session was to recap key points of the group and encourage children to apply what they have learned in daily life situations.	Participants reviewed the group process and recapped what they had learned. Participants completed the gratitude cards by writing what they learned or what assistance they had received from other group members and then presented the gratitude cards to one another.

Control Condition

No group intervention was provided for the control groups, although the students participated in the normal extracurricular activities offered by the school. In addition, the school social workers met all students in the experimental and control groups regularly to track their psychological conditions.

Measures to Control Contamination

Students of experimental and control groups were asked not to share experiences or materials with other students. The therapist was requested to abstain from discussing the intervention with teachers or social workers in the schools.

Outcome Assessments

Hope. The Chinese version of the Children's Hope Scale (Snyder et al., 1997) was used in assessing perceived hope in children. The scale has 6 items. Children were asked how often they had the experience or feeling as listed in the statements and rated the frequency on a 6-point Likert-type scale, ranging from 0 *none of the time* to 6 *all of the time*. An example item is "when I have a problem, I can come up with lots of ways to solve it." Child's hope score was computed by averaging all the item ratings, with a higher score denoting higher hope in the child. Snyder et al. (1997) demonstrated good convergent validity of the scale for showing positive association with perceived competence and self-worth (Harter, 1985). The Chinese version of the Hope Scale demonstrated both internal reliability and temporal reliability (Chow, 2010). Reliability of the scale in the present study was .78.

Gratitude. The Gratitude Questionnaire-6 developed by McCullough, Emmons, and Tsang (2002) was used to measure gratitude in the present study. The scale consists of 6 items in

four facets, namely, intensity (e.g., "I have so much in life to be thankful for"), frequency (e.g., "Long periods of time can go by before I feel grateful to something or someone"), span (e.g., "As I get older, I find myself more able to appreciate the people, events, and situations that have been part of my life history"), and density (e.g., "I am grateful to a wide variety of people"). Each item is rated on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Child's gratitude score was computed by averaging all the item ratings, with a higher score denoting higher gratitude in the child. The scale was proven to be a valid and reliable measure of gratitude for children (Froh et al., 2011) and Chinese people (Chen, Chen, Kee, & Tsai, 2009). Reliability of the scale in the present study was .77.

Depressive symptoms. The depression subscale of the Chinese version of the HADS (Leung et al., 1993) was administered in the current study. The subscale has 7 items. An example item is "I feel as if I am slowed down." Each item is rated on a 4-point scale ranging from 0 (*absence of symptoms*) to 3 (*severe symptoms*). The average of the scores was obtained, with a higher score indicating a higher level of depression. The HADS has adequate test–retest reliability and discriminant validity for early adolescents (White, Leach, Sims, Atkinson, & Cottrell, 1999). The Chinese version of HADS displayed good convergent validity with the Hamilton Rating Scale of Depression (Leung, Wing, Kwong, & Shum, 1999). Reliability of the scale in the present study was .82.

Life satisfaction. Life satisfaction was measured by the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). Participants were asked to reflect the extent they agreed with each of the five statements on a 7-point Likert-type scale. Example item is "In most ways, my life is close to ideal." Item ratings were averaged as the total score, with higher score denoting higher life satisfaction. The scale displayed good reliability, construct validity,

and cross-cultural validity in assessing subjective well-being for Chinese adolescents (Shek, 2007). Reliability of the scale in the present study was .82.

Data Collection

The questionnaire comprised the above scales and questions about children's age, gender, and other sociodemographic information. It took about 15 minutes for the participants to complete the questionnaire. All the participants filled in the pretest questionnaire before they were randomly assigned into experimental or control groups. A research assistant who has no other study responsibilities monitored the questionnaire completion by the participants at school. Within 1 week after the end of intervention, participants of both experimental group and control group were approached by the same research assistant and were asked to complete the same set of questionnaire.

Data Analysis

Descriptive analyses were first carried out to compare mean scores on depression, life satisfaction, hope, and gratitude for intervention and control groups at pre- and posttest. In order to examine whether the intervention program was effective, a 2 (experimental vs. control) x 2 (pre vs. post) repeated measures analysis of variance (ANOVA) was conducted to investigate whether there were Significant Group x Time Interactions on the outcome measures. To determine to what extent the change in depressive symptoms was brought on by hope and gratitude intervention, mediation analysis was conducted. For each proposed mediator (i.e., hope and gratitude), the changes in that variable were regressed on ‘‘intervention’’ (experimental vs. control). Then, changes in depressive symptoms were regressed on the changes in the proposed mediators and ‘‘intervention.’’ Similar mediation analysis was conducted with changes in life satisfaction as the outcome variable. A macro expansion for SPSS, Version 22.0, developed by Preacher and Hayes (2008) was used to conduct the mediation analysis.

Results

The Effects of the Hope and Gratitude Intervention on Outcomes

The ANOVA data presented in Table 3 showed that the experimental group reported higher hope, higher gratitude, greater life satisfaction, and lower depressive symptoms when compared with the control group. Hope score and gratitude score of both groups were not significantly different prior to intervention. Both groups showed increases in hope and gratitude score during the study, yet more pronounced increases of hope and gratitude in the intervention group were shown. The Group x Time interaction for hope was statistically significant (F ¼ 16.97, $p < .009$) when a Bonferroni corrected a level (.0125, .05/4 comparisons) was used to correct for multiple comparisons with moderate effect size (partial Z^2 ¼ .21). The Group x Time interaction for gratitude was statistically significant (F ¼ 25.69, $p < .001$) at the Bonferroni-corrected a level of $p < .0125$) with moderate effect size (partial Z^2 ¼ .28). Depressive symptoms of both groups were not significantly different prior to intervention. Depressive symptoms decreased in the experimental group while slightly increased in the control group over the course of the study. The Group x Time interaction was marginally significant (F ¼ 17.83, p ¼ .018) at the Bonferroni-corrected a level of $p < .0125$). The effect size was moderate (partial Z^2 ¼ .21).

Life satisfaction did not differ significantly between the control and the intervention group at pretest. Life satisfaction increased in the intervention group while decreased for the control group during the study period. The Group x Time interaction reached marginal statistical significance (F ¼ 6.01, p ¼ .017) at the Bonferroni-corrected a level of $p < .0125$). The effect size was moderate (partial Z^2 ¼ .10).

Table 3. Means, Standard Deviations, *t* Tests and 2 (group: intervention, control) x 2 (Time: pretest and posttest) ANOVAs on Outcome Measures.

		Pre		Post				
Measure	Group	Mean	*SD*	Mean	*SD*	*F*	*P*	Partial Z2
Depressive symptoms[a]	Control	1.02	0.43	1.05	0.43	17.83	.018	.21
	Intervention	1.09	0.33	0.71	0.40			
	t	−0.89		2.00*				
Life satisfaction[b]	Control	4.48	1.11	4.31	1.30	6.01	.017	.10
	Intervention	4.20	1.17	4.86	1.32			
	t	1.00		−1.97*				
Hope[c]	Control	2.89	0.50	2.92	0.50	16.97	.009	.21
	Intervention	2.72	0.51	3.46	0.46			
	t	−0.83		−5.25***				
Gratitude[d]	Control	4.47	0.75	4.57	0.96	25.69	<.001	.28
	Intervention	4.27	0.75	5.16	0.76			
	t	1.86		−3.02**				

Note. ANOVA ¼ analysis of variance.
[a]Scores of the scale range from 0 to 3. [b]Scores of the scale range from 1 to 7. [c]Scores of the scale range from 0 to 5. [d]Scores of the scale range from 1 to 5.
*$p < .05$. **$p < .01$. ***$p < .001$.

Testing the Proposed Mediators of Changes in Depressive Symptoms and Life Satisfaction Following Intervention Compared to Control Group

As shown in Table 4, changes in gratitude mediated the effects of intervention on depressive symptoms. As zero is not within the 95% confidence intervals (CIs) of the estimated indirect effects, the change in gratitude is considered as a significant partial mediator. The intervention also predicted significant changes in hope, yet changes in hope were not significantly associated with changes in depressive symptoms (Table 4). Hence, changes in hope failed to be a mediator for the relation between the intervention and depressive symptoms. The tested model explained 53.2% of the variance in change of life satisfaction, adjusted R^2 ¼ .532, F (3, 64) ¼ 24.293, $p < .001$ (Figure 4).

Table 4. Mediators of Changes in Depressive Symptoms Following Intervention.

Variable	*B*	*p*	R^2	Mean Mediation Effect	95% CI
D Hope intervention	1.400	<.001	.369	NA	NA
D Gratitude intervention	1.614	<.001	.568	NA	NA
D Depressive symptoms intervention	−0.318	.046	.532	NA	NA
D Hope	−0.030	.605		−.020	[-0.1492, 0.044]
D Gratitude	−0.250	.002		−.403	[−0.694, −1.963]

Note. Child gender and age are controlled. CI ¼ confidence interval.

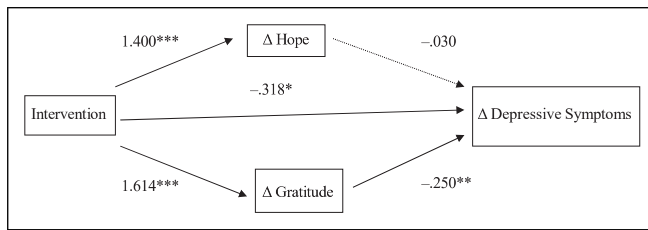

Figure 4. Results from the mediation analysis for effects of the hope and gratitude intervention on depressive symptoms. Child gender and age are controlled. Unstandardized coefficients are presented. Dashed line represents insignificant path. *p < .05. **p < .01. ***p < .001.

As shown in Table 5, changes in hope as well as changes in gratitude mediated the effects of the intervention on life satisfaction. As zero is not within the 95% CIs of the estimated indirect effects, it can be concluded that changes in hope and changes in gratitude are two significant mediators. This mediation was complete, as the direct effect of the intervention on life satisfaction was no longer significant when correcting for the indirect effects. The tested model explained 56.4% of the variance in change of life satisfaction, adjusted R^2 ¼ .564, F (3, 64) ¼ 27.853, p < .001 (Figure 5).

Table 5. Mediators of Changes in Life Satisfaction Following Intervention.

Variable	B	p	R^2	Mean Mediation Effect	95% CI
D Hope intervention	1.400	<.001	.369	NA	NA
D Gratitude intervention	1.614	<.001	.568	NA	NA
D Life satisfaction intervention	0.544	.146	.564	NA	NA
D Hope	0.279	.047		.210	[0.008, 0.663]
D Gratitude	0.565	.002		.912	[0.435, 1.551]

Note. Child gender and age are controlled. CI ¼ confidence interval.

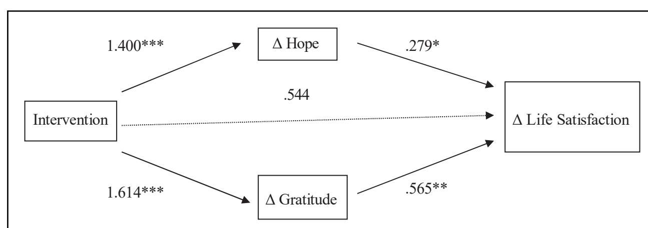

Figure 5. Results from the mediation analysis for effects of the hope and gratitude intervention on life satisfaction. Child gender and age are controlled. Unstandardized coefficients are presented. Dashed line represents insignificant path. *p < .05. **p < .01. ***p < .001.

Discussion and Application to Practice

The study examined the efficacy of a positive psychology intervention for a sample of Chinese children with depressive symptoms. The current study found that participation in an 8-week group intervention that incorporated elements of hope and gratitude was associated with higher hope and gratitude, lower depression, and greater life satisfaction. Furthermore, changes in gratitude mediated the effects of the intervention on depressive symptoms and life satisfaction, and changes in hope mediated the effects of the intervention on life satisfaction.

The effect sizes of the current intervention were moderate (partial Z^2 ¼ .21 for changes in depression and partial Z^2 ¼ .10 for changes in life satisfaction), which is comparable to the effect sizes reported by a meta-analysis (Sin & Lyubomirsky, 2009). Yet it should be noted that participants in this study reported moderate levels of depressive symptoms (*M* ¼ 1.09 for intervention group and *M* ¼ 1.02 for control group, score range 0–3). Hence, this study addressed a subclinical sample and should be considered as evidencing the efficacy of positive psychology program in preventive intervention of depression.

In accordance with previous research (Froh et al., 2009; Marques, Lopez, et al., 2011), this study showed that a hope and gratitude intervention is effective for children. The positive attributes of hope and gratitude are believed to occur regularly and become stable in late childhood. Gratitude is linked to the cognitive process of seeing other's behaviors as intentional and understanding costs to the benefactor and benefits for the beneficiary. Those social–cognitive mechanisms are tied to antecedent casual thought, which appears between ages 7 and 10 (Froh et al., 2008). Regarding hope, it is believed to be established in the infant to toddler stage (Snyder, 2000). According to Snyder (2005), pathway thinking is associated with three processes: the sensing and perceiving of ‘‘what's out there,'' the learning of

temporal connection of events, and the selection of specific goals, while agency thinking is related to the self-recognition that one is the author of action. These cognitive processes were considered as the foundation of hope, which is set by age of 2 and should remain stable as the child grows up (Snyder, 2005). Given hope and gratitude's relationship to well-being in child samples (e.g., Froh, Miller, & Snyder, 2007; Snyder, 2005), and that hope and gratitude begin to develop in childhood, it makes sense that children are likely to benefit from hope and gratitude interventions.

This study is the first to investigate the mechanism of change in depressive symptoms and life satisfaction following a hope and gratitude intervention. There is a dearth of research on how positive psychology intervention works. Emmons and McCullough (2003) assessed the effect of the gratitude intervention on daily positive affect in 65 people with neuromuscular conditions. They found that the effect of the gratitude intervention on daily positive affect was mediated by the effect of the gratitude intervention on gratitude. Corresponding with Emmons and McCullough (2003), the present study showed that the effects of the hope and gratitude intervention on life satisfaction were mediated by the increases in hope and gratitude following intervention. Accumulating evidence suggests that hope contributes to life satisfaction, as hope is positively related to self-esteem, perceived competence, and actual achievements in social and academic aspects (Marques, Pais-Ribeiro, & Lopez, 2011; Snyder, 2002). Meanwhile, grateful people are more satisfied with life as they have the ability to notice, appreciate, and savor help from others and elements of one's daily life (Watkins et al., 2003).

Only gratitude mediated the relation between the intervention and depressive symptoms. It seems that changes in gratitude are more important than changes in hope in mediating the

effects of the intervention on depressive symptoms. Gratitude can produce positive emotions, as grateful people are more likely to encode and retrieve positive experiences, notice and savor elements of life, and have satisfying interpersonal relationships (Watkins, 2004; Wood, Joseph, et al., 2008). Positive emotions of gratitude could loosen people's cling to negative emotions of depression (Fredrickson, 1998). In contrast, hope helps reduce depression by promoting active coping strategies under stress (Chang, 1998). In other words, hope intervention may take effect for depressed people in stressful situations. As we do not evaluate participating children's stress level, it is unknown whether stress level moderates the relation between higher hope and fewer depressive symptoms following the intervention. Another possible explanation is that the relatively small sample size might limit the power to detect a significant path from hope to depressive symptoms.

The direct effects of the intervention on depressive symptoms remain significant, after correcting for the indirect effects mediated by changes in gratitude. This implicates some non-specific therapeutic factors for reducing depression. One possible factor is the empowerment nature of the intervention. Positive psychology intervention emphasizes participants' virtues and strengths and attributes their improvements to their own actions and behaviors (Sheldon & King, 2001). Another possible factor is that children in the experimental groups feel positive and privileged about being selected. The evidence that reduced depressive symptoms and improved life satisfaction was attributable to the hope and gratitude intervention is further enhanced by the rigor of the study design, that is, the use of random assignment to experimental and control groups with approximately equivalent baseline scores. Therapist training and supervision ensured that the intervention and assessments were delivered consistently. Given the developmental characteristics of our participants, means of delivery and worker directedness were adjusted for children's ages and

developmental needs. Unstructured and structured plays and a combination of experiential activities and discussions were provided (Dwivedi, 1993; Fatout, 1996).

Positive psychology and social work share the goal of promoting individual well-being. Positive psychology focuses on identifying positive traits, creating positive experiences, and cultivating positive relationships to facilitate human growth and flourishing. These goals are consistent with the strength-based perspective of social work. Both positive psychology and social work believe that children have potentials and internal resources within them, and they thrive when nurtured and supported by their environment. Therefore, positive psychology can be used by social workers as a theoretical framework to work with children (Dekel & Taubman-Ben-Ari, 2015). Moreover, compared to strength-based perspective of social work, positive psychology provides a more detailed list of positive personal attributes as well as more concrete plans to identify and promote these positive traits. As illustrated in this research, positive psychology intervention teaches children ways to increase their positive cognition, emotions, and behaviors, which may help children cope with current emotional problems and increase their life satisfaction as well as enhance their capability to deal with future stress and adversities. Hence, we advocate an integrated view of positive psychology and social work to nurturing and cultivating children's well-being.

Some limitations of the present study should be noted. First, the sample of primary school students with moderate depressive symptoms limits the relevance of our study results to treatment of depression in clinical populations. The use of convenience sampling also limits the generalizability to children at large. Future research is expected to investigate the efficacy of positive psychology intervention for Chinese children in both clinical and community samples with a range of clinically relevant outcomes.

Second, sample size of this study is small, which suggest limited power to detect statistically significant effects (Campbell, Grimshaw, & Steen, 2000). It is possible that the association between increases in hope and decrease in depressive symptoms could not be detected at a statistically significant level due to the low power. Larger trials should be conducted to replicate and determine the stability of the effect.

Third, both participants and the therapist who deliver the treatment know the participants' treatment assignment. It is possible that children in the experimental groups may show some sort of positive feeling for the privilege of being selected, which might contribute to the lower depression. In addition, participants who are unblended about the group assignment may discern the study purpose and act positively which they believe correspond to what the researcher is looking for. The good-subjective effect (Nichols & Maner, 2008) is considered as an extraneous variable, exerting influence other than intended by the researcher.

Fourth, despite our measure to control contamination, it is still possible that children of the experimental group might interact or even share experiences with those of the control group. A recommended trial design to protect against contamination is cluster randomization (Solomon, Cavanaugh, & Draine, 2009), as individuals randomized to different conditions are not in the same setting. Cluster randomization also requires for a larger sample size so as to compensate for possible selection bias, limited degrees of freedom, and variance inflation (Chow & Liu, 2014).

Fifth, this study assessed the outcome measures in two stages: pretest and posttest. Thus, it is implausible to determine whether changes in the hope and gratitude occur before the changes

in depressive symptoms and life satisfaction. This prevents us to draw firm conclusions about the assumed causal relationship between proposed mediators and outcomes. Future study is expected to measure changes in proposed mediators and outcomes at different time points in order to determine whether change in mediators is prior to the change in outcomes.

Sixth, this study failed to include a follow-up assessment, and thus it is unclear whether changes can be maintained. Future trials could be improved by incorporating follow-up assessments. Also, some booster sessions could be held on a regular basis (Frisch, 2013), and follow-up assessments can be used to determine whether these maintenance strategies are effective.

Conclusion

The present study offers some evidence that a positive psychology group intervention is useful in decreasing depression as well as increasing life satisfaction for primary school students with mild depression in Hong Kong, China. In addition, this study is the first to investigate the mechanism of change in depressive symptoms and life satisfaction following a hope and gratitude intervention. The findings suggest that the intervention enhanced human strengths of hope and gratitude, which in turn contribute to consequent decrease in depressive symptoms and increase in life satisfaction. Findings of the present study suggest potentially useful direction for the development of future interventions aiming at not only relieving suffering but also improving well-being for children.

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