

Solution-Focused Brief Therapy for Students in Schools: A Comparative Meta-Analysis of the English and Chinese Literature

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Abstract

Objective: This review analyzed the effectiveness of SFBT as a school-based intervention by synthesizing and comparing results from the English and Chinese literature. **Method:** In order to achieve a rigorous analysis, the search aligned with the Cochrane guidelines. Fifty studies, containing 246 effect size estimates and a total of 2,921 participants, were included in the review. Data on study and intervention characteristics were extracted using a pre-defined coding sheet. Analysis involved the calculation of Hedges' g effect sizes and utilized Robust Variance Estimation in meta-regression to estimate an overall treatment effect and moderator analyses. **Results:** Combining both English and Chinese studies, an overall treatment effect size estimate of SFBT for student outcomes was $d = 0.176, p < 0.001$. The treatment effect of SFBT for student outcomes was significantly greater in comparison to waitlist control ($d = 1.690, p < 0.01$), but not significantly different than treatment-as-usual ($d = 0.140, p < 0.05$) or to alternative interventions ($d = 0.103, p = 0.504$). **Conclusions:** These findings add to the body of literature on SFBT's effectiveness for student outcomes. Given empirical evidence from both English and Chinese studies, SFBT demonstrates promising efficacy as a mental health intervention for school-based therapists.

Solution-Focused Brief Therapy (SFBT) is a strengths-based intervention that was developed at the Brief Family Therapy Center in Milwaukee by two social work practitioners, Steve de Shazer and Insoo Kim Berg along with an interdisciplinary collaboration of researchers and therapists. SFBT has roots in systemic family therapy (MRI brief approaches) and linguistic theory. It is a brief mental health intervention that focuses on changes in relationships and social interactions that lead to improvements in psychosocial functioning, and satisfactory goal attainment (Franklin, Trepper, McCollum & Gingerich, 2011). A recently published systematic review and meta-summary of SFBT's change process (Franklin et al., 2018) found that SFBT practitioners apply "the purposeful use of language in the form of the co-construction of meaning in a unique way that is different from some other therapies (p. 11)." Specifically, SFBT practitioners use questions and responses (paraphrases and summaries) that are not neutral or objective but contain embedded assumptions about client competencies and their situations and activate clients toward building their own solutions (Franklin, Streeter, Webb & Guz, 2018; Franklin, Zhang, Froerer, & Johnson, 2018). In practice, this therapeutic process is collaborative between the client and school mental health professional and includes SFBT technique questions (e.g., miracle questions, exception questions, scaling questions, and coping questions) that helps clients to better understand their strengths, past successes, and desired future. The subsequent responses of clients are used to activate new ways to view difficulties and new actions to take to reach goals. For examples, a school social worker may help a student question if the problem *always* exists, focus on the future possibilities (as opposed to past or present conflict), initiate goal setting and behavioral activation toward positive emotion and effective coping responses (Zhang & Franklin, in press).

Since its development, SFBT has increasingly been practiced in both K-12 and post-secondary education settings (Kim, 2008; Gong & Hsu, 2017; Kim & Franklin, 2009) and is believed to be a good brief intervention to use with children and adolescents in elementary and secondary schools, and older transition age youth in college. Elementary schools and secondary schools provide accessible mental health services to vulnerable youth with school social workers and other mental health professionals providing these services. Though colleges do not provide universal public access to services, colleges are educational settings where people of all ages and cultural backgrounds enroll and many have access to school mental health services. School mental health across K-12 and post-secondary settings are increasingly viewed as a continuum of services because many students with mental health disabilities now enter college and require mental health accommodation and services (Beauchemin, 2018).

Literature Review

Most of the literature on SFBT in education is directed toward the training of school mental health practitioners and teachers. Several studies also exist on the outcomes of K-12 students in schools showing the potential of SFBT to improve behavioral and emotional issues, academic, and school attendance problems (Metcalf, 1995; Franklin, Biever, Moore, Clemons, & Scamardo, 2001; Franklin & Hopson, 2009; Franklin, Streeter, Kim, & Tripodi, 2007; Murphy & Duncan, 2007; Gingerich & Peterson's 2013). Similarly, SFBT has been studied with college students who have psychosocial problems, developmental needs associated with young adulthood, and the college student experience such as relationship problems, identity exploration, processing of adolescent trauma, and termination from college (Beauchemin, 2018; Ng, Parikh & Guo, 2012; McNaught, 2014). Therefore, a systematic review of studies on SFBT across the continuum of K-12 and post-secondary education practices has the potential to examine the

effectiveness of SFBT across the life course in education settings. The aim of this study is to examine the effectiveness of SFBT in all educational grade levels (K-12 & college) amongst US and Chinese students where a number of experimental design studies has been conducted.

The Practice of SFBT in Schools

There is a large literature on SFBT in schools across disciplines (e.g., Franklin & Gerlach, 2007; Metcalf, 2008; Murphy, 2007; Murphy & Duncan, 2007; Wallace, Hai, & Franklin, 2020) that indicates that SFBT is being practiced within schools in the United States, Canada, Europe, Australia, Latin America, South Africa, Korea, and in the provinces of Mainland China and Taiwan (e.g., Kim, Kelly, & Franklin, 2017; Daki & Savage, 2010; Fitch, Marshall, & McCarthy, 2012; Liu et al., 2015; González, Franklin, Cornejo, Castro, & Smock, 2017). SFBT was first practiced and researched in schools in the US during the 1990's and began to emerge within school based counseling and teaching practices in other countries. (Metcalf, 1995; LaFountain & Gardner, 1996). Interestingly, Chinese researchers have been some of the most enthusiastic to adopt SFBT into school practice, citing that the strength-based perspective, person centered, and future-orientation of SFBT aligns well with Chinese cultural values (Ng, Parikh & Guo, 2012). The literature indicates that many of the components of SFBT remain consistent when used in the context of school mental health services regardless of settings. The implementation and effectiveness of SFBT within education settings and across cultures deserves further investigation.

The multisystem levels of interventions framework is reflective of how SFBT and other mental health interventions are practiced in schools around the world. Intersecting with tiers of services delivery, mental health services in schools may be facilitated by a variety of professionals (Author Blinded., 2017). For example, SFBT can be adapted to individual, group,

family, and organizational levels and may be facilitated by teachers, counselors, and mental health professionals (Metcalf, 2010; Franklin, Bolton, & Guz, 2018). These levels of interventions are described as Tiers 1, 2 or 3. Tier 1 interventions are school or classroom level interventions that provide preventative services to a wide student population. Examples of school and classroom interventions are anti-bullying programming (Bowllan, 2011) and social-emotional instruction (Domitrovich, Cortes, & Greenberg, 2007). Tier 2 interventions are targeted to address a specific mental health symptom and/or a specific student population. These programs are typically delivered in small group format and are not provided to the general student body (Eiraldi et al., 2016). Tier 3 interventions are delivered through individual counseling and interventions that often target acute student needs (Daki & Savage, 2010).

SFBT Studies in Education

Most studies on SFBT in education have been completed in North America and East Asia, in particular, China. Despite the available studies on SFBT in North American and Chinese schools, there has not been a systematic review or comparison of both English and Chinese studies. Such a comparison will support the evaluation and effective implementation of SFBT across K-12 and post-secondary education, and across different cultural contexts within schools. Authors could only find two systematic literature reviews that specifically examined the practice of SFBT in schools. One literature review was from the US (Kim & Franklin, 2009) and the second was a meta-analysis from researchers in Taiwan (Gong & Hsu, 2017). The two reviews are independent and do not provide comparative information or specific details about how SFBT is being practiced in schools (e.g., Tiers of Intervention, modality, numbers of sessions, etc.) that could be useful for understanding how SFBT is implemented in school-based practice. The Kim and Franklin (2009) study included articles based on the studies' use of identified SFBT

techniques and principles. To offer a scope of the available literature, the review included quasi-experimental and experimental studies. Of the 7 included studies, 6 were quasi-experimental and 1 was a single case design. The included studies used a variety of measurements including standardized measurements and school records (i.e., attendance data and GPA) to determine effectiveness of SFBT programs. The results of the review were promising; however, due to research design limitations of the included studies, Kim and Franklin (2009) were unable to make a conclusive statement about the effectiveness of SFBT in schools.

Gong and Hsu (2017) reviewed 24 studies, 15 studies from Taiwan and 9 from mainland China. The majority of the studies ($N = 20$) were dissertations while 4 were published articles. The results demonstrated a significant immediate and follow up effect for SFBT implemented in group settings. Gong and Hsu (2017) discussed the implications of these significant results, stating that SFBT's approach could be applied within Chinese culture. These authors specifically mentioned that the future-oriented and strengths-based elements of SFBT are of interest to Chinese practitioners. This contrasts to other therapies that may force clients to speak about past trauma or personal flaws. While Gong and Hsu (2017) have demonstrated compelling results for the use of SFBT in Chinese schools, the authors noted a need for more research to better understand the usefulness and cultural responsiveness of SFBT in China.

Aims of the Study

Since the Kim and Franklin (2009) and Gong and Hsu (2017) reviews, the research on SFBT in schools has grown, especially the global practice of SFBT in schools. Thus, there is a need to reexamine the effectiveness of SFBT in schools and to compare the strength of evidence supporting SFBT between the English and Chinese literature. This systematic review and meta-analysis aims to 1) synthesize the effectiveness of SFBT as a school-based intervention among

K-12 and post-secondary education students and 2) to compare results from the English and Chinese literature. The results of the English and Chinese literature will be compared across 8 domains of student outcomes: internalizing outcomes, externalizing outcomes, academic attitude outcomes, academic behavior outcomes, academic performance outcomes, social relational outcomes, psychological wellness of self-outcomes, and general well-being outcomes. The English and Chinese SFBT studies were selected for this review due to the increasing number of available primary outcome research studies on the practice of SFBT in education. By including both English and Chinese studies the authors hope to expand on the findings of previous reviews of SFBT outcomes in schools while offering a comparative analysis across different countries, client populations, and age groups.

Methods

Search procedures

We conducted a systematic search of literature for English and Chinese studies following the Cochrane Collaboration Guidelines (Higgins & Green, 2011). For English studies, we searched across eight electronic databases, five academic journals, two professional websites, and reference lists of included studies. For electronic databases, academic journals and professional websites, we used the following keywords and logic terms: (school* or college* or university*) AND (SFBT or solution* or solution focused or solution-focused) AND (effect* or effic*). The terms were used for title and abstract search. For Chinese studies, we used China National Knowledge Infrastructure (CNKI) as our search platform and searched across five electronic databases. Specific search strategies and keywords used are elaborated in appendix 1. For both English and Chinese studies, we searched all available studies from inception to June 2019. The formal search of an initial pool of literature across electronic databases was conducted

and completed on June 16th, 2019 for both English and Chinese studies. Manual search of literature was completed on June 20th, 2019.

Inclusion and exclusion criteria

To be eligible for inclusion, a study needed to examine treatment effects of solution-focused brief therapy for students' outcomes in schools delivered in one of the following modalities: individual, family, group, classroom. If an intervention used principles of SFBT as its core theory and/or guidance, then an intervention would be eligible. If an intervention only incorporated techniques of SFBT (e.g., cognitive behavioral therapy with SFBT's miracle question technique), that intervention would be *ineligible*. School-aged individuals, from primary school to college students, were all considered as students, and thus were eligible for inclusion. We did not pose any constraints on student outcomes, which were grouped post hoc based on conceptual similarities. We also did not exclude school settings and included a range of settings such as: primary schools, middle and high-schools, vocational schools, community colleges, liberal art colleges, and universities. Furthermore, eligible studies needed to be either a randomized or non-randomized controlled trial, meaning a study must include a control group for inclusion. Studies needed to report enough statistical information to calculate effect sizes. We did not limit inclusion based on publication status, but studies must have been originally published either in English or in Chinese. Studies were excluded if a study's sample was a subset of the population that was reported by another study already included in the review and therefore repetitive/dependent.

Data extraction

A group of experienced school mental health researchers and practitioners developed a data extraction sheet for this review. The three researchers who developed the coding sheet

(available upon reasonable request from the corresponding author) were all tenure-track faculty members affiliated with research-intensive universities in the United States. Five studies were first coded as a pilot before a refined coding sheet was finalized. Individual studies were then coded for study bibliographical information (e.g., author, year, publication country), study design (e.g., randomized controlled trial or not, type of comparison used), participant characteristics (e.g., age, gender, racial background), and intervention characteristics (e.g., intervention modality, provider background, if supervision was offered). Outcomes were conceptually grouped into eight categories: (1) internalizing outcomes (e.g., depression, anxiety), (2) externalizing outcomes (e.g., aggression, ADHD), (3) academic attitude outcomes (e.g., school burnout, positive feeling about school), (4) academic behavior outcomes (e.g., learning behavior efficiency, academic procrastination), (5) academic performance outcomes (e.g., GPA, academic achievement), (6) social relational outcomes (e.g., relationship with teacher, perceived peer relationships, relationship with parents), (7) psychological wellness of self-outcomes (e.g., self-esteem, self-efficacy, self-image), and (8) general well-being outcomes (e.g., quality of life, overall happiness, confidence).

To assess risk of bias, we used Cochrane Collaboration's tool of risk bias for clinical trials (Higgins et al., 2011) using the criteria outlined in the Cochrane Handbook for Systematic Reviews of Intervention, Table 8.5.d: Criteria for judging risk of bias in the Risk of Bias Assessment Tool (Higgins et al., 2011). Because we also included controlled trials without randomization, we used the Risk of Bias In Non-Randomized Studies – of Interventions (ROBINS-I; Sterne et al., 2016) for evaluating risk of bias among those studies.

Inter-rater and inter-coder reliability

Four coders (2 English and 2 Chinese) screened and coded all studies included in this review. We screened English studies in Covidence (<https://www.covidence.org/>) as recommended by the Cochrane Collaboration. We screened Chinese studies using Microsoft Word and Excel 365 because Covidence does not have capacity to manage Chinese literature. The four coders screened and coded all studies independently and each study was at least screened and coded by two coders. For any disagreement that couldn't be resolved between the two coders, a third coder was involved to reach consensus. If consensus was not obtained among the three coders, the senior member of the research team (first author) would be involved to make a final decision. Both the inter-screener and the inter-rater reliability was determined by a percent agreement model, dividing the number of agreements over the number of possible agreements. Across the four coders, we reached satisfactory inter-screener reliability of 96% and satisfactory inter-rater reliability of 87%. All disagreements were resolved after involving a third coder.

Data analysis

Data analysis proceeded in four stages using R software (R Development Core Team, 2013): (1) descriptive statistics of study characteristics, (2) calculating effect sizes and meta-analysis, (3) assessing publication bias, and (4) subgroup meta-analysis and moderator analysis. Outcomes from eligible studies all used continuous measures, and their effect size estimates were calculated using Hedges's g (Cooper et al., 2019) which represents the standardized mean difference between the treatment and control group effect (Cohen, 1988; Glass, 1976). All effect sizes (g statistic) were adjusted using Hedges's small sample size correction to obtain unbiased estimates (Hedges & Olkin, 1985) and noted as d in this review.

An overall treatment effect, subgroup analyses, and moderator analyses were all conducted using meta-regression with robust variance estimation (RVE) (Hedges et al., 2010; Tanner-Smith et al., 2016). Meta-regression with RVE was chosen for a couple of reasons. First, many studies in this review used multiple measures to evaluate the same construct more than once. As a result, these outcomes were correlated with each other. Meta-regression with RVE effectively addresses dependence among effect size estimates and includes all outcomes, correlated or not, in the analysis. Second, meta-regression with RVE holds no assumption about effect size estimates' sampling distribution and estimates the covariance structure of those dependent effect size estimates without actually knowing it (Hedges et al., 2010; Tanner-Smith & Tipton, 2014). Therefore, it fits better with our current study than other available methods (e.g., generalized least squares estimation; Gleser & Olkin, 2009) and multilevel meta-analysis modeling (Van den Noortgate et al., 2013). Third, meta-regression with RVE obtains robust results regardless of the modeling strategy (i.e., random- versus fixed-effects models; Hedges et al., 2010). Finally, meta-regression with RVE allows flexible modeling of moderator. An intercept-only meta-regression model estimates the overall treatment effect across studies, and by adding "predictor(s)" into meta-regression, it evaluates if a variable significantly "moderates" the treatment effect. For example, by regressing treatment effect sizes on study country (0 = English, 1 = Chinese), the coefficient of the study country variable reflects the difference in treatment effect size between English and Chinese studies.

Moderator analysis was conducted after observing heterogeneity across studies and/or effect size estimates. Heterogeneity analysis provides an empirical evaluation about whether individual effect sizes are from the same or different population parameter(s). For example, it assesses whether the true population effect size of group-based school SFBT is the same as the

true effect size of individual-based school SFBT. Given the cluster nature of our data, we evaluated the between study and between effect size variability statistics by fitting the data using multilevel modeling and calculating I^2 for both between effect size and between study heterogeneity (Thompson & Sharp, 1999). In selecting variables for subgroup and moderator analyses, we used study design characteristics (e.g., type of comparison, manuscript type); participant demographic information (e.g., age, race); intervention characteristics (e.g., treatment length, hours per session); and provider characteristics (e.g., if provided training or if provided supervision). Meta-regression analysis used the “*robumeta*” package and heterogeneity analysis used the “*metafor*” package in R.

Statistical Significance Testing. Statistical significance testing is still a developing area in meta-analysis (Borenstein, Hedges, Higgins, & Rothstein, 2009; Rolanin, & Pigott, 2014). On the one hand, the concept of multiplicity, which is conducting multiple statistical test within one study, is inherent in most meta-analyses (Rolanin, & Pigott, 2014; Cafri, Kromrey, & Brannick, 2010). Therefore, correction for an inflated Type I error rate should be addressed. On the other hand, existing post-hoc correction methods, like the Bonferroni correction, often pose an overly strict correction in meta-analysis, contributing to the already underpowered moderator analyses that are key in most meta-analyses studies (Cafri, Kromrey, & Brannick, 2010; Nakagawa, 2004). As a result, an inflated Type II error rate also becomes a concern in most meta-analyses. To balance both sides, this study intentionally chose not to do a formal Bonferroni correction while adopted a lower critical value (i.e., $p < 0.01$) for statistical significance than the conventional value (i.e., $p < 0.05$).

Publication bias

Publication bias was assessed both visually and statistically. We used funnel plot of effect size estimates graphed against their standard errors for visual inspection. A relatively symmetric funnel is considered evidence of no publication bias. However, because visual inspection of the funnel plot is rather subjective, we also used Vevea and Woods (2005) weight function model to conduct a sensitivity analysis again to assess the possibility of publication bias. Conceptually, the Vevea and Woods weight function model estimates a *theoretical* average treatment effect assuming there is publication bias in comparison to an empirical average treatment effect that is observed and calculated using the data. If the two models are not statistically different from each other, using a likelihood ratio test of model fit, there is evidence supporting no publication bias.

Publication bias was incorporated into the final synthesis using a sensitivity analysis framework (Katikireddi, Egan, & Petticrew, 2015). Specifically, in addition to the analyses described earlier, we also conducted subgroup analysis across studies with high risk of bias versus studies with low risk of bias. For all moderator analyses, we also conducted study quality as a control variable to evaluate if risk of bias altered any findings. Given sensitivity analysis incorporating risk of bias and study design did not meaningfully alter any significant or non-significant findings, this paper reports the full analysis without incorporating risk of bias. Results of the sensitivity analysis will be shared upon contacting the corresponding author.

Results

Search results

Figure 1 presents the PRISMA flow diagram which detailed our search procedure. For this review, we separately present the diagram for English and Chinese studies. The initial pool consisted of 10,875 English and 651 Chinese studies after duplications were removed. Four coders excluded 9,891 English studies and 347 Chinese studies based on title screening, and

further excluded 877 English studies and 209 Chinese studies based on abstract screening. A full text screening of 107 English studies and 95 Chinese studies resulted in 17 English studies and 33 Chinese studies for final analysis (N = 50).

Study characteristics

Table S1 and Table S2 (supplement) presents study characteristics of all 17 English studies and 33 Chinese studies, respectively. A total of 50 studies (containing 246 effect size estimates) included 2,921 participants. English and Chinese studies reported average participants ages of 14.52 ($SD = 3.61$) and 17.60 ($SD = 3.37$) years old, respectively. Eight English studies reported an average of 62.16% Caucasian participants ($SD = 20.09$) and 14 English studies reported an average of 56.18% female participants ($SD = 21.82$). Most English studies were peer-reviewed journal articles ($n = 15, 88.2\%$) whereas the majority of Chinese studies were graduate theses or dissertations ($n = 27, 81.8\%$). Over half of the English studies were non-randomized controlled trials ($n = 10, 58.8\%$) and most Chinese studies were randomized controlled trials ($n = 28, 84.8\%$). Almost half of the English studies used waitlist as comparison ($n = 8, 47.1\%$) and over half of the Chinese studies used waitlist as comparison ($n = 19, 57.6\%$). Group SFBT is the most studied SFBT modality in both English ($n = 8, 47.1\%$) and Chinese studies ($n = 30, 90.9\%$), and tier 2 intervention is the most commonly delivered school interventions in both English ($n = 9, 52.9\%$) and Chinese studies ($n = 26, 78.8\%$).

The majority of English studies ($n = 12, 70.6\%$) provided training to SFBT providers whereas most Chinese studies ($n = 15, 55.6\%$) did *not* provide training to SFBT providers. For both English and Chinese studies, more than half of the studies did not provide on-going supervision to providers, $n = 9, 52.9\%$ and $n = 18, 66.7\%$, respectively. Half of the English studies reported using some form of SFBT manuals ($n = 9, 52.9\%$) and a little more than half did

not use fidelity measures ($n = 9$, 56.3%). Most of the Chinese studies reported using some form of SFBT manuals ($n = 22$, 84.6%) but most did not use fidelity measures ($n = 26$, 86.7%).

Interventions in English studies lasted from 0.5 to 7 months (mean = 3.59, $SD = 0.89$), averaged at 0.96 hours per session ($SD = 0.31$), with an average of 7.34 sessions (ranged from 1 to 16 sessions). Similarly, interventions in Chinese studies lasted from 1 to 2 months (mean = 1.80, $SD = 0.35$), averaged at 1.8 hours per session ($SD = 0.72$), with an average of 7.22 sessions (ranged from 4 to 16 sessions).

Publication bias and risk of bias

Funnel plot by plotting effect size estimates against their standard error was used to visually assess publication bias (eFigure S1). Overall, the plot seemed reasonably symmetric and had no obvious signs for publication concern. This conclusion was further confirmed by the Vevea and Woods (2005) sensitivity analysis. The analysis poses a line of the observed average treatment effect size and a line of the theoretical treatment effect size so that the funnel plot is symmetric. Given there is no visual difference between the two lines, it further confirmed the absence of publication bias.

In this systematic review and meta-analysis, we included both published and non-published studies in accordance with the Cochrane Collaboration Guidelines (Higgins & Green, 2011). We used two methods to examine the quality of the primary studies in the review, the Cochrane Risk of Bias Measure for randomized controlled trials and the ROBINS-I tool for controlled trials without randomization. For English RCTs, studies showed low risk of bias in incomplete outcome data and in selective reporting. English RCTs reported moderate risk of bias in blinding of outcome data, and high risk of bias in random sequence generation and allocation concealment. English controlled trials without randomization showed overall low risk of bias

with the greatest concern in the measurement of outcomes. Chinese RCTs reported low risk of bias in random sequence generation, incomplete outcome data and in selective reporting. Unsure risk of bias was observed among Chinese RCTs in allocation concealment and blinding of participants and personnel. Chinese controlled trials without randomization reported low risk of bias overall with the greatest concern in participants deviation and measurement outcomes. Detailed appraisal of risk of bias can be found in Tables S3 to S6.

Meta-analytic results

An overall treatment effect and subgroup analyses were calculated using an intercept only meta-regression model with RVE (results presented in Table 1). Combining both English and Chinese studies, an overall treatment effect size estimate of SFBT for student outcomes was $d = 0.176, p < 0.001$. Subgroup analyses revealed an overall statistically significant treatment for both English studies ($d = 0.108, p < 0.01$) and Chinese studies ($d = 0.230, p < 0.001$), for both peer-reviewed journal articles ($d = 0.123, p < 0.01$) and graduate thesis or dissertation ($d = 0.193, p < 0.001$), and for both randomized controlled trials ($d = 0.143, p < 0.01$) and non-randomized controlled trials ($d = 0.154, p < 0.01$). The treatment effect of SFBT for student outcomes was significantly greater than waitlist control ($d = 0.169, p < 0.01$), but not greater than treatment as usual ($d = 0.140, p < 0.05$) or alternative interventions ($d = 0.103, p = 0.504$). Finally, statistically significant treatment effect size estimates were observed among internalizing outcomes, $d = 0.127, p < 0.01$, academic outcomes, $d = 0.115, p < 0.01$, and psychological well-being of self-outcomes, $d = 0.187, p < 0.01$, but not for social relational outcomes, $d = 0.260, p < 0.05$.

An overall statistically significant treatment effect was observed among group-based SFBT, $d = 0.183, p < 0.001$, but not for other modalities, i.e., individual-, family-, or classroom-

based SFBT interventions. Both Tier 1 and Tier 2 SFBT interventions reported statistically significant overall treatment effect, $d = 0.219, p < 0.01$ and $d = 0.163, p < 0.001$, respectively. Studies reported no training of provider ($d = 0.118, p < 0.001$), and with supervision ($d = 0.196, p < 0.01$) reported statistically significant treatment effect size estimates. Most family-level outcomes focused on students' relationship with parents. An overall statistically significant treatment effect was observed among internalizing outcomes, $d = 0.127, p < 0.01$, academic outcomes, $d = 0.115, p < 0.01$, and psychological well-being of self-outcomes, $d = 0.187, p < 0.01$.

Moderator analysis

Heterogeneity analyses did not identify between effect size heterogeneity but indicated between study variability with $I^2 = 20.51\%$. Furthermore, we investigated I^2 for English and Chinese studies separately. Interestingly, I^2 for English studies was 49.62% whereas I^2 for Chinese studies was 0%. To explore potential sources of variability among effect sizes, we entered individual “moderator” into the meta-regression equation one at a time (Table 2). Given the unique nature of this current review, we controlled for country of studies (i.e., English versus Chinese) for all moderator analyses. On average, the overall treatment effect size was significantly greater among Chinese studies than English studies, $b_1 = 0.122, p < 0.01$. The notation b_1 for the rest of this manuscript indicates the slope coefficient in a meta-regression which expresses the expected change for a one-unit difference in the independent variable, i.e. moderator.

Controlling for country of studies, percentage of Caucasian participants was negatively associated with greater treatment effect size estimate, $b_1 = -0.003, p < 0.01$. This result indicated that it is more likely to observe greater treatment effect among studies with higher percentage of

non-Caucasian participants. Similarly, percentage of female participants was associated with treatment effect, $b_1 = 0.003$, $p < 0.001$, suggesting studies with higher percentage of female participants reported greater treatment effects. Classroom-based SFBT interventions reported greater treatment effect than individual-based SFBT programs, however, the difference was only statistically significant at a critical p -value of 0.05, $\beta_3=0.16$, $p < 0.05$. Table 2 reported results of the moderator analysis with a critical value of $p < 0.05$, though in this study we adopted a strict critical value of $p < 0.01$. Table S2 presents results of all moderator analyses regardless of statistical significance.

Discussion

This systematic review and meta-analysis examined the effectiveness of SFBT as a school-based intervention across K-12 and post-secondary schools in the English and Chinese literature. Results of this review demonstrate that SFBT is a promising and likely effective school-based intervention for school social workers and other mental health professionals to use in schools. The treatment effect for the combined English and Chinese literature was statistically significant. The separate English and Chinese treatment effects were also significant regardless of publication type (dissertation or journal article) or study design (quasi-experimental or RCT). These findings align with previous reviews and meta-analyses which reported positive treatment effects for the use of SFBT as a school-based intervention (Gon & Hu, 2017; Kim & Franklin, 2009). We included a heterogenous set of studies in this comparative meta-analysis and the findings overall were positive but worth noting that the effects were small. Small effects are not uncommon in school intervention research and have been reported in other meta-analysis. (Franklin et al., 2017).

While both English and Chinese studies reported statistically significant treatment effects

for SFBT, higher treatment effects were reported among Chinese studies than English studies. This result is consistent with the current outcome literature on the use of SFBT in China (Shen, 2005; Liu et al., 2015) that has shown larger treatment effects than has been found in US studies. Researchers have cautioned that the larger treatment effects in Chinese studies needs to be considered further and not to be taken at face value until we can better determine what is meant by the differences (Liu et al., 2015). It is also notable that many of the included Chinese studies were dissertations, which may possibly contribute to the larger treatment effect.

Comparing the English and Chinese SFBT Literature

Regarding the larger treatment effects in Chinese studies, it is also possible in the future that SFBT may be proven to be a particularly efficacious intervention for the Chinese and other Asian populations as has been indicated in practice literature (Kim, 2013). Other studies are needed to investigate the cultural effectiveness of SFBT with different cultural groups. Though there have been promising results for the use of SFBT with East Asian populations, there is little research detailing how SFBT is culturally adapted or why it may be culturally relevant to Asian populations (Hsu & Wang, 2011). A recent qualitative study by Hsu and Chen (2019) examined SFBT techniques that work well with Chinese culture and provided explanations for why the techniques may or may not work. These researchers found that some techniques work in harmony with Chinese culture such as goal setting, principles such as *do more of what is working*, *one small step*, and *small changes can lead to larger changes* all work well with the Chinese clients' pragmatic thinking. Other SFBT principles such as *not knowing approach*, *believing that the client is the expert*, and *leading from one-step behind* are harder for East Asian clients to accept, but are perceived as useful SFBT principles because the approach empowers the client and challenges them to think differently about their situation. Additional SFBT

techniques such as the miracle question were found to need significant cultural adaptations but could be used with the appropriate modifications. More research, exploring the cultural adaption of SFBT and the cultural meaning of SFBT to Asian populations would provide additional context for results such as the ones being reported in this study.

Moderator Effects of SFBT in Schools

This review identified results favoring SFBT for treating internalizing outcomes, which is consistent with the previous SFBT studies (Woods, Bond, Humphrey, Symes, & Green, 2011; Gingerich & Peterson, 2013; Kim, 2008; Schmit, Schmit, & Lenz, 2016). SFBT has repeatedly been shown to be a promising intervention for internalizing disorders but existing studies include small samples and are of variable quality. While several reviews, including this one, show SFBT may be effective with internalizing disorders, additional studies are still needed to confirm these promising findings. SFBT also reported an overall statistically significant treatment effect for academic outcomes, social relational outcomes, and psychological well-being of self. Even though all outcomes were significantly different from zero, it is notable that this study found significantly higher treatment effects among social relational outcomes than internalizing outcomes, and higher treatment effect among social relational outcomes than academic outcomes.

While other reviews have noted a paucity of support for the effectiveness of SFBT on relationship outcomes (Kim, 2008), our study found SFBT reported favorable results on the social relational outcomes. One possible clinical explanation concerning the effects on social relational outcomes is the fact that SFBT has frequently been used in community-based settings in the resolution of social problems and may be useful in the types of problems requiring practical interventions in the social environments and between people. This would be consistent

with SFBT's historic development within social work and the brief family therapies that targets developmental, interactional, and relational outcomes.

While a variety of ages are involved within the school studies, adolescents represent the average age of participants (i.e., 14 years for US studies and 17 years for Chinese studies) and SFBT delivered to females showed the strongest treatment effects. This is a wide range of differences in the ages between the adolescents from younger to older adolescents and this needs to be examined further to see if SFBT works equally well with the different age groups. Given age was not a significant moderator, we only conducted exploratory subgroup analysis of treatments for students with different age ranges, i.e., < 13, 13 – 18, and 18 or older. We did not detect any age differences in relation to treatment effects. The strongest treatment effect size was observed among group-based SFBT interventions, and individual-based SFBT studies reported an overall insignificant treatment effect. One possible explanation for this finding is the majority of the primary studies were completed in a group and that includes the Chinese studies that showed larger effect sizes. While it is not really known why SFBT was not effective as an individual intervention, it is important to note that other studies have found that SFBT works well in groups (Schmit, Schmit, & Lenz, 2016). Franklin et al. (2018) suggest that the relational and social construction focus of SFBT may make it more effective in groups and within institutional settings such as schools and youth and child welfare agencies. Another possible explanation of the greater treatment effect among group-based SFBT versus other forms of SFBT could simply be due to the fact that close to 50 percent of the studies were group-based. As a result, the non-significant treatment effect of individual-based SFBT could simply be due to low statistical power.

Based on the findings within this study, clinicians working in a school may want to consider offering SFBT in a group modality because the group modality was the most frequent modality used in both US and Chinese studies examined here. Groupwork and classroom settings are also very consistent to the delivery of interventions within schools and the importance of the use of SFBT in a group has been discussed by practitioners who have pioneered SFBT group interventions (Metcalf, 1995; Selekman, 1991). As noted, the majority of Chinese studies were in a group and almost all of them used a researcher developed treatment manual which outlined the session structures and key therapeutic techniques of SFBT, primarily including miracle questions, exception questions, past successes, scaling questions, and coping questions. For those group SFBT studies with a treatment manual available, all of them emphasized co-constructing strength or positive emotions with group participants. These observations are highly consistent with the SFBT change process literature (Franklin et al., 2017; Kim & Franklin, 2015). Additionally, SFBT reported higher treatment effects when compared to the treatment as usual and waitlist control groups.

The treatment effect, however, was not different when compared to alternative interventions. The alternative interventions in the included studies varied slightly but the majority had a cognitive or behavioral theoretical foundation. This means that the results of the present study do not allow us to conclude that the specific ingredients of SFBT are more effective than other interventions, and there is no way to know if the results obtained may be due to the common factors and the relative effective impact of all therapeutic interventions (Wampold, 2015).

Practice Implications

The practice literature notes the flexibility of SFBT for school social workers and other school mental health providers (Chen et al., 2018; Kelly, Kim, & Franklin, 2008; Metcalf, 2008). This review shows SFBT can be used by different mental health and school personnel and can be trained to teachers and as is indicated by its use within the studies in this review. It can also be used across all Tiers of intervention which has significant implications to mental health interventions within schools. In this study, Tier 1 and Tier 2 interventions' treatment effects were both statistically significant, however, SFBT was usually delivered in Tier 2 interventions. The results of this review highlight the effective ways in which SFBT can be delivered in schools by teachers, in coaching and teacher consultations, and in smaller group therapy sessions that extend classroom learning.

Results from this meta-analysis shows SFBT can be used in K-12 and post -secondary school settings where it can be used as an intervention to address student mental health, social needs and the well-being of students. This finding is consistent with the practice literature that demonstrates different ways that SFBT has been used by school social workers in elementary and secondary schools (Kim, Kelly & Franklin, 2017) to work with different populations of at-risk students. It has also increasingly been adapted to college settings because there is a need for brief, evidence-based interventions that can address the increase of the mental health problems of students (Beauchemin, 2018). In college settings, for example, SFBT is used as part of student counseling services, in wellness and health programs, and in career counseling by student services teams who are usually made-up of social workers, professional counselors, and clinical psychologists.

Findings from the moderator analyses also have practice implications for the use of SFBT in various school settings and grade levels. These comparisons of treatment effects provide

useful information for guiding modifications for the implementation of SFBT in schools and university settings. Given the statically significant results for group-based SFBT and classroom-based SFBT services, school clinicians can emphasize incorporating more SFBT techniques in group counseling and classroom programs. This can be especially important and beneficial for older adolescents in high school and college where peer relationships are vital for their social, emotional, and mental well-being. Additionally, the finding that greater portion of female and non-Caucasian clients is associated with increased treatment effects will help school social workers and other school mental health practitioners in deciding what therapeutic approach to use with their clients based on gender and race. Results suggest that SFBT which emphasizes more relationship questions and solution-building conversations may offer a different approach for school practitioners to use than comparative interventions that are more problem focused and expert driven.

It is likely to be an interest to practitioners to know what they can do to improve the effects of SFBT but this study did not address why SFBT achieved small effect sizes. Other reviews on school mental health interventions that included CBT oriented interventions that SFBT was being compared to in this study show similar results. A general pattern is that when interventions are moved into real world settings like schools that smaller effects are often achieved and these results may be affected by many contextual factors (Baskin, Slaten, Sorenson, Glover-Russell, Merson, 2010). Based on past reviews, there are several possible reasons that SFBT like other mental health interventions may only produce small effects and some reasons could be related to a need to change the intervention and other reasons may be more methodological. It has been shown, for example, that school mental health interventions may not be as efficacious to address externalizing problems, and that there is a lack of effectiveness with

males in comparison to females and in particular ethnic minority males. (Franklin, et.al, 2017). This study indicated that SFBT was not as effective with males as with females and not all problem categories were impacted the same.

In order to improve the effects of SFBT in schools, social workers can purposefully design SFBT interventions that are targeted toward different problems and groups of students because the same components of the intervention may not work the same with all students. For example, the miracle question may not be an effective intervention with Chinese students (Hsu & Chen, 2019). Social workers can add adjunctive interventions that may be able to address the structural changes needed to help males and students of color (e.g. immigration status, changes in policing, school to prison pipeline, all female teachers, etc.) SFBT, for example, could be expanded from groups with students to groups with teachers and more work within families and the community may be indicated to improve the results. Differences in measures especially the quality of measures and small sample sizes in the studies may also impact effects within the school mental health intervention studies. (Park, Guz, Zhang, Beretvas, Franklin & Kim, 2020). So, to improve the effectiveness of SFBT we need RCT studies that also study process change and with larger samples and better qualities in measures and study designs.

Quality of Studies

Limitations

There are several limitations to this review and meta-analysis. First, though the authors made attempts to include all possible studies in the review and meta-analysis, it is impossible to guarantee that every potential study was identified during the search process. Second, while our investigative team made effort to ensure objectivity and rigor, there is always a chance that our findings are subject to human errors during screening and data extraction. Thirdly, this study

does not go into great description of the non-White students in the English studies which could have been relevant to the results of the analysis. This was in large part because we had issues of missingness and low variability in this variable that prevent us from meaningful synthesis and a more nuanced analysis than our current analysis. Fourth, the Risk of Bias measure (described in results) showed several limitations to study designs that would warrant caution in interpreting positive findings with confidence. This means that the promising outcomes in this study need to be evaluated along with the overall quality of the primary studies which limits the confidence that we can put in the results and indicate that more studies with improved research designs are needed before we can conclude that SFBT is an effective intervention for schools.

Other limitations of this review are embedded in the weaknesses in the study designs. Several studies had small sample sizes and lacked fidelity measures and follow-ups that could have provided more confidence in the overall outcomes achieved. There were also limitations to measures that may have impacted the assessment of outcomes. Despite these limitations, this meta-analysis builds on previous research in both the US and China that has shown the effectiveness of SFBT in schools and improves upon previous reviews on this topic.

Conclusion

SFBT has been used in schools since the early 1990's and previous studies have indicated that it is a flexible brief mental health intervention that can be successfully implemented in schools by school social workers, teachers, and other school-based mental health professionals. The results of the current systematic review and meta-analysis shows that SFBT is a promising and likely effective school-based intervention in both the US and China. SFBT works best when delivered in a group modality and is effective for several presenting problems related to internalizing, academic, and interpersonal issues. It can be equally effective with different age

groups in K-12 and post-secondary education settings. This review builds on past research that indicates the efficacy of SFBT as a school-based intervention but the quality of the primary studies analyzed limit our ability to conclude that SFBT is an effective intervention for school settings. The fact that SFBT achieved similar results when compared to other interventions in schools also precludes us from saying it is a better intervention., however, it offers a different approach for school practitioners to use than comparative interventions.

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Figure 1. PRISMA flow diagram of literature search

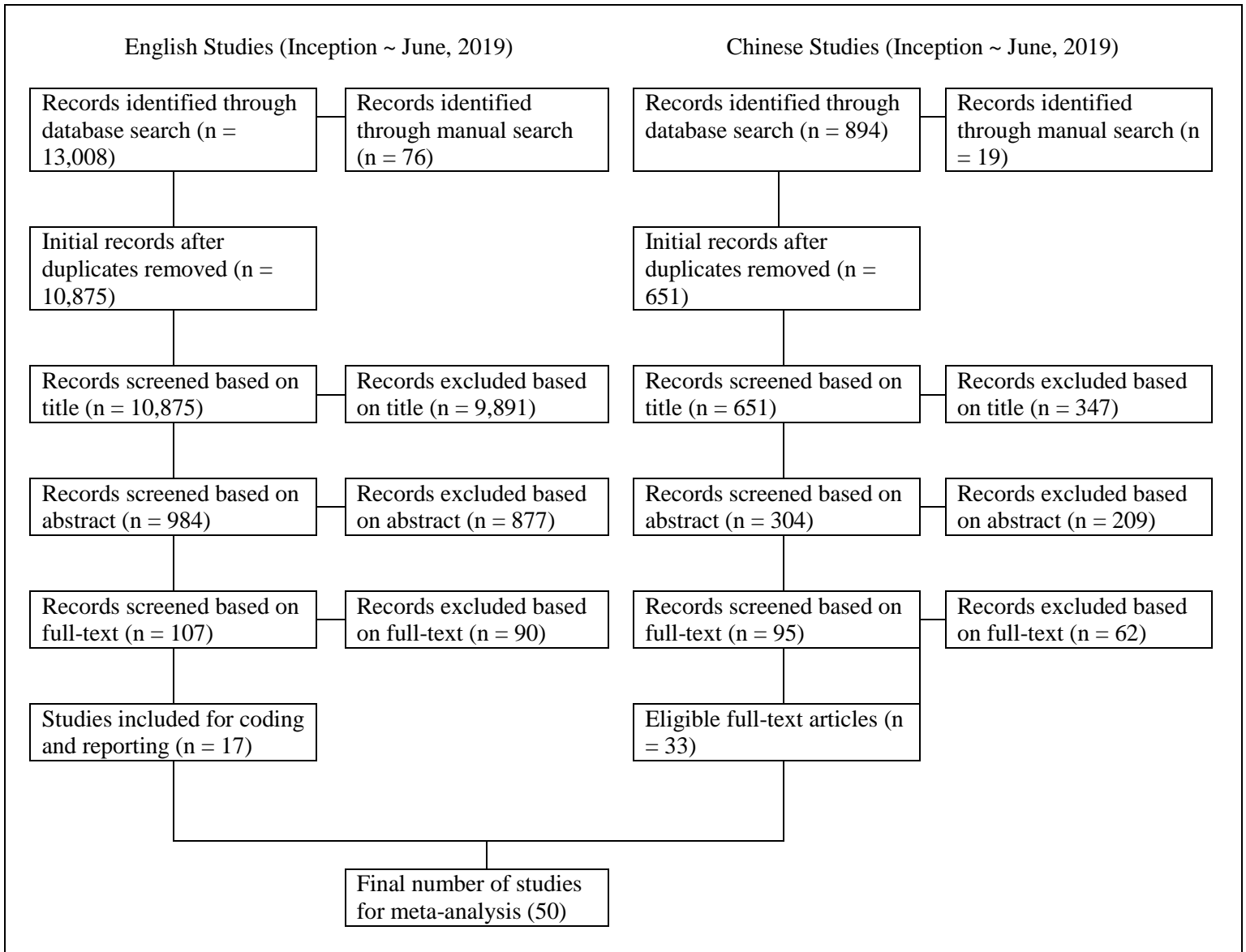


Table 1. Overall treatment effect and subgroup analysis*

| Parameter | Estimate / SE | t (df) | 95% CI | N / K | p value |
|---------------------------------|---------------|-------------|----------------|----------|------------------|
| Over Tx Effect | 0.176 / 0.028 | 6.25 (18.8) | 0.117 – 0.235 | 50 / 246 | <i>p</i> < 0.001 |
| English studies | 0.108 / 0.032 | 3.35 (7.84) | 0.033 – 0.182 | 17 / 92 | <i>p</i> < 0.01 |
| Chinese studies | 0.230 / 0.045 | 5.16 (14.2) | 0.008 – 0.235 | 33 / 154 | <i>p</i> < 0.001 |
| Journal articles | 0.123 / 0.034 | 3.66 (8.63) | 0.047 – 0.200 | 20 / 102 | <i>p</i> < 0.01 |
| Thesis and/or dissertation | 0.193 / 0.041 | 4.71 (12.4) | 0.104 – 0.282 | 30 / 144 | <i>p</i> < 0.001 |
| Randomized controlled trial | 0.143 / 0.04 | 3.59 (12.1) | 0.056 – 0.230 | 34 / 159 | <i>p</i> < 0.01 |
| Non-randomized controlled trial | 0.154 / 0.04 | 3.75 (7.07) | 0.060 – 0.250 | 16 / 87 | <i>p</i> < 0.01 |
| Treatment as usual | 0.14 / 0.04 | 3.42 (6.84) | 0.043 – 0.238 | 20 / 77 | <i>p</i> < 0.05 |
| Alternative intervention | 0.103 / 0.122 | 0.85 (1.59) | -0.575 – 0.781 | 4 / 29 | <i>p</i> = 0.504 |
| Waitlist control | 0.169 / 0.036 | 4.78 (7.01) | 0.086 – 0.253 | 26 / 134 | <i>p</i> < 0.01 |
| Individual-based intervention | 0.048 / 0.033 | 1.46 (3.98) | -0.044 – 0.141 | 8 / 40 | <i>p</i> = 0.218 |
| Family-based intervention | 0.063 / 0.003 | 24.4 (1) | 0.031 – 0.096 | 2 / 17 | <i>p</i> < 0.05 |
| Group-based intervention | 0.183 / 0.043 | 4.3 (12.6) | 0.091 – 0.275 | 30 / 180 | <i>p</i> < 0.001 |
| Classroom-based intervention | 0.187 / 0.003 | 60.8 (1) | 0.148 – 0.226 | 2 / 9 | <i>p</i> < 0.05 |
| Tier 1 intervention | 0.219 / 0.043 | 5.09 (5.81) | 0.113 – 0.325 | 10 / 44 | <i>p</i> < 0.01 |
| Tier 2 intervention | 0.163 / 0.031 | 5.27 (10.4) | 0.094 – 0.231 | 35 / 171 | <i>p</i> < 0.001 |
| Tier 3 intervention | 0.050 / 0.042 | 1.19 (2.82) | -0.088 – 0.187 | 5 / 31 | <i>p</i> = 0.323 |
| Ph.D. intern | 0.200 / 0.029 | 6.92 (1.25) | -0.033 – 0.434 | 5 / 26 | <i>p</i> = 0.060 |
| Master's degree | 0.103 / 0.060 | 1.7 (3.81) | -0.068 – 0.273 | 10 / 70 | <i>p</i> = 0.167 |
| Master's intern | 0.192 / 0.079 | 2.41 (5.39) | -0.008 – 0.392 | 16 / 67 | <i>p</i> = 0.057 |
| Various degrees | -- | -- | -- | -- | -- |
| Received training | 0.321 / 0.117 | 2.76 (7.71) | 0.051 – 0.592 | 20 / 72 | <i>p</i> < 0.05 |
| No training | 0.118 / 0.030 | 3.89 (8.70) | 0.049 – 0.187 | 24 / 134 | <i>p</i> < 0.001 |
| Received supervision | 0.186 / 0.049 | 3.7 (11.4) | 0.078 – 0.294 | 27 / 120 | <i>p</i> < 0.01 |
| No supervision | 0.138 / 0.038 | 3.6 (4.92) | 0.039 – 0.236 | 17 / 86 | <i>p</i> < 0.05 |
| Internalizing outcomes | 0.127 / 0.028 | 4.5 (8.65) | 0.063 – 0.192 | 21 / 56 | <i>p</i> < 0.01 |
| Externalizing outcomes | 0.126 / 0.064 | 1.94 (4.62) | -0.451 – 0.297 | 13 / 31 | <i>p</i> = 0.115 |
| Academic outcomes | 0.115 / 0.028 | 4.14 (8.87) | 0.052 – 0.178 | 20 / 60 | <i>p</i> < 0.01 |
| Social relational outcomes | 0.262 / 0.072 | 3.61 (6.29) | 0.103 – 0.086 | 14 / 28 | <i>p</i> < 0.05 |
| Psychological wellbeing of self | 0.187 / 0.047 | 4 (5.97) | 0.072 – 0.302 | 22 / 52 | <i>p</i> < 0.01 |
| General wellbeing | 0.191 / 0.073 | 2.63 (3.71) | -0.017 – 0.399 | 9 / 19 | <i>p</i> = 0.063 |

* For each subgroup analysis we sampled a different subsample of the dataset, therefore, concern for an inflated Type I error remains relatively low. However, we recommend a conservative approach, i.e. *p* < 0.01, for interpreting statistical significance. We italicized all *p*-values that are below this threshold to represent statistical significance.

Table 2. Moderator analysis¹

| Parameter^{2,3,4} | | Estimate / SE | t (df) | 95% CI | N / K | p value |
|--|-----------|----------------------|---------------|-----------------|--------------|------------------|
| Country of Studies (<i>ref</i> : English) | β_0 | 0.108 / 0.032 | 3.35 (7.84) | 0.033 – 0.182 | 50 / 246 | <i>p</i> < 0.01 |
| Chinese studies | β_1 | 0.122 / 0.055 | 2.22 (22.03) | 0.008 – 0.235 | 50 / 246 | <i>p</i> < 0.01 |
| Race (16.29% White, mc) | β_0 | 0.228 / 0.016 | 14.26 (1.28) | 0.104 – 0.350 | 40 / 201 | <i>p</i> < 0.05 |
| % White | β_1 | -0.003 / 0.0001 | -5.24 (2.37) | -0.004 – -0.001 | 40 / 201 | <i>p</i> < 0.01 |
| Gender (57.26% Female, mc) | β_0 | 0.083 / 0.020 | 4.23 (8.10) | 0.038 – 0.129 | 31 / 172 | <i>p</i> < 0.01 |
| % Female | β_1 | 0.003 / 0.001 | 4.10 (5.26) | 0.001 – 0.004 | 31 / 172 | <i>p</i> < 0.001 |
| Modality (<i>ref</i> : Individual) | β_0 | 0.027 / 0.037 | 0.73 (3.94) | -0.076 – 0.130 | 50 / 246 | <i>p</i> = 0.505 |
| Family-based | β_1 | 0.036 / 0.037 | 0.99 (1.66) | -0.158 – 0.230 | 50 / 246 | <i>p</i> = 0.446 |
| Group-based | β_2 | 0.091 / 0.061 | 1.50 (7.20) | -0.052 – 0.235 | 50 / 246 | <i>p</i> = 0.177 |
| Classroom-based | β_3 | 0.160 / 0.037 | 4.32 (2.94) | 0.041 – 0.279 | 50 / 246 | <i>p</i> < 0.05 |

1. Moderators were entered into the meta-regression model once a time. Only moderators statistically significant at *p* < 0.05 level are being presented. Results of all moderator analyses are presented in the supplemental file. To be mindful of possible inflated Type I error rate while not over strictly reducing statistical power, like using Bonferroni Correction, we recommend adopting a critical value of *p* < 0.01 for statistical significance, italicized in the table.
2. β_0 is the intercept in a meta-regression and β_1 is the slope in a meta-regression model.
3. Except for “country of studies”, all other moderator analyses controlled for “country of studies”.
4. mc = mean center

Table S1. Study characteristics of included English studies

| Author | Sample ¹ | Demographics ² | Design ³ | Treatment Description | Tiers of Intervention | Inclusion Criteria | Outcome Measures |
|---|---------------------|---|-------------------------------|---|--|--|---|
| Ates (2016) | T=15 C=15 | High school students Race NR 46% female | RCT: TAU | Intervention was a manualized curriculum developed by the researchers to align with the principles and techniques of SFBT. Treatment included 6 sessions, 90 minutes, once a week | Tier 2 intervention for high school students challenged by school burn out | Students volunteered to take the School Burnout Scale. 30 students with the highest burnout scores were sorted into treatment and control groups | School Burnout Scale |
| Beauchemin (2018) [from a dissertation] | T=29 C=30 | 20 years old 63% White 56% female | RCT: Alternative treatment | Licensed clinicians with at least two years of SFBT experience facilitated a manualized SFBT group curriculum. Treatment included 7 sessions, each session being 60 minutes, once per week | Tier 2 of intervention of students in college experiencing stress | Students who self-identified as experiencing stress volunteered. Participants were screened for inclusion by severity of symptoms, student enrollment status and age | Perceived Stress Scale (PSS) Five-Factor Wellness Evaluation of Lifestyle (5F-WEL) |
| Franklin et al. (2008) [from a dissertation] | T=30 C=29 | 10.93 years old 73.3% White 50% female | CT: TAU | Experienced masters-level practitioners facilitated SFBT with fidelity requirements to use identified SFBT techniques each session. Treatment included 5-7 sessions, each sessions lasting 30-45 minutes, once per week | Tier 3 of intervention focused on students displaying challenging behavior. In addition to direct work with students, the intervention included teacher SFBT training and teacher-practitioner consultations | Students were selected by teachers and principals. The students were selected based on having received more than one behavioral referral | Child Behavioral Checklist (CBCL) Youth Self Report Child Behavioral Checklist (CBCL) Teacher Report |

| | | | | | | | |
|------------------------|---------------|---|---------------|---|--|--|--|
| Franklin et al. (2007) | T=46 C=39 | 17.3 years old 54.3% White 63% female | CT: TAU | School staff at SFBT oriented alternative high school provided SFBT services to students with the aim of dropout prevention. The school was oriented around SFBT principles and techniques. Treatment included school level SFBT intervention for 2 years | Tier 1 of intervention with students enrolled in a SFBT alternative high school. The alternative high school was a public choice option for students with 10 or more credits | Students in the treatment group attended a SFBT alternative high and students in the comparison group attended a traditional high school | Attendance Graduation Rates |
| Green et al. (2007) | T=28 C=28 | 16.09 years old Race NR 100% female | RCT: Waitlist | Teachers facilitated an intervention that combined a SFBT and cognitive-behavioral framework to target a personal and academic related goal. Treatment included 10 sessions, over the course of 28 weeks | Tier 3 of intervention with female students who were not identified as vulnerable or at-risk | Students in high school who did not self-report depression symptoms volunteered for services | Trait Hope Scale Cognitive Hardiness Scale Depression Anxiety and Stress Scale (DASS-21) |
| Indriūnienė (2017) | T=92 C=100 | 17.05 years old Race NR 55.4% female | CT: TAU | Psychologists facilitated a SFBT intervention. Treatment included 1 to 6 sessions, participants received an average of 2.70 session, each session lasting 50 to 60 minutes | Tier 3 intervention of students with challenges participating in physical education classes | Students who had challenges participating in physical education classes volunteered | Students' self-evaluations (student weighted 0-11 point scale) Teachers' behavioral evaluations (teacher weighted 0-10 point scale) |

| | | | | | | | Students' self-rated motivation (student weighted 0-10 point scale) |
|----------------------------|--------------------|---|----------------------------------|--|--|---|--|
| Joker & Ghaderi (2015) | T & C= 30 | 17.5 years old Race NR Gender NR | RCT: TAU | Intervention was a manualized SFBT curriculum developed by researchers. Treatment included 10 sessions, each lasting 90 minutes, once a week | Tier 2 intervention of students with challenges related to self-concept | Students identified as scoring low on a self-concept test | Self-Conception Questionnaire |
| LaFountain & Garner (1996) | T=176 C=135 | Mixed grades Race NR 57% female | RCT: TAU | School counselors were trained to facilitate a manualized SFBT intervention. Treatment included 8 weeks | Tier 2 of intervention of students school counselors selected for SFBT groups | School counselors at elementary, middle and high schools volunteered to facilitate SFBT groups and selected 4-8 students from their caseload to participate | Index of Personality Characteristics (IPC) Student Goal (counselor reported on a 1-5 scale) |
| Littrell et al. (1995) | T=61 | 15.6 years old 89% White 47.5% female | CT: Various Treatment Conditions | Counselors trained in brief counseling facilitated a session focused on goal setting. Treatment included a single session of brief therapy that ranged 20 to 50 minutes, average session length being 40 minutes | Tier 3 of intervention for self-referred students working toward self-identified goals | Students self-referred and were excluded if they had a severe clinical need | Goal Attainment (joint student-teacher evaluation scale ranging from 0% to 100%) Intense Feeling Scale (student report on a 1-7 scale) Student Concern Scale |

(student report
on a 1-7 scale)

| | | | | | | | |
|---------------------|------------------|---|-------------------------------|---|---|---|---|
| Marinaccio (2001) | T=24 C=24 | Mixed grades Race NR Gender NR | CT: Waitlist | Licensed mental health professionals facilitated a SFBT family program. Treatment included 2 to 7 school-based family sessions, sessions were scheduled weekly, bi-monthly or monthly to meet accommodate the families' needs | Tier 3 of school-based family sessions with the student as the primary client | Elementary, middle and high school students were referred for behavioral, emotional or academic problems by the school counselor or a teacher | Behavioral Assessment System for Children (BASC) Parent Rating Scale Behavioral Assessment System for Children (BASC) Teacher Rating Scale Behavioral Assessment System for Children (BASC) Self-Report of Personality |
| Boyer et al. (2014) | T = 76 C = 83 | 14.4 years old Race NR 26.5% female | RCT: Alternative treatment | Mental health professional facilitated a manualized intervention combined SFBT with Motivational Interviewing. Treatment was 8 individual sessions and 2 parent sessions | Tier 3 of intervention with parent sessions | Students with a prior ADHD diagnosis between the ages of 12 and 17 attending school | Disruptive Behavior Disorder (DBD) Rating Scale Parent Version Four Neuropsychological Tests: tower test, trail making test, key search test and zoo map test Child Depression Inventory |

Child Behavior Check
List

Screen for Child
Anxiety Related
Emotional Dis-
Orders

Disruptive Behavior
Disorder (DBD) Rating
Scale

School Attitude
Questionnaire

Homework Problems
Checklist

Conflict Behavior
Questionnaire Parent
Version

Conflict Behavior
Questionnaire
Adolescent Version

Impairment Rating
Scale (IRS) Parent
Version

| | | | | | | | Disruptive Behavior Disorder (DBD) Rating Scale Teacher Version |
|----------------------|--------------------|---|----------------------------|---|---|--|---|
| | | | | | | | Medication Use |
| Kvarme et al. (2010) | T = 84 C = 60 | 12.5 years old Race NR 63% female | CT: Waitlist | Trained school nurse facilitated a standardized solution-focused intervention. The intervention was called “Reteaming” and was developed by researchers to help children build social skills. Treatment included 6 sessions, each session being 60 minutes, once per week | Tier 2 of intervention of students with a socially withdrawn presentation and low self-efficacy | Students were selected by teachers and school nurses based on socially withdrawn behavior | General Self-Efficacy (GSE) scale Domain-specific self-efficacy |
| Cook (1998) | T = 33 C = 35 | 10.5 years old Race NR Gender NR | RCT: Alternative treatment | Researcher facilitated an intervention based on SFBT principles. Treatment included 6 sessions, each sessions being 30 minutes, once per week | Tier 1 of intervention through classroom instruction | Second grade students were selected for the developmental importance of self-concept. No student specific inclusion criteria | Pier-Harris Children’s Self Concept Scale |
| Corcoran (2006) | T = 139 C = 100 | 10 years old 78% White 37% female | CT: TAU | Masters student interns training in SFBT facilitated the intervention. Treatment included 4 to 6 sessions | Tier 3 of intervention with family sessions | Students were referred for challenging behavior by their school counselors and were screened out for stressful life events | Conner’s Parent Rating Scale Feelings, Attitudes, and Behaviors Scale for Children (FAB-C) |

| | | | | | | | |
|-------------------------|------------------|---|---------------|--|--|---|--|
| Froeschle et al. (2007) | T = 40 C = 40 | 8 th grade students 40% White 100% female | RCT: Waitlist | The “Solution, Act Mentorship” intervention was a combination of SFBT, action learning techniques and peer mentorship. The intervention as facilitated by 1 school counselor, 3 peer mentors, and 5 community members. Treatment included 16, each session being 60 minutes, once per week | Tier 2 intervention with students who display challenging behavior at school and/or home | Students self-reported not already participating in a drug prevention program or counseling program | American Drug and Alcohol Survey (ADAS) Substance Abuse Subtle Screening Inventory Adolescent Version 2 (SASSI-A2) Piers-Harris Children’s Self-Concept Scale Version 2 (PHCSCS-2) Home and Community Social Behavior Scales (HCSBS) School Social Behavior Scales, Second Edition (SSBS-2) Knowledge Exam (standardized measure designed and normed by the researchers) GPA |
| Newsome (2004) | T = 26 C = 26 | 7 th & 8 th grade students 71% White | CT: TAU | 2 Masters interns, the researcher and the school social worker facilitated a manualized SFBT | Tier 2 intervention to examine the effect of SFBT on GPA and attendance | Students at risk for academic failure and/or with a poor attendance record | GPA School Office Referrals |

| | | | | | | | |
|----------------|--------------------|--|----------|---|--|--|--|
| | | 27% female | | intervention. Treatment included 8 sessions | | | School Attendance |
| Wallace (2009) | T = 204 C = 209 | 4 th and 5 th grade students 29% White Gender NR | RCT: TAU | Intervention was a manualized “Working on What Works” (WOWW) program. Treatment included 10 weeks | Tier 1 intervention at the classroom level | General population of 4 th and 5 th grade students | Teachers’ Sense of Efficacy Scale (TSES) |
| | | | | | | | Student-Teacher Relationship Scale—Short Form (STRS-SF) |
| | | | | | | | Student Internalizing Behavior Teacher/Staff Version |
| | | | | | | | Community and Youth Collaborative Institute School Experience Surveys (CAYCI) Student Externalizing Behavior Teacher/Staff Version |
| | | | | | | | Behavioral Referrals (school records) |

1. T = number of participants in the treatment group, C = number of participants in the control group
 2. Demographic information included mean age, % female and % Chinese. NR = Not Reported
 3. RCT = randomized controlled trial, CT = non-randomized controlled trial, TAU = treatment-as-usual

Table S2. Study characteristics of included Chinese studies

| Author | Sample ¹ | Demographic ² | Design ³ | Treatment Description | Tiers of Intervention | Inclusion Criteria | Outcome Measures |
|--------------|---------------------|---|---------------------|--|---|--|--|
| Cheng (2006) | T = 8 C = 8 | 21 years old 100% Chinese 100% female | RCT: Waitlist | Three master psychological professionals provided individual intervention using SFBT counseling. Treatment included 4 sessions, each session being 50 minutes, once per week | Tier 3 intervention of female college students with interpersonal relationship issues | Female college students with interpersonal relationship issues are randomly recruited | Wu IIP Circumplex Scales |
| Chou (2003) | T = 8 C = 8 | 17.5 years old 100% Chinese 34.75% female | RCT: Waitlist | Master student in psychological counseling provided group intervention using SFBT manual. Treatment included 7 sessions, each session being 120 minutes, once per week | Tier 2 intervention of vocational school students that indicate low self-conception | Vocational school students with low self-conception are recruited from the primary study participants | Tennessee Self-Concept Scale II Chinese Revision (TSCS:2) |
| Gui (2016) | T = 14 C = 14 | 17.5 years old 100% Chinese 39.28% female | RCT: Waitlist | School mental health professionals provided group intervention using SFBT manual. Treatment included 8 sessions, each session being 90 minutes, once per week | Tier 2 intervention of vocational school students with academic self-efficacy issues | Vocational school students with academic self-efficacy issues voluntarily choose to participate in the study | College Student Academic Burnout Questionnaire; College Student Self-Efficacy Questionnaire |
| Han (2012) | T = 12 C = 10 | 21 years old, 100% Chinese Gender NR | RCT: Waitlist | Master student in developmental psychology provided group intervention using SFBT manual. Treatment included 6 sessions, each session being 180 minutes, once per week | Tier 2 intervention of college students who experience interpersonal communication issues | College students with interpersonal communication issues voluntarily choose to participate | Interpersonal Relationship Comprehensive Diagnostics Scale; College Student Interpersonal Communication Skill Questionnaire; College Student Interpersonal Communication Competency Questionnaire; |

| | | | | | | | |
|---------------------|------------------|--|---------------|--|--|--|---|
| Ho (2008) | T = 5 C = 5 | 20 years old, 100% Chinese Gender NR | CT: Waitlist | School mental health professions provided group intervention using SFBT manual. Treatment included 6 sessions, each session being 120 minutes, once per week | Tier 2 intervention of college students who want to improve career self-efficacy | Freshman and sophomore college students who want to improve career-efficacy voluntarily choose to participate | Career Belief Inventory (CBI); Career Decision Self-Efficacy Scale |
| Hsieh (2007) | T = 7 C = 7 | 11.5 years old 100% Chinese Gender NR | RCT: Waitlist | 8 weeks of group SFBT sessions using a researcher developed treatment manual | Tier 2 intervention of third/fourth grade students with self-esteem and/or relational issues | Students referred by teachers for self-esteem and/or social relational issues | Student Social Relationship Scale; Student Interaction Scale; Social Self-Esteem Scale |
| Huang (2003) | T = 16 C = 8 | 21 years old 100% Chinese 79.2% female | RCT: Waitlist | Master student in psychological counseling provided group intervention using SFBT manual. Treatment included 6 sessions, each session being 120 minutes, once per week | Tier 2 intervention of college students who want to improve career self-efficacy | College students who want to improve career self-efficacy voluntarily choose to participate in the study | Career Self-Efficacy Questionnaire |
| Huang (2007) | T = 8 C = 8 | 10.5 years old 100% Chinese 50% female | RCT: Waitlist | Master student in psychology provided intervention using SFBT manual. Treatment included 8 sessions, each session being 30 minutes, once per week | Tier 2 intervention of elementary school students indicate depression tendency | Elementary school students who indicate depression tendency are referred by the school mental health professionals | Chang Children's Depression Inventory (CDI); Elementary School Student Self-Conception Scale; Behavioral Disorder Scale |
| Huang et al. (2014) | T = 10 C = 10 | 21 years old, 100% Chinese Gender NR | RCT: Waitlist | Lecture in management school provided group intervention using SFBT manual. Treatment included 6 sessions, each session | Tier 2 intervention of college students who experience academic procrastination issues | College students with academic procrastination issues voluntarily choose to participate | Procrastination Assessment Scale for Students (PASS) revised by Guan |

being 90 minutes, once per week

| | | | | | | | |
|----------------|------------------|--|---------------------------|---|---|---|--|
| Hung (2010) | T = 12 C = 12 | 17 years old 100% Chinese 45.8% female | RCT: Waitlist | School mental health professions provided group intervention using SFBT manual. Treatment included 6 sessions, each session being 180 minutes, once per week | Tier 2 intervention of high school students who have confusion about happiness and career self-efficacy | High school students who want to improve happiness and career self-efficacy are referred by teachers or voluntarily choose to participate | Career Decision Self-Efficacy Scale; Psychological Well-Being Scale; Group Therapeutic Factor Scale |
| Li (2012) | T = 10 C = 9 | 13 years old 100% Chinese 26.4% female | RCT: Waitlist | Master student in psychological counseling provided group intervention using SFBT manual. Treatment included 9 sessions, each session being 90 minutes, once per week | Tier 2 intervention of junior high school students that indicate adiction to Internet | Junior high school students with Internet addiction issue are referred by teachers | Chen Internet Addiction Scale (CIAS) Self-Esteem Inventory Emotional Quotient Inventory: Youth Version EQ-i:YV Interpersonal Relationship measurement and Adaptive Index of Junior High School Students |
| Li (2014) | T = 24 C = 48 | 19 years old 100% Chinese Gender NR | RCT: Waitlist RCT: TAU | Master student in applied psychology provided group intervention using SFBT manual. Treatment included 6 sessions, each session being 90 minutes, once per week | Tier 2 intervention of freshman college students | Freshman college students voluntarily choose to participate in the study | Life Events Scale; Coping Style Questionnaire |
| Lien (2007) | T = 10 C = 10 | 16.8 years old 100% Chinese 100% male | RCT: Waitlist | Master student in psychological counseling provided group intervention using SFBT manual. Treatment included 8 | Tier 2 intervention of high school students that indicate adiction to Internet | High school students with Internet addiction issue are referred by teachers and parents, or voluntarily choose to | Internet Addiction Scale (IAS) |

| | | | | | | | |
|------------------|------------------|--|---------------|---|---|--|---|
| | | | | sessions, each session being 180 minutes, once per week. | | participate in the study | |
| Lin (2007) | T = 6 C = 6 | 10.5 years old 100% Chinese 75% female | RCT: Waitlist | Master student in psychological counseling provided group intervention using SFBT manual. Treatment included 10 sessions, each session being 45 minutes, twice per week | Tier 2 intervention of elementary school students are shy in school | Shy elementary school students are referred by the school mental health professionals | Social Avoidance and Distress; Fear of Negative Evaluation; Social Anxiety for Children; Elementary School Student Shyness Scale; Elementary School Student Self-Esteem Scale |
| Liu (2015) | T = 10 C = 10 | 21 years old, 100% Chinese Gender NR | RCT: Waitlist | Master student in mental health education provided group intervention using SFBT manual. Treatment included 8 sessions, each session being 150 minutes, once per week | Tier 2 intervention of college students who experience self-acceptance issues | College students with self-acceptance issues voluntarily choose to participate | Self-Acceptance Questionnaire (SAQ) |
| Liu (2015) | T = 10 C = 10 | 17 years old, 100% Chinese Gender NR | CT: Waitlist | Master student in mental health education provided group intervention using SFBT manual. Treatment included 8 sessions, each session being 150 minutes, once per week | Tier 2 intervention of high school students who experience self-acceptance issues | College students with self-acceptance issues voluntarily choose to participate | Self-Acceptance Questionnaire (SAQ) |
| Lo et al. (2004) | T = 8 C = 8 | 16.5 years old 100% Chinese 87.5% female | RCT: Waitlist | School mental health professions provided group intervention using SFBT manual. Treatment included 8 sessions, each session being 120 minutes, once per week | Tier 2 intervention of vocational high school students who experience shyness and other interpersonal relationship issues | Vocational high school students who experience shyness and other interpersonal relationship issues are referred by | The Henderson/Zimbardo Shyness Questionnaire; Shyness Scale developed by Su; |

| | | | | | | | |
|-------------|------------------|--|---------------|--|---|--|--|
| | | | | | | teachers or voluntarily choose to participate | Interpersonal Relationship Scale; Self-Awareness Scale; Social Self-Esteem Scale |
| Song (2016) | T = 36 C = 35 | 16 years old 100% Chinese 54.8% female | RCT: Waitlist | Docotral mental health intern at school provided group intervention using SFBT manual. Treatment included 8 sessions, each session being 90 minutes, once per week | Tier 2 intervention of boarding school students with interpersonal relationship issues | Boarding school students with interpersonal relationship issues are randomly recruited | Interpersonal Relationship Comprehensive Diagnostics Scale |
| Su (2003) | T = 8 C = 8 | Age NR 100% Chinese 100% male | RCT: Waitlist | Master student in psychological counseling provided group intervention using SFBT manual. Treatment included 8 sessions, each session being 120 minutes, once per week | Tier 2 intervention of high school female students are more frequently angry than peers | High school students who get angry more frequently are referred by teachers | State-Trait Anger Expression Inventory; Angry Event Response Scale |
| Sun (2011) | T = 24 C = 24 | 21 years old 100% Chinese Gender NR | RCT: Waitlist | Master student in mental health education group intervention using SFBT manual. Treatment included 6 sessions, each session being 180 minutes, twice per week | Tier 2 intervention of impoverished undergraduates who experience low self-esteem | Impoverished college students with low self-esteem voluntarily choose to participate | Self-Esteem Scale (SES) General Self-Efficacy Scale (GSES) Self-Acceptance Questionnaire (SAQ) |
| Sun (2013) | T = 35 C = 34 | 19 years old 100% Chinese Gender NR | RCT: Waitlist | Master student in mental health education group intervention using specific SFBT techniques. Session length not reported | Tier 2 intervention of freshman college students | Freshman college students are randomly recruited who expressed emotional issues | Psychological Capital Questionnaire (PCQ) Positive and Negative Affect Scale (PANAS) |

| | | | | | | | |
|----------------|------------------|--|---------------|---|---|--|--|
| Tsai (2005) | T = 10 C = 10 | Age NR 100% Chinese 62.5% female | RCT: Waitlist | Master student in compulsory education provided group intervention using SFBT manual. Treatment included 7 sessions, each session being 60 minutes, once per week | Tier 2 intervention of elementary school students who experience negative emotions | Elementary school students who experience negative emotions are referred by teachers | Adolescent Emotional Questionnaire |
| Wang (2010) | T = 22 C = 22 | 19 years old 100% Chinese Gender NR | RCT: Waitlist | Master student in psychology provided group intervention using SFBT manual. Treatment included 5 sessions, each session being 120 minutes, twice per week | Tier 2 intervention of college students who have adaptation issues and want to improve creativity | College students with adaptation issues and wanting to improve creativity voluntarily choose to participate | Creativity Assessment Packet (CAP); Military School Student Adaptation Scale; Schema Questionnaire |
| Wang (2014) | T = 8 C = 8 | 21 years old 100% Chinese Gender NR | CT: Waitlist | Master student in developmental psychology provided group intervention using SFBT manual. Treatment included 16 sessions, each session being 120 minutes, twice per week | Tier 2 intervention of impoverished undergraduates who experience love stress issues | Impoverished college students with academic procrastination issues are selected from the primary study sample | College Student Love Stress Questionnaire; SCL-90 |
| Wang (2016) | T = 15 C = 15 | 16.5 years old 100% Chinese 43.3% female | RCT: Waitlist | Master student in mental health education provided group intervention using SFBT manual. Treatment included 8 sessions, each session being 90 minutes, once per week | Tier 2 intervention of vocational school students with emotion regulation issues | Vocational school students with emotion regulation issues are randomly recruited | Adolescent Daily Emotion Regulation Questionnaire |
| Wu (2008) | T = 15 C = 22 | Age NR 100% Chinese 51.4% female | CT: Waitlist | Master student in psychological counseling provided individual intervention using SFBT counseling. Treatment included 4 sessions, each session being 40 minutes, once or twice per week | Tier 3 intervention of vocational school students | Vocational students with low epistemological belief and learning motivation are selected to participate in the study | Epistemological Beliefs Scale |

| | | | | | | | |
|------------------|------------------|--|---------------|--|---|---|--|
| Wu et al. (2015) | T = 10 C = 10 | 20 years old 100% Chinese Gender NR | RCT: Waitlist | Master intern in mental health and psychological counseling provided group intervention using SFBT manual. Treatment included 8 sessions, each session being 90 minutes, once per week | Tier 2 intervention of college students with love stress issues | College students with love stress issues voluntarily choose to participate in the study | College Student Love Stress Questionnaire; SCL-90 |
| Ye (2015) | T = 10 C = 10 | 16.5 years old 100% Chinese Gender NR | RCT: Waitlist | Psychologists with clinical experience provided group intervention using SFBT manual. Treatment included 7 sessions, each session being 120 minutes, once per week | Tier 2 intervention of high school students who experience depression | High school students who experienced depression are selected to participate in the study | Self-Rating Depression Scale (SDS) |
| Zhang (2011) | T = 16 C = 15 | 21 years old 100% Chinese 77.4% female | RCT: Waitlist | Master student in developmental psychology provided group intervention using SFBT manual. Treatment included 6 sessions, each session being 180 minutes, once per week | Tier 2 intervention of college students who want to improve the self-efficacy of career decision making | College students that want to improve the self-efficacy of career decision making voluntarily choose to participate | College Student Career Decision Self-Efficacy Scale (Revised by Peng and Long from CDSE) |
| Zhang (2012) | T = 8 C = 8 | 16.5 years old 100% Chinese Gender NR | CT: Waitlist | Master student in applied psychology provided group intervention using SFBT manual. Treatment included 8 sessions, each session being 90 minutes, once per week | Tier 2 intervention of high school students who indicate higher level of depression than peers | High school students with higher level of depression are selected to participate in the study | Self-Rating Depression Scale (SDS); Self-Rating Anxiety Scale (SAS); Social Support Rating Scale |
| Zhou (2011) | T = 32 C = 32 | 21 years old 100% Chinese | RCT: Waitlist | Master student in applied psychology provided group intervention using SFBT | Tier 2 intervention of college students who want to | College students who want to improve English academic | College Students English Academic Self-Efficacy; |

| | | | | | | | |
|-------------|------------------|--|---------------|--|--|---|--|
| | | 57.1% female | | manual. Treatment included 4 sessions, each session being 180 minutes, once per week | improve English academic self-efficacy | self-efficacy voluntarily choose to participate in the study | 16 Personality Factor (16PF); Positive and Negative Affect Schedule (PANAS); College students' psychological capital questionnaire |
| Zhou (2016) | T = 12 C = 12 | 16.5 years old 100% Chinese Gender NR | RCT: Waitlist | Master student in mental health education provided group intervention using SFBT manual. Treatment included 6 sessions, each session being 90 minutes, once per week | Tier 2 intervention of high school students who indicate lower scores in positive emotions scale and higher score in negative emotions scale | High school students who hold negative class-related academic emotions voluntarily choose to participate in the study | High School Student Class-Related Academic Emotions Questionnaire; High School Student Emotional Regulation Questionnaire |
| Zhu (2015) | T = 29 C = 31 | 16.5 years old 100% Chinese 55.2% female | RCT: Waitlist | Master student in applied psychology provided group intervention using SFBT manual. Treatment included 8 sessions, each session being 90 minutes, once per week | Tier 2 intervention of technical school students with least quality friendships | Technical school students with least quality friendships are randomly recruited | Friendship Quality Questionnaire (FQQ) revised by the author for this study |

1. T = number of participants in the treatment group, C = number of participants in the control group

2. Demographic information included mean age, % female and % Chinese. NR = Not Reported

3. RCT = randomized controlled trial, CT = non-randomized controlled trial, TAU = treatment-as-usual

Table S3. Cochrane collaboration's tool for assessing risk of bias (English Studies)

| | Random sequence generation | Allocation concealment | Blinding of participants and personnel | Blinding of outcome data | Incomplete outcome data | Selective reporting |
|----------------------------|----------------------------------|---------------------------|--|-----------------------------|----------------------------|------------------------|
| Ates et al. (2016) | - | - | - | - | - | - |
| Beauchemin (2018) | - | - | - | - | + | + |
| Green et al. (2007) | - | - | - | - | + | + |
| Joker & Ghaderi (2015) | - | - | - | - | ? | ? |
| LaFountain & Garner (1996) | - | - | - | - | + | + |
| Boyer et al. (2014) | + | + | - | + | + | + |
| Cook (1998) | - | - | - | + | + | + |
| Froeschle et al. (2007) | + | ? | + | + | + | + |
| Wallace (2009) | - | - | - | - | + | + |

* “+” low risk of bias; “-” high risk of bias; “?” unclear risk of bias

Table S4. Cochrane collaboration's tool for Risk Of Bias In Non-Randomized Studies of Interventions (ROBINS-I) (English Studies)

| Study Info | Pre-Intervention Bias | | At Intervention Bias | | Post-Intervention Bias | | |
|------------------------|-----------------------|------------------------|---------------------------------|-----------|------------------------|------------------------|-------------------------------|
| | Confounding | Participants Selection | Classifications of Intervention | Deviation | Missing Data | Measurement of Outcome | Selection of Reported Results |
| Franklin et al. (2008) | LR | LR | LR | LR | LR | LR | LR |
| Franklin et al. (2007) | MR | LR | LR | LR | LR | MR | LR |
| Indriūnienė (2017) | LR | LR | LR | LR | LR | MR | LR |
| Littrell et al. (1995) | LR | LR | LR | MR | NI | MR | LR |
| Marinaccio (2001) | LR | LR | LR | MR | LR | MR | LR |
| Kvarme et al. (2010) | LR | LR | LR | LR | LR | LR | LR |
| Corcoran (2006) | LR | LR | LR | LR | LR | LR | LR |
| Newsome (2004) | LR | LR | LR | LR | LR | LR | LR |

* LR: Low Risk, Moderate Risk: MR, Serious Risk: SR, Critical Risk: CR, NI: No Information.

Table S5. Cochrane collaboration's tool for assessing risk of bias (Chinese Studies)

| | Random sequence generation | Allocation concealment | Blinding of participants and personnel | Blinding of outcome data | Incomplete outcome data | Selective reporting |
|---------------------|----------------------------|------------------------|--|--------------------------|-------------------------|---------------------|
| Cheng (2006) | + | ? | ? | ? | + | + |
| Chou (2003) | + | ? | ? | ? | + | + |
| Gui (2016) | + | ? | ? | ? | + | + |
| Han (2012) | + | ? | ? | ? | + | + |
| Hsieh (2008) | + | ? | ? | ? | + | + |
| Huang (2003) | + | ? | ? | ? | + | + |
| Huang (2007) | + | ? | ? | ? | + | + |
| Huang et al. (2014) | + | ? | ? | ? | + | + |
| Hung (2010) | + | ? | ? | ? | + | + |
| Li (2012) | + | ? | ? | ? | + | + |
| Li (2014) | + | ? | ? | ? | + | + |
| Lien (2007) | + | ? | ? | ? | + | + |
| Lin (2007) | + | ? | ? | ? | + | + |
| Liu (2015) | + | ? | ? | ? | + | + |
| Lo et al. (2004) | + | ? | ? | ? | + | + |
| Song (2016) | + | ? | ? | ? | + | + |
| Su (2003) | + | ? | ? | ? | + | + |
| Sun (2011) | + | ? | ? | ? | + | + |
| Sun (2013) | + | ? | ? | ? | + | + |
| Tsai (2005) | + | ? | ? | ? | + | + |
| Wang (2010) | + | ? | ? | ? | + | + |
| Wang (2016) | + | ? | ? | ? | + | + |
| Wu et al. (2015) | + | ? | ? | ? | + | + |
| Ye (2015) | + | ? | ? | ? | + | + |
| Zhang (2011) | + | ? | ? | ? | + | + |
| Zhou (2016) | + | ? | ? | ? | + | + |
| Zhou (2011) | + | ? | ? | ? | + | + |
| Zhu (2015) | + | ? | ? | ? | + | + |

* “+” low risk of bias; “-” high risk of bias; “?” unclear risk of bias

Table S6. Cochrane collaboration's tool for Risk Of Bias In Non-Randomized Studies of Interventions (ROBINS-I) (Chinese Studies)

| Study Info | Pre-Intervention Bias | | At Intervention Bias | | Post-Intervention Bias | | |
|--------------|-----------------------|------------------------|---------------------------------|-----------|------------------------|------------------------|-------------------------------|
| | Confounding | Participants Selection | Classifications of Intervention | Deviation | Missing Data | Measurement of Outcome | Selection of Reported Results |
| Ho (2008) | LR | LR | LR | LR | NI | LR | LR |
| Liu (2015) | LR | LR | LR | LR | NI | MR | LR |
| Wang (2014) | LR | LR | LR | LR | LR | MR | LR |
| Wu (2008) | LR | LR | LR | MR | NI | NI | LR |
| Zhang (2012) | LR | LR | LR | MR | LR | MR | LR |

* LR: Low Risk, Moderate Risk: MR, Serious Risk: SR, Critical Risk: CR, NI: No Information.

Figure S1. Funnel Plot for Publication Bias and Vevea and Woods Sensitivity Analysis.

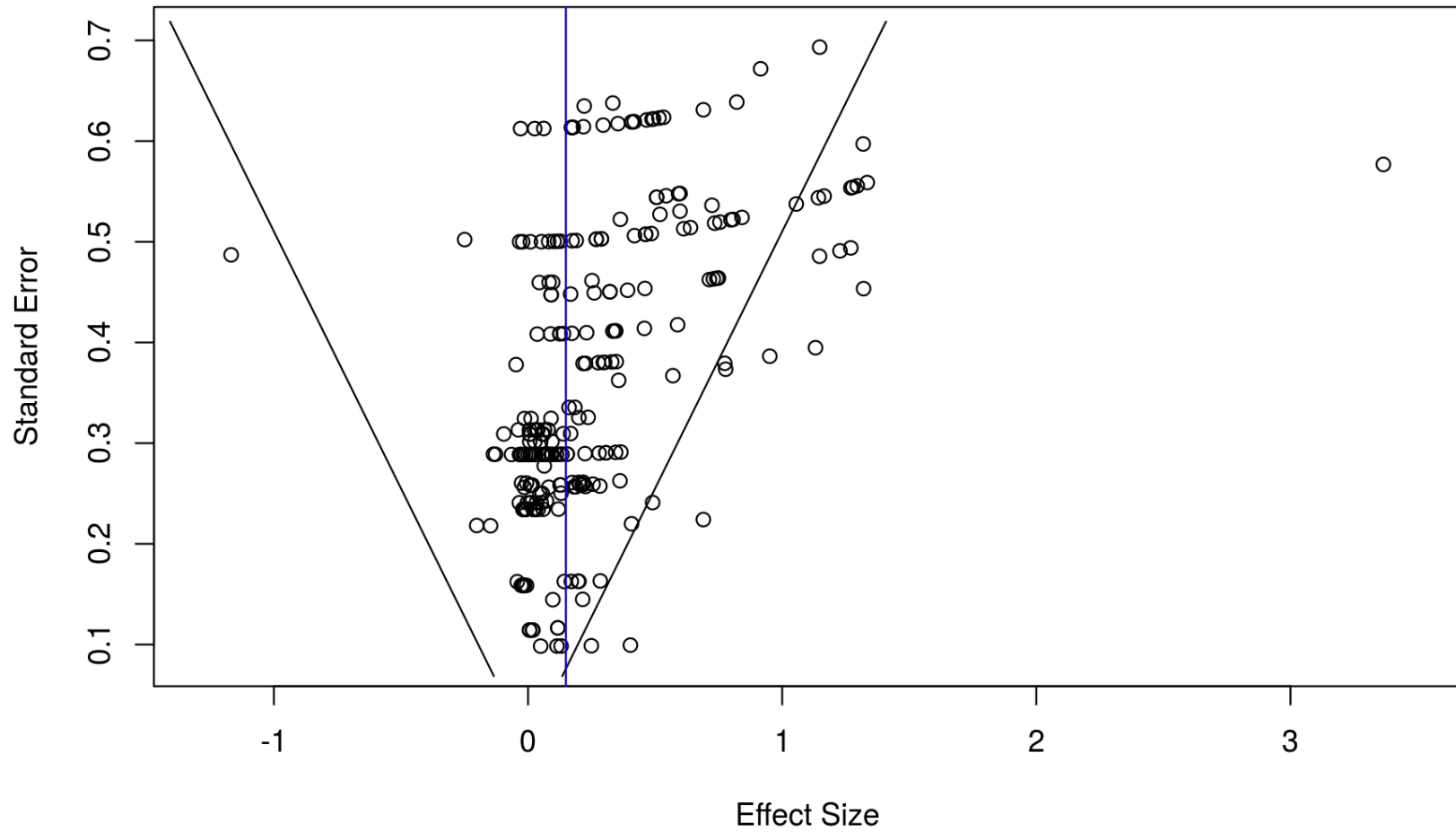


Table S7. Moderator analysis¹

| Parameter ^{2,3} | | Estimate / SE | t (df) | 95% CI | N / K | p value |
|---|-----------|-----------------|----------------|-----------------|----------|-------------|
| Country of Studies (<i>ref:</i> English) | β_0 | 0.108 / 0.032 | 3.35 (7.84) | 0.033 – 0.182 | 50 / 246 | $p < 0.01$ |
| Chinese studies | β_1 | 0.122 / 0.055 | 2.22 (22.03) | 0.008 – 0.235 | 50 / 246 | $p < 0.01$ |
| Manuscript Type (<i>ref:</i> Journal) | β_0 | 0.115 / 0.034 | 3.34 (7.22) | 0.034 – 0.196 | 50 / 246 | $p < 0.05$ |
| Thesis/Dissertation | β_1 | -0.077 / 0.051 | -1.50 (2.10) | -0.286 – 0.133 | 50 / 246 | $p = 0.266$ |
| Age (16.18 yrs old, mc) | β_0 | 0.181 / 0.033 | 5.48 (20.96) | 0.113 – 0.250 | 42 / 214 | $p < 0.001$ |
| Age | β_1 | -0.0004 / 0.011 | -0.033 (10.19) | -0.025 – 0.024 | 42 / 214 | $p = 0.974$ |
| Race (16.29% White, mc) | β_0 | 0.228 / 0.016 | 14.26 (1.28) | 0.104 – 0.350 | 40 / 201 | $p < 0.05$ |
| % White | β_1 | -0.003 / 0.0001 | -5.24 (2.37) | -0.004 – -0.001 | 40 / 201 | $p < 0.01$ |
| Gender (57.26% Female, mc) | β_0 | 0.083 / 0.020 | 4.23 (8.10) | 0.038 – 0.129 | 31 / 172 | $p < 0.01$ |
| % Female | β_1 | 0.003 / 0.001 | 4.10 (5.26) | 0.001 – 0.004 | 31 / 172 | $p < 0.001$ |
| Design (<i>ref:</i> RCT) | β_0 | 0.061 / 0.044 | 1.39 (4.44) | -0.056 – 0.178 | 50 / 246 | $p = 0.230$ |
| Controlled trial | β_1 | 0.073 / 0.059 | 1.24 (8.85) | -0.061 – 0.207 | 50 / 246 | $p = 0.250$ |
| Control Group (<i>ref:</i> TAU) | β_0 | 0.085 / 0.041 | 2.10 (5.23) | -0.018 – 0.188 | 50 / 246 | $p = 0.087$ |
| Alternative intervention | β_1 | -0.017 / 0.109 | -0.15 (3.28) | -0.349 – 0.315 | 50 / 246 | $p = 0.887$ |
| Waitlist control | β_2 | 0.038 / 0.050 | 0.76 (11.50) | -0.071 – 0.147 | 50 / 246 | $p = 0.464$ |
| Modality (<i>ref:</i> Individual) | β_0 | 0.027 / 0.037 | 0.73 (3.94) | -0.076 – 0.130 | 50 / 246 | $p = 0.505$ |
| Family-based | β_1 | 0.036 / 0.037 | 0.99 (1.66) | -0.158 – 0.230 | 50 / 246 | $p = 0.446$ |
| Group-based | β_2 | 0.091 / 0.061 | 1.50 (7.20) | -0.052 – 0.235 | 50 / 246 | $p = 0.177$ |
| Classroom-based | β_3 | 0.160 / 0.037 | 4.32 (2.94) | 0.041 – 0.279 | 50 / 246 | $p < 0.05$ |
| Tiers (<i>ref:</i> Tier 1) | β_0 | 0.161 / 0.050 | 3.21 (6.20) | 0.391 – 0.283 | 50 / 246 | $p < 0.05$ |
| Tier 2 | β_1 | -0.036 / 0.052 | -0.69 (7.08) | -0.159 – 0.087 | 50 / 246 | $p = 0.511$ |
| Tier 3 | β_2 | -0.111 / 0.065 | -1.71 (9.02) | -0.259 – 0.036 | 50 / 246 | $p = 0.122$ |
| Hours per session (1.6 hours, mc) | β_0 | 0.102 / 0.074 | 1.37 (14.32) | -0.057 – 0.260 | 44 / 199 | $p = 0.192$ |

| | | | | | | |
|--|-----------|----------------|--------------|----------------|----------|-------------|
| Hours per session | β_1 | 0.044 / 0.072 | 0.60 (9.94) | -0.118 – 0.205 | 44 / 199 | $p = 0.205$ |
| Number of sessions (7.2 session, mc) | β_0 | 0.099 / 0.030 | 3.25 (7.56) | 0.028 – 0.170 | 48 / 236 | $p < 0.05$ |
| Number of sessions | β_1 | 0.015 / 0.009 | 1.67 (5.77) | -0.007 – 0.038 | 48 / 236 | $p = 0.148$ |
| Session duration (2.2 months, mc) | β_0 | 0.116 / 0.037 | 3.14 (5.22) | 0.022 – 0.209 | 46 / 228 | $p < 0.05$ |
| Session duration | β_1 | 0.008 / 0.021 | 0.38 (2.51) | -0.066 – 0.082 | 46 / 228 | $p = 0.731$ |
| Provider education (<i>ref:</i> phd intern) | β_0 | 0.170 / 0.049 | 3.47 (1.22) | -0.242 – 0.582 | 32 / 167 | $p = 0.142$ |
| Master's degree | β_1 | -0.143 / 0.062 | -2.32 (3.64) | -0.322 – 0.352 | 32 / 167 | $p = 0.089$ |
| Master's intern | β_2 | -0.119 / 0.071 | -1.67 (3.78) | -0.322 – 0.084 | 32 / 167 | $p = 0.174$ |
| Various educational levels | β_4 | 0.009 / 0.050 | 0.18 (1.23) | -0.403 – 0.421 | 32 / 167 | $p = 0.883$ |
| Received training (<i>ref:</i> no) | β_0 | 0.096 / 0.036 | 2.68 (6.97) | 0.011 – 0.181 | 44 / 206 | $p < 0.05$ |
| Received training | β_1 | 0.082 / 0.083 | 0.98 (6.98) | -0.115 – 0.278 | 44 / 206 | $p = 0.359$ |
| Received supervision (<i>ref:</i> no) | β_0 | 0.096 / 0.041 | 2.35 (5.56) | -0.006 – 0.197 | 44 / 206 | $p = 0.061$ |
| No supervision | β_1 | 0.021 / 0.054 | 0.38 (11.87) | -0.097 – 0.139 | 44 / 206 | $p = 0.710$ |

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5. Moderators were entered into the meta-regression model once a time. Results of the treatment outcome as a moderator were not presented given too many categories and switching of different reference group.
 6. Except for “country of studies”, all other moderator analyses controlled for “country of studies”.
 7. mc = mean center
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Appendix 1. Search Strategies for English and Chinese Studies

English Studies.

Electronic Databases: Child Development & Adolescent Studies, CINAHL Complete, Education Abstracts, Family Studies Database, PsycINFO, Social Sciences Abstract, the Cochrane Library, and Medline.

Academic Journals: Journal of Clinical and Child and Family Psychology Review, Journal of School Psychology, School Psychology Review, Review of Educational Research, Educational Review.

Professional Websites: www.sfbta.org, and <https://solutionfocused.net/>.

Chinese Studies.

Electronic Databases: we used the large infrastructure of the China Knowledge Resource Integrated Database. The specific databases we used include: China Academic Journals Full-Text Database, China Doctoral Dissertation Full-Text Database, China Masters' Thesis Full-Text Database, China Reference Works Online, and China Proceedings of Conference Full-Text Database.