



Investigating The Effectiveness of Resilience-Based Interventions in Australian Youth and Its Variability Across Refugee and Non-Refugee Samples

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Abstract

Resilience - the ability to flourish in the face of hardships - is a powerful determinant of mental health and well-being. The importance of resilience is being recognised in the domain of therapy, as evinced by the development of numerous resilience-enhancing interventions. This study examined the efficacies of three resilience programs based in Australia - Bright Thinking, Connect-3 and Linked-up - by looking at their abilities to improve measured scores of resource, resilience and adversity in non-clinical child and adolescent samples. Of further interest was the effectiveness of the programs across two distinct sociocultural groups: refugee and non-refugee groups. Additionally, this study compared the efficacies of the Bright Thinking and Connect-3 programs which target children of the same age group. Results show that all three programs led to significant reductions in adversities, the Connect-3 and Linked-up programs led to significant increases in resources, and the Connect-3 program alone led to significant increases in resilience. Refugee and non-refugee groups did not respond differently to the Connect-3 program, however showed varied responses to the Linked-up program in terms of one resource factor and one adversity factor. The Bright Thinking program demonstrated greater efficacy than the Connect-3 program by yielding greater reductions in adversity scores. Overall, this study supports the therapeutic utility of all three programs, however shows variabilities in their patterns of outcome. Only the Linked-up program led to different outcomes for refugee and non-refugee groups, tentatively suggesting that the effectiveness of interventions may vary as a function of sociocultural status. Considering the exploratory nature of many of the inquiries made in this study, these findings require further investigation in the future.

Introduction

The ability to flourish and achieve positive outcomes in spite of adversities has been a growing topic of interest in psychology. Given the perpetuity with which we encounter stress and adversity in our lives, there is no doubt that resilience has direct and significant impacts on our mental well-being. While resilience is a critical skill for every age group, it is particularly important during the developmental phases of childhood and adolescence, when individuals are confronted with substantial changes in their biological, social and cognitive functioning (Cohen et al., 2015). The conflicts and dilemmas that arise from these changes must be effectively reconciled to develop as healthy adults, for the problems experienced during youth often sustain into adulthood and later life (King, Vidourek & Merianos, 2016). While clinical interventions may not eliminate the adversities that children or adolescents experience, they certainly have the capacity to mitigate the effects of adversities through enhancing individuals' resilience.

Understanding Resilience

Resilience is generally conceptualised as an individual's ability to recover from adversities. Otherwise stated, it is the ability to achieve good outcomes "despite experiences with stressors shown to carry significant risk for developing psychopathology" (Hjemdal, Friborg, Stiles, Martinussen & Rosenvinge, 2006, p.84). The concept of resilience is an inherently ambiguous one, "heavily laden with subjective, often unarticulated assumptions" (Glantz & Slobada, 1999, p. 110). This has led to varied definitions of the term resilience, each with different conceptualisations of what constitutes the construct. However, these varied definitions are not necessarily incompatible nor mutually exclusive, rather they tend to highlight and focus

on different factors that comprise an individual's resilience (Hjemdal et al., 2006). For instance, while early work on resilience primarily focused on the individual's internal qualities (Luthar, 2000), growing research in the area brought to attention the impact of environmental factors in shaping one's resilience (Worsley, 2014). A holistic integration of these different views arrive at a consensus that resilience is a multi-faceted construct - it is the repertoire and complex interaction of various protective and risk factors (Miller et al., 2016), which includes the inherent qualities of the individual, external factors such as family environment and social networks (Hjemdal et al., 2006; von Soest, Mossige, Stefansen & Hjemdal, 2009), and the individual's capacity to capitalise on these resources (Miller et al., 2016). As phrased by Hjemdal and colleagues (2006), resilience is the "conceptual umbrella" for factors, both internal and external, that ultimately "modify the impact of adversity" (p. 84).

The Resilience Doughnut Model

Current models of resilience agree that the various protective and risk factors that constitute resilience are situated both internally and externally. They adopt the views of the ecological model, which conceptualises individuals as being embedded in multiple layers of contexts (Bronfenbrenner & Morris, 2006). The individual actively explores within and interacts with their social ecologies, and as a result endows power to their social contexts to shape the expression of their resilience.

Different models of resilience construct different lists of the exact factors that comprise resilience, and offer different explanations for the mechanism by which these factors shape resilience (Worsley, 2014). One such example is the Resilience Doughnut Model developed by

Worsley (2006), which conceptualises resilience to take the form of a doughnut. The inner circle represents the internal characteristics of the individual, while the outer circle represents the external resources to which the individual has access. Specifically, the inner circle reflects individuals' key beliefs relating to three areas: "I am", which portrays individuals' self-perceptions, "I can" which represents their belief in own abilities, and "I have" which is the awareness of one's external resources (Grotberg, 1995). The outer circle is segmented into seven different domains in which individuals access their resources. These domains are: parent, skill, family, education, peer, community and money. The positioning of internal and external factors as two concentric circles represents an active interaction between the two spheres. Resilience is developed when the external factors foster the development of internal strengths (Miller et al., 2016) (see Figure 1). Although, the abundance of all seven forms of resources is not a prerequisite for being resilient. Worsley (2006) suggests that targeting three of the seven factors for each individual would be sufficient in enhancing resilience.



The Resilience Doughnut model has not yet been extensively researched, however a small number of past findings support its ability to deliver some positive outcomes. In a series of case studies conducted by Worsley (2014), a program based on the Resilience Doughnut was implemented through an online tool at three schools, targeting students ranging from 12 to 17 years of age. The program involved determining one's three strongest resources, then developing a project that utilises these strengths. Students were measured on their levels of anxiety, depression and resilience at various time-points including prior to the program, immediately following the program, and at 12 and 24 months after the conclusion of the program. Results showed that students with medium to high levels of anxiety displayed increases in their resilience scores over time. Another study by Miller and colleagues (2016) looked at a more systematic implementation of the Resilience Doughnut programs. It examined the effects of two programs - Connect-3 and Linked-up - administered over several sessions in a clinical setting. The study found significant increase in personal competence and significant decrease in adversities following the completion of the Connect-3 program. Overall, the findings of past research provide a good reason to hypothesise the utility of the Resilience Doughnut model. Interventions built on the frameworks of the model appear to deliver some clear and reasonable benefits. It is to these intervention programs and their operationalisation that we now direct our attention.

Programs based on the Resilience Doughnut Model

There are currently three programs derived from the Resilience Doughnut Model - the Bright Thinking, Connect-3 and Linked-up programs - that aim to “enhance resilience in non-clinical child and adolescent populations” (Miller et al., 2016, p. 3). The programs also

incorporate the views of Positive Psychology and Solution Focused Theory into their operationalisation. Positive Psychology is a shift from the traditional focus on identifying and repairing damage, to a focus on building individuals' positive qualities (Seligman, 2002). It recognises that achieving therapeutic success is a two-fold process requiring a balance between fixing problems and developing strengths (Seligman, 1998). The Solution Focused Theory is a future-oriented approach to therapy that focuses on developing solutions to achieve one's desired future (De Shazer, Dolan & Korman, 2007). These solutions are derived from the individual's own capacities and resources - that is, the clients' own strengths are actively utilised to accomplish their goals for the future. In therapeutic practice, the integration of Positive Psychology and Solution Focused Therapy takes the form of interventions that emphasise clients' strengths as opposed to problems, and which mobilise and apply these strengths to the clients' processes of change (Corcoran & Pillai, 2009). This is an underlying feature of the Resilience Doughnut programs.

The interventions are differentiated based on program content and target age. The Bright Thinking program targets children aged 8 to 12 years and aims to enhance resilience through teaching an optimistic thinking style. It proposes that children are fixed to a pessimistic mindset, whether desired or not, because they lack the capacity to change. Thus, the intervention assists in developing the skills necessary to transition from a pessimistic to optimistic cognition. The Connect-3 program also targets children of ages 8 to 12, with the fundamental goal of building resilience through empowering children. That is, the program assists the children in discovering their personal strengths, and encourages them to utilise these strengths in service of building positive connections with others. The planned outcome is an improvement in self-confidence as

well as interpersonal skills. The Linked-up program explores the same topics as the Connect-3 program but targets adolescents aged 13 to 16 years, and has been tailored appropriately for the said age group. Overall, these programs share the goal of enhancing their clients' resilience via a range of implementation strategies, through which they ultimately seek to alter the course of their developmental trajectories (Worsley, 2014).

The Connect-3 and Linked-up programs have already been examined on their efficacies, as discussed in the previous section, however the Bright Thinking program is yet to be investigated.

Sociocultural Considerations: A Specific Case of Refugees

With stress and adversity being a universal human experience, there is no doubt that resilience is a cross-culturally relevant construct. At the same time, resilience is intrinsically a sociocultural product, given that the expression of resilience is fundamentally shaped by contextual forces (Ungar, 2015). Thus, in administering resilience-based programs, it is important to illustrate a picture of the sociocultural landscape in which the client is embedded, in order to maximise the efficacy of interventions in building resilience. In the present study, the accessibility of the programs discussed above have been expanded to the refugee population. As defined by the United Nations, a refugee is “a person who is outside his/her country of nationality or habitual residence... (with) a well-founded fear of persecution” and an inability “to avail himself/herself of the protection of that country” (The 1951 Refugee Convention, 1951). The refugee group represents a unique sociocultural status, one that offers an array of adverse experiences with implications on their mental wellbeing (Ringold, Burke & Glass, 2005). This

includes, but is not limited to, traumatic events experienced prior to migration, mandatory detention, separation from one's cultural roots, adjustment to and possibly incompatibility with the new culture, language barrier, racial discrimination and compromised education (Hutchinson & Dorsett, 2012; Murray, Davidson, & Schweitzer, 2008; Schweitzer, Melville, Steel & Lacherez, 2006). In relation to the seven external factors defined by the Resilience Doughnut, departure from the country of origin cuts access to communal resources. Barriers in communication may obstruct career prospects (Schweitzer et al., 2007) and lead to monetary difficulties. For young refugees, their relative lack of language barriers may burden them with responsibilities for the family that create tensions in their relationships with their parents (Reedy, 2007). Racial discrimination, a common experience amongst young refugees in school settings, may hinder the development of positive relationships with peers (Brough et al., 2003). The lack of a comprehensive national policy regarding the education of refugee children and adolescents (Christie & Sidhum 2002) creates educational contexts that are not conducive for learning and growth. Taken together, the refugee experience undoubtedly involves no shortage of adversities. Of interest is whether these adversities, often impeding access to one's external resources, hinder the development of resilience in therapeutic settings. Examining the different ways in which refugees and non-refugees respond to resilience-based interventions can enhance our understanding of the mechanisms by which various external factors influence an individual's expression of resilience. This allows us to develop programs that are socioculturally sensitive, so as to maximise their efficacies across a wide range of populations. Moreover, examining how the refugee group overcomes the various adversities arising from their status will deepen our

appreciation of the mechanisms of resilience at work - that is, how negative life experiences do not invariably lead to negative outcomes.

The Present Study

The Resilience Doughnut model has not yet been extensively researched, with only preliminary evidence of its therapeutic utility. As for the Bright Thinking program, the present study is in fact the first to investigate its effects. With this gap in research, it is necessary to conduct confirmatory research that can establish and add further support to the efficacy of the Resilience Doughnut programs.

Furthermore, it would be of worth to examine how the effects of the programs differ for two distinct sociocultural groups that vary in their levels of adversities. This inquiry would not only create a better understanding of the mechanisms by which resilience is expressed, but also allow for the development of “culturally competent programs” that account for “individual and community needs” (Murray et al., 2008, p. 18).

As an additional inquiry, the present study seeks to compare the effects of two programs targeted at the same age group: the Bright Thinking and Connect-3 programs. This is an advancement from previous studies which have not directly compared across different interventions. The analysis would reveal to us how different implementations of the Resilience Doughnut lead to different therapeutic outcomes. Ultimately, the overarching goal of the present study is to generate a range of findings that enable the refinement and improvement of the resilience-based programs.

Hypotheses

Firstly, we hypothesise that there will be significant increases in resource and resilience and significant decrease in adversity following each of the programs. This hypothesis derives from our general expectations for the programs, as well as empirical evidence from past investigations (Miller et al., 2016; Worsley, 2014). The remaining inquiries - that regarding the differential responses of refugees and non-refugees, and that regarding the different effects of Bright Thinking and Connect-3 programs - are not guided by any a priori hypotheses, as they are exploratory in nature and have yet been investigated in past literature.

In regards to the dependent variables - resource, resilience and adversity, each of which are comprised of a number of factors - we expect positive correlations between factors of resource and resilience, negative correlations between factors of resource and adversity, and negative correlations between factors of resilience and adversity. That is, we expect that experiences of adversity will decrease when resource availability and resilience increase, based on the conception of these variables.

General Method

Participants

Participants of the study comprised of children and adolescents enrolled into one of the Bright Thinking, Connect-3 or Linked-up programs. Parents completed consent forms alongside their child, permitting the collection of their child's data and its use in the research project. Those who did not provide their consent were still able to participate in the programs. Participants for each of the programs belonged to either the Centre group or the Refugee group - the former

referring to those who completed the programs at The Resilience Centre, Sydney, and the latter referring to refugee students who attended the programs in their school settings. Refugee status was determined by the participating schools and teams at Mt. Druitt, Plumpton and Doonside using criteria set by the Department of Social Services. They were either born in Australia to humanitarian parents, or migrated as infants.

The complete dataset included 261 participants in total, with 65 participants in the Bright Thinking group (25%), 125 in the Connect-3 group (48%) and 71 in the Linked-up group (27%). 179 participants were in the Centre group (69%) and the remaining 82 participants were in the Refugee group (31%). Due to a large number of participants missing either their pre-intervention or post-intervention data, there were only 168 participants without any missing data. Of these, 31 were enrolled in Bright Thinking (18%), 94 in Connect-3 (56%) and 43 in Linked-up (26%). 108 were part of the Center group (64%) and 61 were part of the Refugee group (36%).

It is also worth noting the participants' socio-economic backgrounds, which varied systematically across the Centre and Refugee groups. Participants who completed their programs at The Resilience Centre in Epping were of high socio-economic status, with the Epping to North Epping Statistical Area ranking in the highest deciles on all four SEIFA measures (ABS, 2016). Meanwhile, participants in the Refugee group came from low to middle socio-economic backgrounds, with the Plumpton area ranking between 4 to 6 deciles on the SEIFA measures, and the Doonside and Mt. Druitt areas ranking in the lowest deciles between 1 to 2 (ABS, 2016).

Materials

Resilience Doughnut Quiz The Resilience Doughnut Quiz, based on the frameworks of The Resilience Doughnut model (Worsley, 2006), aims to determine individuals' resource availabilities and maps their abilities to deal with adversities. It categorises protective factors in to seven external resources - parent, skill, family, education, peer, community and money. The scale consists of 70 items - 10 for each of the seven factors - rated on a 6-point Likert scale that ranges from 0 (Disagree very strongly) to 5 (Agree very strongly). Higher scores are taken to mean greater resource availability. The score for each factor is an average of the scores on items that comprise the factor.

Internal reliability, as determined using data generated in the current study, was found to be acceptable with an overall Cronbach α of .87, and alpha values for each of the factors ranging between .77 and .90.

Resilience Scale for Adolescents The Resilience Scale for Adolescents (READ; Hjemdal et al., 2006) is a questionnaire measuring levels of resilience in adolescents. It is an adaptation of the Resilience Scale for Adults (RSA; Hjemdal, Friborg, Martinussen & Rosenvinge, 2001) that has been simplified for use with the adolescent population. The scale consists of 28 positively worded items, separated into 5 subscales - personal competence, social competence, structured style, social resources and family cohesion. Items are rated on a 5-point Likert scale ranging from 0 (Totally Agree) to 4 (Totally Disagree). Higher scores indicate higher levels of resilience. The score for each subscale is an average of the scores on items that comprise the subscale.

The READ demonstrates strong internal consistency with a Cronbach α of .94 for the total score. Each of the individual subscales were also shown to display acceptable to high internal consistencies with Cronbach α ranging between .70 and .90 (Hjemdal et. al., 2006; von Soest et. al., 2009). Scores on each of the subscales were found to have significant negative correlations with depressive and anxiety symptoms (Hjemdal, Aunem Reinfjell, Stiles & Friborg, 2007), supporting the construct validity of the scale.

Strengths and Difficulties Questionnaire The Strength and Difficulties Questionnaire (SDQ; Goodman, 1997) is a behavioral screening measure for children that provides a representation of both their strengths and difficulties in relation to their behaviors, emotions and relationships. The scale serves an array of functions in the clinical setting, including the detection of those at high risk of developing mental health problems (Goodman, 2000) and as a measurement of treatment outcomes (Goodman, 2001). It is suitable for ages 4 to 16 and can be answered via self-report from ages 11 to 16. The questionnaire consists of 25 positively and negatively worded items, with five items tapping each of the five dimensions - emotional problems, conduct problems, hyperactivity, peer problems and prosocial behaviour. Items are rated using a 3-point Likert scale ranging from 0 (Not true) to 2 (Certainly true), indicating the extent to which each statement applies to the respondent. This excludes five items which follow a reverse scoring system. The score for each subscale is a summation of the scores on the items that comprise the subscale. A higher score reflects more of the relevant dimension. A total difficulties score is generated by adding up the scores for emotional problems, conduct problems hyperactivity and peer problems. In the present study, the SDQ was used as a measure of

participants' adversities. Higher scores on emotional problems, conduct problems, hyperactivity, peer problems and total difficulties suggested higher levels of adversities, whereas a higher score on the prosocial scale reflected greater social strength. The SDQ displays satisfactory internal consistency with a Cronbach α averaging at .73 across the subscales (Goodman, 2001). However, the internal consistency for self-reported peer problems was found to be low ($\alpha = .41$). The scale also demonstrates good validity in screening for individuals at high risk for developing mental health problems (Goodman, Ford, Simmons, Gatward & Meltzer, 2000).

Procedure

The three programs - Bright Thinking, Connect-3 and Linked-up - were run multiple times between the years 2015 and 2018 with approximately 6 to 10 participants in every run. The Linked-Up and Connect-3 programs consisted of 6 weekly sessions lasting 1.5 hours each. The Bright Thinking program consisted of 6 weekly sessions lasting 1 hour each.

All programs were delivered by trained psychologists who followed program structures outlined by manuals. Parent information sessions were held following the first program session, allowing parents to engage with the activities included in the programs. Following the remaining sessions, the contents of each session and guidance on how they may be implemented in home and school settings were provided to parents through letters.

The Resilience Doughnut quiz, READ and SDQ were administered to the participants one week prior to the commencement of the programs to record their pre-intervention scores. The same measures were administered again following the termination of the programs, yielding participants' post-intervention scores. Questionnaires were completed using a computer device.

Participants had the option of completing the measures at home or during a pre-screening session at the centre. It is unknown whether any participants were required to complete the questionnaires through other means in the case that computers were not available.

All statistical analyses were performed using SPSS version 25 (IBM Corp, 2017).

Study 1

In the first study, we sought to examine the general effectiveness of each of the three resilience programs.

Method

3 paired samples T-tests were run for each of the intervention programs, comparing pre- and post-intervention scores for every subscale measured in the Resilience Doughnut, READ and SDQ.

Results

Bright Thinking. Results show a significant decrease in mean emotional problem scores by 1.40 points ($t(29) = -3.09, p = .00, d = .56$), and a significant decrease in mean total difficulties score by 3.13 points ($t(29) = -2.95, p = .01, d = .54$) (see Table 1).

Table 1
Comparison of Pre and Post-Intervention Scores for Bright Thinking

Variable	Pre <i>M</i>	Post <i>M</i>	Difference	<i>p</i>	Cohen's <i>d</i>
Resilience Doughnut					
Parent factor	4.22	4.31	0.10	.40	.16
Skill factor	4.14	4.17	0.03	.81	.04
Family factor	4.12	4.26	0.14	.34	.18
Education factor	4.30	4.24	-0.06	.64	.09
Peer factor	4.02	4.08	0.06	.65	.08
Community factor	3.66	3.75	0.09	.45	.14
Money factor	3.71	3.82	0.11	.28	.20
READ					
Personal competence	2.74	2.81	0.07	.46	.14
Social competence	2.78	2.93	0.15	.09	.32
Structured style	2.71	2.83	0.12	.37	.17
Social resources	3.41	3.30	-0.11	.23	.23
Family cohesion	3.33	3.32	-0.01	.89	.03
SDQ					
Emotional problems	4.87	3.47	-1.40	.00**	.56
Conduct problems	3.37	2.90	-0.47	.09	.32
Hyperactivity	6.07	5.40	-0.67	.14	.28
Peer problems	5.37	4.77	-0.60	.10	.31
Prosocial	8.17	8.17	0.00	1.00	.00
Total difficulties	19.67	16.53	-3.13	.01**	.54

p* < .05. *p* < .01.

Connect-3 There were significant increases in the scores for all the subscales in the Resilience Doughnut Quiz. On average, scores on the parent factor increased by 0.21 points ($t(93) = 3.60, p = .00, d = .37$), skill factor increased by 0.24 ($t(93) = 4.43, p = .00, d = .46$), family factor increased by 0.19 ($t(93) = 3.63, p = .00, d = .37$), education factor increased by 0.15, ($t(93) = 2.14, p = .04, d = .22$), peer factor increased by 0.26 ($t(93) = 2.74, p = .01, d = .28$),

community factor increased by 0.22 ($t(93) = 2.54, p = .01, d = .26$), and money factor increased by 0.30 ($t(93) = 3.72, p = .00, d = .38$) (see Table 2).

As for the READ subscales, personal competence increased by 0.19 points on average ($t(93) = 2.50, p = .01, d = .26$), social competence increased by 0.23 on average ($t(93) = , p = .02, d = .25$), and family cohesion increased by 0.22 on average ($t(93) = 2.82, p = .01, d = .29$).

Changes in social resources scores approached statistical significance, with a mean increase of 0.15 points ($t(93) = 1.94, p = .06, d = .20$) (see Table 2).

On the SDQ measure, there was a significant decrease in mean emotional problems score by 0.63 points, $t(93) = -2.94, p = .00, d = .30$. Changes in the total difficulties scores were approaching statistical significance, with a mean decrease of .84 ($t(93) = -1.84, p = .07, d = .19$) (see Table 2).

Table 2

Comparison of Pre and Post-Intervention Scores for Connect 3

Variable	Pre <i>M</i>	Post <i>M</i>	Difference	<i>p</i>	Cohen's <i>d</i>
Resilience Doughnut					
Parent factor	4.03	4.24	0.21	.00**	.37
Skill factor	4.08	4.32	0.24	.00**	.46
Family factor	4.15	4.35	0.19	.00**	.37
Education factor	4.18	4.33	0.15	.04*	.22
Peer factor	3.91	4.17	0.26	.01**	.28
Community factor	3.51	3.74	0.22	.01*	.26
Money factor	3.64	3.94	0.30	.00**	.38
READ					
Personal competence	2.69	2.89	0.19	.01*	.26
Social competence	2.70	2.93	0.23	.02*	.25
Structured style	2.80	2.93	0.14	.11	.17
Social resources	3.23	3.39	0.15	.06	.20
Family cohesion	3.07	3.29	0.22	.01**	.29
SDQ					
Emotional problems	4.61	3.98	-0.63	.00**	.30
Conduct problems	3.93	3.93	0.00	1.00	.00
Hyperactivity	5.90	5.86	-0.04	.84	.02
Peer problems	5.49	5.32	-0.17	.38	.09
Prosocial	7.85	7.79	-0.06	.76	.03
Total difficulties	19.93	19.09	-0.84	.07	.19

p* < .05. *p* < .01.

Linked-up There were significant increases in two of the subscales in the Resilience Doughnut Quiz. Mean skill factor score increased by 0.25 points ($t(42) = 2.72, p = .01, d = .42$), and mean family factor score increased by 0.28 points ($t(42) = 2.11, p = .04, d = .32$). Increases in parent and community factor scores were approaching statistical significance, with a mean increase of 0.21 points for both factors ($t(42) = 1.93, p = .06, d = .29$) ($t(42) = 1.93, p = .06, d = .29$) (see Table 3).

No significant changes were found for any of the READ subscales, however an increase in mean personal competence score by 0.17 points was approaching significance ($t(42) = 1.92$, $p = .06$, $d = .29$). On the SDQ measure, there was a significant decrease in emotional problems by 0.61 points on average, $t(42) = -2.40$, $p = .02$, $d = .37$ (see Table 3).

Table 3
Comparison of Pre and Post-Intervention Scores for Linked Up

Variable	Pre <i>M</i>	Post <i>M</i>	Difference	<i>p</i>	Cohen's <i>d</i>
Resilience Doughnut					
Parent factor	3.75	3.96	0.21	.06	.29
Skill factor	3.71	3.96	0.25	.01**	.42
Family factor	3.68	3.97	0.28	.04*	.32
Education factor	3.79	3.79	0.01	.97	.01
Peer factor	3.52	3.74	0.21	.08	.28
Community factor	2.89	3.10	0.21	.06	.29
Money factor	3.47	3.52	0.05	.65	.07
READ					
Personal competence	2.36	2.53	0.17	.06	.29
Social competence	2.41	2.51	0.11	.30	.16
Structured style	2.36	2.53	0.18	.12	.25
Social resources	2.95	2.96	0.00	.96	.01
Family cohesion	2.74	2.80	0.06	.41	.13
SDQ					
Emotional problems	5.91	5.30	-0.61	.02*	.37
Conduct problems	3.77	3.95	0.19	.44	.12
Hyperactivity	5.51	5.95	0.44	.13	.24
Peer problems	5.47	5.72	0.26	.31	.16
Prosocial	7.42	7.49	0.07	.78	.04
Total difficulties	20.65	20.93	0.28	.67	.07

* $p < .05$. ** $p < .01$.

Discussion

It was hypothesised that there would be significant increases in measures of resources (Resilience Doughnut) and resilience (READ), and significant decreases in adversities (SDQ) following each of the interventions. Consistent with the hypothesis, we found that the scores on a range of resource and resilience factors increased while the scores on one of the adversity factors decreased. However, the three intervention programs displayed different patterns of results.

The Bright Thinking program yielded significant decreases in emotional problems and total difficulties while producing no significant increases in resources and resilience. The Connect-3 program displayed the greatest success, leading to significant increases in all measured resource factors as well as three of the five resilience factors including personal competence, social competence and family cohesion. The program also led to a significant decrease in emotional problems. These findings are consistent with, as well as add to the findings of past research which revealed significant increases in personal competence following the program (Miller et al., 2016).

Our findings suggest that the Connect-3 program is particularly successful in facilitating the growth of personal strengths as well as the development of positive connections with one's social ecologies. Following the Linked-Up program, there were significant increases in perceived skill and family resources. Unlike the Connect-3 program however, no significant changes were found in any of the resilience factors, consistent with the findings of Miller and colleagues (2016). Given that the Linked-up and Connect-3 programs follow the same structure and content, the differences in results may be due to the nature of the age groups to which the programs were directed. One possible inference is that the programs demonstrate greater efficacy for children as

opposed to adolescents in developing resilience. On the other hand, the Linked-up program led to significant decrease in participants' emotional problems - a new finding that has not been established by past research.

Interestingly, all three intervention programs were successful in reducing emotional problems but no other individual subscales of adversities. This suggests that the resilience programs exhibit particular strength in alleviating emotional problems as opposed to other forms of adversities. Of the three programs, the Bright Thinking program alone led to significant reductions in total adversities. Given that the Bright Thinking and Connect-3 programs dealt with children of the same age group, the former may be a more effective implementation for alleviating general experiences of adversity in that particular age group.

In interpreting these results, it is important to recall that our dataset was derived from a non-clinical sample. Mean scores on adversity subscales were not clinically high with the majority of scores falling within a middle to low categorical range. Mean scores on the Resilience Doughnut and READ scales also showed no substantial lack of resilience and resources. Thus, the lack of statistically significant changes in the majority of the measured factors do not come as a surprise in a sample that was not drastically problematic to begin with. Our findings may not be generalisable to clinical populations whose baseline profiles would differ from that of our's.

Study 2

The second study sought to compare the Refugee and Centre groups on their responses to the intervention programs. No a priori hypothesis was available as this study was exploratory.

Method

For each of the Connect-3 and Linked-up programs, a (2) x 2 Mixed ANOVA model was used to compare the Centre and Refugee groups on their changes from pre- to post-intervention. As for the Bright Thinking program, due to the lack of post-intervention data from the Refugee group, changes in pre- and post-intervention scores could not be compared across Centre and Refugee groups. Instead, a One-way ANOVA model was utilised to compare pre-intervention scores between Centre and Refugee groups. Welch tests were used in place of One-Way ANOVA for any data that violated the equality of variances assumption.

Results

Connect-3 Results show that there were no significant differences between the Centre and Refugee groups in terms of pre- to post-intervention changes (see Table 4). However, difference between the two groups regarding changes in structured style scores approached statistical significance ($F(1, 92) = 3.38, p = .07, \eta^2 = .03$) (see Table 4). Whereas scores from the Refugee group increased over time, scores from the Centre group decreased marginally (see Figure 1.) Difference between the groups regarding changes in hyperactivity scores was also approaching significance ($F(1, 92) = 3.42, p = .07, \eta^2 = .04$). Scores for the refugee group increased overtime, whereas scores of the Centre group decreased (see Figure 2).

Table 4
Interactions Between Time and Refugee-Status for Connect 3

Variable	<i>F</i>	<i>p</i>	Eta Squared
Resilience Doughnut			
Parent factor	1.42	.24	.01
Skill factor	2.40	.13	.02
Family factor	0.53	.47	.01
Education factor	0.20	.66	.00
Peer factor	0.22	.64	.00
Community factor	1.52	.22	.02
Money factor	0.25	.62	.00
READ			
Personal competence	0.58	0.45	.01
Social competence	0.15	0.70	.00
Structured style	3.38	0.07	.03
Social resources	0.04	0.85	.00
Family cohesion	0.14	0.71	.00
SDQ			
Emotional problems	1.71	0.19	.02
Conduct problems	0.01	0.91	.00
Hyperactivity	3.42	0.07	.04
Peer problems	0.16	0.69	.00
Prosocial	0.00	0.98	.00
Total difficulties	0.00	1.00	.00

**p* < .05.

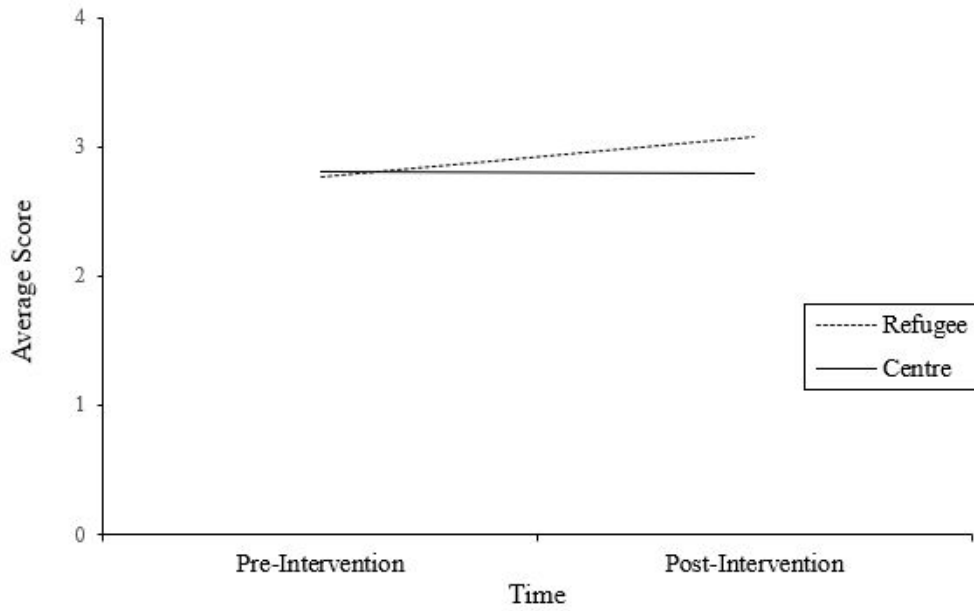


Figure 1: Structured Style Scores by Time for Connect-3

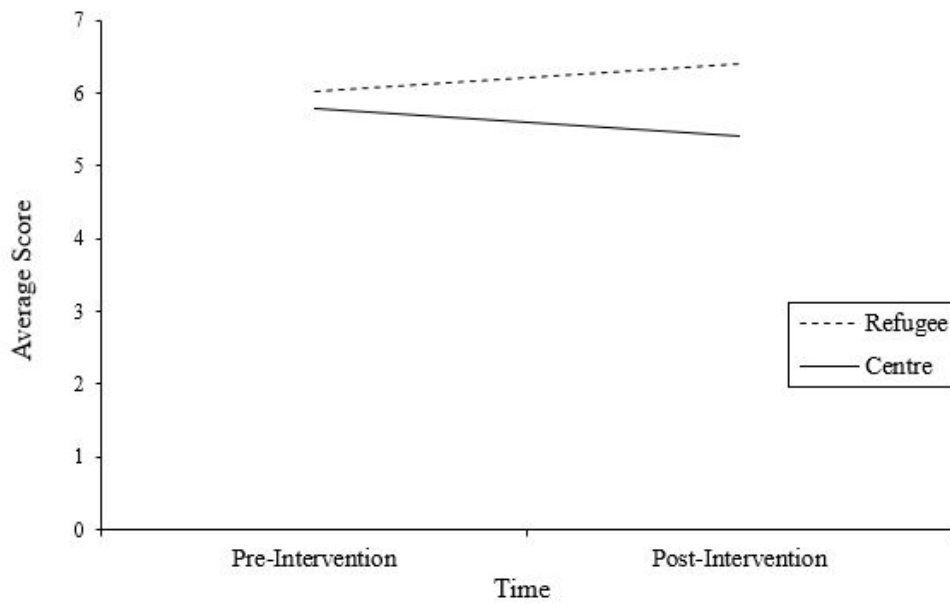


Figure 2: Hyperactivity Scores by Time for Connect-3

Linked-up There were significant differences between the Refugee and Centre groups in regards to the changes in education scores ($F(1,41) = 4.65, p = .04, \eta^2 = .10$) and peer problems scores ($F(1,41) = 6.30, p = .02, \eta^2 = .13$) from pre- to post-intervention (see Table 5). For the education factor, the Refugee group displayed a decrease in scores over time whereas the Centre group displayed an increase (see Figure 3). For the peer problems factor, the opposite pattern was observed (see Figure 4).

Table 5
Interactions Between Time and Refugee-Status for Linked Up

Variable	<i>F</i>	<i>p</i>	Eta Squared
Resilience Doughnut			
Parent factor	0.03	.85	.00
Skill factor	0.73	.40	.02
Family factor	1.04	.31	.02
Education factor	4.65	.04*	.10
Peer factor	0.72	.40	.02
Community factor	0.00	1.00	.00
Money factor	0.70	.41	.02
READ			
Personal competence	1.70	.20	.04
Social competence	1.15	.29	.03
Structured style	0.06	.81	.00
Social resources	0.77	.39	.02
Family cohesion	2.84	.10	.06
SDQ			
Emotional problems	1.69	.20	.04
Conduct problems	0.01	.95	.00
Hyperactivity	0.10	.75	.00
Peer problems	6.30	.02*	.13
Prosocial	0.66	.42	.02
Total difficulties	1.57	.22	.04

* $p < .05$.

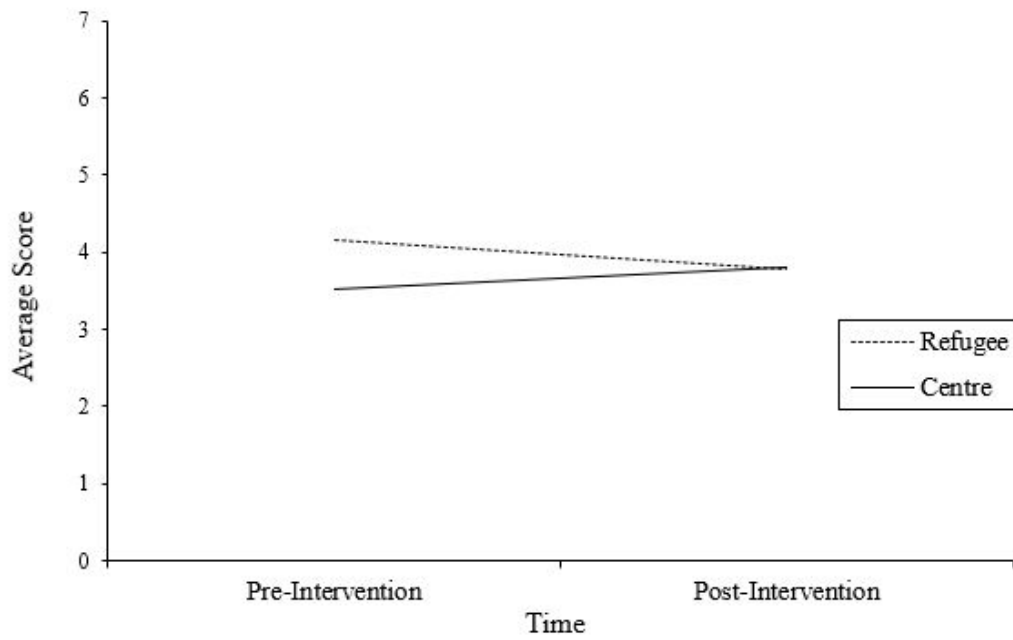


Figure 3: Education Factor Scores by Time for Linked-Up

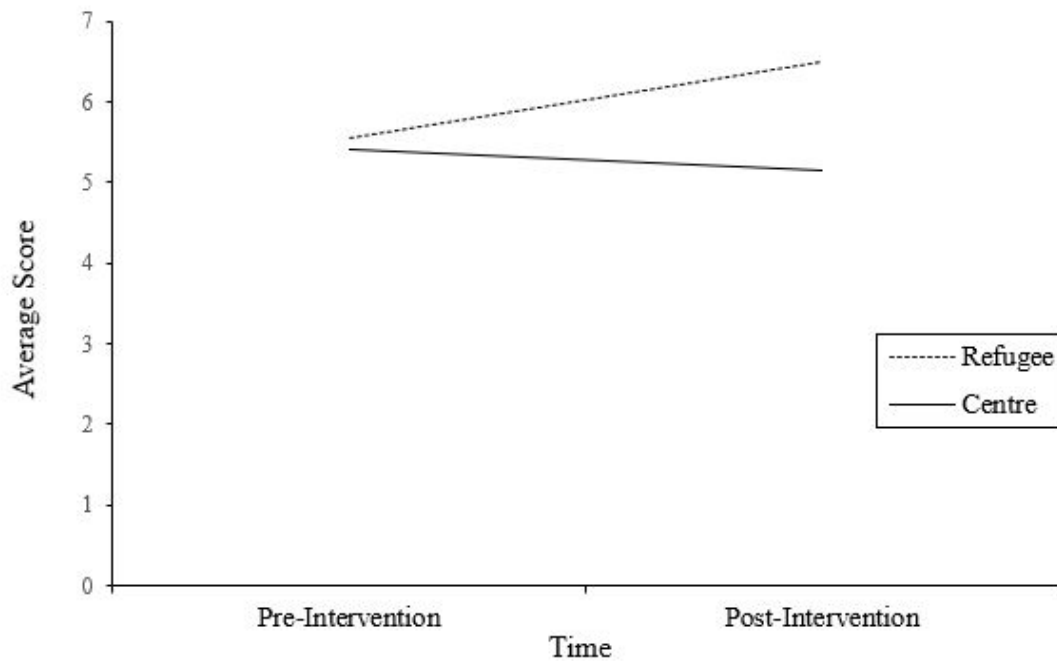


Figure 4: Peer Problems Scores by Time for Linked-Up

Bright Thinking The baseline scores of Refugee and Centre groups differed significantly on a number of factors. The Centre group scored significantly higher than the Refugee group on the parent factor by 0.50 points on average ($F(1,62) = 4.97, p = .03, \eta^2 = .07$). Scores on family cohesion were also found to be significantly higher for the Centre group by 0.63 points on average ($F(1,62) = 6.41, p = .01, \eta^2 = .09$) (see Table 6).

Table 6
Comparison of Pre-Intervention Scores Between Refugee and Non-Refugee Groups for Bright Thinking

Variable	<i>F</i>	<i>p</i>	Eta Squared
Resilience Doughnut			
Parent factor	4.97	.03*	.07
Skill factor	0.12	.74	.00
Family factor	0.42	.52	.01
Education factor	1.17	.28	.02
Peer factor	0.05	.83	.00
Community factor	0.56	.46	.01
Money factor	1.65	.20	.03
READ			
Personal competence	0.66	.42	.01
Social competence	0.84	.36	.01
Structured style	1.21	.28	.02
Social resources	0.18	.67	.00
Family cohesion	6.41	.01*	.09
SDQ			
Emotional problems	1.10	.30	.02
Conduct problems	0.28	.60	.00
Hyperactivity	0.97	.33	.02
Peer problems	0.79	.38	.01
Prosocial	1.25	.27	.02
Total difficulties	0.76	.39	.01

* $p < .05$.

Discussion

The second study was interested in examining how the Refugee and Centre groups exhibited different responses to the intervention programs. As the inquiry was an exploratory one, there were no a priori hypotheses to define our expectations. For the Connect-3 program, there were no significant differences between the two groups in terms of pre- to post-intervention changes. Meanwhile, the Linked-up program yielded significantly different outcomes for the two groups with regard to the changes in education and peer problems scores. Specifically, the Centre group displayed an increase in education scores and a decrease in peer problems scores, while the Refugee group exhibited the exact opposite outcomes. At face value, these results appear to suggest that the Linked-Up program privileges one group over another. That is, the Centre group, as characterised by lower adversities, is implied to derive greater benefits from the program than the Refugee group, as characterised by higher adversities. However, the two groups were found to differ significantly as a result of their opposing directions of change. This runs counter-intuitive to the general expectation for clinical interventions to facilitate positive change at maximum and lack of change at minimum. Thus, the apparent differences between the Refugee and Centre groups may not be attributable to the intervention itself, but a reflection of inconsistencies in responding over time or other confounding factors that occurred between the two time points of assessment. That is, the observed differences between the two groups may not pertain to our topic of interest. Unfortunately, the potential for history effects is a general limitation of any within-subjects analysis. Alternatively, the unexpected directions of change may truly implicate that the Linked-Up program has adverse effects on educational resources and peer problems for marginalised sociocultural groups. However, this is not a likely explanation

given that the Linked-up and Connect-3 programs follow the same content and structure, and no such results were found from the Connect-3 group. It is important to note that this study did not investigate whether the pre- to post-intervention changes were significant within each of the adversity groups. Directions of change were inferred from visual representations of the data, and does not confirm that these unexpected changes were meaningful.

In comparing the adversity groups for the Bright Thinking intervention, only the pre-intervention scores could be compared due to the absence of post-intervention data from the Refugee Group. Overall, the Centre group displayed higher family cohesion and parent factor scores compared to the Refugee group. However, these findings have no particular implications for the present inquiries. Future studies should compare the responses of Refugee and Centre groups to the Bright Thinking program once the post-intervention data becomes available.

Study 3

The third study was interested in comparing the efficacies of the Bright Thinking and Connect-3 programs, which targeted children of the same age group.

Method

A (2) x 2 Mixed ANOVA model was used to compare the changes in pre- and post-intervention scores between the Bright Thinking and Connect-3 programs.

Results

Results show that there was a significant difference between the Bright Thinking program and Connect-3 program in regards to the changes in total difficulties score ($F(1, 122) = 5.18, p =$

.03, $\eta^2 = .04$) (see Table 7). The mean scores decreased for both interventions, but to a greater extent for the Bright Thinking intervention (see Figure 5).

Table 7
Interactions between Time and Intervention (Bright Thinking and Connect 3)

Variable	<i>F</i>	<i>p</i>	Eta Squared
Resilience Doughnut			
Parent factor	0.90	.34	.01
Skill factor	3.22	.08	.02
Family factor	0.19	.66	.00
Education factor	2.14	.15	.02
Peer factor	1.23	.27	.01
Community factor	0.62	.43	.00
Money factor	1.56	.21	.01
READ			
Personal competence	0.69	.41	.01
Social competence	0.18	.68	.00
Structured style	0.02	.90	.00
Social resources	3.21	.08	.03
Family cohesion	2.52	.12	.02
SDQ			
Emotional problems	2.87	.09	.02
Conduct problems	1.69	.20	.01
Hyperactivity	1.97	.16	.02
Peer problems	1.16	.28	.01
Prosocial	0.03	.87	.00
Total difficulties	5.18	.03*	.04

* $p < .05$.

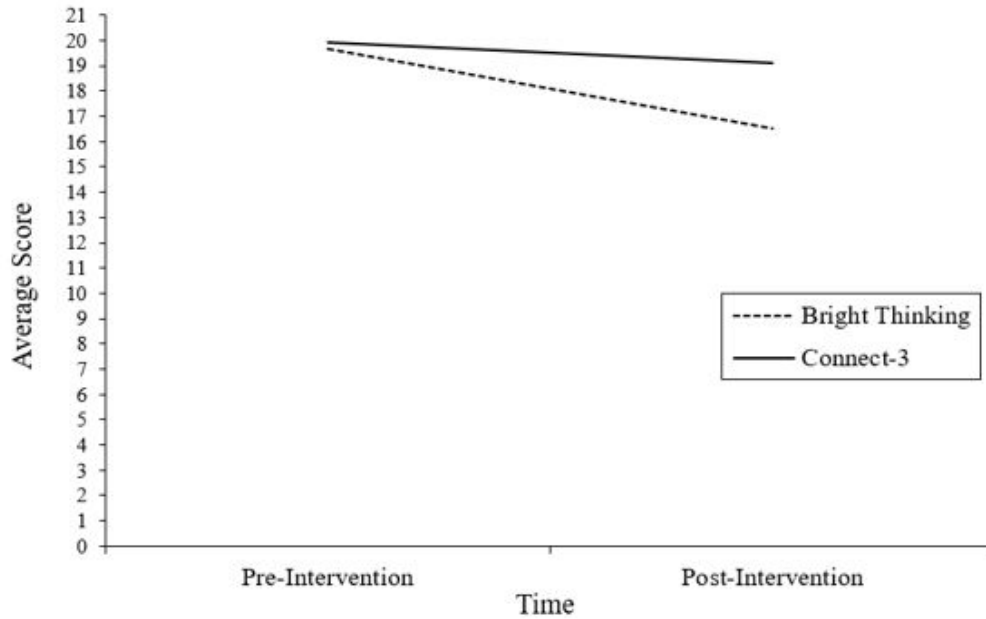


Figure 5: Total Difficulties Score by Time between Bright Thinking and Connect-3

Discussion

This study was interested in comparing the efficacy of two programs targeted at the same age group: the Bright Thinking and Connect-3 programs. Again, as the present study was the first to make such an examination, there were no a priori hypotheses guiding our expectations. The results inform us that the two programs do not differ significantly in terms of changes to one's resources and resilience. However, there were significant differences in regards to participants' overall adversities, with the Bright Thinking program yielding greater decreases in total difficulties scores compared to the Connect-3 program. This suggests that the two programs are similarly effective in facilitating the growth of positive qualities in children aged 8 to 12. However, the Bright Thinking intervention, with its primary focus on transitioning from a pessimistic to optimistic mindset, demonstrates greater efficacy in reducing negative challenges.

In tandem with past research that demonstrates an association between pessimistic thinking and various psychological difficulties (Chaplin, Gillham & Seligman., 2009), our findings suggest that a change in one's thinking style is integral to reducing one's difficulties.

One consideration for this study is that the Refugee group enrolled in the Bright Thinking program were missing on their post-intervention data, hence were omitted from the analyses of the study. This means that while the dataset for the Connect-3 program consisted of both Refugee and Centre groups, the dataset for the Bright Thinking program were solely comprised of the Centre group. Thus, the apparent differences between the two programs may pertain to systematic differences between the Refugee and Centre groups, such as socio-economic status as previously discussed. To control for these potentially confounding factors, future studies should be conducted when the post-intervention data for the Bright Thinking Refugee group becomes available.

Resources, Resilience and Adversities

Method

A correlation matrix for all subscales of the Resilience Doughnut Quiz, READ and SDQ was created using SPSS version 25 (IBM Corp, 2017).

Results

All factors of the Doughnut Quiz had significant positive correlations with all factors of the READ.

All factors of the Doughnut Quiz, excluding community and money factors, had significant negative correlations with the SDQ emotional problems factor. All factors of the Doughnut quiz, excluding parent and skill factors, had significant positive correlations with the

SDQ hyperactivity factor. Skill and family factors from the Doughnut quiz had significant positive correlations with the SDQ peer problems factor. All factors of the Doughnut quiz had significant positive correlations with the SDQ prosocial behaviours factor.

All of the READ factors had significant negative correlations with the SDQ emotional problems factor, and significant positive correlations with the SDQ prosocial behaviours and hyperactivity factor. Personal competence, social competence and structured style factors from the READ had significant positive correlations with the SDQ peer problems factor.

General Discussion

The overarching aim of the present study was to evaluate the effectiveness of three interventions based on The Resilience Doughnut Model (Worsley, 2006): Bright Thinking, Connect-3 and Linked-Up. The efficacy of the programs were assessed by measuring improvements in resource, resilience and adversity factors.

Study 1 made a general examination of the outcomes associated with each program. The expectation for resource and resilience to increase, and for adversity to simultaneously decrease, was partially met. All programs effectively alleviated the experience of emotional problems - as expected from a sample struggling with high levels of anxiety. The Bright Thinking and Connect-3 programs further facilitated the growth of several resource factors. The Connect-3 program alone led to substantial improvements in resilience factors. Overall, children enrolled in the Connect-3 program enjoyed the greatest range of therapeutic benefits, corresponding with the findings of Miller and colleagues (2016) which showed that the Connect-3 program led to greater improvements than the Linked-up program. Given that these two programs are only

Table 8
Correlation Matrix for the Resilience Doughnut and READ subscales

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1. Parent Factor	-																		
2. Skill Factor	.56**	-																	
3. Family Factor	.64**	.62**	-																
4. Education Factor	.52**	.65**	.56**	-															
5. Peer Factor	.37**	.53**	.51**	.61**	-														
6. Community Factor	.39**	.47**	.50**	.54**	.44**	-													
7. Money Factor	.48**	.53**	.48**	.47**	.38**	.46**	-												
8. Personal Competence	.33**	.63**	.45**	.49**	.40**	.40**	.46**	-											
9. Social Competence	.32**	.55**	.45**	.49**	.51**	.43**	.43**	.69**	-										
10. Structured Style	.40**	.58**	.47**	.42**	.35**	.39**	.53**	.71**	.61**	-									
11. Social Resources	.44**	.47**	.52**	.42**	.45**	.35**	.37**	.60**	.63**	.57**	-								
12. Family Cohesion	.58**	.49**	.61**	.50**	.40**	.47**	.44**	.63**	.61**	.62**	.70**	-							
13. Emotional Problems	-.16**	-.25**	-.14**	-.12**	-.10*	-.02	-.00	-.30**	-.16**	-.13**	-.16**	-.18**	-						
14. Conduct Problems	-.07	-.03	.07	.04	.05	.09	-.02	.07	.03	.08	.01	-.02	.44*	-					
15. Hyperactivity	-.01	.08	.14**	.11*	.13**	.11*	.13**	.14**	.16**	.17**	.15**	.12*	.37*	.39**	-				
16. Peer Problems	-.00	.11*	.11*	.08	.02	.05	.13**	.14**	.13**	.18**	.07	.00	.36*	.40**	.29**	-			
17. Prosocial Behaviour	.27**	.31**	.31**	.32**	.34**	.31**	.31**	.36**	.50**	.39**	.38**	.38**	.10*	.07	.22**	.24**	-		
18. Total Difficulties	-.10**	-.05	-.05	.02	.02	.07	.07	-.03	.03	.07	.00	-.05	.80**	.75	.68**	.66**	.20**	-	

* $p < .05$. ** $p < .01$.

differentiated based on age, perhaps the content of the programs work more effectively for younger children as opposed to older youth. In addition, both the current study and the study by Miller and colleagues (2016) found that the programs, excluding Connect-3, did not lead to significant changes across the full range of measured factors. This may imply that the programs are selectively effective at improving specific factors of resource, resilience and adversity. Other factors may require a different or more focused means of influence.

Study 2 investigated the differential effectiveness of the programs across refugee and non-refugee samples. The two samples represent two distinct sociocultural groups that vary in their levels of experienced adversity. Only the Linked-up program yielded different outcomes for the two groups, with the non-refugee group showing improvements and the refugee group showing declines in educational resource and peer problems. However, as discussed, the observed declines in the refugee sample may not be an effect of the intervention. Moreover, the two groups only exhibited differences on a small number of measured factors. At the current stage, it can only be tentatively suggested that the two sociocultural groups differ in their responses to intervention.

Study 3 investigated the effects of two resilience programs targeting the same age group: Bright Thinking and Connect-3. Whilst both programs were similarly effective in facilitating the growth of resource and resilience, the Bright Thinking program demonstrated greater efficacy in reducing the experience of adversities. As the Bright Thinking program focuses on the development of positive cognition, it is implicated that one's style of thinking is fundamental to the regulation of adversity experiences.

Relationship Between Resources, Resilience and Adversities

As expected, measures of resilience (READ) and resources (the Resilience Doughnut Quiz) were significantly correlated. Higher scores on resources were associated with higher scores on resilience. Consistent with previous findings (Miller et al., 2016), not all adversity factors (SDQ) were negatively correlated with resilience and resources. Only the emotional problems factor was negatively correlated with all measured factors of resilience and resource. The lack of negative correlations with the other factors of the SDQ may simply reflect the nature of our participants: that they represent an anxious population rather than one with an even spread of adversities.

Strengths

The current study makes some valuable contributions over and above the findings of previous research. It is the first to make an investigation of the Bright Thinking program, first to directly compare the efficacies of two resilience programs, and the first to consider the differential effectiveness of the programs across two sociocultural groups. Findings of the current study may be used to guide the expectations of future investigations, as well as to inform the potential refinements that can be made to the programs.

The data used in the current study were consistently collected over five years. This has clear benefits over utilising data from a single run of the programs, as group sizes for individual runs were kept relatively small. As a result, the dataset was fairly large and more representative of the population it was drawn from. This method of data collection will serve to benefit future studies, as the sample will only increase in size.

Another strength of the study relates back to the nature of the interventions themselves. The Bright Thinking, Connect-3 and Linked-up programs build on the assumption of resilience as a multi-faceted construct, encompassing a multitude of protective and risk factors. They support the use of a broad range of resources to facilitate the development of resilience. Hence, the programs effectively equip their clients to face the various adversities that emerge in life. At the same time, it should be considered in future investigations whether the focus on a range of resource and resilience domains is more effective than a specialised focus.

Limitations

Despite the many strengths, the current study is not without its set of limitations. The first limitation concerns its generalisability. Baseline measures of resource, resilience and adversity did not illustrate a highly problematic sample, as participants did not display grossly high levels of adversity nor demonstrated an outstanding lack of resource and resilience factors. The lack of significant improvements in many of the measured factors may be due to the participants not exhibiting severe problems in the first place. As such, the current findings may not be transferable to clinical populations that experience greater problems. Also, the majority of our participants enrolled into the resilience programs due to their experiences of anxiety as opposed to other difficulties. Thus, our sample may be more representative of an anxious population as opposed to a one that experiences a mix of adversities. This imposes further limitations to the generalisability of our findings.

The second limitation relates to the way in which this study makes generalisations about the refugee population. By dichotomising the refugee and non-refugee groups, it may connote that the refugee population is one homogeneous sociocultural group with identical expressions of

resilience. However, the refugee experience is far from uniform. There is immense diversity in their experiences that the current study does not capture by collectively referring to them as “the Refugee group”. Did they experience any traumatic events? Did they undergo mandatory detention? Do they actively bond with their ethnic community within the host nation, as a way of alleviating the cultural alienation they experience from migration? These are only some of the factors that have been shown to moderate the experience of adversity (Hutchinson & Dorsett, 2012; Murray et al., 2008). While the present study makes some valuable contributions to our understanding of the refugee experience, it is important that the diversity of this experience is not overlooked to avoid making any over-simplifications.

Thirdly, there is the potential presence of language barriers within the refugee sample. This may have undermined the efficacy of the interventions as well as the accuracy of assessment. It will be important to ensure that the assessment tools have been validated for use with various cultural groups.

Another limitation is that the interventions and the assessments were not administered in standardised settings. For the Centre group, the interventions were delivered in The Resilience Centre, a private clinic in Sydney. In contrast, the Refugee group partook in the programs administered school settings. In regards to assessment setting, participants had the option of completing the assessments at their homes or during a pre-screening session at the clinic. An array of environmental factors may have influenced the assessment responses. In particular, home environments are not as controlled or private as clinical settings, lending participants prone to distractibility.

Another limitation arises from the inherent problem of all within-subjects analyses: history effects. As the study utilised longitudinal data, its findings may have been subject to a range of temporal influences. This may include unexpected life events or sudden changes in participants resource availabilities. Differences between pre-intervention and post-intervention scores, or the lack thereof, may be attributed to such events as opposed to the intervention itself. Furthermore, while the data for the Centre group was collected over the last 5 years, data for the Refugee group was only collected over the last 2 years. Overtime, as the therapists became more accustomed to implementing the intervention procedures, the quality of the interventions may have slightly improved. In such a case, the Refugee group would have been subjected to improved delivery of the programs. The differences between the Refugee and Centre groups may have arisen from factors pertaining to the clinicians, not clients.

Finally, some demographic information on our participants were not available. This information is important in understanding the makeup of the group samples so as to gauge whether there could be potential systematic differences to consider. In respect to the current study, information on mean age and gender were missing. Although each intervention programs targeted a specific age range, the mean age of the investigated groups may have been substantially different if the groups were on relatively opposite ends of the age category. Gender imbalances are also of concern. While Miller and colleagues (2016) previously found that there were no significant differences between gender groups, excluding scores on personal competency, we still cannot disregard the possibility of gender effects having occurred in the current study.

Future Directions

Due to missing data from the Refugee group in the Bright Thinking intervention, analysis could not be run to determine whether there were differences between the Centre and Refugee group in regard to pre- to post-intervention changes. It is also important to note that the Refugee and Centre groups were not of equal sizes, with the refugee group forming a comparatively small sample. Future studies may continue exploring the same research questions as addressed in the current study, but with more balanced and larger sample sizes, and when both pre- and post-intervention data become available.

Future studies could also investigate the efficacy of the current programs against other programs based on different models of resilience. Although the interventions based on the Resilience Doughnut Model may be regarded as advantageous due to its broad focus on a variety of domains, it would be worthwhile to test this idea.

Another possible pathway for future studies is to include a control group in addition to the intervention groups. This would allow future studies to have broader clinical implications for the programs and eliminate temporal influences on factors of interest.

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