



Scale Development and Psychometric Qualities of The Resilience Doughnut Tool: A Valid, Solution Focused and Ecological Measure of Resilience with Australian Adolescents.

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Scale development and psychometric qualities of the Resilience Doughnut tool. A valid, Solution-Focused and ecological measure of resilience with Australian adolescents

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The Resilience Doughnut is an ecological and Solution-Focused model outlining the seven contexts where resilience skills can be developed. The premise of this study was to test the psychometric properties of the online resilience doughnut measurement tool. The analysis contains item analysis and confirmatory factor analysis. Each context was explored as a separate subtest. The results showed the model to be a good fit with Cronbach alpha coefficient between .63 and .87. Correlations were conducted with the subscales of the Strength and Difficulties (SDQ) questionnaire and The Resilience scale for Adolescents (READ) revealing that the stronger the resources (RD) the greater the levels of personal and social competence and the lower the emotional and behavioural difficulties experienced. Implications for further study are discussed noting the validity of enhancing existing strong social resources to develop resilience.

People who display resilience show they are in a process of sorting, prioritising and ordering their most helpful resources in order to activate recovery, sustain life or grow through trauma or adversity (Zautra, Arewasikporn & Davis, 2010). Furthermore, resilience research has shown that resource and process focused interventions are more successful in enhancing a young person's healthy development (Masten & Coatsworth, 1998). Resilience is also defined as a process, not a fixed state, so ideally interventions that enhance that process should use a Solution-Focused and strength approach (Masten & Wright, 2010).

Some of the key characteristics of a Solution-Focused approach as noted

by de Shazer and Berg (1997) are; using a miracle question to help a client and therapist to envisage their preferred future, scaling the process, complimenting on the strengths involved so far, and assigning homework or experiments that may activate these strengths (Durrant, 2016).

The Resilience Doughnut is a strength-based ecological model, which uses a Solution-Focused approach to activate existing strong resources in a person's life to help them towards their preferred future. As a dynamic conversational tool, the Resilience Doughnut model prompts questions that envisage the preferred future, highlights the strong resources and provides a platform to compliment how they have worked so far (Worsley, 2011, 2012). The resources are seen in the everyday ordinary relationships that exist at any point in time and can be activated by combining the strengths in a homework activity or experiment.

It is therefore of value for people, to accurately assess their own resources as an indication of the possible pathways for further personal development. A measure should preferably be based on either a definition or a theory, however there are very many different definitions of resilience and no common consensus. Thus basing a measure on a theory or a model would be the remaining option. The Resilience Doughnut model (Worsley, 2014a), originated in response to working with youth in a range of environments from clinical psychological practice, youth work, corrective services, and paediatric medicine and education facilities. It was observed that the most useful interventions (Domínguez & Arford, 2010; Riley & Masten, 2005; Steinhardt & Dolbier, 2008) took into account where and with whom the young person was more likely to develop the navigation and negotiation skills, in order to help them cope with their difficulties. From observation in clinical practice, it became clear that in order to help vulnerable young adults to develop resilience it may be more useful to measure the potential pathways and contexts where resilience can develop, than to quantify their resilience at any one time (Ben-Arieh, 2005; Burgin & Steck, 2009).

The Resilience Doughnut model was developed after examining research into the ecological and developmental assets, which build a child's healthy self-esteem and social competence that contribute to building resilience (Bronfenbrenner, 2005; Masten & Wright, 2010; Sharkey, You & Schnoebelen, 2008; Tol, Jordans, Reis & de Jong, 2009; Ungar & Liebenberg, 2009). The model has been helpful for future planning and programming with youth in a number of contexts (Worsley, 2014) and has the potential to influence policy development to effect positive changes in young people and as a strengthening tool against mental health difficulties.

Psychological Resilience

From previous research (Benard, 2004; Grotberg, 1995; McGraw, Moore, Fuller & Bates, 2008; M. Rutter, 2006; Ungar, Brown, Liebenberg, Cheung & Levine, 2008) it seems that there are three dynamics that help to define the process of resilience. Firstly there are internal or personal characteristics that enable a person to bounce back from adversity (Benard, 2004; Grotberg, 1995). Secondly there are external or environmental influences that contribute to the building of these internal assets or personal competencies (Fuller, McGraw & Goodyear, 1998; Ungar, 2008; Ungar & Lerner, 2008; Werner & Smith, 2001). Thirdly, the interaction of the internal characteristics with the external available resources, which hinder or enhance a resilience mindset ultimately affect an individual's reaction to adversity (Rutter, 2008).

The Resilience Doughnut model is a simple diagram of two circles, one inside the other, which conceptually represents the interaction of these internal characteristics and external contexts in developing resilience. The model is based on the definition that resilience is a process of continual development of personal competence while negotiating available resources in the face of adversity.



Figure 1. The Resilience Doughnut framework

The inner circle represents the internal individual characteristics and the outer circle represents the external contexts within which an individual develops. The external contexts are divided into seven sections, each of which has been shown in the research to contribute to building individual resilience. The interactional nature of the internal and external worlds of an individual is represented by the visual connection between the inner circles of the framework within the external circle. Thus, the two circles, an inner circle and an external circle divided into seven external contexts, represent the essence of the resilience doughnut model (see Figure 1).

The internal structure of the Resilience Doughnut

The inner circle of the framework, representing the internal characteristics of an individual showing resilience, give expression to a number of concepts, which repeatedly appear in research. These concepts contribute to raising self-esteem (Benard, 2004; Frydenberg, 2007; Grotberg, 1995; Werner E., 1992), self-efficacy (; Benard, 2004; H. W. Marsh, Martin & Hau, 2006), and an individual's awareness of their available resources (McDonald & Mair, 2010). In combination they contribute to resilience as noted by Grotberg's I have, I am and I can categories (1995). These categories are the basis of the internal individual concepts for the Resilience Doughnut, which interact with the external contexts.

The external structure of the Resilience Doughnut.

The outer circle of the framework, divided into seven sections, (Fry & Debats, 2010; Gilgun, Klein & Pranis, 2000; Windle & Woods, 2004) addresses research, which shows the environmental contexts where resilience can be hindered or developed. These seven contexts, are labelled parent, skill, family, education, peer, community and money. A number of research constructs make up each context with some common features between each context (Worsley, 2011).

Scale development process

The items in the Resilience Doughnut measure were initially generated from the research on each of the seven sections of external factors in the model (Table 1). This formed the preliminary Resilience Doughnut tool, which divided the external section into seven subtests with ten items within each subtest. The items were simple statements, beginning with "I have", "I am", or

“I can”, with a dichotomous response Yes or No (Worsley, 2011).

Parent	Discipline style and Decision-making, warmth/affection Monitoring/control/Independence Parent satisfaction and purpose Parent reliability and adaptability
Skill	Optimistic thinking, Success, achievement, persistence Organisation, self-discipline, confidence
Family	Connectedness, Traditions and events, Family networks Belonging and valued Tough times
Education	Belonging, Inclusive and respectful environment Teacher expectations, optimism, relationship School organisation and Extra activities, Engagement
Peer	Belonging Conflict Group identity Conformity, cooperation, selfcontrol and regulation
Community	Informal network, Local resources, neighbourhood Organised groups, religious youth, sport club
Money	Chores, Earning and spending money, Family work ethic

Table 1. External contexts of the Resilience doughnut framework with constructs that informed items in the preliminary resilience doughnut tool.

To review the items a small sample of young people (30 students, aged 12-15 years, 18 males and 12 females) who attended two state high schools in Sydney’s southern suburbs and 150 adults who had attended the Resilience Doughnut training workshops over an 18-month period (primarily teachers, school counsellors, case workers and youth-workers) were selected. Signed permission was sought from parents and guardians of the youth prior to the interviews.

Ten items for each of the seven subtests were generated initially based on the above empirical research and the students then tested each item. Stu-

dents were asked to fill out the questionnaire and give comments and items were revised in accordance with comments.

Each subtest was also tested with the sample of adults who worked with young people in various contexts as recommended by DeVellis (2003). Further modifications were made to the items, with particular consideration as to the helpfulness of a conversational tool around each of the contexts. These adult experts on adolescents, suggested multiple times that the positively worded items would help the adults and young people feel confident in discussing their strengths within each of the seven contexts. For this reason, negatively worded items were removed and the language used by the sample subjects replaced a number of negative items.

Based on the feedback from the young people and the expert adults, the dichotomous response format was changed to a Likert scale of six, giving a forced choice. The format adapted to the suggestions of the youth people and is as follows; 0 = xxx = no never, 1 = xx = almost never, 2 = x = not really, 3 = $\sqrt{}$ = sort of, 4 = $\sqrt{\sqrt{}}$ = sometimes, 5 = $\sqrt{\sqrt{\sqrt{}}}$ = yes always. Only the ticks and crosses were visible with the wording appearing when the pointer hovered over the area. The number allocated to the response was not visible to the students.

This continuum allowed for a wider range of responses and stimulated further discussion with subsequent representative samples. The scores were collated for each item and then divided by 5 giving a total score out of 10 for each subtest. These total scores were visible to the students.

Aim.

The present study explores the psychometric properties of the Resilience Doughnut (RD) scale in relation to reliability and indications of validity. To test the hypothesis that each factor represents external contextual factors they were treated as independent subtests and confirmatory factor analysis was undertaken to explore the measurement model of each of the subtests separately. It was hypothesised that each subtest would factorise according to the items representing the research constructs.

Correlation between each of the seven subtests from the RD and the Resilience Scale for Adolescents (READ) and the Strength and Difficulties Questionnaire (SDQ) was undertaken in order to explore indications of construct validity. It was hypothesised that the seven subtests would show positive significant correlation with the subscales of the READ measure and negative significant correlation with the difficulties subscales and a positive significant correlation with the prosocial subscale of the SDQ.

Method

Participants

In all, 867 adolescents were included from seven high schools in three states in Australia. There were 75% female and 25% male participants. Their mean age was 15.20 (SD=1.71). Each school sought permission from the participant's parents or guardians to be involved in the study. The seven schools were representative of a wide range of students from low to high socio economic status across three states in Australia. Two of the schools were for Catholic girls, (low fees), and a third one for boys (high fees) in middle class areas in Melbourne and Sydney. The other four schools comprised of one state boys high school (no fee) in Sydney, a coeducational school in a country town of NSW, a coeducational school in WA, (each from a low socio economic areas) and a private school in Sydney with high fees from a high socio economic area.

Measures

The Resilience Scale for Adolescents (READ), (Hjemdal, Friborg, Stiles, Martiussen & Rosenvinge, 2006; Soest, Mossige, Stefansen & Hjemdal, 2010) has 28 items with five subscales of personal ($\alpha = .76$) and social competence ($\alpha = .77$), structured style ($\alpha = .69$), awareness of social resources ($\alpha = .79$) and family cohesion ($\alpha = .89$). Higher scores indicate higher levels of resilience on the specific factors. The READ is a measure of protective factors associated with resilience that has shown good validity. Previous studies have shown the READ has a negative correlation with depressive and social anxiety symptoms, as well as the ability to predict depressive symptoms controlling for age, gender, stressful life events and levels of anxiety symptoms (Hjemdal, Aune, Reinjell, Stiles & Friborg, 2007; Hjemdal, Vogel, Solem, Hagen & Stiles, 2011). In another large study a moderate negative correlation was found with symptoms of emotional disorders and self-harm, and mild negative correlation with externalizing behaviour like para-suicide, alcohol intoxication, smoking, using illicit drugs violent behaviour and being exposed to bullying (von Soest, Mossing, Stefansen & Hjemdal, 2010).

The Strength & Difficulties Questionnaire (SDQ) (Goodman, 1997; Hawes & Dadds, 2004) has 33 items with five subscales: emotional symptoms ($\alpha = .66$), conduct problems ($\alpha = .66$), hyperactivity ($\alpha = .80$), peer difficulties ($\alpha = .59$), and pro-social behaviours ($\alpha = .70$). Higher scores indicate a higher presence of emotional, conduct, hyperactivity, and peer difficulties with the exception of pro-social behaviours where higher scores indicate presence of higher levels of positive characteristics. The SDQ has been used widely in Australia

and is regularly used as a pre-screening tool for students to determine behavioural or emotional difficulties. It has high discriminate validity and has cut-off points to classify subjects as normal, borderline or abnormal. The total difficulties score is determined by the sum of the scales excluding the prosocial scale. The prosocial scale assesses a child's resources, ability to relate well with peers and show care for others (Silva, Osorio & Loureiro, 2015).

The Resilience Doughnut tool (RD) (Worsley, 2014b) which has 70 items, divided into seven subtests titled parent, skill, family, education, peer, community and money.

Data analysis

The means and standard deviations as well as correlations were estimated using IBM SPSS 22.0. The confirmatory factor analyses was undertaken using Mplus 7.31 (Muthén & Muthén, 1998-2014). Because each of the subtests are separate tests relating to specific themes, each of the subtests were run independently in confirmatory factor analyses (CFA). The CFA was conducted with the asymptotically distribution free method to examine the overall fit of the measurement model; error terms in the items were allowed to correlate. The fit indices derived were the comparative fit index (CFI) and the incremental fit index (IFI), both with values $\geq .90$ being regarded as acceptable model fits. The root mean square error of approximation (RMSEA) values $\leq .05$ was considered a good model fit. Pearson correlations were calculated between the factor scores and measures of psychological distress.

Procedure

The three measures were completed on a purpose build computer program which enabled the results to be collated immediately. Students had access to the results of their Resilience Doughnut highlighting the three strongest factors. The time taken to complete the questionnaires was 20-30 minutes depending on the student's literacy level. The consistency with the instructions and delivery of the measures, as well as the student report of more honest responses to the questions was ensured using the on line format.

After receiving permission from parents, students were then sent log in details to complete the tests. Some of the schools used class time for the students to complete the tests while others required the students to complete the questionnaires at home.

De-identified data from each student was then immediately available for the researchers in order to run the statistical analysis.

Results

Confirmatory factor analysis

Participant included in the confirmatory factor analysis was 867. The results from the CFA are presented in Table 2. For the subtest, Parents, no changes were undertaken. CFI and TLI were within acceptable range. The RMSEA was slightly above the recommended limit but still within the acceptable range. For the subtest Skills the initial results were $\chi^2(35) = 142.99$, $p < .000$, CFI = .934, TLI = .899, RMSEA = .070, (CI = .059 - .082). Based on the modification indices, two items were deleted and then the fit indices were within the acceptable range. For the subtest Family, the fit indices were within the acceptable range with 10 items. For the subtest Education the initial results were $\chi^2(35) = 202.27$, $p < .000$, CFI = .910, TLI = .885, RMSEA = .074, (CI = .065 - .084). The modification indices indicated that one item could be deleted, and then the fit indices were within the acceptable range. For the subtest Peer the initial results were $\chi^2(35) = 148.66$, $p < .000$, CFI = .876, TLI = .840, RMSEA = .061, (CI = .051 - .072). The modification indices indicated that four items could be deleted, which yielded a results with fit indices within the acceptable range. For the subtest community the initial results were $\chi^2(35) = 269.82$, $p < .000$, CFI = .826, TLI = .776, RMSEA = .088, (CI = .078 - .098). Based on the modification indices, one item was deleted and the fit indices were within acceptable range. For the final subtest Money the initial results were $\chi^2(35) = 178.74$, $p < .0001$, CFI = .892, TLI = .861, RMSEA = .069, (CI = .059 - .079). Based on modification indications one item was deleted and the fit indices were within the acceptable range.

	No items	Alpha	Chi-square	CFI	TLI	RMSEA
RD parent	10	.87	167.40*	.937	.919	.066
RD skill	8	.82	71.43*	.958	.941	.054
RD family	10	.85	139.29*	.939	.921	.059
RD education	9	.84	110.42*	.944	.926	.060
RD peer	6	.63	21.47*	.963	.938	.040
RD community	9	.76	99.03*	.933	.911	.055
RD money	9	.79	107.13*	.926	.901	.059

* $p < .001$

Table 2: Confirmatory factor analyses with each of the subtests for the Resilience Doughnut, with the mean and standard deviation (N = 867).

Exploration of construct validity

Table 3 presents the correlations between the subtests of the Resilience Doughnut and READ total score as well as its five factors. The correlations were all positive and significant in the moderate to strong range. The highest correlation was between RD Parents and the READ Family cohesion. The lowest correlation was between RD Peer and READ Structured style. However, RD Education and READ Structured style correlated in the high range.

Subscales	Parent	Skill	Family	Education	Peer	Community	Money
READ personal competence	.41**	.51**	.32**	.50**	.23**	.41**	.39**
READ social competence	.30**	.42**	.31**	.38**	.32**	.40**	.27**
READ personal structure	.41**	.43**	.31**	.48**	.16**	.40**	.44**
READ family cohesion	.67**	.39**	.51**	.44**	.21**	.44**	.40**
READ social resources	.47**	.35**	.42**	.42**	.27**	.38**	.27**
READ total	.54**	.51**	.44**	.54**	.28**	.49**	.43**

**p<.001

Table 3: The correlations between the Resilience Doughnut subtests and the READ total and factor scores (N = 867).

Table 4 presents the correlations between the Resilience Doughnut subtests and the SDQ factor scores. All correlations were significant, and negative for the SDQ factor scores Emotional symptoms, Conduct problems, Hyperactivity and Peer problems and positive for the factor Pro-social. The exception was the non-significant correlation between Peer and Hyperactivity.

Table 5 presents four multiple hierarchical linear regression analyses with four of the SDQ factors as dependent variables. The results indicate that the subtests RD Parents, RD Skills and RD Education were unique predictors of SDQ Emotional symptoms and that they explained 13% of the variance. For SDQ Conduct disorder 16% of the variance was explained by the unique predictors were RD Parents, RD Education. For SDQ Hyperactivity 21% was explained, and the negative unique predictors were RD Education, RD Money, and RD Parents. However, RD Peer was a positive predictor indicating that the

higher adolescents score themselves on the resilience peer subtest the higher they score themselves on levels of hyperactivity. For SDQ Peer problems 9% of the variance was explained by the predictors. The negative significant predictors were RD Parents, RD Peers and RD Education. However, RD Money was a positive unique significant predictor of levels of SDQ peer problems.

Subscales	Parent	Skill	Family	Education	Peer	Community	Money
SDQ emotional symptoms	-.28**	-.30**	-.20**	-.30**	.14**	-.25**	-.20**
SDQ conduct problems	-.37**	-.17**	-.22**	-.32**	-.07*	-.20**	-.22**
SDQ hyperactivity	-.32**	-.28**	-.24**	-.40**	-.06	-.28**	-.33**
SDQ peer problems	-.23**	-.18**	-.16**	-.23**	-.19**	-.19**	-.08*
SDQ pro-social	.32**	.30**	.29**	.34**	.22**	.32**	.25**

*p<05 **p<.01

Table 4: The correlations between the Resilience Doughnut subtests and the SDQ factor scores (N = 867).

	SDQ emotion	SDQ conduct	SDQ hyper	SDQ peer
Step 1 R ²	.13***	.16***	.21***	.09***
RD parents	-3.31***	-6.73***	-2.27*	-3.63***
RD skill	-3.38***	1.15	-1.20	-.71
RD family	-.03	-.33	-.86	.26
RD education	-2.76**	-4.93***	-6.34***	-2.51*
RD peer	.17	1.86	3.83***	-3.29***
RD community	-.58	.74	-.51	-.90
RD money	-.54	-1.54	-4.92***	2.46*

*p<05 **p<.01 ***p<.001

Table 5: Multiple hierarchical linear regression analyses with the SDQ factors as dependent variables and the Resilience Doughnut subtests as predictors (N = 867).

Discussion

If personal resilience is the process of navigating and negotiating with social resources (RD) to increase personal and social competence (READ). It would therefore be the successful use of these resources, which would show a healthy coping response to adversity. That is, activating helpful resources (RD) would lead to a healthy response to difficulties rather than being overwhelmed by them (SDQ). Furthermore, working with the existing strong resources supports a solution focused approach of finding and doing more with what is working (Kelly, Bluestone-Miller, Mervis & Fuerst, 2012).

Since the Resilience Doughnut model represented the available resources in this study, the Resilience Doughnut tool needed to be assessed for validity and reliability before any correlations could be carried out. The results from the confirmatory factor analysis appeared to align with the theoretical concepts from the research on each of the seven contexts. Several items were deleted to achieve an acceptable fit as each of these items another referred to the same concept. One item was removed from the Community subscale as it did not add any value to the fit. The removal of 9 items therefore made the combined subscales 61 items for a confirmatory analysis showing an acceptable fit for the model. Internal consistency of the scales was then examined and provided evidence for an acceptable reliability of the scales for the sample with an Alpha coefficient between .63 and .87 for each of the factors. From these results it appears that the research constructs are well represented by the items. This result then enabled the second set of hypothesis of the model to be tested.

The first hypothesis suggests that a higher score in resource strengths as shown by the Resilience Doughnut would be associated with a higher score in personal and social competence as measured by the READ. The five subscales in the READ are; Personal competence (self-confidence, planning, hope, determination); Social resources (aware of supports and value of people); Social competence (communication and social skills); Family cohesion (positive family, supportive and common values); Personal structure (plan ahead and organization skills). The high correlation of each of the subscales of the READ and each of the contexts of the RD shows that strong positive connections in various contexts is related to stronger social and personal competence. Of interest was the separate subtest for parents and family in the RD. The items in the RD refer to specific characteristics of the relationship of the parents separate to other family members thereby giving a separate subtest. It would seem there is value of having a separate measure when there is high parental conflict or out of home care is in place allowing a measure to assess

the extended family cohesion. The high correlation of both RD parent and RD family with the READ family cohesion subscale confirms the validity of both these scales in measuring the positive family support available. The lowest correlation between RD peer and READ structured style, indicate that stronger peer relationships were not associated with stronger organizational skills, however the high correlation with the RD education and the READ structured style indicates a stronger connection with education was associated with stronger organizational skills. Thus from the correlations with the READ and the RD subtests it would seem that the hypotheses have been confirmed indicating that the higher the resource strengths, indicated by the RD subtests, the higher the level of personal and social competence experienced and vice versa.

The second hypothesis is that an increase in resource strengths would lead to lower difficulties experienced according to the SDQ. A significant negative correlation with the four difficulty subscales in the SDQ, with six of the seven contexts of the Resilience Doughnut was evident, again indicating that positive connections in various contexts are related to lower emotional and social problems and higher prosocial behaviours. The only subscale to not reach significance was the peer subscale with the hyperactivity subscale.

The subtest of hyperactivity is sensitive to inattentiveness and restlessness, which may not directly impact the relationship with peers. Of interest however is the strong correlation of hyperactivity with the RD education subscale which may indicate that symptoms of inattention and restlessness interfere with the youth's experience of education.

Further interesting findings were revealed in the multiple hierarchical analysis showing there were various subscales of the SDQ predicted by the RD subscales.

High RD Parent, Skills and Education factors were unique predictors of lower Emotional symptoms. High RD Parent and Education factors were unique predictors of lower conduct disorders, and high RD Education, Money and Parent factors were unique predictors of lower hyperactivity. The positive predictor of a high RD Peer factor with symptoms of hyperactivity is contrary to the correlation findings. However, with other factors taken into account the positive prediction may be explained by the distracting nature of friendships during adolescence with more friendships reported, the more distractible and restless a young person may be (Marsh, Allen, Ho, Porter & McFarland, 2006). Furthermore, some of the items for the RD peer factor refer to tensions experienced through conflict ("I have friends who say what they think and sometimes we fight"), and fitting in with the peer group ("I can change how I behave in my group so I can fit in"), which may lead to times of

inattentiveness and restlessness indicative of hyperactivity as measured by the SDQ.

Further analysis also showed that higher RD peer, parent and education subscales predicted lower RD peer problems, which again supported the hypothesis that the successful negotiation of resources led to social and personal competence. However, it was interesting to note that a high RD money subscale predicted higher RD peer problems. The RD money subscale refers to the management of money (“I can talk about how to save and spend money in my family”), earning through working (“I am earning money through doing extra chores or working”), spending (“I am happy with how I spend my money”), saving (“I can wait and save for things I would like to buy”) and attending to chores at home (“I am asked to contribute to chores around the house”). Of consideration, the youth in the sample who are in paid work (ages 15 years,) would be in the early stage of their paid working life and time away to work or do chores may interfere with social interaction with their peers.

Furthermore, the regression analysis shows that between two and four of the RD factors independently of each other, predict levels of emotional and behavioural symptoms. It has long been the hypothesis for the model (Worsley, 2012, 2015) that when three RD factors are strong and positive, the individual has greater levels of competence associated with resilience skills. This would suggest that the contexts are not independent dimensions of resilience. This study has not addressed the interactional nature of the external contexts on resilience thus further studies are recommended to test this hypothesis.

The results from this study enable a number of pathways of study to continue.

It would be of interest to examine the number and strength of the RD subscales which contribute to developing resilience. Understanding the number of protective contexts needed to develop resilience could lead to predictive and preemptive analysis giving rise to more tailored interventions in times of difficulties. Examination of each of the protective contexts and their relative strengths in developing resilience across cultures may show multiple pathways to resilience according to the available strengths in each culture. Studies as to the application of the model during the transitions of adult life stages (McDonald & Mair, 2010), such as parenting and aging may be useful in emphasizing the relative strengths needed to develop and maintain healthy functioning during these transitional stages.

Overall, the emphasis in the model of the interactions of intentional and positive relationships occurring in a number of different contexts, show that the person who is more connected is more resilient in the face of adversity. The studies on the merit of social capital (Bottrell, 2009; Cheung & Yue, 2013;

Parcel, Dufur & Zito, 2010; Sarracino, 2010) in coping with life are well supported by the Resilience Doughnut model. It might be advantageous to then use the Resilience Doughnut model to assess the strengths of social capital in mental health (McKenzie & Harpham, 2006), aging, trauma, natural disasters (Augustine, 2010; Pfefferbaum, Pfefferbaum & Norris, 2010; Terrion, 2006).

In conclusion it would seem that the Resilience Doughnut tool based on the model is a good fit representing the concepts from the literature and previous studies in resilience ecological factors. The linear hypotheses of higher resources leading to increased personal competence, and decreased emotional and social difficulties was well supported by this study of Australian youth. It would therefore be advantageous to explore this model in a number of contexts to determine the validity of the model across contexts and cultures, as well as ascertain the number and strength of the resources needed to build resilience at any one time.

References

- Augustine, J. (2010). *The effects of individual, family, and community factors on adult resilience: A study on the tsunami survivors of 12/26/2004*. Unpublished Ph.D. dissertation: University of Denver.
- Ben-Arieh, A. (2005). Where are the children? Children's role in measuring and monitoring their well-being. *Social Indicators Research*, 74(3), 573–596. doi: 10.1007/s11205-004-4645-6
- Benard, B. (2004). *Resiliency. What we have learned*. San Francisco: Wested.
- Bottrell, D. (2009). Dealing with disadvantage: Resilience and the social capital of young people's networks. *Youth & Society*, 40(4), 476–501. doi: 10.1177/0044118X08327518
- Bronfenbrenner, U. (2005). Strengthening family systems (1988). [References] *Making human beings human: Bioecological perspectives on human development* (pp. 260–273). Thousand Oaks, CA: Sage Publications Ltd.
- Burgin, D. & Steck, B. (2009). Evaluation of resilience — Factors in the diagnostic-therapeutic interview with children. *Schweizer Archiv für Neurologie und Psychiatrie*, 160(6), 257–264.
- Cheung, C. K. & Yue, X. D. (2013). Sustaining resilience through local connectedness among sojourn students. *Social Indicators Research*, 111(3), 785–800. doi: 10.1007/s11205-012-0034-8
- Domínguez, S. & Arford, T. (2010). It is all about who you know: Social capital and health in low-income communities. *Health Sociology Review*, 19(1), 114–129. doi: 10.5172/hesr.2010.19.1.114
- Durrant, M. (2016). Confessions of an unashamed Solution-Focused purist: What is (and isn't) Solution-Focused? *Journal of Solution-Focused Brief Therapy*, 2(1),

40–49.

- Fry, P. S. & Debats, D. L. (2010). Psychosocial resources as predictors of resilience and healthy longevity of older widows. [References] *New frontiers in resilient aging: Life-strengths and well-being in late life* (pp. 185–212). New York, NY: Cambridge University Press.
- Frydenberg, E. (2007). *The best of coping. Developing coping skills for adolescents. Facilitators guide*. ACER Press, South Melbourne.
- Fuller, McGraw, K. & Goodyear, M. (1998). *The mind of youth — Initial findings from the Resiliency Project*. Unpublished report for the Department of Education, Victoria. Department of Education. Melbourne.
- Gilgun, J. F., Klein, C. & Pranis, K. (2000). The significance of resources in models of risk. *Journal of Interpersonal Violence*, 15(6), 631–650. doi: 10.1177/088626000015006005
- Goodman, R. (1997). The Strength and Difficulties Questionnaire; A research note. *Journal of Child Psychology and Psychiatry*, 38, 581–586.
- Grotberg. (1995). *A guide to promoting resilience in children: Strengthening the human spirit. Early Childhood development: Practice and reflections*. Retrieved from <http://resilnet.uiuc.edu/library/grotb95b.html>
- Hawes, D. J. & Dadds, M. R. (2004). Australian data and psychometric properties of the Strengths and Difficulties Questionnaire. *Australian and New Zealand Journal of Psychiatry*, 38(8), 644–651. doi: 10.1111/j.1440-1614.2004.01427.x
- Hjemdal, O., Friborg, O., Stiles, T. C., Martinussen, M. & Rosenvinge, J. H. (2006). A new scale for adolescent resilience: Grasping the central protective resources behind healthy development. *Measurement and Evaluation in Counseling and Development*, 39, 8496.
- Kelly, M., Bluestone-Miller, R., Mervis, B. & Fuerst, R. (2012). The family and school partnership program: A framework for professional development. *Children & Schools*, 34, 249-252. doi: 10.1093/cs/cds031.
- Marsh, Allen, J. P., Ho, M., Porter, M. & McFarland, F. C. (2006). The changing nature of adolescent friendships longitudinal links with early adolescent ego development. *Journal of Early Adolescence*, 26(4), 414–431. doi: 10.1177/0272431606291942
- Marsh, H. W., Martin, A. J. & Hau, K. T. (2006). A multimethod perspective on self-concept research in educational psychology: A construct validity approach. In M. Eid & E. Diener (Eds.), *Handbook of multimethod measurement in psychology* (pp. 441–456). Washington, DC: American Psychological Association.
- Masten, A. S. & Coatsworth, J. (1998). The development of competence in favorable and unfavorable environments: Lessons from research on successful children. *American Psychologist*, 53(2), 205–220. doi: 10.1037/0003-066X.53.2.205
- Masten, A. S. & Wright, M. O. D. (2010). Resilience over the lifespan: Developmental perspectives on resistance, recovery, and transformation. [References] *Handbook of adult resilience* (pp. 213–237). New York, NY: Guilford Press.

- McDonald, S. & Mair, C. A. (2010). Social capital across the life course: Age and gendered patterns of network resources. *Sociological Forum*, 25(2), 335–359. doi: 10.1111/j.1573-7861.2010.01179.x
- McGraw, K., Moore, S., Fuller, A. & Bates, G. (2008). Family, peer and school connectedness in final year secondary school students. *Australian Psychologist*, 43(March), 27-37. doi: 10.1080/00050060701668637
- McKenzie, K. & Harpham, T. (2006). *Social capital and mental health*. London, England: Jessica Kingsley Publishers.
- Parcel, T. L., Dufur, M. J. & Zito, R. C. (2010). Capital at home and at school: A review and synthesis. *Journal of Marriage and Family*, 72(4), 828-846. doi: 10.1111/j.1741-3737.2010.00733.x
- Pfefferbaum, B., Pfefferbaum, R. L. & Norris, F. H. (2010). Community resilience and wellness for the children exposed to Hurricane Katrina . In R. P. Kilmer, V. Gil-Rivas, R. G. Tedeschi & L. G. Calhoun (Eds.), *Helping families and communities recover from disaster: Lessons learned from hurricane Katrina and its aftermath* (pp. 265–285). Washington, DC: American Psychological Association.
- Riley, J. R. & Masten, A. S. (2005). Resilience in context. In R. D. Peters, B. Leadbeater & R. J. McMahon (Eds.), *Resilience in children, families, and communities: Linking context to practice and policy* (pp. 13–25). New York, NY: Kluwer Academic/Plenum Publishers.
- Rutter, M. (2008). Multiple meanings of a developmental perspective on psychopathology. *Hellenic Journal of Psychology*, 5(3), 281–323.
- Rutter, M. (2006). The promotion of resilience in the face of adversity. . In A. Clarke-Stewart & J. Dunn (Eds.), *Families count: Effects on child and adolescent development* (pp. 26–52). New York: Cambridge University Press.
- Sarracino, F. (2010). Social capital and subjective well-being trends: Comparing 11 western European countries. *The Journal of Socio-Economics*, 39(4), 482–517. doi: 10.1016/j.socec.2009.10.010
- Sharkey, J. D., You, S. & Schnoebelen, K. (2008). Relations among school assets, individual resilience, and student engagement for youth grouped by level of family functioning. *Psychology in the Schools*, 45(5), 402–418. doi: 10.1002/pits.20305
- Silva, T. B., Osorio, F. L. & Loureiro, S. R. (2015). SDQ: discriminative validity and diagnostic potential. *Frontiers in Psychology*, 6, 811. doi: 10.3389/fpsyg.2015.00811
- Soest, T., Mossige, S., Stefansen, K. & Hjemdal, O. (2010). A validation study of the Resilience Scale for Adolescents (READ). *Journal of Psychopathology and Behavioral Assessment*, 32(2), 215–225. doi: 10.1007/s10862-009-9149-x
- Steinhardt, M. & Dolbier, C. (2008). Evaluation of a resilience intervention to enhance coping strategies and protective factors and decrease symptomatology. *Journal of American College Health*, 56(4), 445-453. doi: 10.3200/JACH.56.4.445-454
- Terrion, J. L. (2006). Building social capital in vulnerable families: Success markers of a school-based intervention program. *Youth & Society*, 38(2), 155–176. doi:

10.1177/0044118X05282765

- Tol, W. A., Jordans, M. D., Reis, R. & de Jong, J. (2009). Ecological resilience: Working with child-related psychosocial resources in war-affected communities. . In D. Brom, R. Pat-Horenczyk & J. D. Ford (Eds.), *Treating traumatized children: Risk, resilience and recovery* (pp. 164–182). New York, NY: Routledge/Taylor & Francis Group.
- Ungar, M. (2008). Resilience across cultures. *British Journal of Social Work, 38*(2), 218–235. doi: 10.1093/bjsw/bcl343
- Ungar, M., Brown, M., Liebenberg, L., Cheung, M. & Levine, K. (2008). Distinguishing differences in pathways to resilience among Canadian youth. *Canadian Journal of Community Mental Health, 27*(1), 1–13.
- Ungar, M. & Lerner, R. M. (2008). Introduction to a special issue of research in human development: Resilience and positive development across the life span: A view of the issues. *Research in Human Development, 5*(3), 135–138. doi: 10.1080/15427600802273961
- Ungar, M. & Liebenberg, L. (2009). Cross-cultural consultation leading to the development of a valid measure of youth resilience: The international resilience project. *Studia Psychologica, 51*(2-3), 259–268.
- Werner, E. E. & Smith, R. S. (2001). *Journeys from childhood to the midlife: Risk, resilience and recovery*. London: Cornell University Press.
- Werner, E. E. & Smith, R. S. (1992). *Overcoming the odds: High risk children from birth to adulthood*. Cornell University Press..
- Windle, G. & Woods, R. T. (2004). Variations in subjective wellbeing: the mediating role of a psychological resource. *Ageing and Society, 24*(4), 583-602. doi: 10.1017/s0144686x04002107
- Worsley, L. (2011). *The Resilience Doughnut. The secret of strong kids*. Sydney: Griffin Press.
- Worsley. (2012). *The Resilience Doughnut. The secret of strong adults*. Griffin Press.
- Worsley. (2014a). Building resilience in three Australian high schools, Using the Resilience Doughnut framework. In S. Prince-Embury & D. Saklofske (Eds.), *Resilience interventions for youth in diverse populations* (pp. 217–257). New York, Heidelberg: Springer.
- Worsley. (2014b). *The Resilience Doughnut. The Resilience Report*, Retrieved 2015, from <http://www.resiliencereport.com/>
- Worsley. (2015). The Resilience Doughnut; combining strengths to thrive. In M. C. P. S. Holden (Ed.), *Victim victorious: From fire to phoenix* (pp. 67–88). Bond University, Robina: Nova Science Publishers.
- Zautra, A. J., Arewasikporn, A. & Davis, M. C. (2010). Resilience: Promoting well-being through recovery, sustainability, and growth. *Research in Human Development, 7*(3), 221-238. doi: 10.1080/15427609.2010.504431

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