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Complete List of Authors:	Gartland, Deirdre; Murdoch Children's Research Institute, Intergenerational Health; The University of Melbourne, Pediatrics Riggs, Elisha; Murdoch Childrens Research Institute, Intergenerational Health; The University of Melbourne, Department of General Practice Giallo, Rebecca; Murdoch Childrens Research Institute, Intergenerational Health Glover, Karen; Murdoch Childrens Research Institute, Intergenerational Health; South Australian Health and Medical Research Institute Limited, Women and Kids theme Stowe, Mardi; Victorian Foundation for Survivors of Torture Mongta, Sharon; Djirra, Family Violence Weetra, Donna; South Australian Health and Medical Research Institute Limited, Women and Families Brown, Stephanie; Murdoch Children's Research Institute, Intergenerational Health; South Australian Health and Medical Research Institute Limited,
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Development of a multidimensional culturally and socially inclusive measure of factors that support child resilience: co-designed with Aboriginal and refugee background communities in Australia.

Dr D Gartland[1,2] (DPsych)

Dr E Riggs[1,3] (PhD)

Dr R Giallo[1,3] (PhD)

Ms K Glover[1,4] (MBA)

Ms M Stowe[5] (MSw)

Ms S Mongta[6] (BSw)

Ms Donna Weetra[4]

Prof SJ Brown[1, 2 ,3,4] (PhD)

and members of the Childhood Resilience Study Collaborative Group*

*(Professor Helen Herman, Professor Kelsey Hegarty, A/Professor Jane Yelland, Ms Amanda Mitchell, Ms Selena White, Ms Tanya Koolmatrie, Ms Sue Casey, Mr Josef Szwarc, A/Professor Georgie Paxton)

[1] Intergenerational Health Research Group, Murdoch Children's Research Institute, Parkville, Melbourne Australia.

[2] Department of Paediatrics, University of Melbourne, Melbourne, Australia

[3] Department of General Practice, University of Melbourne, Melbourne, Australia

[4] South Australian Health and Medical Research Institute, Adelaide, Australia

[5] Victorian Foundation for the Survivors of Torture, Melbourne, Australia

[6] Wadja Aboriginal Family Place, Royal Children's Hospital, Melbourne, Australia

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Corresponding Author: Dr Deirdre Gartland
Murdoch Children's Research Institute, 50 Flemington Rd, Parkville, Victoria, Australia 3056.
deirdre.gartland@mcri.edu.au
+61 03 9386 6618

Words:4418

Abstract (300)

Objective Develop a comprehensive and inclusive measure to assess child resilience factors, co-designed with Aboriginal and refugee background communities.

Design Community based participatory research methods used to develop and revise Child Resilience Questionnaire (parent/caregiver-, child-, school-report) based on a socio-ecological model of resilience. Pilot testing and validation of parent/caregiver report (CRQ-P/C) is the focus of this paper.

Setting Australia.

Participants Culturally and socially diverse parents/caregivers of children aged 5-12 years completed the CRQ-P/C for the pilot (n=489) and validation study (n=1114). Recruitment via hospital clinics, community networks (Aboriginal and bicultural researchers) and nested follow-up of participants in two prospective birth cohort studies.

Analysis Exploratory and confirmatory factor analyses conducted to assess the structure and construct validity of CRQ-P/C subscales. Cronbach's alpha used to assess internal consistency of subscales. Criterion validity assessed with the Strengths and Difficulties Questionnaire (SDQ) parent-report.

Results Conceptually developed CRQ comprised 169 items in 19 subscales across five socio-ecological domains (self, family, friends, school and community). Two rounds of psychometric revision and community consultations created a CRQ-P/C comprised of 43 items in 11 scales: self (positive self, positive future, managing emotions), family (connectedness, guidance, basic needs), school (teacher support, engagement, friends) and culture (connectedness, language). Excellent scale reliability (α=0.7-0.9), except *basic needs* scale (α=0.61) (where a highly endorsed item was retained for conceptual integrity). Criterion validity was supported: scales had low to moderate negative correlations with SDQ total difficulties score ($R_{s=}$ -0.2/-0.5. p<0.001); children with emotion/behavioural difficulties had lower CRQ-P/C scores (β=-14.5, 95%CI -17.5 to -11.6, adjusted for gender).

Conclusion The CRQ-P/C is a culturally and socially inclusive, multi-domain measure of factors supporting child resilience. It has good psychometric properties and will have broad applications in clinical, educational and research settings. The tool adds to the few culturally competent measure available to Aboriginal and refugee background communities.

Strengths and Limitations of this study: (Up to 5 short bullet points)

- Use of participatory methods and co-design processes to ensure content validity and a measure that is culturally and socially inclusive of diverse populations.
- Use of gold standard psychometric approaches, including confirmatory factor analysis to establish construct validity, and testing of criterion validity against the Strengths and Difficulties Questionnaire.
- While the families taking part represent a cross section of the Australian community, the measure may not work as well in other settings or communities not represented in our study.
- While we were able to assess criterion validity, the Strengths and Difficulties Questionnaire is not a gold standard measure of resilience as no such measure was available at the time of the study.

Children exposed to social adversity and trauma have higher risks of adverse behavioural, emotional, developmental, and physical health problems.(1-3) However, many children experiencing adversity have outcomes similar to peers who have not experienced the same level or type of adversity. Understanding what enables children to do well despite exposure to social adversity has been hampered by a lack of culturally and psychometrically validated measures.(4, 5)

Much resilience research has focused on identifying individuals or populations exposed to a specific adversity and using a measure of competence (e.g. academic or social) to identify individuals showing positive outcomes (6). These individuals are categorised as 'resilient'. Thus resilience is conceptualised as an 'outcome'. However, a growing number of studies look at resilience as the process by which positive or protective factors mediate a child's mental, academic, or social outcomes. (7-10) In an ecological-transactional model of resilience each level of the environment - the child surrounded by their family, community and societal factors - contains risk and protective factors.(11, 12) Resilience can be seen as the process of drawing on available internal resources or the environment to develop, maintain or recover developmental or health outcomes despite adversity.(13-15). As a lifelong process, resilience needs to be considered within the context of life course development, and across these socio-ecological domains.

Some communities, including First Nations and refugee communities, experience a significantly higher cumulative load of early life stress and adversity. This can be linked to the impacts of colonisation, persecution, experiences of war, social disadvantage and intergenerational trauma. Despite these experiences, many of these communities demonstrate resilience, (16-19) but are poorly represented in the existing child resilience literature - as demonstrated in a systematic review conducted as part of this study.(20) The few resilience measures currently available are almost universally adult or youth focused and developed without adequate consideration of cultural diversity. (21-24)

Middle childhood represents a neglected period in research and clinical work.(25) A number of disorders and psychopathologies such as depression, self-injury, substance use, and eating disorders commonly emerge in adolescence (26), but increasingly antecedents are being identified in childhood.(27, 28) Sandwiched between early childhood and adolescence, middle childhood represents a critical 'turning point' or transition, where appropriate intervention may significantly change a life course.(25, 29) Better evidence about factors supporting resilience in children experiencing adversity is essential to inform effective interventions

A review of resilience measures conducted in 2011 stressed the lack of measures for children under 12 years.(22). A more recent review identified few studies employing a psychometrically validated

measure of resilience. Of those using validated measures, the most commonly used were the Strengths and Difficulties Questionnaire (n=6) and the Child Behaviour Checklist (n=5), neither of which was designed to assess resilience. A systematic review of resilience factors associated with positive outcomes for adolescents in out-of-home care identified a greater number of resilience measures. The one study conducted with children (≤ 12 years) used the *Strengths Scale* of the *Child and Adolescent Needs and Strengths* measure to identify resilience factors. Seven of the remaining 16 studies included a standardised measure of resilience factors. Four measures were cited: Resilience Scale for Children and Adolescents (individual resilience factors only), the Child and Youth Resilience Measure (a multidomain brief measure developed and tested with adolescents and adults); the Adolescent Resilience Questionnaire (a multidomain adolescent measure), and the Resilience Scale (a multidomain adult measure). Finally, a measure developed to assess the social and emotional wellbeing of indigenous youth - Strong Souls – includes a resilience scale that addresses individual and social aspects of resilience.(30) None of these measures were developed with children, specifically children aged 5-12 years, nor do the measures address all domains in which resilience factors (and vulnerabilities) will exist. Greater scientific rigour and consistency in measurement tools is needed, particularly for children, including the development and validation of culturally and socially inclusive tools (22, 23, 31-33).

This paper describes the development of the Child Resilience Questionnaire (CRQ), a culturally and socially inclusive multidimensional measure of factors supporting resilient child outcomes. Community based participatory research methods and co-design with Aboriginal and refugee-background communities (34, 35) were employed to create a measure with high cultural acceptability, reliability, and effectiveness for use in a range of diverse contexts. A parent/caregiver, child and teacher report were developed. The objectives of this paper are to describe: 1) development of the CRQ conceptual scales and items; 2) initial pilot testing of the parent/carer version (CRQ-P/C) assessing the overall structure and performance of individual items and scales; and 3) results of psychometric testing of the revised CRQ-P/C, including assessment of construct validity, criterion validity with the Strengths and Difficulties Questionnaire, and internal consistency/reliability.

Method

The study was designed to develop an inclusive, multidimensional measure of resilience in children that was relevant to a range of contexts in which children may encounter adversity and show resilience. Two methodological approaches were used to ensure participation by families with diverse social and cultural backgrounds, adversity exposures and resilience factors. 1) the questionnaire was co-designed with Aboriginal and refugee background communities; and 2)

families were recruited from outpatient clinics in a large public tertiary hospital. Public hospitals provide free healthcare and the clinics are attended by large numbers of families every day, including urban and rural based families, with significant variation in economic, cultural and social backgrounds.

Throughout every stage of the study, the following processes were used to embed community consultation, engagement and co-design. The study was conducted in partnership with the Aboriginal Health Council of South Australia, an Aboriginal family support unit at the hospital, and the lead provider of refugee counselling services in Victoria. These partners were involved in the funding application and study design as recommended in community consultation guidelines.(36-38) Working groups involving academic and non-academic (partner) study investigators were established to co-design research processes. The Aboriginal working group involved Aboriginal researchers, Aboriginal and non-Aboriginal study investigators, and representatives of partner organisations. The refugee working group involved study investigators, representatives of partner organisations, staff from the hospital's Immigrant Health Centre, refugee advocates and bicultural researchers employed on the study. Aboriginal researchers or bicultural workers were employed to work with their communities and networks to advertise the study and recruit families. As a member of the community, they ensured that the recruitment, consent and questionnaire administration were conducted in ways that promoted cultural safety and trust, including speaking to families in their preferred language.

The three stages in the development of the CRQ-P/C will be discussed in turn: 1) generation of potential items and development of conceptual subscales; 2) pilot testing of draft items; and 3) refinement and validation of final CRQ-P/C.

1) Development of conceptual scales and items

The draft CRQ was developed based on an ecological-transactional model of resilience, with input sought from diverse population groups to ensure variation in the type and severity of adversity experienced and the individual, family, and community level resilience factors that would be identified. The recruitment and conduct of discussion groups have been described elsewhere (39). In brief, resilience factors were identified in a systematic review of existing literature (20) and in discussion groups with people working with higher risk families, and parents and children of diverse backgrounds. These factors were grouped by the first author into socio ecological domains (individual, family, friends, school, and community). Conceptual scales and items were co-designed and three versions were created; a parent/caregiver version (CRQ-P/C) for children aged 5-12 years; a self-report version for children aged 7-12 years (CRQ-C); and a school staff version for children

aged 5-12 years (CRQ-S). All development processes involved iterative consultation and community engagement as described above. While space limits this paper to describing the CRQ-P/C, publication of the CRQ-C and CRQ-S will follow.

Pilot study to test draft CRQ-P/C

Parents/caregivers of children aged 5-12 years from diverse backgrounds were recruited from four sources from June-December 2016.

1) Aboriginal families were recruited via the community networks of Aboriginal investigators and researchers based in South Australia. Parents/caregivers of Aboriginal children were invited to complete the draft CRQ-P/C on paper.

2) The draft CRQ-P/C was included in a pilot follow-up questionnaire completed by mothers/carers of Aboriginal children aged 5-7 years in the Aboriginal Families Study, a community-based birth cohort of 344 Aboriginal families recruited in South Australia

3) Families of refugee-background were recruited via community networks of bicultural researchers in four diverse communities: Assyrian Chaldean (from Iraq and Syria), Karen (from Burma); Tamil (from Sri Lanka) and Sierra Leone families (from Sierra Leone). Families completed the CRQ-P/C on paper in English, Karen, Arabic with assistance from the bicultural researcher as needed.

4) Representing the 'general' population, urban and rural families from diverse economic, cultural and social backgrounds were recruited in specialist outpatient clinics at a large tertiary children's hospital. Families in the waiting areas were invited to complete the CRQ-P/C on paper while waiting for their child's appointment.

Validation study

As above, parents/caregivers of children aged 5-12 years from diverse backgrounds were recruited between September 2017 - March 2020:

1) Aboriginal families were recruited via community networks of Aboriginal investigators and researchers and completed the CRQ-P/C on iPad or paper. The CRQ-P/C was completed by mothers/caregivers of study children participating in the Aboriginal Families Study.

2) Refugee-background families were recruited via the community networks of the bicultural workers in four diverse communities: Assyrian Chaldean (from Iraq and Syria), Hazara (from Afghanistan), Karen (from Burma and Thailand); Sierra Leone families (from Sierra Leone).. Parents/carers completed the CRQ-P/C on iPad or paper in English, Karen, Arabic or Dari as preferred.

3) Representing the 'general' population, urban and rural based families with diverse economic, cultural and social backgrounds were recruited in the specialist clinics of a tertiary children's hospital. Parents/carers were randomised to complete the CRQ-P/C on iPad or paper.

4) A population sample of families were recruited via a pregnancy cohort study of 1507 first time mothers, followed up over 10 years (Maternal Health Study). Child exposure to intimate partner violence has been investigated in this cohort. Mothers were invited to complete the CRQ-P/C using an online REDCap database.

Measures

Child Resilience Questionnaire

The CRQ-P/C comprises multiple scales across the individual, family, school and community domains. Figure 1 provides an outline of the domains, subscales and example items in the draft CRQ-P/C, pilot and final CRQ-P/C. The conceptually developed draft CRQ-P/C was over inclusive for testing purposes, with 169 items in 19 subscales.

Parents/carers were asked "How often are the following true for your child?", with response options 0 "Not at all, 1 "Not often", 2 "Sometimes", 3 "Most of the time" 4 "All of the time". To support respondents with limited literacy and/or familiarity with research questions, response options were accompanied by a pictogram of a glass that was empty ('Not at all") through to a full glass ("All of the time"). The CRQ-P/C was available in English, Arabic, Karen, and Dari. Translations were conducted by accredited translators. The translated versions were assessed by study bicultural workers and revised to ensure words and language style were appropriate for the local community involved.

Strengths and Difficulties Questionnaire (SDQ)

As the most common measure of child resilience at the time of the study, the SDQ was included to test criterion validity. The measure comprises 25 statements on a 3-point scale (0=Not True to 2=Certainly True) assessing emotional and behavioural difficulties. Six subscales assess emotional symptoms, conduct problems, hyperactivity and inattention, peer problems, and prosocial behaviours. The Total Difficulties score is calculated based on the first five subscales, with higher scores indicating more difficulties. A pre-defined cut-off score of ≥14 was used to classify children scoring in the clinical range based on Australian norms.(40, 41)

Analysis

Analyses of data collected in the pilot study and validation study was conducted iteratively. Descriptive statistics were used to summarise characteristics of the children (subject) and the parents/carers (respondent) completing the questionnaire.

Pilot study

The distribution of item responses and missing data were examined. Items were removed if they had limited response sets, were highly skewed, or had a high proportion of missing data. Exploratory factor analyses (EFA) using maximum likelihood and varimax rotation in SPSS was then used to examine the factor structure within each domain.(42) Determination of the number of factors and items to retain was guided: by eigenvalues>1 (Kaiser's rule), scree plot, variance explained by the model, pattern of factor loadings, interpretability of the scale, and the conceptual underpinning of the scales.(43, 44)

Validation study

The revised CRQ-P/C was employed in the validation study. Confirmatory Factor Analyses (CFA) were conducted using MPlus with robust maximum likelihood estimation on the covariance structures on the scales within each domain. The adequacy of the models was assessed using goodness-of-fit Chi Square (χ^2), and practical fit indices including the Comparative Fit Index, Goodness-of-Fit index (GFI) and Adjusted Goodness-of-Fit index (AGFI) with estimates of 0.90 or above indicating acceptable model fit.(45) The Root Mean Square Error of Approximation (RMSEA) with values close to or below 0.05 within the 90% confidence interval also indicated good model fit.(44) Standardised factor loadings, standardised residual covariances and modification indices were examined to identify model misfit. All modifications were theoretically driven based on the relevance of items to the scale and degree of redundancy.(42-44)

Internal scale consistency was examined using Cronbach Alpha, with 0.7-0.9 deemed good to excellent.(46, 47). Finally, criterion validity of the CRQ-P/C was assessed by examining the Pearsons' rank correlation between CRQ scale scores and SDQ total score.(42, 43, 47).

Results

Participants

The recruitment sources and social characteristics of the children (subject) and their parents/carers (respondents) are outlined in Table 1 for the pilot and validation studies. The majority of children were Australian born, with a mean age of 9.7 (SD 1.6) in the pilot and 9.1 (SD 2.3) in the validation study, with slightly more boys than girls (52.8% compared to 47.2% in the validation sample). Targeted recruitment in the pilot and validation studies was successful in engaging a significant proportion of Aboriginal and/or Torres Strait Islander families (13.7 and 22.3 respectively) and refugee-background families (17.6 and 10.0% respectively).

Pilot Study - Testing of items and CRQ-P/C structure

The conceptually developed draft CRQ-P/C comprised 19 scales and 169 items. Examination of item distributions, missing values and participant feedback guided the exclusion of 74 items (self-domain–15; school-17, family-41; community-1). A very brief description of the factor analyses is provided below, with comprehensive details prioritised for the validation study. (Factor solutions, item loadings and a record of decisions are detailed in Supplementary Table 1).

Self: A seven-factor solution was identified explaining 54.8% of the variance in scores. A four-factor solution was retained based on criteria described above. The factors reflected *Positive self*, *Positive Future*, *Managing emotions/problems (positive)* and *Managing emotions (negative)* (see Figure 1). A number of items were removed due to low communalities or low/multiple factor loadings. Given the conceptual overlap, the three-item factor *Managing emotions (negative)* was dropped and a three-factor solution was accepted for validation.

Family: A six-factor solution was identified explaining 54.5% of the variance in scores. Four of the six conceptually developed scales were accepted for validation *Connectedness, Guidance*, *Basic needs* and *Friends*. Three items were dropped for loading on multiple factors. Two items in the *Connectedness* scale also loaded on the *Basic needs factor* (I listen to my child, I am close to my child). These items were retained as seen as conceptually important in consultations. The *Friends* scale had only two items loading at >0.4 and was revised for validation.

School: A six-factor solution was identified explaining 59.1% of the variance in scores, with the first three factors retained reflecting *Belonging, Engagement, Teacher support* scales. One item identified as ambiguous/difficult to answer by respondents was deleted, and two items with low factor loadings were dropped.

Community: A six-factor structure was identified explaining 61.4% of the variance. Three scales were retained - *Connection to culture, Religion and Spiritualty* and *Community*) (see Figure 1). Five items were deleted due to low loadings and/or conceptual overlap. In consultations, it was agreed that *Connection to culture* and *Community* scales also overlapped conceptually. *Connection to culture* was retained as more congruent with the resilience literature, while *Community* appeared to be more related to what could be considered socio-economic factors (e.g. having green spaces, feeling safe in your community). Other changes made in this domain are described below.

Consultation driven revisions: Working group, community and investigator consultations on the face and content validity of the revised CRQ resulted in three further alterations:

1) The community/culture domain was developed to capture resilience factors that were broadly relevant - not limited to overseas born or Aboriginal families. However many respondents indicated they ‘didn’t have a culture’ and skipped the section (mean missing data was 7.0 (SD=11.4) compared

to 3.9 (SD=10.1) in self-domain or 5.1 (SD=11.6) in the school domain). A preamble was added asking respondents to tick a list of factors important to their family that reflected a diverse interpretation of culture (e.g. the food you eat, family celebrations, family traditions, religion). It was hoped this would highlight the broad relevance of the section and encourage completion.

2) Language as a connection to culture was identified as a gap in the revised CRQ in consultations. Therefore, two new language scales (*Opportunity to learn*, *Connectedness)* were created for multilingual families through iterative consultations (See Figure 1).

3) Peer relationships are known to be associated with resilience, (20) but the two scales addressing them (*Friends* and *School Belonging)* did not form strong scales. These scales were revised and expanded through an iterative process of consultation and included in the school domain (See Figure 1).

Validation study

The revised CRQ-P/C comprised 81 items in 15 subscales (see Figure 1). Scale items, item descriptives (mean, standard deviation, skewness and kurtosis), initial and final confirmatory factor model fit and loadings are provided in Table 2 (self and family domains) and Table 3 (school and community domains). Actions taken to improve model fit in confirmatory factor analyses (CFA) are described below.

Self: The CFA for *Positive Future* was a good fit to the data, and all four items retained. The one factor congeneric *Self-Identity* model did not have good fit. This improved with removal of item 1 (poor response distribution). The CFA for *Managing Emotions* showed poor fit to the data. Sequential removal of three items with lowest factor loadings and/or conceptual overlap with other items resulted in a three-item subscale. The factor loadings for the remaining items were excellent (model fit indices not available for three item models).

Family: The one factor congeneric model for *Connectedness* was a poor fit to the data. There was also redundancy between items. Item 2 was dropped as it had the lowest factor loading. Model fit was improved and the remaining items had excellent factor loadings. In the *Basic Needs* scale, the item “My child feels safe at our home” was retained for conceptual integrity despite being endorsed by most respondents (poor distribution). Item 1 and 3 were very highly endorsed and overlapped conceptually with other items. Dropping these two items resulted in good model fit. Finally, the one factor congeneric model *Guidance* showed poor model fit indices. Item 3 was removed due to the low factor loading and potential variation and ambiguity in wording around what is right and wrong across families. The factor loadings for the remaining items were excellent.

School: The one factor congeneric models for *Teacher support* and *Engagement* had inadequate fit indices, and the items with the lowest factor loadings were dropped sequentially to achieve good fit indices. The one factor congeneric models for the Belonging and Friends scales did not fit the data. Three and four factor CFA models were tested for this domain. The Teacher support and School engagement factors were consistent in both models, but the Belonging and Friends items were mixed. With compatibility between the two concepts, the decision was made to test a one factor congeneric model with the Belonging and Friends items combined, retaining items that loaded on the 3-factor model. Eight items were retained but the model had very poor fit to the data. Sequential removal of the worst performing seven items did not achieve good model fit, however the factor loadings for the remaining three items from the *Friends* scale were excellent (≥0.75) and this scale was retained.

Culture: The added preamble to the culture section appeared to work well, with fewer missing items (mean =1.3, SD=3.7). One item in the connectedness scale was identified in community consultations as having poor face validity and was dropped (Our family culture makes my child feel special). The one factor congeneric *Connectedness* scale model showed poor model fit. Two items with the lowest factor loadings were removed. There was also redundancy between items 3 and 4. Item 3 was retained as it was more concisely worded. Good model fit was achieved.

The items in the *Spirituality* scale had the highest level of missing data (≈10%). One item with poor distribution was dropped. The one factor congeneric model of the remaining items showed very poor fit. Sequentially dropping three items with the lowest loadings or conceptual overlap was insufficient to achieve acceptable model fit. The three-item factor had poor face validity and was dropped.

An EFA was conducted to assess the underlying factor structure for the two new language scales. Scree plot and eigenvalues supported a one factor structure, explaining 21% of the variance, comprising six of the eight *Connectedness* scale items. A one factor congeneric model of the six items showed poor model fit. Dropping item 3 (lowest factor loading), followed by item 5 (overlapped conceptually with item 6) resulted in good model fit indices and excellent item factor loadings.

The final CRQ-P/C

The scale summary statistics and scale reliability are shown in Table 4. With the exception of the *Basic Needs* scale in the family domain (Cronbach's α = 0.61), the final scales showed excellent internal consistency (Cronbach's α=0.73 to 0.88), with high internal consistency for the questionnaire as a whole (Cronbach's α=0.93).

Spearman's rank correlations between the CRQ-P/C scales are presented in Table 5. Generally, correlations between the subscales were moderate and in the expected direction. Scales within the same domain tended to be more highly correlated with each other than with scales in other domains. A strong correlation was observed between the *Positive Self* and *Positive Future* scales (r_s=0.66, p<0.001). As could be expected, the Culture *Language* subscale showed the lowest correlations with other scales, the highest correlation with the Culture *Connectedness* scale (r_s=0.23, p<0.001), and was negatively correlated with the *Family Basic Needs* scale.

Parents/caregivers rated girls higher on average than boys on five subscales: *Positive self, Managing Emotions*, *Family Connectedness, School Engagement* and *Friends* (see Table 4). Overall, the CRQ-P/C mean total score (excluding the *Culture - Language* scale) for boys was lower than for girls (t_{839}=3.0, p=0.003).

Criterion Validity

Criterion validity of the CRQ-P/C was assessed using the Strengths and Difficulties Questionnaire (SDQ). All CRQ-P/C scales showed low to moderate negative correlations with the SDQ total difficulties score. As would be expected given the content of the SDQ, the *Emotion Regulation* and *Friends* scales were the most highly correlated (r_s=-0.53 and r_s=-0.45 respectively). The total CRQ-P/C score was moderately negatively correlated with the SDQ total difficulties score (r_s=-0.47).

Almost one in five children (18.4%) were identified as having clinically significantly symptoms on the SDQ (total difficulties score ≥14). The mean CRQ-P/C total resilience score for children identified as having emotional and/or behavioral difficulties was lower than for children without difficulties (mean=103.4, SD=18.7 and 119.3, SD=15.5 respectively). Linear regression analysis identified children with difficulties scored lower on average on the CRQ-P/C by 14 points (β=-14.5, 95%CI -17.5 to -11.6, p<0.001), after adjusting for child gender.

Discussion

Extensive community based participatory research methods ensured the Child Resilience Questionnaire has good content validity and addresses a broad range of factors that can support child resilience across diverse contexts. The pilot testing and validation involved large samples, with targeted recruitment of families from diverse backgrounds, including families known to experience greater social disadvantage, adversity and resilience.(48, 49) The final CRQ-P/C comprises 10 scales across the domains of self, family, school and culture, with 43 items in total. Good psychometric properties were attained. Subscale internal consistency reliability was excellent apart from the family *Basic needs* scale, which was adequate. Construct validity was supported, with all scales

showing moderate negative correlation with the SDQ total difficulties score, and significantly lower mean resilience scores for children identified as having emotional and/or behavioral difficulties.

Several aspects of the CRQ-P/C are important for note. Two scales in the Self-domain - *Positive self* and *Positive future* - were strongly correlated (r_s=0.66). Further research is required to determine if it is sufficient to retain just one of these scales. 2) The family *Basic needs* scale showed only adequate internal consistency reliability (0.61), and almost a third of children (31%) were scored at the top of the scale range. Community consultations stressed that meeting basic family needs is a key factor underpinning child resilience. The scale addresses feeling safe at home, having routines, feeling special in your family, and having your own space in the place where you live. Despite very high positive endorsement, the item "I feel safe in my family" was retained for conceptual integrity. Children who are scored lower in this domain may be a particularly vulnerable group, with further research required to corroborate this. 3) The importance of cultural factors for resilient outcomes is not new.(19, 20, 50-52) What is new is the assessment of *connectedness* to culture and *language* as a connection to culture/community. Efforts were also made to assess potential strengths associated with a child's connection to religious and/or faith communities/institutions. Religion/spirituality was identified as potentially supporting child resilience in consultations, with mixed findings in the literature focused on adolescents or adults.(20) The spirituality/religion scale was unsuccessful. A high proportion of respondents skipped these items, or alternatively, responded with strong positive or negative endorsement of all items. It may be too disparate a factor to capture in a single scale, or a more distal factor for children than for adolescents or adults. Finally, the friends scale was not strongly consistent across the revisions but showed excellent scale reliability with three items. While friendships in middle childhood have been highlighted as developmentally important (25) and associated with positive self-worth and school engagement (53), most investigation in terms of resilience has been with adolescents.(54-56) Availability of the multidomain Child Resilience Questionnaire will facilitate investigation of the importance of specific resilience factors, such as friends, in different contexts (e.g. Aboriginal families) or adversities (e.g. family violence exposure) to advance our understanding of child resilience and how to support positive outcomes in the face of adversity.

Strengths of our study include use of: participatory methods and co-design processes to ensure content validity and cultural acceptability; and gold standard psychometric approaches, including confirmatory factor analysis to establish construct validity; and testing of criterion validity against the SDQ.(23). In addition, we recruited culturally diverse participants and employed a range of approaches to community consultation and co-design to ensure cultural validity of the CRQ-P/C. While our study has many strengths compared to previous research, there are important limitations

to note. Our focus was children aged 5-12, and the measure may not be appropriate for use outside this age range. While the families taking part represent a cross-section of the Australian community, the measure may not work as well in other settings, or in communities not represented in our study, for example First Nation populations in other countries or refugee background communities not included in the development of the questionnaire. While we were able to assess criterion validity using the SDQ as a proxy measure of resilience, this is not a measure of resilience. No such measure existed at the time of the study. Further assessment against new resilience measures will enable more rigorous assessment. It was beyond the scope of this paper to report on the child report CRQ (CRQ-C) against the CRQ-P/C, but this is underway. Assessment of test-retest reliability and the psychometric properties of the CRQ-P/C in different populations, child ages and contexts are also planned.

Conclusion

Resilience was originally seen as a static characteristic of an individual – unique heroic figures achieving remarkable things despite tragic childhoods. It is now better conceptualized as a more 'ordinary magic'.(13) A dynamic process of drawing on internal and external resources to adapt, recover or thrive despite adverse experiences. Thus children who have access to resilience factors within themselves, and in their family, school and community will fare better in the face of adversity, than children who are not similarly resourced. The CRQ-P/C is the first culturally and socially inclusive, multi-domain measure of child resilience that reflects this paradigm shift. The measure will facilitate investigation of a child's strengths or vulnerabilities across different aspects of their socio-ecological world. Availability of the first developmentally appropriate child measure with demonstrated content, construct validity, reliability and criterion validity will facilitate understanding of resilience across settings, contexts, adversities, and countries.

Socially inclusive and culturally appropriate research methods and tools are fundamental to creating the evidence needed to guide interventions to support child resilience across diverse contexts and settings. This tool expands the extremely limited number of culturally inclusive measures available for use with Aboriginal and refugee background children.

The CRQ-C/P will support more complex and nuanced examinations of child resilience, with wide ranging applications including in: clinical settings for starting conversations with families about a child's strengths and potential vulnerabilities; evaluation of programs aimed at building child resilience; and finally, in child resilience research.

Author contributions: DG ER RG KG SJB conceptualized the study; DG ER RG KG DW MS SM SJB and the CRS collaborative group co-designed this study. DG, ER DW, SM, facilitated discussion groups and undertook data collection for the discussion groups, pilot study and/or validation study; DG, RG conducted the analyses for this paper; DG ER RG KG DW MS SM SJB and CRS collaborative group interpretated the data; DG drafted the paper. All authors critically revised the paper, approved the manuscript to be published and are accountable for the accuracy and integrity of the work.

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Data availability: No additional data available

Public involvement: This study grew from community consultations being conducted in Aboriginal communities in rural, regional and remote South Australia. Community members wanted to better understand why some children and families were doing well, while others in similar situations were not doing so well. Representatives from the public were consulted at each stage, for example, the study recruitment and conduct of the study were guided by an Aboriginal Advisory Group, an Aboriginal Working Group and a refugee background working group, each of which included community members. Community Aboriginal staff and bicultural workers were employed to guide and conduct the research and consult on the findings at each stage. Authors on this paper include representatives from all of these groups (with the exception of our bicultural workers).

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Table 1 Description of recruitment and participants

	Pilot Study n (%)	Validation study n (%)
Respondents		
Recruitment source		
Hospital Specialist Clinics	339 (69.3)	499 (44.8)
Refugee background communities	86 (17.6)	111 (10.0)
Aboriginal communities	18 (3.7)	71 (6.4)
Aboriginal Mother-Child cohort	46 (9.4)	165 (14.8)
General population Mother-Child cohort		268 (24.1)
Questionnaire format		
Paper	489 (100)	271 (24.3)
iPad		588 (52.8)
Online (REDCap)		255 (22.9)
Self-reported gender		
Female	391 (81.6)	938 (84.7)
Male	88 (18.4)	170 (15.3)
Continent of birth		
Australia	330 (69.0)	807 (72.7)
Asia	97 (20.3)	199 (17.9)
Europe	22 (4.6)	54 (4.9)
Africa	25 (5.2)	35 (3.2)
North America	2 (0.4)	9 (0.8)
South America	2 (0.4)	6 (0.5)
CRQ-P/C Target child		
Australian born		
Yes	244 (76.5)	988 (89.2)
No	75 (23.5)	120 (10.8)
Child gender		
Female		439 (47.2)
Male		491 (52.8)
Age *Mean (SD)*	*9.7 (1.6)*	*9.1 (2.3)*
5-6 years	6 (1.8)	230 (20.8)
7-8 years	86 (25.2)	225 (20.3)
9-10 years	132 (38.7)	240 (21.7)
11-12 years	111 (32.6)	410 (37)
13 years	6 (1.8)	3 (0.3)
Aboriginal &/or Torres Strait Islander	67 (13.7)	247 (22.3)
Community (refugee background families)		
Assyrian Chaldean (Iraq, Syria)	30 (34.9)	29 (26.1)
Karen (Burma, Thailand)	25 (29.1)	30 (27.0)
Sierra Leone (Sierra Leone)	16 (18.6)	22 (19.8)
Tamil (Sri Lanka)	15 (17.4)	-
Hazara (Afghanistan)	-	30 (27.0)
Years in Australia (refugee background families)		
Born in Australia	15 (25.0)	33 (31.1)
1-2 years	10 (16.7)	33 (31.1)
3-5 years	16 (26.7)	21 (19.8)
6+ years	19 (31.6)	19 (17.9)
Total	489 (100)	1114 (100)

Figure 1. CRQ-P/C scale progression from conceptual scales to final version.

Table 2. CRQ-P/C item summary, including standardised factor loadings from initial and final confirmatory factor models (CFA) for the SELF and FAMILY domains (n=1111).

	DOMAIN					Model fit/ Factor loadings	
	Item	N	M (SD)	Skew	Kurt	Initial congeneric CFA	Final congeneric CFA
SELF							
Self-Identity						$\chi^2_{(14)}$=124.20, p<.001; RMSEA=.09 (.07, .10); CFI=.98; TLI=.98	$\chi^2_{(5)}$=37.76, p<.001; RMSEA=.08 (.06, .10); CFI=.99; TLI=.99
1	My child feels good…	1110	3.1 (0.6)	-0.4	3.5	.75	-
2	My child keeps trying …	1107	2.8 (0.8)	-0.3	2.8	.70	.70
3	My child is a strong…	1105	3.1 (0.8)	-0.6	3.2	.82	.83
4	My child is a confident ..	1108	2.9 (0.8)	-0.5	3.0	.85	.81
5	My child likes to try….	1111	3.0 (0.9)	-0.6	2.6	.69	.70
6	My child is a brave …	1107	3.1 (0.8)	-0.7	3.1	.76	.78
Positive future						$\chi^2_{(2)}$=22.90, p<.001; RMSEA=.10 (.07,.14); CFI=.99; TLI=.99	No modifications
1	My child is positive about …	1109	3.2 (0.8)	-0.7	3.5	.84	.84
2	My child looks forward to…	1109	3.2 (0.8)	-0.9	3.5	.70	.70
3	My child is hopeful …	1108	3.3 (0.7)	-1.0	4.2	.95	.95
4	My child is positive …	1102	3.3 (0.7)	-0.8	3.5	.95	.95
Managing emotions/problems						$\chi^2_{(9)}$=184.67, p<.001; RMSEA=.14 (.12, .16); CFI=.99; TLI=.97	No fit indices for 3-item model
1	My child thinks about the reasons …	1107	2.8 (0.9)	-0.4	2.9	.33	-
2	My child knows how to manage …	1109	2.4 (0.9)	-0.3	2.9	.84	-
3	My child copes well …	1108	2.5 (0.9)	-0.5	3.3	.83	.77
4	My child knows how to calm …	1108	2.4 (1.0)	-0.3	2.8	.82	.83
5	My child knows how to manage …	1107	2.5 (0.9)	-0.3	3.1	.91	.94
6	My child worries about …	1104	2.0 (1.0)	-0.1	3.0	.04	-
FAMILY							
Connectedness						$\chi^2_{(5)}$= 167.22, p<.001; RMSEA=.18 (.16, .20); CFI=.98 TLI=.97.	$\chi^2_{(2)}$= 3.30, p=.192; RMSEA=.03 (.00, .07); CFI=1.00; TLI=1.00
1	My child talks to me about …	1075	3.1 (0.8)	-0.7	3.5	.83	.84
2	I listen to my child …	1069	3.6 (0.6)	-0.8	3.0	.61	-
3	My child talks to me about their feelings ..	1072	3.2 (0.8)	-0.9	3.8	.93	.93
4	My child talks to me about their worries…	1068	3.1 (0.9)	-0.8	3.4	.89	.89
5	I am close …	1071	3.7 (0.5)	-1.8	6.6	.75	.70
Basic needs						$\chi^2_{(9)}$= 42.50, p<.001; RMSEA=.06 (.04, .08); CFI=.99; TLI=.98	$\chi^2_{(2)}$= 4.00, p=.135; RMSEA=.03 (.00, .08); CFI=1.00; TLI=.99
1	My child likes being …	1073	3.5 (0.6)	-1.3	5.3	.71	-
2	My child feels safe …	1070	3.8 (0.5)	-2.3	8.6	.77	.67
3	My child feels they belong…	1070	3.7 (0.6)	-2.1	8.6	.82	-
4	Our family has routines …	1068	3.4 (0.7)	-1.0	3.5	.58	.61

5	My child feels special …	1069	3.4 (0.8)	-1.5	6.1	.75	.79
6	My child has own space…	1068	3.5 (0.8)	-2.1	7.4	.58	.60
						$\chi^2_{(2)}$=10.03, p<.001; RMSEA=.06 (.03, .10); CFI=1.00; TLI=.99	No fit indices for 3-item model
Guidance							
1	My child is given responsibilities …	1073	2.8 (1.0)	-0.6	2.8	.73	.72
2	My child helps with things like …	1068	2.8 (1.0)	-0.3	2.3	.79	.82
3	Our family talks about …	1068	3.6 (0.6)	-1.5	5.1	.51	-
4	I teach my child life …	1071	3.3 (0.8)	-1.0	3.4	.75	.73

Table 3. CRQ-P/C item summary, including standardised factor loadings from initial and final confirmatory factor models (CFA) for the SCHOOL and COMMUNITY domains (n=1111).

	DOMAIN Item	N	M (SD)	Skew	Kurt	Model fit/ Factor loadings Initial congeneric CFA	 Final congeneric CFA
SCHOOL							
Teachers						$\chi^2_{(9)}$=177.93, p<.001; RMSEA=.14 (.12, .15); CFI=.98; TLI=.97	$\chi^2_{(2)}$=28.89, p<.001; RMSEA=.12 (.08,.15); CFI=1.00; TLI=.99
1	The teachers help …	1084	3.3 (0.8)	-0.9	3.5	.79	.80
2	The teachers listen to ….	1081	3.1 (0.8)	-0.8	3.3	.84	.88
3	My child's school/teachers celebrate …	1078	3.3 (0.8)	-1.1	4.0	.74	-
4	My child has a teacher they can …	1075	3.0 (1.0)	-0.9	3.3	.75	.76
5	The teachers let my child know …	1078	3.2 (0.8)	-0.8	3.4	.81	.75
6	The teachers are fair …	1070	3.2 (0.8)	-1.0	4.5	.70	-
Engagement						$\chi^2_{(9)}$=99.86, p<.001; RMSEA=.10 (.08, .12); CFI=.98; TLI=.97	$\chi^2_{(2)}$=25.41, p<.001; RMSEA=.10 (.07, .15); CFI=.99; TLI=.98
1	My child likes learning …	1095	3.2 (0.8)	-1.0	3.7	.89	.88
2	My child doesn't like …	1082	3.2 (1.0)	-1.2	3.8	.63	-
3	My child is interested …	1081	3.2 (0.8)	-0.9	3.4	.88	.88
4	Trying hard at school …	1077	3.0 (1.0)	-0.8	3.2	.68	.71
5	My child finishes work …	1061	2.8 (0.9)	-0.6	2.9	.64	.65
Belonging PLUS Friend scale						$\chi^2_{(35)}$=607.70 p<.001; RMSEA=.13 (.12, .14); CFI=.92; TLI=.90	No fit indices for 3-item model
1	My child gets bullied …	1083	3.0 (1.0)	-0.7	3.1	.58	-
3	My child feels comfortable …	1073	3.2 (1.0)	-1.4	4.8	-.39	-
4	My child feels different …	1075	3.0 (1.1)	-0.7	2.8	.61	-
5	My child gets in trouble ….	1081	3.2 (0.9)	-1.1	4.0	.31	-
6	My child is lonely …	1066	3.2 (0.9)	-1.2	3.9	.80	-
7	My child finds it hard …	1090	2.9 (1.1)	-0.7	2.8	.73	-
8	My child would like to …	1073	1.9 (1.2)	-0.0	2.1	.48	-
9	My child has a group of friends …	1081	3.3 (0.8)	-1.1	4.4	-.83	.81
10	My child has a friend they can …	1067	2.7 (1.1)	-0.6	2.8	-.67	.75
11	My child has a best …	1077	3.2 (1.0)	-1.3	4.3	-.78	.90
COMMUNITY							
Culture						$\chi^2_{(27)}$= 568.07, p<.001; RMSEA=.14 (.13, .15); CFI=96; TLI=.94	$\chi^2_{(2)}$= 33.3, p<.001; RMSEA=.13 (.09,.17); CFI=.99; TLI=.98
1	My child is strong because …	1029	2.9 (0.9)	-0.9	3.9	.78	.83
2	My child is connected …	1025	3.0 (0.9)	-0.9	3.7	.80	.81
3	My child can deal with problems …	1026	2.8 (1.0)	-0.6	3.2	.82	-
4	Our family culture or values …	1023	2.8 (0.9)	-0.6	3.2	.85	.81

5	My child likes going to events …	1011	3.1 (0.9)	-1.0	3.7	.72	-
6	My child is connected to elders …	1020	3.2 (1.1)	-1.3	3.9	.63	-
7	My child is strong because of our family …	1016	2.9 (1.0)	-0.8	3.2	.84	.79
8	Our family culture makes my …	1003	2.9 (1.0)	-0.8	3.2	-	-
Religion / Spirituality						$\chi^2_{(5)}$=178.83, p<.001; RMSEA=.19 (.17, .21); CFI=.98; TLI=.96	
1	My child looks to their elders …	1008	2.8 (1.1)	-0.7	2.7	-	-
2	My child is connected to people …	991	1.3 (1.5)	0.7	2.0	.69	-
3	My child is connected to people …	997	2.1 (1.4)	-0.2	1.8	.87	-
4	My child is connected to their spirit …	966	2.0 (1.4)	-0.0	1.7	.79	-
5	Our family talk or yarn about …	1007	2.6 (1.1)	-0.6	2.6	.84	-
6	Our family stories or spiritual beliefs …	994	2.3 (1.3)	-0.3	2.1	.89	-
Language – Opportunity to learn						Not Calculated	Not Calculated
1	Learning this language …	488	2.5 (0.7)	-1.0	2.9		
2	My child would like to learn …	487	2.5 (0.6)	-1.1	3.0		
3	My child has had the opportunity …	491	2.5 (0.7)	-0.8	2.5		
4	I encourage my child …	487	2.7 (0.5)	-1.5	4.3		
Language – Connectedness						$\chi^2_{(9)}$=123.42, p<.001; RMSEA=.16 (.14, .19); CFI=0.99; TLI=.99	$\chi^2_{(2)}$=15.84, p<.001; RMSEA=.12 (.07,.18); CFI=1.00; TLI=1.00
1	My child can speak …	496	2.1 (0.6)	-0.1	2.4	.95	.96
2	My child can understand …	493	2.4 (0.6)	-0.5	2.3	.94	.95
3	A family member speaks to …	487	2.5 (0.6)	-0.9	2.8	.85	-
4	My child understands when …	488	2.4 (0.7)	-0.7	2.3	.89	.87
5	My child can easily talk to …	487	2.1 (0.8)	-0.2	1.6	.90	-
6	My child likes to talk to …	487	2.1 (0.8)	-0.2	1.7	.91	.86
7	Understanding this language…feel special	482	2.5 (0.7)	-0.9	2.6	-	-
8	Understanding this language…feel connected	483	2.5 (0.7)	-1.0	2.9	-	-

Table 4. Summary of the final scales for the Child Resilience Questionnaire – Parent/Caregiver version.

		CRQ-P/C total sample				Girls (n=421)	Boys (n=471)		
	Items (range[1])	n	Range	Mean (SD)	Cronbach α	Mean (SD	Mean (SD)	T-test	P value
SELF									
Positive self	5 (0 - 20)	1,112	2 - 20	14.8 (3.3)	0.83	15.2 (3.2)	14.8 (3.3)	2.0	0.042
Positive future	4 (0 - 16)	1,111	0 - 16	12.8 (2.7)	0.87	13.0 (2.5)	12.8 (2.7)	1.1	0.256
Managing emotions	3 (0 -12)	1,100	0 - 12	7.1 (2.4)	0.86	7.8 (2.3)	7.2 (2.4)	3.6	<0.001
FAMILY									
Connectedness	4 (0 - 16)	1,071	3 - 16	13.0 (2.6)	0.85	13.3 (2.5)	12.9 (2.6)	2.0	0.046
Basic Needs	4 (0 - 16)	1,070	6 - 16	14.1 (2.0)	0.61	14.1 (2.0)	14.1 (2.0)	-0.1	0.898
Guidance	3 (0 - 12)	1,076	1 - 12	8.9 (2.3)	0.73	9.0 (2.3)	8.8 (2.3)	1.5	0.133
SCHOOL									
Teacher Support	4 (0 - 16)	1,080	0 - 16	12.6 (2.8)	0.81	12.7 (2.6)	12.7 (2.8)	0.2	0.811
Engagement	4 (0 - 16)	1,079	2 - 16	12.2 (2.8)	0.81	12.9 (2.5)	11.8 (3.0)	5.4	<0.001
Friends	3 (0 - 12)	1,049	0 - 12	9.2 (2.4)	0.80	9.5 (3.3)	9.0 (2.4)	3.2	0.002
CULTURE									
Connectedness	5 (0 - 20)	1,023	0 - 16	11.6 (3.2)	0.84	11.8 (3.3)	11.6 (3.1)	0.8	0.433
Language[2]	4 (0 - 8)	489	0 - 8	4.9 (2.3)	0.88	5.2 (2.3)	4.9 (2.3)	0.9	0.347
CRQ total score	39 (0 - 156)	1,062	57 - 152	115.8 (17.4)	0.93	118.6 (16.7)	115.1 (17.6)	3.0	0.003
CRQ total score (incl. lang)[2]	43 (0 - 172)	480	64 - 164	127.7 (18.4)	0.93	130.0 (17.6)	127.9 (18.4)	1.2	0.249

[1] Response options ranged from 0 'Not at all' to 4 'All of the time", with exception of language where response options ranged from 0 'Not at all' to 2 'A lot".
[2] Completed by multilingual families only.

Table 5. Spearman's correlations between CRQ-P/C scales, total CRQ-P/C score and the Strengths and Difficulties Questionnaire (SDQ) total score.

	SELF			FAMILY			SCHOOL			CULTURE		
DOMAIN	Positive Self	Positive Future	Managing emotions	Connected ness	Basic Needs	Guidance	Teacher Support	Engage ment	Friends	Connected ness	Language[1]	CRQ-P/C Total
CRQ-P/C Scale	n=1112	n=1111	n=1100	n=1071	n=1060	n=1063	n=1080	n=1079	n=1079	n=1023	n=489	n=1062
SELF												
Positive Future	0.661											
Emotion Regulation	0.564	0.547										
FAMILY												
Connectedness	0.413	0.443	0.323									
Basic Needs	0.282	0.383	0.225	0.499								
Guidance	0.249	0.273	0.200	0.449	0.402							
SCHOOL												
Teacher Support	0.312	0.319	0.254	0.349	0.290	0.241						
Engagement	0.456	0.441	0.427	0.366	0.314	0.284	0.472					
Friends	0.373	0.394	0.403	0.328	0.282	0.263	0.380	0.377				
CULTURE												
Connectedness	0.378	0.362	0.318	0.429	0.406	0.356	0.291	0.304	0.289			
Language (n=489)	0.159	0.100	0.116	0.120	-0.021[2]	0.051[2]	0.072[2]	0.192	0.001	0.233		
CRQ-P/C Total	0.713	0.724	0.637	0.674	0.569	0.541	0.584	0.682	0.634	0.634	0.163	
SDQ total difficulties score (n=980)	-0.332	-0.324	-0.531	-0.213	-0.207	-0.152	-0.195	-0.394	-0.449	-0.217	-0.051[2]	-0.471

[1] Completed by multilingual families only.
[2] Nonsignificant p-value (> 0.05)

Supplementary Tables:

Supplementary Table 1A. Four-factor solution with maximum likelihood extraction and varimax rotation of the SELF items in pilot study.

Supplementary Table 1B. Four-factor solution with maximum likelihood extraction and varimax rotation of the FAMILY items in pilot study.

Supplementary Table 1C. Four Factor solution with maximum likelihood extraction and varimax rotation of the SCHOOL items in pilot study.

Supplementary Table 1D. Four-factor solution with maximum likelihood extraction and varimax rotation of the COMMUNITY items in pilot study.

Conceptually Developed Scales	Revision 1 - Draft CRQ-C	Revision 2 - Final CRQ-C
SELF		
Self identity (9 items) My child is a confident person My child is a brave person		
	Positive self (7 items) My child is a brave person My child likes to try new things	**Positive self (5 items)** My child is a brave person My child likes to try new things
Positive sense of self (7 items) My child feels good about themself My child likes to try new things		
Hopes /Expectations (7 items) My child looks forward to growing up My child is hopeful about their life	**Positive future (4 items)** My child looks forward to growing up My child is hopeful about their life	**Positive future (4 items)** My child looks forward to growing up My child is hopeful about their life
Personal agency /self-efficacy (12 items) My child is good at sorting out problems My child won't try things if they might make a mistake		
	Managing emotions/problems (6 items) My child copes well if they have a problem My child knows how to calm down when they feel angry	**Managing emotions/problems (3 items)** My child copes well if they have a problem My child knows how to calm down when they feel angry
Coping Skills (11 items) My child has someone they can share their worries with My child knows how to calm down when they feel angry		
FAMILY		
Parent role / guidance (10 items) I teach my child life skills e.g. money, how to cook My child is given responsibilities in our family e.g…	**Guidance (5 items)** I teach my child life skills e.g. money, how to cook My child is given responsibilities in our family e.g…	**Guidance (3 items = 2 new items)** I teach my child life skills e.g. money, how to cook My child is given responsibilities in our family e.g…
Positive parent-child relship (8 items) My child talks to me about their feelings I am close to my child		
	Connectedness (5 items) My child talks to me about their feelings My child talks to me about what is happening in their life	
Communication (8 items) My child talks to me about what is happening in their life We talk things through in our family		
		Connectedness (5 items) My child talks to me about their feelings My child feels safe at home
Basic needs – family (7 items) My child feels loved by our family I am able to look after my child needs e.g…		
	Basic needs (6 items) My child feels safe at home My child has their own space in our house	
Basic needs – home (6 items) My child feels safe at home My child has their own space in our house		
FRIENDS		
Friends (9 items) My child has a close/best friend My child would like to have more friends	**Friends (5 items) *RETURNED+ NEW*** My child has a best/close friend My child would like to have more friends	
SCHOOL		
		Belonging (5 items) *My child would like to have more friends* My child gets bullied or teased at school My child feels different to the other children at their school
Belonging and safety (11 items) My child gets bullied or teased at school My child feels they belong at their school	**Belonging (7 items)** My child gets bullied or teased at school My child feels different to the other children at their school	
Engagement (9 items) My child is interested in what they learn at school Trying hard at school is important to my child	**Engagement (6 items)** My child is interested in what they learn at school Trying hard at school is important to my child	**Engagement (4 items)** My child is interested in what they learn at school Trying hard at school is important to my child
Positive teacher-child relationships (10 items) The teachers help my child when they need it The teachers let my child know when they are doing well	**Teachers (6 items)** The teachers help my child when they need it The teachers let my child know when they are doing well	**Teachers (4 items)** The teachers help my child when they need it The teachers let my child know when they are doing well
Environment (10 items) My child obeys the school rules My child enjoys attending their school		
COMMUNITY		
Connection to culture (14 items) My child is proud of our family's culture My child is strong because of our culture	**Connection to culture (6 items)** My child is connected to our family culture (e.g..) My child is strong because of our family culture	**Connection to culture (5 items)** My child is connected to our family culture (e.g...) My child is strong because of our family culture My child is strong because of our family stories, values or spiritual beliefs
Religion/sprituallity/beliefs (7 items) My child is strong because of their religion or beliefs My child is connected to people through their religion, faith or stories	**Religion / Spirituality (8 items)** My child is strong because of our family stories, values or spiritual beliefs My child is connected to people through our spiritual beliefs or stories	
Basic needs (10 items) My child feels safe in the area where we live Our family is happy living where we live	***LANGUAGE Opportunity to learn (6 items) NEW*** *I have had the opportunity to learn this language* *Learning this language is important to me*	
Community spaces/places (4 items) My child goes to a group or activity in our community e.g… My child enjoys going to community events/ activities	***LANGUAGE Connectedness (6 items) NEW*** *My child can understand this language* *Understanding this language makes my child feel connected to our family or community*	***LANGUAGE Connectedness (4 items)*** *My child can understand this language* *Understanding this language makes my child feel connected to our family or community*

Supplementary Tables 1A – 1D

Table 1A. Four-factor solution with maximum likelihood extraction and varimax rotation of the SELF items.

	Factor			
	1	2	3	4
Managing emotions (positive)				
My child knows how to manage their feelings	0.832			
~~My child is good at solving problems by themself~~	~~0.718~~			
My child copes well if they have a problem ~~with friends~~ (Revised)[3]	0.620	0.311		
My child knows manage worried or anxious	0.599			
My child knows how to calm down when they feel angry	0.527		0.395	
~~My child copes well problem at home~~[1]	~~0.446~~	~~0.301~~	~~0.319~~	
My child thinks about why things happen	0.436			
Managing emotions (negative) DROPPED				
~~My child worries making a mistake~~				~~0.688~~
~~My child worries about things going wrong~~				~~0.665~~
~~My child wont try things if they might make a mistake~~				~~0.499~~
~~My child keeps their feelings inside~~				~~0.413~~
Positive Self				
My child is a brave person		0.676		
My child is a confident person		0.625		
My child likes to try new things		0.610	0.332	
My child feels good about themself		0.559	0.438	
My child is a strong person on the inside	0.315	0.524		
My child keeps trying even when things get hard	0.383	0.446		
~~My child is happy to be different from other kids~~		~~0.328~~		
Positive Future				
My child is positive about their future			0.692	
My child is hopeful about their life			0.642	
My child is positive about their life			0.620	
My child looks forward to growing up			0.469	
~~My child can easily name things they are good at~~[1]		~~0.355~~	~~0.373~~	
~~My child tries to work out why things go wrong~~[1]		~~0.301~~	~~0.305~~	

[1] Deleted as low and equal loading on multiple factors.
[2] Retained as consultations identified as conceptually important.
[3] Revised to make more general (previously was a similar question for school, home and friends).

Table 1B. Four-factor solution with maximum likelihood extraction and varimax rotation of the FAMILY items.

	Factor			
	1	2	3	4
Connectedness				
My child talks to me about their worries	0.809			
My child talks to me about their feelings	0.782			
My child talks to me about what is happening in their life	0.753			
~~My child feels special in our family~~[1]	~~0.481~~	~~0.433~~		
~~I am interested in things that my child likes~~[1]	~~0.424~~	~~0.352~~		
I listen to my child[2]	0.374	0.452		
I am close to my child[2]	0.364	0.379		
Basic needs				
My child feels safe at *our* home[3]		0.603		
My child likes being in our ~~house~~ *home*[3]		0.522		
I am able to provide what my child needs		0.405		
My child has their own space in ~~our house~~ *the place where we live*[3]		0.373		
My child feels they belong in the place where we live[4]		New		
Guidance				
My child helps with things like shopping			0.665	
My child has responsibilities in family			0.599	
I teach my child life skills e.g. money			0.564	
~~Our family enjoys visiting others~~[1]		~~0.335~~	~~0.421~~	
Our family has routines			0.351	
Friends				
My child has a close/best friend				0.637
My child's friends come to our ~~house~~ *home*[3]				0.612
My child would like to have more friends				-0.370
My child feels lonely				-0.367
My child has a friend they can talk to about their worries[4]				New
My child has a group of friends they have fun with[4]				New
My child finds it hard making friends [4]				New

[1] Deleted as low and equal loading on two factors.
[2] Retained as consultations identified as conceptually important.
[3] Advised in consultations on wording changes to be more inclusive of different living arrangements, including not having a house.
[4] Added through consultations to strengthen scale.

Table 1C. Four Factor solution with maximum likelihood extraction and varimax rotation of the SCHOOL items.

	Factor		
	1	2	3
Teachers			
Teachers listen to my child when have a problem	0.797		
The teachers help my child when they need it	0.744		
The teachers are fair	0.643		
Teachers let child know when doing well	0.620		
My child has a teacher talk upset or angry	0.585		
My child's school or teachers celebrate achievements	0.576		
Engagement			
My child likes learning at school		0.822	
Trying hard at school is important to my child		0.738	
My child is interested in what they learn at school	0.367	0.648	
My child doesn't like going to school		-0.448	0.353
My child finishes work on time		0.395	
Belonging			
My child is lonely at school			0.733
My child gets bullied or teased at school			0.656
~~My child fits in at school~~[1]	~~0.358~~		~~-0.518~~
My child feels different to the other children at their school			0.472
My child gets in trouble at school			0.451
~~There are children similar to my child in their class~~[2]			~~-0.353~~
~~There are other people like my child at their school~~[2]			~~-0.341~~
My child feels comfortable in identifying with their culture at school[3]			*New*
My child's school acknowledges/respects my child's culture[3]			*New*

[1] Identified as ambiguous/difficult to answer by respondents and in consultations.

[2] Dropped due to low factor loading and conceptual overlap with item above.

[3] Added after consultations to strengthen scale.

Table 1D. Four-factor solution with maximum likelihood extraction and varimax rotation of the COMMUNITY items.

	Factor 1	2	3	4
Connected to culture				
My child is strong because of our culture	0.773			
~~My child enjoys taking part in our family traditions[2]~~	~~0.766~~			
My child is connected to our family's culture *(e.g. food, music, celebrations)*[5]	0.675			
My family's culture makes my child feel special	0.670	0.365		
My child likes going to events that celebrate our family's culture	0.593			
~~My child is connected to spirit by being in country[1]~~	~~0.518~~			~~0.300~~
~~My child enjoys going to community events/activities[2]~~	~~0.489~~		~~0.438~~	
~~My family tell stories about our family's history[2]~~	~~0.469~~			
~~People in our community come together to celebrate events[2]~~	~~0.464~~			
Our family culture or values help my child when things are hard[3]	*New*			
My child is connected to elders in our community (e.g. grandparents, aunties/uncles, respected adults)[3]	*New*			
My child looks to their elders (a respected older person) to guide them[3]	*New*			
~~My child is connected to elders~~ (revised above)				~~0.942~~
~~My child looks to elders for guidance~~ (revised above)				~~0.680~~
Religion /Spirituality				
My child is connected to people through their religion, beliefs or stories		0.745		
My child connected to people through our church, mosque or temple		0.637		
My child is strong because of ~~their religion or beliefs~~ *our family stories, values or spiritual beliefs[3]*		0.604		
~~My child goes to a special place with our family[2]~~	~~0.464~~	~~0.494~~		
Our family talk or yarn about our stories, beliefs or values[3]		*New*		
Our family stories or spiritual beliefs comfort my child when things are hard[3]		*New*		
My child can deal with problems better because of our family's beliefs, stories or values[3]		*New*		
My child is connected to elders in our community (e.g. grandparents, aunties/uncles, respected adults)[3]		*New*		
~~**Community** **DROPPED More a measure of socio-economic status~~				
~~Our family knows other families where we live~~	~~0.323~~		~~0.519~~	
~~There are playgrounds or green spaces around where we live~~			~~0.478~~	
~~I let my child play outside in the streets or parks where we live~~			~~0.471~~	
~~My child feels safe in the area where we live~~			~~0.405~~	
~~My child goes to a group or activity in our community~~			~~0.400~~	
~~My child is involved in our community~~			~~0.381~~	
~~My child feels different from others in the commty where we live~~			~~-0.336~~	
~~There are places where we live that my child doesn't feel safe~~				
Language - opportunity to learn [3]				
My child can speak this language				*New*
My child can understand this language				*New*
Learning this language is important to my child				*New*
My child would like to learn more of this language				*New*
My child has had the opportunity to learn this language				*New*
I encourage my child to learn this language				*New*
Language – connectedness[3]				
A family member speaks to my child in this language				*New*
My child understands when people in our family/community are talking in this language				*New*
My child can easily talk to elders (respected older people) in this language				*New*
My child likes to talk to our family/relatives in this language				*New*
Understanding this language makes my child feel special				*New*
Understanding this language makes my child feel connected to our family or community				*New*

[1] Identified as difficult to answer by non-Aboriginal respondents.

[2] Dropped due to low factor loading and/or conceptual overlap.

[3] Added/revised after consultations to strengthen scale.

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	5-6
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6-7
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	6-7
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7-8
Bias	9	Describe any efforts to address potential sources of bias	5,13
Study size	10	Explain how the study size was arrived at	
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	9-12
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	8
		(*b*) Describe any methods used to examine subgroups and interactions	12
		(*c*) Explain how missing data were addressed	8
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	N/A
		(*e*) Describe any sensitivity analyses	N/A
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Table 1
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Table 1
		(b) Indicate number of participants with missing data for each variable of interest	Table 2, Table 3
Outcome data	15*	Report numbers of outcome events or summary measures	Table 3
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	13
		(*b*) Report category boundaries when continuous variables were categorized	12
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	13
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	13-14
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	15
Generalisability	21	Discuss the generalisability (external validity) of the study results	15
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	1

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

Development and validation of a multidimensional, culturally and socially inclusive Child Resilience Questionnaire (parent/caregiver report) to measure factors that support resilience: a community-based participatory research and psychometric testing study in Australia

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Complete List of Authors:	Gartland, Deirdre; Murdoch Children's Research Institute, Intergenerational Health; The University of Melbourne, Pediatrics Riggs, Elisha; Murdoch Childrens Research Institute, Intergenerational Health; The University of Melbourne, Department of General Practice Giallo, Rebecca; Murdoch Childrens Research Institute, Intergenerational Health Glover, Karen; Murdoch Childrens Research Institute, Intergenerational Health; South Australian Health and Medical Research Institute Limited, Women and Kids theme Stowe, Mardi; Victorian Foundation for Survivors of Torture Mongta, Sharon; Djirra, Family Violence Weetra, Donna; South Australian Health and Medical Research Institute Limited, Women and Families Brown, Stephanie; Murdoch Children's Research Institute, Intergenerational Health; South Australian Health and Medical Research Institute Limited,
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Development and validation of a multidimensional, culturally and socially inclusive Child Resilience Questionnaire (parent/caregiver report) to measure factors that support resilience: a community-based participatory research and psychometric testing study in Australia

Dr D Gartland[1,2] (DPsych)

Dr E Riggs[1,3] (PhD)

Dr R Giallo[1,3] (PhD)

Ms K Glover[1,4] (MBA)

Ms M Stowe[5] (MSw)

Ms S Mongta[6] (BSw)

Ms D Weetra[4]

Prof SJ Brown[1, 2 ,3,4] (PhD)

and members of the Childhood Resilience Study Collaborative Group*

*(Professor Helen Herman, Professor Kelsey Hegarty, A/Professor Jane Yelland, Ms Amanda Mitchell, Ms Selena White, Ms Tanya Koolmatrie, Ms Sue Casey, Mr Josef Szwarc, A/Professor Georgie Paxton)

[1] Intergenerational Health Research Group, Murdoch Children's Research Institute, Parkville, Melbourne Australia.

[2] Department of Paediatrics, University of Melbourne, Melbourne, Australia

[3] Department of General Practice, University of Melbourne, Melbourne, Australia

[4] South Australian Health and Medical Research Institute, Adelaide, Australia

[5] Victorian Foundation for the Survivors of Torture, Melbourne, Australia

[6] Wadja Aboriginal Family Place, Royal Children's Hospital, Melbourne, Australia

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Corresponding Author: Dr Deirdre Gartland
Murdoch Children's Research Institute, 50 Flemington Rd, Parkville, Victoria, Australia 3056.
deirdre.gartland@mcri.edu.au
+61 03 9386 6618

Words:4418

Abstract (300)

Objective Develop a comprehensive socially inclusive measure to assess child resilience factors.

Design A socio-ecological model of resilience, community based participatory research methods and two rounds of psychometric testing created the Child Resilience Questionnaire (parent/caregiver-, child-, school-report). The parent/caregiver report (CRQ-P/C) is the focus of this paper.

Setting Australia.

Participants Culturally and socially diverse parents/caregivers of children aged 5-12 years completed the CRQ-P/C in the pilot (n=489) and validation study (n=1114). Recruitment via a large tertiary hospital's outpatient clinics, Aboriginal and refugee background communities (Aboriginal and bicultural researchers networks) and nested follow-up of mothers in a pregnancy cohort and a cohort of Aboriginal families.

Analysis Exploratory and confirmatory factor analyses conducted to assess the structure and construct validity of CRQ-P/C subscales. Cronbach's alpha used to assess internal consistency of subscales. Criterion validity assessed with the Strengths and Difficulties Questionnaire (SDQ) parent-report.

Results Conceptually developed CRQ comprised 169 items in 19 subscales across five socio-ecological domains (self, family, friends, school and community). Two rounds of psychometric revision and community consultations created a CRQ-P/C with 43 items in 11 scales: self (positive self, positive future, managing emotions), family (connectedness, guidance, basic needs), school (teacher support, engagement, friends) and culture (connectedness, language). Excellent scale reliability (α=0.7-0.9), except *basic needs* scale (α=0.61) (where a highly endorsed item was retained for conceptual integrity). Criterion validity was supported: scales had low to moderate negative correlations with SDQ total difficulties score ($R_{s=}$ -0.2/-0.5. p<0.001); children with emotion/behavioural difficulties had lower CRQ-P/C scores (β=-14.5, 95%CI -17.5 to -11.6, adjusted for gender).

Conclusion The CRQ-P/C is a new multidomain measure of factors supporting resilience in children. It has good psychometric properties and will have broad applications in clinical, educational and research settings. The tool also adds to the few culturally competent measures relevant to Aboriginal and refugee background communities.

Strengths and limitations of this study

- Use of participatory methods and co-design processes to ensure content validity and a measure that is culturally and socially inclusive of diverse populations.
- Use of gold standard psychometric approaches, including confirmatory factor analysis to establish construct validity, and testing of criterion validity against the Strengths and Difficulties Questionnaire.
- While the families taking part represent a cross section of the Australian community, the measure may not work as well in other settings or communities not represented in our study.
- While we were able to assess criterion validity, the Strengths and Difficulties Questionnaire is not a gold standard measure of resilience as no such measure was available at the time of the study.

Introduction

Children exposed to social adversity and trauma have higher risks of adverse behavioural, emotional, developmental, and physical health problems.(1-3) However, many children experiencing adversity have outcomes similar to peers who have not experienced the same level or type of adversity. Understanding what enables children to do well despite exposure to social adversity has been hampered by a lack of culturally and psychometrically validated measures.(4, 5)

Much resilience research has focused on identifying individuals or populations exposed to a specific adversity and using a measure of competence (e.g. academic or social) to identify individuals showing positive outcomes (6). These individuals are categorised as 'resilient'. Thus resilience is conceptualised as an 'outcome'. However, a growing number of studies look at resilience as the process by which positive or protective factors mediate a child's mental, academic, or social outcomes. (7-10) In an ecological-transactional model of resilience, each level of the environment - the child surrounded by their family, community and societal factors - contains risk and protective factors.(11, 12) Resilience can be seen as the process of drawing on available internal resources or the environment to develop, maintain or recover developmental or health outcomes, despite adversity.(13-15). As a lifelong process, resilience needs to be considered within the context of life course development and across these socio-ecological domains.

Some communities, including First Nations and refugee communities, experience a significantly higher cumulative load of early life stress and adversity. This can be linked to the impacts of colonisation, persecution, experiences of war, social disadvantage and intergenerational trauma. Despite these experiences, many of these communities demonstrate resilience, (16-19) but are poorly represented in the existing child resilience literature - as demonstrated in a systematic review conducted as part of this study.(20) The few resilience measures currently available are almost universally adult, or youth focused and developed without adequate consideration of cultural diversity. (21-24)

Middle childhood represents a neglected period in research and clinical work.(25) A number of disorders and psychopathologies such as depression, self-injury, substance use, and eating disorders commonly emerge in adolescence (26), but increasingly antecedents are being identified in childhood.(27, 28) Sandwiched between early childhood and adolescence, middle childhood represents a critical 'turning point' or transition, where appropriate intervention may significantly change a life course.(25, 29) Better evidence about factors supporting resilience in children experiencing adversity is essential to inform effective interventions.

A review of resilience measures conducted in 2011 stressed the lack of measures for children under 12 years.(22). A more recent review identified few studies employing a psychometrically validated measure of resilience.(23) Of those using validated measures, the most commonly used were the Strengths and Difficulties Questionnaire (n=6) and the Child Behaviour Checklist (n=5), neither of which was designed to assess resilience. A systematic review of resilience factors associated with positive outcomes for adolescents in out-of-home care identified a greater number of resilience measures. The one study conducted with children (≤ 12 years) used a scale from the *Child and Adolescent Needs and Strengths* measure to identify resilience. Seven of the remaining 16 studies included a standardised measure of resilience factors. Four measures were cited: Resilience Scale for Children and Adolescents (individual resilience factors only), the Child and Youth Resilience Measure (a multidomain brief measure developed and tested with adolescents and adults); the Adolescent Resilience Questionnaire (a multidomain adolescent measure), and the Resilience Scale (a multidomain adult measure). Finally, a measure developed to assess the social and emotional wellbeing of Indigenous youth - Strong Souls – includes a resilience scale that addresses individual and social aspects of resilience.(30) None of these measures were developed with children, specifically, children aged 5-12 years, nor do the measures address all domains in which resilience factors (and vulnerabilities) will exist. Greater scientific rigour and consistency in measurement tools is needed, particularly for children, including the development and validation of culturally and socially inclusive tools.(22, 23, 31-33)

This paper describes the development of the Child Resilience Questionnaire (CRQ), a culturally and socially inclusive multidimensional measure of factors supporting resilient child outcomes. Community based participatory research methods and co-design with Aboriginal and refugee background communities (34, 35) were employed to create a measure with high cultural acceptability, reliability, and effectiveness for use in a range of diverse contexts. A parent/caregiver, child and teacher report were developed. The objectives of this paper are to describe: 1) development of the CRQ conceptual scales and items; 2) initial pilot testing of the parent/carer version (CRQ-P/C) assessing the overall structure and performance of individual items and scales; and 3) results of psychometric testing of the revised CRQ-P/C, including assessment of construct validity, criterion validity with the Strengths and Difficulties Questionnaire, and internal consistency/reliability.

Methods

The study was designed to develop an inclusive, multidimensional measure of resilience in children that was relevant to a range of contexts in which children may encounter adversity and show resilience. Two methodological approaches were used to ensure participation by families with

diverse social and cultural backgrounds, adversity exposures and resilience factors: 1) the questionnaire was co-designed with Aboriginal and refugee background communities, populations with high levels of historic and current discrimination, intergenerational trauma, and violence exposures; and 2) families with a child suffering an illness or injury were recruited from outpatient clinics in a large public Victorian tertiary hospital. Public hospitals provide free healthcare, and the clinics are attended by large numbers of families every day, including urban and rural based families, with significant variation in economic, cultural and social backgrounds.

Throughout every stage of the study, the following processes were used to embed community consultation, engagement and co-design. The study was conducted in partnership with the Aboriginal Health Council of South Australia, an Aboriginal family support unit in a large tertiary hospital in Victoria, and the lead provider of refugee counselling services in Victoria. These partners were involved in the funding application and study design as recommended in community consultation guidelines.(36-38) Working groups involving academic and non-academic (partner) study investigators were established to co-design research processes. The Aboriginal working group involved Aboriginal researchers, Aboriginal and non-Aboriginal study investigators, and representatives of partner organisations. The refugee working group involved study investigators, representatives of partner organisations, staff from the hospital's Immigrant Health Centre, refugee advocates and bicultural researchers employed on the study. Aboriginal researchers or bicultural workers were employed to work with their communities and networks to advertise the study and recruit families. As a member of the community, they ensured that the recruitment, consent and questionnaire administration were conducted in ways that promoted cultural safety and trust, including speaking to families in their preferred language.

At each stage of the study, informed parent/caregiver written or verbal consent was required for participation, and parent/caregiver written or verbal consent was required for each child's participation. Participants were given a copy of the information statement, including contact details of study researchers. Researchers went through the study information statement with the family, covering the purpose of the study, confidentiality, use of the data etc. Researchers answered any questions, and parents wishing to participate then signed the consent form or verbally consented, with the researcher signing a verbal consent form on their behalf (important in Aboriginal and refugee background communities where language and literacy barriers can exist). Where parents gave signed consent for a child to participate, the child was also asked if they were happy to participate (informed assent).

The three stages in the development of the CRQ-P/C will be discussed in turn: 1) generation of potential items and development of conceptual subscales; 2) pilot testing of draft items; and 3) refinement and validation of final CRQ-P/C.

1) Development of conceptual scales and items

The draft CRQ was developed based on an ecological-transactional model of resilience, with input sought from diverse population groups to ensure variation in the type and severity of adversity experienced and the individual, family, and community level resilience factors that would be identified. The recruitment and conduct of discussion groups have been described elsewhere (39). In brief, resilience factors were identified in a systematic review of existing literature (20) and in discussion groups with people working with higher risk families, and parents and children of diverse backgrounds. These factors were grouped by the first author into socio ecological domains (individual, family, friends, school, and community). Conceptual scales and items were co-designed and three versions were created; a parent/caregiver version (CRQ-P/C) for children aged 5-12 years; a self-report version for children aged 7-12 years (CRQ-C); and a school staff version for children aged 5-12 years (CRQ-S). All development processes involved iterative consultation and community engagement as described above. While space limits this paper to describing the CRQ-P/C, publication of the CRQ-C and CRQ-S will follow.

Pilot study to test draft CRQ-P/C

Parents/caregivers of children aged 5-12 years from diverse backgrounds and contexts in which children may encounter adversity and show resilience were recruited from four sources from June-December 2016.

1) Aboriginal families were recruited via the community networks of Aboriginal investigators and researchers based in South Australia. Parents/caregivers of Aboriginal children were invited to complete the draft CRQ-P/C on paper.

2) The draft CRQ-P/C was included in a pilot follow-up questionnaire completed by mothers/carers of Aboriginal children aged 5-7 years in the Aboriginal Families Study, a community-based birth cohort of 344 Aboriginal families recruited in South Australia.

3) Families of refugee background were recruited via community networks of bicultural researchers in four diverse communities: Assyrian Chaldean (from Iraq and Syria), Karen (from Burma), Tamil (from Sri Lanka) and Sierra Leone families (from Sierra Leone). Families completed the CRQ-P/C on paper in English, Karen, Arabic with assistance from the bicultural researcher as needed.

4) Representing the 'general' population, urban and rural families from diverse economic, cultural and social backgrounds were recruited in specialist outpatient clinics at a large tertiary children's hospital. Families in the waiting areas were invited to complete the CRQ-P/C on paper while waiting for their child's appointment.

Validation study

As above, parents/caregivers of children aged 5-12 years from diverse backgrounds and a range of settings in which children may encounter adversity and show resilience were recruited between September 2017 - March 2020:

1) Aboriginal families were recruited via community networks of Aboriginal investigators and researchers and completed the CRQ-P/C on iPad or paper. The CRQ-P/C was completed by mothers/caregivers of study children participating in the Aboriginal Families Study.

2) Refugee background families were recruited via the community networks of the bicultural workers in four diverse communities: Assyrian Chaldean (from Iraq and Syria), Hazara (from Afghanistan), Karen (from Burma and Thailand); Sierra Leone families (from Sierra Leone). Parents/carers completed the CRQ-P/C on iPad or paper in English, Karen, Arabic or Dari as preferred.

3) Representing the 'general' population, urban and rural based families with diverse economic, cultural and social backgrounds were recruited in the specialist clinics of a tertiary children's hospital. Parents/carers were randomised to complete the CRQ-P/C on iPad or paper.

4) A sample of families were recruited via a pregnancy cohort study of 1507 first time mothers, followed up over 10 years (Maternal Health Study). Child exposure to intimate partner violence has been investigated in this cohort, with 1 in 3 exposed to IPV by age 10.(40) Mothers were invited to complete the CRQ-P/C using an online REDCap survey.

Measures

Child Resilience Questionnaire

The CRQ-P/C comprises multiple scales across the individual, family, school and community domains. Figure 1 provides an outline of the domains, subscales and example items in the draft CRQ-P/C, pilot and final CRQ-P/C. The conceptually developed draft CRQ-P/C was over inclusive for testing purposes, with 169 items in 19 subscales.

Parents/carers were asked, "How often are the following true for your child?", with response options 0 "Not at all, 1 "Not often", 2 "Sometimes", 3 "Most of the time" 4 "All of the time". To support respondents with limited literacy and/or familiarity with research questions, response

options were accompanied by a pictogram of a glass that was empty ('Not at all") through to a full glass ("All of the time"). The CRQ-P/C was available in English, Arabic, Karen, and Dari. Translations were conducted by accredited translators. The translated versions were assessed by study bicultural workers and revised to ensure words and language style were appropriate for the local community involved.

Strengths and Difficulties Questionnaire

As the most common measure of child resilience at the time of the study, the Strengths and Difficulties Questionnaire (SDQ) was included to test criterion validity. The measure comprises 25 statements on a 3-point scale (0=Not True to 2=Certainly True) assessing emotional and behavioural difficulties. Six subscales assess emotional symptoms, conduct problems, hyperactivity and inattention, peer problems, and prosocial behaviours. The SDQ total difficulties score is calculated based on the first five subscales, with higher scores indicating more difficulties. A pre-defined cut-off score of ≥14 was used to classify children scoring in the clinical range based on Australian norms.(41, 42)

Analysis

Analyses of data collected in the pilot study and validation study was conducted iteratively. Descriptive statistics were used to summarise characteristics of the children (subject) and the parents/carers (respondent) completing the questionnaire.

Pilot study

The distribution of item responses and missing data were examined. Items were removed if they had limited response sets, were highly skewed, or had a high proportion of missing data. Exploratory factor analyses (EFA) using maximum likelihood and varimax rotation in SPSS was then used to examine the factor structure within each domain.(43) Determination of the number of factors and items to retain was guided: by eigenvalues>1 (Kaiser's rule), scree plot, variance explained by the model, pattern of factor loadings, interpretability of the scale, and the conceptual underpinning of the scales.(44, 45)

Validation study

The revised CRQ-P/C was employed in the validation study. Confirmatory Factor Analyses (CFA) were conducted using MPlus with robust maximum likelihood estimation on the covariance structures on the scales within each domain. The adequacy of the models was assessed using goodness-of-fit Chi Square (χ^2), and practical fit indices including the Comparative Fit Index, Goodness-of-Fit index (GFI) and Adjusted Goodness-of-Fit index (AGFI) with estimates of 0.90 or above indicating acceptable

model fit.(46) The Root Mean Square Error of Approximation (RMSEA) with values close to or below 0.05 within the 90% confidence interval also indicated good model fit.(45) Standardised factor loadings, standardised residual covariances and modification indices were examined to identify model misfit. All modifications were theoretically driven based on the relevance of items to the scale and degree of redundancy.(43-45)

Internal scale consistency was examined using Cronbach Alpha, with 0.7-0.9 deemed good to excellent.(47, 48). Finally, criterion validity of the CRQ-P/C was assessed by examining the Pearsons' rank correlation between CRQ scale scores and SDQ total score.(43, 44, 48).

Patient and public involvement

This study grew from community consultations being conducted in Aboriginal communities in rural, regional and remote South Australia. Community members wanted to better understand why some children and families were doing well, while others in similar situations were not doing so well. Representatives from the public were consulted at each stage. For example, the study recruitment and conduct of the study were guided by an Aboriginal Advisory Group, an Aboriginal Working Group and a refugee background working group, each of which included community members. Community Aboriginal staff and bicultural workers were employed to guide and conduct the research and consult on the findings at each stage. Authors on this paper include representatives from all of these groups (with the exception of our bicultural workers).

Results

Participants

The recruitment sources and social characteristics of the children (subject) and their parents/carers (respondents) are outlined in Table 1 for the pilot and validation studies. The majority of children were Australian born, with a mean age of 9.7 (SD 1.6) in the pilot and 9.1 (SD 2.3) in the validation study, with slightly more boys than girls (52.8% compared to 47.2% in the validation sample). Targeted recruitment in the pilot and validation studies was successful in engaging a significant proportion of Aboriginal and/or Torres Strait Islander families (13.7 and 22.3 respectively) and refugee background families (17.6 and 10.0% respectively).

Pilot Study - Testing of items and CRQ-P/C structure

The conceptually developed draft CRQ-P/C comprised 19 scales and 169 items. Examination of item distributions, missing values and participant feedback guided the exclusion of 74 items (self-domain–15; school-17, family-41; community-1). A very brief description of the factor analyses is provided

below, with comprehensive details prioritised for the validation study. (Factor solutions, item loadings and a record of decisions are detailed in Supplementary Table 1).

Self: A seven-factor solution was identified explaining 54.8% of the variance in scores. A four-factor solution was retained based on criteria described above. The factors reflected *Positive self*, *Positive Future*, *Managing emotions/problems (positive)* and *Managing emotions (negative)* (see Figure 1). A number of items were removed due to low communalities or low/multiple factor loadings. Given the conceptual overlap, the three-item factor *Managing emotions (negative)* was dropped, and a three-factor solution was accepted for validation.

Family: A six-factor solution was identified, explaining 54.5% of the variance in scores. Four of the six conceptually developed scales were accepted for validation *Connectedness, Guidance*, *Basic needs* and *Friends*. Three items were dropped for loading on multiple factors. Two items in the *Connectedness* scale also loaded on the *Basic needs factor* (I listen to my child, I am close to my child). These items were retained as seen as conceptually important in consultations. The *Friends* scale had only two items loading at >0.4 and was revised for validation.

School: A six-factor solution was identified explaining 59.1% of the variance in scores, with the first three factors retained reflecting *Belonging, Engagement, Teacher support* scales. One item identified as ambiguous/difficult to answer by respondents was deleted, and two items with low factor loadings were dropped.

Community: A six-factor structure was identified, explaining 61.4% of the variance. Three scales were retained - *Connection to culture, Religion and Spiritualty* and *Community* (see Figure 1). Five items were deleted due to low loadings and/or conceptual overlap. In consultations, it was agreed that *Connection to culture* and *Community* scales also overlapped conceptually. *Connection to culture* was retained as more congruent with the resilience literature, while *Community* appeared to be more related to what could be considered socio-economic factors (e.g. having green spaces, feeling safe in your community). Other changes made in this domain are described below.

Consultation driven revisions: Working group, community and investigator consultations on the face and content validity of the revised CRQ resulted in three further alterations:

1) The community/culture domain was developed to capture resilience factors that were broadly relevant - not limited to overseas born or Aboriginal families. However, many respondents indicated they ‘didn’t have a culture’ and skipped the section (mean missing data was 7.0 (SD=11.4) compared to 3.9 (SD=10.1) in self-domain or 5.1 (SD=11.6) in the school domain). A preamble was added asking respondents to tick a list of factors important to their family that reflected a diverse interpretation

of culture (e.g. the food you eat, family celebrations, family traditions, religion). It was hoped this would highlight the broad relevance of the section and encourage completion.

2) Language as a connection to culture was identified as a gap in the revised CRQ in consultations. Therefore, two new language scales (*Opportunity to learn*, *Connectedness)* were created for multilingual families through iterative consultations (See Figure 1).

3) Peer relationships are known to be associated with resilience, (20) but the two scales addressing them (*Friends* and *School Belonging)* did not form strong scales. These scales were revised and expanded through an iterative process of consultation and included in the school domain (See Figure 1).

Validation study

The revised CRQ-P/C comprised 81 items in 15 subscales (see Figure 1). Scale items, item descriptives (mean, standard deviation, skewness and kurtosis), initial and final confirmatory factor model fit and loadings are provided in Table 2 (self and family domains) and Table 3 (school and community domains). Actions taken to improve model fit in confirmatory factor analyses (CFA) are described below.

Self: The CFA for *Positive Future* was a good fit to the data, and all four items retained. The one factor congeneric *Self-Identity* model did not have good fit. This improved with removal of item 1 (poor response distribution). The CFA for *Managing Emotions* showed poor fit to the data. Sequential removal of three items with lowest factor loadings and/or conceptual overlap with other items resulted in a three-item subscale. The factor loadings for the remaining items were excellent (model fit indices not available for three item models).

Family: The one factor congeneric model for *Connectedness* was a poor fit to the data. There was also redundancy between items. Item 2 was dropped as it had the lowest factor loading. Model fit was improved, and the remaining items had excellent factor loadings. In the *Basic Needs* scale, the item “My child feels safe at our home” was retained for conceptual integrity despite being endorsed by most respondents (poor distribution). Item 1 and 3 were very highly endorsed and overlapped conceptually with other items. Dropping these two items resulted in good model fit. Finally, the one factor congeneric model *Guidance* showed poor model fit indices. Item 3 was removed due to the low factor loading and potential variation and ambiguity in wording around what is right and wrong across families. The factor loadings for the remaining items were excellent.

School: The one factor congeneric models for *Teacher support* and *Engagement* had inadequate fit indices, and the items with the lowest factor loadings were dropped sequentially to achieve good fit

indices. The one factor congeneric models for the *Belonging* and *Friends* scales did not fit the data. Three and four factor CFA models were tested for this domain. The Teacher support and School engagement factors were consistent in both models, but the Belonging and Friends items were mixed. With compatibility between the two concepts, the decision was made to test a one factor congeneric model with the Belonging and Friends items combined, retaining items that loaded on the 3-factor model. Eight items were retained, but the model had very poor fit to the data. Sequential removal of the worst performing seven items did not achieve good model fit, however the factor loadings for the remaining three items from the *Friends* scale were excellent (≥0.75) and this scale was retained.

Culture: The added preamble to the culture section appeared to work well, with fewer missing items (mean =1.3, SD=3.7). One item in the connectedness scale was identified in community consultations as having poor face validity and was dropped (Our family culture makes my child feel special). The one factor congeneric *Connectedness* scale model showed poor model fit. Two items with the lowest factor loadings were removed. There was also redundancy between items 3 and 4. Item 3 was retained as it was more concisely worded. Good model fit was achieved.

The items in the *Spirituality* scale had the highest level of missing data (≈10%). One item with poor distribution was dropped. The one factor congeneric model of the remaining items showed very poor fit. Sequentially dropping three items with the lowest loadings or conceptual overlap was insufficient to achieve acceptable model fit. The three-item factor had poor face validity and was dropped.

An EFA was conducted to assess the underlying factor structure for the two new language scales. Scree plot and eigenvalues supported a one factor structure, explaining 21% of the variance, comprising six of the eight *Connectedness* scale items. A one factor congeneric model of the six items showed poor model fit. Dropping item 3 (lowest factor loading), followed by item 5 (overlapped conceptually with item 6), resulted in good model fit indices and excellent item factor loadings.

The final CRQ-P/C

The scale summary statistics and scale reliability are shown in Table 4. With the exception of the *Basic Needs* scale in the family domain (Cronbach's α = 0.61), the final scales showed excellent internal consistency (Cronbach's α=0.73 to 0.88), with high internal consistency for the questionnaire as a whole (Cronbach's α=0.93).

Spearman's rank correlations between the CRQ-P/C scales are presented in Table 5. Generally, correlations between the subscales were moderate and in the expected direction. Scales within the

same domain tended to be more highly correlated with each other than with scales in other domains. A strong correlation was observed between the *Positive Self* and *Positive Future* scales (r_s=0.66, p<0.001). As could be expected, the Culture *Language* subscale showed the lowest correlations with other scales, the highest correlation with the Culture *Connectedness* scale (r_s=0.23, p<0.001), and was negatively correlated with the *Family Basic Needs* scale.

Parents/caregivers rated girls higher on average than boys on five subscales: *Positive self, Managing Emotions*, *Family Connectedness, School Engagement* and *Friends* (see Table 4). Overall, the CRQ-P/C mean total score (excluding the *Culture - Language* scale) for boys was lower than for girls (t_{839}=3.0, p=0.003).

Criterion validity

Criterion validity of the CRQ-P/C was assessed using the Strengths and Difficulties Questionnaire (SDQ). All CRQ-P/C scales showed low to moderate negative correlations with the SDQ total difficulties score. As would be expected given the content of the SDQ, the *Emotion Regulation* and *Friends* scales were the most highly correlated (r_s=-0.53 and r_s=-0.45 respectively). The total CRQ-P/C score was moderately negatively correlated with the SDQ total difficulties score (r_s=-0.47).

Almost one in five children (18.4%) were identified as having clinically significantly symptoms on the SDQ (total difficulties score ≥14). The mean CRQ-P/C total resilience score for children identified as having emotional and/or behavioral difficulties was lower than for children without difficulties (mean=103.4, SD=18.7 and 119.3, SD=15.5 respectively). Linear regression analysis identified children with difficulties scored lower on average on the CRQ-P/C by 14 points (β=-14.5, 95%CI -17.5 to -11.6, p<0.001), after adjusting for child gender.

Discussion

Extensive community based participatory research methods ensured the Child Resilience Questionnaire has good content validity and addresses a broad range of factors that can support child resilience across diverse contexts. The pilot testing and validation involved large samples, with targeted recruitment of families from diverse backgrounds, including families known to experience greater social disadvantage, adversity and resilience.(49, 50) The final CRQ-P/C comprises 10 scales across the domains of self, family, school and culture, with 43 items in total. Good psychometric properties were attained. Subscale internal consistency reliability was excellent apart from the family *Basic needs* scale, which was adequate. Construct validity was supported, with all scales showing moderate negative correlation with the SDQ total difficulties score, and significantly lower mean resilience scores for children identified as having emotional and/or behavioral difficulties.

Several aspects of the CRQ-P/C are important for note. 1) Two scales in the Self-domain - *Positive self* and *Positive future* - were strongly correlated (r_s=0.66). Further research is required to determine if it is sufficient to retain just one of these scales. 2) The family *Basic needs* scale showed only adequate internal consistency reliability (0.61), and almost a third of children (31%) were scored at the top of the scale range. Community consultations stressed that meeting basic family needs is a key factor underpinning child resilience. The scale addresses feeling safe at home, having routines, feeling special in your family, and having your own space in the place where you live. Despite very high positive endorsement, the item "I feel safe in my family" was retained for conceptual integrity. Children who are scored lower in this domain may be a particularly vulnerable group, with further research required to corroborate this. 3) The importance of cultural factors for resilient outcomes is not new.(19, 20, 51-53) What is new is the assessment of *connectedness* to culture and *language* as a connection to culture/community. Efforts were also made to assess potential strengths associated with a child's connection to religious and/or faith communities/institutions. Religion/spirituality was identified as potentially supporting child resilience in consultations, with mixed findings in the literature focused on adolescents or adults.(20) The spirituality/religion scale was unsuccessful. A high proportion of respondents skipped these items or, alternatively, responded with strong positive or negative endorsement of all items. It may be too disparate a factor to capture in a single scale, or a more distal factor for children than for adolescents or adults. Finally, the friends scale was not strongly consistent across the revisions but showed excellent scale reliability with three items. While friendships in middle childhood have been highlighted as developmentally important (25) and associated with positive self-worth and school engagement (54), most investigation in terms of resilience has been with adolescents.(55-57) Availability of the multidomain Child Resilience Questionnaire will facilitate investigation of the importance of specific resilience factors, such as friends, in different contexts (e.g. Aboriginal families) or adversities (e.g. family violence exposure) to advance our understanding of child resilience and how to support positive outcomes in the face of adversity.

Strengths of our study include use of: participatory methods and co-design processes to ensure content validity and cultural acceptability; and gold standard psychometric approaches, including confirmatory factor analysis to establish construct validity; and testing of criterion validity against the SDQ.(23). In addition, we recruited culturally diverse participants and employed a range of approaches to community consultation and co-design to ensure cultural validity of the CRQ-P/C. While our study has many strengths compared to previous research, there are important limitations to note. Our focus was children aged 5-12, and the measure may not be appropriate for use outside this age range. While the families taking part represent a cross-section of the Australian community,

the measure may not work as well in other settings, or in communities not represented in our study, for example, First Nation populations in other countries or refugee background communities not included in the development of the questionnaire. While we were able to assess criterion validity using the SDQ as a proxy measure of resilience, this is not a measure of resilience. No such measure existed at the time of the study. Further assessment against new resilience measures will enable more rigorous assessment. It was beyond the scope of this paper to report on the child report CRQ (CRQ-C) against the CRQ-P/C, but this is underway. Assessment of test-retest reliability and the psychometric properties of the CRQ-P/C in different populations, child ages and contexts are also planned.

Conclusion

Resilience was originally seen as a static characteristic of an individual – unique heroic figures achieving remarkable things despite tragic childhoods. It is now better conceptualised as a more 'ordinary magic'(13) - a dynamic process of drawing on internal and external resources to adapt, recover or thrive despite adverse experiences. Thus, children who have access to resilience factors within themselves, and in their family, school and community will fare better in the face of adversity than children who are not similarly resourced. The CRQ-P/C is the first culturally and socially inclusive, multidomain measure of child resilience that reflects this paradigm shift. The measure will facilitate investigation of a child's strengths or vulnerabilities across different aspects of their socio-ecological world. Availability of the first developmentally appropriate child measure with demonstrated content, construct validity, reliability and criterion validity will facilitate understanding of resilience across settings, contexts, adversities, and countries.

Socially inclusive and culturally appropriate research methods and tools are fundamental to creating the evidence needed to guide interventions to support child resilience across diverse contexts and settings. This tool expands the extremely limited number of culturally inclusive measures available for use with Aboriginal and refugee background children.

The CRQ-C/P will support more complex and nuanced examinations of child resilience, with wide ranging applications including in: clinical settings for starting conversations with families about a child's strengths and potential vulnerabilities; evaluation of programs aimed at building child resilience; and finally, in child resilience research.

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Table 1. Description of recruitment and participants

	Pilot Study n (%)	Validation study n (%)
Respondents		
Recruitment source		
Hospital Specialist Clinics	339 (69.3)	499 (44.8)
Refugee background communities	86 (17.6)	111 (10.0)
Aboriginal communities	18 (3.7)	71 (6.4)
Aboriginal Mother-Child cohort	46 (9.4)	165 (14.8)
General population Mother-Child cohort		268 (24.1)
Questionnaire format		
Paper	489 (100)	271 (24.3)
iPad		588 (52.8)
Online (REDCap)		255 (22.9)
Self-reported gender		
Female	391 (81.6)	938 (84.7)
Male	88 (18.4)	170 (15.3)
Continent of birth		
Australia	330 (69.0)	807 (72.7)
Asia	97 (20.3)	199 (17.9)
Europe	22 (4.6)	54 (4.9)
Africa	25 (5.2)	35 (3.2)
North America	2 (0.4)	9 (0.8)
South America	2 (0.4)	6 (0.5)
CRQ-P/C Target child		
Australian born		
Yes	244 (76.5)	988 (89.2)
No	75 (23.5)	120 (10.8)
Child gender		
Female		439 (47.2)
Male		491 (52.8)
Age *Mean (SD)*	*9.7 (1.6)*	*9.1 (2.3)*
5-6 years	6 (1.8)	230 (20.8)
7-8 years	86 (25.2)	225 (20.3)
9-10 years	132 (38.7)	240 (21.7)
11-12 years	111 (32.6)	410 (37)
13 years	6 (1.8)	3 (0.3)
Aboriginal &/or Torres Strait Islander	67 (13.7)	247 (22.3)
Community (refugee background families)		
Assyrian Chaldean (Iraq, Syria)	30 (34.9)	29 (26.1)
Karen (Burma, Thailand)	25 (29.1)	30 (27.0)
Sierra Leone (Sierra Leone)	16 (18.6)	22 (19.8)
Tamil (Sri Lanka)	15 (17.4)	-
Hazara (Afghanistan)	-	30 (27.0)
Years in Australia (refugee background families)		
Born in Australia	15 (25.0)	33 (31.1)
1-2 years	10 (16.7)	33 (31.1)
3-5 years	16 (26.7)	21 (19.8)
6+ years	19 (31.6)	19 (17.9)
Total	489 (100)	1114 (100)

Figure 1. CRQ-P/C scale progression from conceptual scales to final version

Table 2. CRQ-P/C item summary, including standardised factor loadings from initial and final confirmatory factor models (CFA) for the SELF and FAMILY domains (n=1111)

	DOMAIN					Model fit/ Factor loadings	
	Item	N	M (SD)	Skew	Kurt	Initial congeneric CFA	Final congeneric CFA
SELF							
	Self-Identity					$\chi^2_{(14)}$=124.20, p<.001; RMSEA=.09 (.07, .10); CFI=.98; TLI=.98	$\chi^2_{(5)}$=37.76, p<.001; RMSEA=.08 (.06, .10); CFI=.99; TLI=.99
1	My child feels good…	1110	3.1 (0.6)	-0.4	3.5	.75	-
2	My child keeps trying …	1107	2.8 (0.8)	-0.3	2.8	.70	.70
3	My child is a strong…	1105	3.1 (0.8)	-0.6	3.2	.82	.83
4	My child is a confident ..	1108	2.9 (0.8)	-0.5	3.0	.85	.81
5	My child likes to try….	1111	3.0 (0.9)	-0.6	2.6	.69	.70
6	My child is a brave …	1107	3.1 (0.8)	-0.7	3.1	.76	.78
	Positive future					$\chi^2_{(2)}$=22.90, p<.001; RMSEA=.10 (.07,.14); CFI=.99; TLI=.99	No modifications
1	My child is positive about …	1109	3.2 (0.8)	-0.7	3.5	.84	.84
2	My child looks forward to…	1109	3.2 (0.8)	-0.9	3.5	.70	.70
3	My child is hopeful …	1108	3.3 (0.7)	-1.0	4.2	.95	.95
4	My child is positive …	1102	3.3 (0.7)	-0.8	3.5	.95	.95
	Managing emotions/problems					$\chi^2_{(9)}$=184.67, p<.001; RMSEA=.14 (.12, .16); CFI=.99; TLI=.97	No fit indices for 3-item model
1	My child thinks about the reasons …	1107	2.8 (0.9)	-0.4	2.9	.33	-
2	My child knows how to manage …	1109	2.4 (0.9)	-0.3	2.9	.84	-
3	My child copes well …	1108	2.5 (0.9)	-0.5	3.3	.83	.77
4	My child knows how to calm …	1108	2.4 (1.0)	-0.3	2.8	.82	.83
5	My child knows how to manage …	1107	2.5 (0.9)	-0.3	3.1	.91	.94
6	My child worries about …	1104	2.0 (1.0)	-0.1	3.0	.04	-
FAMILY							
	Connectedness					$\chi^2_{(5)}$= 167.22, p<.001; RMSEA=.18 (.16, .20); CFI=.98 TLI=.97.	$\chi^2_{(2)}$= 3.30, p=.192; RMSEA=.03 (.00, .07); CFI=1.00; TLI=1.00
1	My child talks to me about …	1075	3.1 (0.8)	-0.7	3.5	.83	.84
2	I listen to my child …	1069	3.6 (0.6)	-0.8	3.0	.61	-
3	My child talks to me about their feelings ..	1072	3.2 (0.8)	-0.9	3.8	.93	.93
4	My child talks to me about their worries…	1068	3.1 (0.9)	-0.8	3.4	.89	.89
5	I am close …	1071	3.7 (0.5)	-1.8	6.6	.75	.70
	Basic needs					$\chi^2_{(9)}$= 42.50, p<.001; RMSEA=.06 (.04, .08); CFI=.99; TLI=.98	$\chi^2_{(2)}$= 4.00, p=.135; RMSEA=.03 (.00, .08); CFI=1.00; TLI=.99
1	My child likes being …	1073	3.5 (0.6)	-1.3	5.3	.71	-
2	My child feels safe …	1070	3.8 (0.5)	-2.3	8.6	.77	.67
3	My child feels they belong…	1070	3.7 (0.6)	-2.1	8.6	.82	-
4	Our family has routines …	1068	3.4 (0.7)	-1.0	3.5	.58	.61

5	My child feels special …	1069	3.4 (0.8)	-1.5	6.1	.75	.79
6	My child has own space…	1068	3.5 (0.8)	-2.1	7.4	.58	.60
						$\chi^2_{(2)}$=10.03, p<.001; RMSEA=.06 (.03, .10); CFI=1.00; TLI=.99	No fit indices for 3-item model
Guidance							
1	My child is given responsibilities …	1073	2.8 (1.0)	-0.6	2.8	.73	.72
2	My child helps with things like …	1068	2.8 (1.0)	-0.3	2.3	.79	.82
3	Our family talks about …	1068	3.6 (0.6)	-1.5	5.1	.51	-
4	I teach my child life …	1071	3.3 (0.8)	-1.0	3.4	.75	.73

Table 3. CRQ-P/C item summary, including standardised factor loadings from initial and final confirmatory factor models (CFA) for the SCHOOL and COMMUNITY domains (n=1111)

	DOMAIN Item	N	M (SD)	Skew	Kurt	Model fit/ Factor loadings Initial congeneric CFA	 Final congeneric CFA
SCHOOL							
Teachers						$\chi^2_{(9)}$=177.93, p<.001; RMSEA=.14 (.12, .15); CFI=.98; TLI=.97	$\chi^2_{(2)}$=28.89, p<.001; RMSEA=.12 (.08,.15); CFI=1.00; TLI=.99
1	The teachers help …	1084	3.3 (0.8)	-0.9	3.5	.79	.80
2	The teachers listen to ….	1081	3.1 (0.8)	-0.8	3.3	.84	.88
3	My child's school/teachers celebrate …	1078	3.3 (0.8)	-1.1	4.0	.74	-
4	My child has a teacher they can …	1075	3.0 (1.0)	-0.9	3.3	.75	.76
5	The teachers let my child know …	1078	3.2 (0.8)	-0.8	3.4	.81	.75
6	The teachers are fair …	1070	3.2 (0.8)	-1.0	4.5	.70	-
Engagement						$\chi^2_{(9)}$=99.86, p<.001; RMSEA=.10 (.08, .12); CFI=.98; TLI=.97	$\chi^2_{(2)}$=25.41, p<.001; RMSEA=.10 (.07, .15); CFI=.99; TLI=.98
1	My child likes learning …	1095	3.2 (0.8)	-1.0	3.7	.89	.88
2	My child doesn't like …	1082	3.2 (1.0)	-1.2	3.8	.63	-
3	My child is interested …	1081	3.2 (0.8)	-0.9	3.4	.88	.88
4	Trying hard at school …	1077	3.0 (1.0)	-0.8	3.2	.68	.71
5	My child finishes work …	1061	2.8 (0.9)	-0.6	2.9	.64	.65
Belonging PLUS Friend scale						$\chi^2_{(35)}$=607.70 p<.001; RMSEA=.13 (.12, .14); CFI=.92; TLI=.90	No fit indices for 3-item model
1	My child gets bullied …	1083	3.0 (1.0)	-0.7	3.1	.58	-
3	My child feels comfortable …	1073	3.2 (1.0)	-1.4	4.8	-.39	-
4	My child feels different …	1075	3.0 (1.1)	-0.7	2.8	.61	-
5	My child gets in trouble ….	1081	3.2 (0.9)	-1.1	4.0	.31	-
6	My child is lonely …	1066	3.2 (0.9)	-1.2	3.9	.80	-
7	My child finds it hard …	1090	2.9 (1.1)	-0.7	2.8	.73	-
8	My child would like to …	1073	1.9 (1.2)	-0.0	2.1	.48	-
9	My child has a group of friends …	1081	3.3 (0.8)	-1.1	4.4	-.83	.81
10	My child has a friend they can …	1067	2.7 (1.1)	-0.6	2.8	-.67	.75
11	My child has a best …	1077	3.2 (1.0)	-1.3	4.3	-.78	.90
COMMUNITY							
Culture						$\chi^2_{(27)}$= 568.07, p<.001; RMSEA=.14 (.13, .15); CFI=96; TLI=.94	$\chi^2_{(2)}$= 33.3, p<.001; RMSEA=.13 (.09,.17); CFI=.99; TLI=.98
1	My child is strong because …	1029	2.9 (0.9)	-0.9	3.9	.78	.83
2	My child is connected …	1025	3.0 (0.9)	-0.9	3.7	.80	.81
3	My child can deal with problems …	1026	2.8 (1.0)	-0.6	3.2	.82	-
4	Our family culture or values …	1023	2.8 (0.9)	-0.6	3.2	.85	.81

5	My child likes going to events …	1011	3.1 (0.9)	-1.0	3.7	.72	-
6	My child is connected to elders …	1020	3.2 (1.1)	-1.3	3.9	.63	-
7	My child is strong because of our family …	1016	2.9 (1.0)	-0.8	3.2	.84	.79
8	Our family culture makes my …	1003	2.9 (1.0)	-0.8	3.2	-	-
Religion / Spirituality						$\chi^2_{(5)}$=178.83, p<.001; RMSEA=.19 (.17, .21); CFI=.98; TLI=.96	
1	My child looks to their elders …	1008	2.8 (1.1)	-0.7	2.7	-	-
2	My child is connected to people …	991	1.3 (1.5)	0.7	2.0	.69	-
3	My child is connected to people …	997	2.1 (1.4)	-0.2	1.8	.87	-
4	My child is connected to their spirit …	966	2.0 (1.4)	-0.0	1.7	.79	-
5	Our family talk or yarn about …	1007	2.6 (1.1)	-0.6	2.6	.84	-
6	Our family stories or spiritual beliefs …	994	2.3 (1.3)	-0.3	2.1	.89	-
Language – Opportunity to learn						Not Calculated	Not Calculated
1	Learning this language …	488	2.5 (0.7)	-1.0	2.9		
2	My child would like to learn …	487	2.5 (0.6)	-1.1	3.0		
3	My child has had the opportunity …	491	2.5 (0.7)	-0.8	2.5		
4	I encourage my child …	487	2.7 (0.5)	-1.5	4.3		
Language – Connectedness						$\chi^2_{(9)}$=123.42, p<.001; RMSEA=.16 (.14, .19); CFI=0.99; TLI=.99	$\chi^2_{(2)}$=15.84, p<.001; RMSEA=.12 (.07,.18); CFI=1.00; TLI=1.00
1	My child can speak …	496	2.1 (0.6)	-0.1	2.4	.95	.96
2	My child can understand …	493	2.4 (0.6)	-0.5	2.3	.94	.95
3	A family member speaks to …	487	2.5 (0.6)	-0.9	2.8	.85	-
4	My child understands when …	488	2.4 (0.7)	-0.7	2.3	.89	.87
5	My child can easily talk to …	487	2.1 (0.8)	-0.2	1.6	.90	-
6	My child likes to talk to …	487	2.1 (0.8)	-0.2	1.7	.91	.86
7	Understanding this language...feel special	482	2.5 (0.7)	-0.9	2.6	-	-
8	Understanding this language…feel connected	483	2.5 (0.7)	-1.0	2.9	-	-

Table 4. Summary of the final scales for the Child Resilience Questionnaire – Parent/Caregiver version

		CRQ-P/C total sample				Girls (n=421)	Boys (n=471)		
	Items (range[1])	n	Range	Mean (SD)	Cronbach α	Mean (SD	Mean (SD)	T-test	P value
SELF									
Positive self	5 (0 - 20)	1,112	2 - 20	14.8 (3.3)	0.83	15.2 (3.2)	14.8 (3.3)	2.0	0.042
Positive future	4 (0 - 16)	1,111	0 - 16	12.8 (2.7)	0.87	13.0 (2.5)	12.8 (2.7)	1.1	0.256
Managing emotions	3 (0 -12)	1,100	0 - 12	7.1 (2.4)	0.86	7.8 (2.3)	7.2 (2.4)	3.6	<0.001
FAMILY									
Connectedness	4 (0 - 16)	1,071	3 - 16	13.0 (2.6)	0.85	13.3 (2.5)	12.9 (2.6)	2.0	0.046
Basic Needs	4 (0 - 16)	1,070	6 - 16	14.1 (2.0)	0.61	14.1 (2.0)	14.1 (2.0)	-0.1	0.898
Guidance	3 (0 - 12)	1,076	1 - 12	8.9 (2.3)	0.73	9.0 (2.3)	8.8 (2.3)	1.5	0.133
SCHOOL									
Teacher Support	4 (0 - 16)	1,080	0 - 16	12.6 (2.8)	0.81	12.7 (2.6)	12.7 (2.8)	0.2	0.811
Engagement	4 (0 - 16)	1,079	2 - 16	12.2 (2.8)	0.81	12.9 (2.5)	11.8 (3.0)	5.4	<0.001
Friends	3 (0 - 12)	1,049	0 - 12	9.2 (2.4)	0.80	9.5 (3.3)	9.0 (2.4)	3.2	0.002
CULTURE									
Connectedness	5 (0 - 20)	1,023	0 - 16	11.6 (3.2)	0.84	11.8 (3.3)	11.6 (3.1)	0.8	0.433
Language[2]	4 (0 - 8)	489	0 - 8	4.9 (2.3)	0.88	5.2 (2.3)	4.9 (2.3)	0.9	0.347
CRQ total score	39 (0 - 156)	1,062	57 - 152	115.8 (17.4)	0.93	118.6 (16.7)	115.1 (17.6)	3.0	0.003
CRQ total score (incl. lang)[2]	43 (0 - 172)	480	64 - 164	127.7 (18.4)	0.93	130.0 (17.6)	127.9 (18.4)	1.2	0.249

[1] Response options ranged from 0 'Not at all' to 4 'All of the time", with exception of language where response options ranged from 0 'Not at all' to 2 'A lot".
[2] Completed by multilingual families only.

Table 5. Spearman's correlations between CRQ-P/C scales, total CRQ-P/C score and the Strengths and Difficulties Questionnaire (SDQ) total score

	SELF			FAMILY			SCHOOL			CULTURE		
DOMAIN	Positive Self	Positive Future	Managing emotions	Connectedness	Basic Needs	Guidance	Teacher Support	Engagement	Friends	Connectedness	Language[1]	CRQ-P/C Total
CRQ-P/C Scale	n=1112	n=1111	n=1100	n=1071	n=1060	n=1063	n=1080	n=1079	n=1079	n=1023	n=489	n=1062
SELF												
Positive Future	0.661											
Emotion Regulation	0.564	0.547										
FAMILY												
Connectedness	0.413	0.443	0.323									
Basic Needs	0.282	0.383	0.225	0.499								
Guidance	0.249	0.273	0.200	0.449	0.402							
SCHOOL												
Teacher Support	0.312	0.319	0.254	0.349	0.290	0.241						
Engagement	0.456	0.441	0.427	0.366	0.314	0.284	0.472					
Friends	0.373	0.394	0.403	0.328	0.282	0.263	0.380	0.377				
CULTURE												
Connectedness	0.378	0.362	0.318	0.429	0.406	0.356	0.291	0.304	0.289			
Language (n=489)	0.159	0.100	0.116	0.120	-0.021[2]	0.051[2]	0.072[2]	0.192	0.001	0.233		
CRQ-P/C Total	0.713	0.724	0.637	0.674	0.569	0.541	0.584	0.682	0.634	0.634	0.163	
SDQ total difficulties score (n=980)	-0.332	-0.324	-0.531	-0.213	-0.207	-0.152	-0.195	-0.394	-0.449	-0.217	-0.051[2]	-0.471

[1] Completed by multilingual families only.
[2] Nonsignificant p-value (> 0.05)

Supplementary Tables:

Supplementary Table 1A. Four-factor solution with maximum likelihood extraction and varimax rotation of the SELF items in pilot study

Supplementary Table 1B. Four-factor solution with maximum likelihood extraction and varimax rotation of the FAMILY items in pilot study

Supplementary Table 1C. Four Factor solution with maximum likelihood extraction and varimax rotation of the SCHOOL items in pilot study

Supplementary Table 1D. Four-factor solution with maximum likelihood extraction and varimax rotation of the COMMUNITY items in pilot study

Conceptually Developed Scales	Revision 1 - Draft CRQ-C	Revision 2 - Final CRQ-C
SELF		
Self identity (9 items) My child is a confident person My child is a brave person	**Positive self (7 items)** My child is a brave person My child likes to try new things	**Positive self (5 items)** My child is a brave person My child likes to try new things
Positive sense of self (7 items) My child feels good about themself My child likes to try new things		
Hopes /Expectations (7 items) My child looks forward to growing up My child is hopeful about their life	**Positive future (4 items)** My child looks forward to growing up My child is hopeful about their life	**Positive future (4 items)** My child looks forward to growing up My child is hopeful about their life
Personal agency /self-efficacy (12 items) My child is good at sorting out problems My child won't try things if they might make a mistake	**Managing emotions/problems (6 items)** My child copes well if they have a problem My child knows how to calm down when they feel angry	**Managing emotions/problems (3 items)** My child copes well if they have a problem My child knows how to calm down when they feel angry
Coping Skills (11 items) My child has someone they can share their worries with My child knows how to calm down when they feel angry		
FAMILY		
Parent role / guidance (10 items) I teach my child life skills e.g. money, how to cook My child is given responsibilities in our family e.g…	**Guidance (5 items)** I teach my child life skills e.g. money, how to cook My child is given responsibilities in our family e.g…	**Guidance (3 items = 2 new items)** I teach my child life skills e.g. money, how to cook My child is given responsibilities in our family e.g…
Positive parent-child relship (8 items) My child talks to me about their feelings I am close to my child	**Connectedness (5 items)** My child talks to me about their feelings My child talks to me about what is happening in their life	
Communication (8 items) My child talks to me about what is happening in their life We talk things through in our family		**Connectedness (5 items)** My child talks to me about their feelings My child feels safe at home
Basic needs – family (7 items) My child feels loved by our family I am able to look after my child needs e.g…	**Basic needs (6 items)** My child feels safe at home My child has their own space in our house	
Basic needs – home (6 items) My child feels safe at home My child has their own space in our house		
FRIENDS		
Friends (9 items) My child has a close/best friend My child would like to have more friends	**Friends (5 items) *RETURNED+ NEW*** My child has a best/close friend My child would like to have more friends	
SCHOOL		
		Belonging (5 items) *My child would like to have more friends* My child gets bullied or teased at school My child feels different to the other children at their school
Belonging and safety (11 items) My child gets bullied or teased at school My child feels they belong at their school	**Belonging (7 items)** My child gets bullied or teased at school My child feels different to the other children at their school	
Engagement (9 items) My child is interested in what they learn at school Trying hard at school is important to my child	**Engagement (6 items)** My child is interested in what they learn at school Trying hard at school is important to my child	**Engagement (4 items)** My child is interested in what they learn at school Trying hard at school is important to my child
Positive teacher-child relationships (10 items) The teachers help my child when they need it The teachers let my child know when they are doing well	**Teachers (6 items)** The teachers help my child when they need it The teachers let my child know when they are doing well	**Teachers (4 items)** The teachers help my child when they need it The teachers let my child know when they are doing well
Environment (10 items) My child obeys the school rules My child enjoys attending their school		
COMMUNITY		
Connection to culture (14 items) My child is proud of our family's culture My child is strong because of our culture	**Connection to culture (6 items)** My child is connected to our family culture (e.g..) My child is strong because of our family culture	**Connection to culture (5 items)** My child is connected to our family culture (e.g...) My child is strong because of our family culture My child is strong because of our family stories, values or spiritual beliefs
Religion/sprituallity/beliefs (7 items) My child is strong because of their religion or beliefs My child is connected to people through their religion, faith or stories	**Religion / Spirituality (8 items)** My child is strong because of our family stories, values or spiritual beliefs My child is connected to people through our spiritual beliefs or stories	
Basic needs (10 items) My child feels safe in the area where we live Our family is happy living where we live	***LANGUAGE Opportunity to learn (6 items) NEW*** *I have had the opportunity to learn this language* *Learning this language is important to me*	
Community spaces/places (4 items) My child goes to a group or activity in our community e.g… My child enjoys going to community events/ activities	***LANGUAGE Connectedness (6 items) NEW*** *My child can understand this language* *Understanding this language makes my child feel connected to our family or community*	***LANGUAGE Connectedness (4 items)*** *My child can understand this language* *Understanding this language makes my child feel connected to our family or community*

Supplementary Tables 1A – 1D

Table 1A. Four-factor solution with maximum likelihood extraction and varimax rotation of the SELF items.

	Factor			
	1	2	3	4
Managing emotions (positive)				
My child knows how to manage their feelings	0.832			
~~My child is good at solving problems by themself~~	~~0.718~~			
My child copes well if they have a problem ~~with friends~~ (Revised)[3]	0.620	0.311		
My child knows manage worried or anxious	0.599			
My child knows how to calm down when they feel angry	0.527		0.395	
~~My child copes well problem at home~~[1]	~~0.446~~	~~0.301~~	~~0.319~~	
My child thinks about why things happen	0.436			
Managing emotions (negative) DROPPED				
~~My child worries making a mistake~~				~~0.688~~
~~My child worries about things going wrong~~				~~0.665~~
~~My child wont try things if they might make a mistake~~				~~0.499~~
~~My child keeps their feelings inside~~				~~0.413~~
Positive Self				
My child is a brave person		0.676		
My child is a confident person		0.625		
My child likes to try new things		0.610	0.332	
My child feels good about themself		0.559	0.438	
My child is a strong person on the inside	0.315	0.524		
My child keeps trying even when things get hard	0.383	0.446		
~~My child is happy to be different from other kids~~		~~0.328~~		
Positive Future				
My child is positive about their future			0.692	
My child is hopeful about their life			0.642	
My child is positive about their life			0.620	
My child looks forward to growing up			0.469	
~~My child can easily name things they are good at~~[1]		~~0.355~~	~~0.373~~	
~~My child tries to work out why things go wrong~~[1]		~~0.301~~	~~0.305~~	

[1] Deleted as low and equal loading on multiple factors.
[2] Retained as consultations identified as conceptually important.
[3] Revised to make more general (previously was a similar question for school, home and friends).

Table 1B. Four-factor solution with maximum likelihood extraction and varimax rotation of the FAMILY items.

	Factor			
	1	2	3	4
Connectedness				
My child talks to me about their worries	0.809			
My child talks to me about their feelings	0.782			
My child talks to me about what is happening in their life	0.753			
~~My child feels special in our family~~[1]	~~0.481~~	~~0.433~~		
~~I am interested in things that my child likes~~[1]	~~0.424~~	~~0.352~~		
I listen to my child[2]	0.374	0.452		
I am close to my child[2]	0.364	0.379		
Basic needs				
My child feels safe at *our* home[3]		0.603		
My child likes being in our ~~house~~ *home*[3]		0.522		
I am able to provide what my child needs		0.405		
My child has their own space in ~~our house~~ *the place where we live*[3]		0.373		
My child feels they belong in the place where we live[4]		New		
Guidance				
My child helps with things like shopping			0.665	
My child has responsibilities in family			0.599	
I teach my child life skills e.g. money			0.564	
~~Our family enjoys visiting others~~[1]		~~0.335~~	~~0.421~~	
Our family has routines			0.351	
Friends				
My child has a close/best friend				0.637
My child's friends come to our ~~house~~ *home*[3]				0.612
My child would like to have more friends				-0.370
My child feels lonely				-0.367
My child has a friend they can talk to about their worries[4]				New
My child has a group of friends they have fun with[4]				New
My child finds it hard making friends [4]				New

[1] Deleted as low and equal loading on two factors.
[2] Retained as consultations identified as conceptually important.
[3] Advised in consultations on wording changes to be more inclusive of different living arrangements, including not having a house.
[4] Added through consultations to strengthen scale.

Table 1C. Four Factor solution with maximum likelihood extraction and varimax rotation of the SCHOOL items.

	Factor		
	1	2	3
Teachers			
Teachers listen to my child when have a problem	0.797		
The teachers help my child when they need it	0.744		
The teachers are fair	0.643		
Teachers let child know when doing well	0.620		
My child has a teacher talk upset or angry	0.585		
My child's school or teachers celebrate achievements	0.576		
Engagement			
My child likes learning at school		0.822	
Trying hard at school is important to my child		0.738	
My child is interested in what they learn at school	0.367	0.648	
My child doesn't like going to school		-0.448	0.353
My child finishes work on time		0.395	
Belonging			
My child is lonely at school			0.733
My child gets bullied or teased at school			0.656
~~My child fits in at school~~[1]	~~0.358~~		~~-0.518~~
My child feels different to the other children at their school			0.472
My child gets in trouble at school			0.451
~~There are children similar to my child in their class~~[2]			~~-0.353~~
~~There are other people like my child at their school~~[2]			~~-0.341~~
My child feels comfortable in identifying with their culture at school[3]			*New*
My child's school acknowledges/respects my child's culture[3]			*New*

[1] Identified as ambiguous/difficult to answer by respondents and in consultations.
[2] Dropped due to low factor loading and conceptual overlap with item above.
[3] Added after consultations to strengthen scale.

Table 1D. Four-factor solution with maximum likelihood extraction and varimax rotation of the COMMUNITY items.

	Factor 1	2	3	4
Connected to culture				
My child is strong because of our culture	0.773			
~~My child enjoys taking part in our family traditions~~[2]	~~0.766~~			
My child is connected to our family's culture *(e.g. food, music, celebrations)*[5]	0.675			
My family's culture makes my child feel special	0.670	0.365		
My child likes going to events that celebrate our family's culture	0.593			
~~My child is connected to spirit by being in country~~[1]	~~0.518~~			~~0.300~~
~~My child enjoys going to community events/activities~~[2]	~~0.489~~		~~0.438~~	
~~My family tell stories about our family's history~~[2]	~~0.469~~			
~~People in our community come together to celebrate events~~[2]	~~0.464~~			
Our family culture or values help my child when things are hard[3]	*New*			
My child is connected to elders in our community (e.g. grandparents, aunties/uncles, respected adults)[3]	*New*			
My child looks to their elders (a respected older person) to guide them[3]	*New*			
~~My child is connected to elders~~ (revised above)				~~0.942~~
~~My child looks to elders for guidance~~ (revised above)				~~0.680~~
Religion /Spirituality				
My child is connected to people through their religion, beliefs or stories		0.745		
My child connected to people through our church, mosque or temple		0.637		
My child is strong because of ~~their religion or beliefs~~ *our family stories, values or spiritual beliefs*[3]		0.604		
~~My child goes to a special place with our family~~[2]	~~0.464~~	~~0.494~~		
Our family talk or yarn about our stories, beliefs or values[3]		*New*		
Our family stories or spiritual beliefs comfort my child when things are hard[3]		*New*		
My child can deal with problems better because of our family's beliefs, stories or values[3]		*New*		
My child is connected to elders in our community (e.g. grandparents, aunties/uncles, respected adults)[3]		*New*		
~~**Community** **DROPPED More a measure of socio-economic status~~				
~~Our family knows other families where we live~~	~~0.323~~		~~0.519~~	
~~There are playgrounds or green spaces around where we live~~			~~0.478~~	
~~I let my child play outside in the streets or parks where we live~~			~~0.471~~	
~~My child feels safe in the area where we live~~			~~0.405~~	
~~My child goes to a group or activity in our community~~			~~0.400~~	
~~My child is involved in our community~~			~~0.381~~	
~~My child feels different from others in the commty where we live~~			~~-0.336~~	
~~There are places where we live that my child doesn't feel safe~~				
Language - opportunity to learn [3]				
My child can speak this language				*New*
My child can understand this language				*New*
Learning this language is important to my child				*New*
My child would like to learn more of this language				*New*
My child has had the opportunity to learn this language				*New*
I encourage my child to learn this language				*New*
Language – connectedness[3]				
A family member speaks to my child in this language				*New*
My child understands when people in our family/community are talking in this language				*New*
My child can easily talk to elders (respected older people) in this language				*New*
My child likes to talk to our family/relatives in this language				*New*
Understanding this language makes my child feel special				*New*
Understanding this language makes my child feel connected to our family or community				*New*

[1] Identified as difficult to answer by non-Aboriginal respondents.

[2] Dropped due to low factor loading and/or conceptual overlap.

[3] Added/revised after consultations to strengthen scale.

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	5-6
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6-7
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	6-7
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7-8
Bias	9	Describe any efforts to address potential sources of bias	5,13
Study size	10	Explain how the study size was arrived at	
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	9-12
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	8
		(*b*) Describe any methods used to examine subgroups and interactions	12
		(*c*) Explain how missing data were addressed	8
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	N/A
		(*e*) Describe any sensitivity analyses	N/A
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Table 1
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Table 1
		(b) Indicate number of participants with missing data for each variable of interest	Table 2, Table 3
Outcome data	15*	Report numbers of outcome events or summary measures	Table 3
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	13
		(*b*) Report category boundaries when continuous variables were categorized	12
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	13
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	13-14
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	15
Generalisability	21	Discuss the generalisability (external validity) of the study results	15
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	1

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.