**Cover page**

**Title:** The Rugged Resilience Measure (RRM)

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**Acknowledgements:** None

**Abstract:** The Rugged Resilience Measure (RRM) is a brief tool that focuses on the psychological protective factors associated with resilience. In its initial development and validation study, it was tested with 5,880 individuals aged 16-29 years in seven countries (Brazil, China, Indonesia, Russia, Thailand, Vietnam, and the US). Structural validity was confirmed via multigroup confirmatory factor analysis (for sex and country), followed by tests of internal reliability, and convergent, discriminant, and incremental validity. These results of these tests indicated that the RRM is a concise and robust measure of personal resilience that works well in different contexts around the world.

**Introduction**

**Overview of skills, outcomes, or constructs being assessed**

● What skills, outcomes, or constructs are you measuring?

Resilience. Resilience is generally operationalised as the ability to overcome, recover from, or adapt to significant adversity. Specific protective factors have been identified in the research literature that facilitate resilience. This measure assesses these factors, but just those of a psychological nature (“rugged” factors), in order to keep concise and focused and differentiate from measures that explore social-ecological aspects of resilience, such as the Child & Youth Resilience Measure. For further information, please see the development paper (Jefferies et al., 2022; <https://doi.org/10.1007/s11482-021-09953-3>).

● How are these skills, outcomes, or constructs defined?

Please see above for definition.

● Why is it important to policy, practice, communities, theory, etc., to measure these skills, outcomes or constructs?

Resilience remains an important topic in many different domains. For those wishing to build resilience, tools are needed to measure potential change. For more, please see sources like Masten (2013; <https://srcd.onlinelibrary.wiley.com/doi/full/10.1111/cdev.12205>).

**Measure**

Part 1: Overview of the measure

● What measure are you testing?

The Rugged Resilience Measure (RRM).

● For what purposes is the measure intended to be used? (e.g., formative, program evaluation, screening)

The RRM can be used for a variety of purposes. If an individual wishes to get a sense of their level of resilience, they may self-administer and self-score. If researchers wish to involve it in their research, they can get their participants to self-report their responses. If a program evaluator wishes to understand whether an intervention improves resilience, it may be useful there too. There are many applications but primarily we developed it because there was no concise measure of resilience specifically capturing psychological protective factors available.

● How does the measure assess the focal skills, outcomes, or constructs?

The RRM is a survey. Example item:

“I find solutions to problems I encounter”

**Part 2: Measure evidence base**

● If you are testing a new measure or a measure you have assembled from other measures, please describe the psychometric evidence base on other measures of the same or similar skills, in your population (if available) or with populations with similar context and culture. Please also describe why a new measure is needed.

In a study (Jefferies et al., 2022) where we administered both the RRM and the Adult Resilience Measure-Revised (a comparable measure of resilience), the internal consistency of the ARM-R was α = .88, while the RRM was .87.

The ARM-R consists of two factors: One for resources related to an individual and their environment (e.g., community) and another for resources related to family/caregivers. In contrast, the RRM consists of one factor representing the “rugged” qualities. In this sense they are comparable as each is at a similar domain level (psychological / familial / broader social environment).

For the reasons why the new measure was needed, please see the last point in the previous section and the introduction section in Jefferies et al. (2022).

**Part 3: Adaptation, development and assembly**

● If you are testing a new measure … please describe the process of measure development or assembly.

The measure was originally developed in English. The following is taken from Jefferies et al. (2022):

*To create a brief resilience measure focusing on internal protective factors, we were*

*guided by the approach suggested by Boateng et al. (2018) in their recommendations*

*for best practice in scale development and validation. This includes an item development*

*phase, a scale development phase, and a scale evaluation phase. However, a*

*preliminary step is defining the domain of measurement. This is particularly important*

*given differing conceptualisations of resilience (see Chmitorz et al., 2018; Southwick*

*et al., 2014) and the consequences of diverse approaches (e.g., Luthar et al., 2000). Our*

*definition aligns with research that has articulated resilience as involving the presence*

*of modifiable protective factors (internal or external to an individual) that predict one’s*

*recovery from or adaptation to a significant stressor, and can be reflected in forms of*

*functioning (e.g., mental health, wellbeing) (Fritz et al., 2018; Ungar, 2019). This*

*approach to resilience may be conceptualised in a broader framework as both a process*

*and an outcome (see van Breda, 2018), but fundamentally, the domain of interest*

*important to demarcate related specifically to the internal or psychological protective*

*factors important in recovery from or adaptation to adversity.*

*Boateng and colleagues also recommend confirming that no existing instruments*

*adequately suit the purpose.We reviewed existing measures of resilience identified in a*

*relevant systematic review (Windle et al., 2011) and found extant measures lacking due*

*to: a) lack of focus on protective factors (e.g., BRS), b) a lack of specific focus on*

*internal protective factors (e.g., CD-RISC, SPF, CYRM-R), or lack of applicability in*

*diverse settings (e.g., RS). This underscored the need for a brief measure of internal*

*protective factors.*

*As part of the item development phase, we then reviewed extant measures of*

*resilience to generate a list of potential unique factors, drawing on the subscales and*

*relevant items of measures. This was achieved by noting factors a measure purported to target (e.g., humour and creativity from the subscales of Hurtes & Allen’s (2001)*

*Resiliency Attitudes and Skills Profile) or interpreting a possible target factor (if one*

*was not described) (e.g., flexibility from Bartone et al.’s (1989) Dispositional Resilience*

*Scale reverse-coded item “It bothers me when my daily routine gets interrupted”).*

*This led to a list of approximately 20 initial internal factors which were then reviewed*

*by four experts in the field of resilience (university researchers) and a professional*

*specialising in personal coaching for building resilience. A Delphi approach based on*

*the recommendations of Hasson et al. (2000) was then employed to help review the list*

*and gain consensus on a shortlist of the most important psychological protective factors*

*associated with overcoming adversity. The experts initially reflected on the list and*

*contributed further unique factors based on their experience and expertise (a further two*

*were identified). They then considered each in turn to determine importance and*

*conceptual overlap and therefore factors that may be merged or dropped.*

*This process resulted in the following ten factors: ability to cope with stress,*

*adaptability, emotional self-regulation/self-control, meaning making/purpose,*

*motivation/embracing challenges, optimism, perseverance/grit, pride in achievements,*

*problem-solving ability, and self-belief/self-efficacy. Multiple statements were created*

*that could potentially be used as self-report items (e.g., for perseverance: “I can keep*

*going despite difficulties” and “If there is a setback, I can persevere”; pride in*

*achievements: “I take pride in things I have achieved”, “My achievements are a source*

*of strength”). The most appropriate statement for each factor was agreed by the expert*

*panel. No reverse-scored items were used (Bruner, 2019; Rodebaugh et al., 2007).*

**Methods**

**Context, sample, and procedure**

● What is the context and culture in which the measure was tested?

● What is your sample?

● How was the data collected?

The following is taken from Jefferies et al. (2022):

*…the study authors were approached by Edelman Intelligence (EI) who were seeking to conduct a large-scale market research survey exploring social anxiety and the resilience of young people in Brazil, China, Indonesia, Russia, Thailand, the US, and Vietnam. Following discussion, the questionnaire EI subsequently launched included the items developed for the new measure, which led to the creation of a dataset containing responses to the questionnaire. EI granted the study authors access to the dataset for the purpose of secondary analyses of the data. The questionnaire developed by EI was launched in November 2019. In total, 23,346 young people aged 16–29 from the seven countries were invited to participate in the study. The sample was randomly recruited through the market research companies Dynata, Online Market Intelligence (OMI), and GMO Research, who hold nationally representative research panels (matching available census data) and whose members have given their consent to participate in surveys. Invitations sent to potential participants indicated that taking part in the study involved completing a 20-min online questionnaire containing measures of social anxiety, resilience, social media usage, and functioning across various life domains. Participants were compensated for their time using a points-based incentive system, where points earned at the end of the survey are typically proportional to the length of the survey. Points could be redeemed for gift cards, vouchers, donations to charities, and other products or services. All three recruitment companies were affiliated with market research bodies that set standards for ethical practice. Dynata adheres to the Market Research Society code of conduct; OMI and GMO adhere to the ESOMAR market research code of conduct. Of those youth contacted, 76% (n = 17,817) were successfully recruited to take the survey. Sixty-five percent of participants were ineligible, as 10,816 respondents reported that they or their close friends worked in advertising, market research, public relations, journalism or the media, or for a manufacturer or retailer of hair care products (exclusion criteria defined by EI). A further 1121 respondents were excluded for straight-lining responses (the same response to all items of the survey scales), which indicated they were not properly engaged with the survey (Johnson, 2016), and 45 who did not indicate they were male or female (a sex subgroup which was too small for analyses). The final was well-beyond the number of respondents required for the planned analyses (see below), comprising 5880 participants (male = 2896, female = 2984, aged 16–29 years, M= 22.82, SD = 3.97) and matched country characteristics for sex, region, age, ethnicity, and education (Brazil = 847, China = 891, Indonesia = 738, Russia = 862, Thailand = 811, US = 843, Vietnam = 888). Participant ages were collected in years, but some individuals aged 16–17 were recruited through their parents and their exact age was not given. They were assigned an age of 16.5 years in order to derive the mean age and standard deviation for the full sample.*

**Data and analytic plan**

● What data quality issues did you encounter and how did you address them?

“As responses were required for all survey items, there were no missing data. … 1121 respondents were excluded for straight-lining responses (the same response to all items of the survey scales), which indicated they were not properly engaged with the survey (Johnson, 2016)…” (Jefferies, 2022)

● What types of validity, reliability or other psychometric analyses will you be performing

Initial development of the measure involved exploring face validity. Then we tested structural validity/measurement invariance (multi-group confirmatory factor analysis with alignment testing), internal consistency (Cronbach’s alpha and McDonald’s omega), concurrent validity (correlations with the ARM-R), discriminant validity and predictive validity. These are typical tests for measures in the field.

**Results**

**Descriptive**

● In this section, we encourage you to provide a table of summary statistics for each of the items or tasks in your measure.

The following is taken from Jefferies et al. (2022) supplementary materials:

Table

Description automatically generated

**Validity 1**

● In this section, please present your results/findings for at least one of the following types of validity:

[Chosen] Internal structural validity (e.g., factor structure)

Text, table

Description automatically generated

**Other psychometric analyses**

In this section, please present your results/findings for:

● Measurement invariance testing

Please see previous section (part of CFA).

● Sensitivity/specificity

N/A

● Item functioning

No DIF conducted. Would seek to conduct or support others exploring the measure via Rasch/IRT analyses.

**Discussion**

**Summary of results**

● What were your results?

Briefly, all tests produced good outcomes. This is from the Jefferies et al. (2022) paper: “A one-factor model was identified and confirmed to have good fit to the overall sample as well as equivalence across sex and country subgroups. The measure demonstrated good internal reliability (α = .87; ωh = .83) and concurrent validity through significant correlations with a measure of social-ecological resilience (ARM-R: r = .68) and predictive validity with a measure of social anxiety (SIAS: r = −.29). Evidence is also presented for its convergent, discriminant, and incremental validity.”

● Do you results suggest that the measure can be used for its intended purpose(s)?

Yes.

● How do you results align with prior theory and evidence?

Not sure what is meant by this. The results indicated that the measure was robust and fit for use. We also found that scores on the RRM correlated with scores on a measure of social anxiety at a similar strength to those of the Adult Resilience Measure-Revised (r=-.29 and -.25, respectively).

**Limitations**

● What challenges did you encounter throughout the measure development, adaptation, and/or testing process that limit your confidence in the results or the extent to which the findings can be generalised?

We did not encounter any challenges throughout the process that may have limited confidence in the results or generalisability. That said, even though the measure was used with individuals aged 16-29 in seven different countries, it would be interesting to explore adapting the measure for younger children (they may not understand the wording or intention of all items as they currently read).

**Recommendations for revision/use**

● What revisions do you recommend users make to the measure or to the measure administration procedures before using it with the same population?

None.

● What scoring procedures do you recommend based on your evidence?

Sum all items to derive a scale total.

**Appendices**

**References**

Jefferies, P., Vanstone, R. & Ungar, M. The Rugged Resilience Measure: Development and Preliminary Validation of a Brief Measure of Personal Resilience. Applied Research Quality Life 17, 985–1000 (2022). <https://doi.org/10.1007/s11482-021-09953-3>

Masten, A.S. (2014), Global Perspectives on Resilience in Children and Youth. Child Dev, 85: 6-20. <https://doi.org/10.1111/cdev.12205>

**Technical appendices**

N/A, but if you are unable to access the main article above, a copy (accepted manuscript form) can be obtained here: <https://www.researchgate.net/publication/351372836_The_Rugged_Resilience_Measure_Development_and_Preliminary_Validation_of_a_Brief_Measure_of_Personal_Resilience>