Article

Mapping resilience: Analyses of measures and suggested uses in music therapy

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ABSTRACT

Resilience – which is a process and capacity for adaptation when experiencing adverse life circumstances or cumulative stress – seems to be a particularly relevant for music therapists. However, there are challenges when assessing resilience. We screened sources (N=307) and identified seven scales that provide a quantitative measure of the degree of resilience: Connor-Davidson Resilience Scale (CD-RISC), Child and Youth Resilience Measure (CYRM), Devereux Early Childhood Assessment (DECA), Dispositional Resilience Scale (DRS), Resilience Scale (RS), Resilience Scale for Adults (RSA), Resilience Scale for Adolescents (READ). We reviewed each scale, identified salient psychometric properties, and drew conclusions about practical uses in music therapy (screening, profiling for intervention, and measuring effects of treatment). Music therapists strive to promote clients' wellbeing and resilience measurement instruments may provide a way of screening, profiling for intervention, or establishing specific research protocols that target strength-based competencies. These measures, however, may only provide a snapshot of the total variables that may affect responses to treatment since adaptation is only relevant within the broad community systems in which each individual belongs.

KEYWORDS

resilience measures, assessment, screening, psychometric review

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Resilience refers to the process and capacity for adaptation when experiencing adverse life circumstances or cumulative stress. It may therefore be a useful concept in music therapy. Even though there are several instruments appropriate for music therapy, the task of measuring resilience is challenging. There are many definitions, it is a complex construct, and seemingly related characteristics (such as personality traits, measures of stress/anxiety) may not be helpful in predicting healthy resilient adjustment. We, the authors of this paper, two music therapists and a registered nurse, conceptualised this paper as an attempt to identify,

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review and evaluate measures and assessment scales of resilience. Moreover, we aimed to suggest specific situations in which music therapists may use those measures in their clinical practice. Our target audience includes music therapists, researchers, clinicians, or both, who adopt a strength-based philosophy of clinical practice. A strengths-based practice involves shifting from an approach that emphasises symptoms and pathology, to one that focuses on positive experiences while developing coping skills and competencies (c.f. Rolvsjord 2015).

An inherent problem in conceptualising resilience is the plethora of definitions that exist in the literature. In general, resilience is the ability to adjust and grow in the face of adversity. As Luthar, Cicchetti and Becker (2000) point out, such conceptualisation generates questions as to what defines adjustment, the specific processes by which a resilient person adjusts; what constitutes adversity; or how timing, duration and sociocultural elements may support or hinder adaptation. Thus, resilience is a complex construct that represents both the process and capacity for successful adaptation in the face of adverse or challenging life circumstances (Masten, Best & Garmezy 1990).

This multidimensional nature of resilience poses further challenges in conceptualisation. First, people respond differently to comparable experiences at various times during their life trajectory. Resilience is a life-span process, not simply something that occurs in childhood (Rutter 2006). Moreover, some individuals may be resilient in one domain, but not in another. Individuals may be resilient across similar domains (e.g. academic achievement, studying habits), but not be resilient across distinct domains (e.g. academic achievement vs. social competence) (Luthar et al. 2000). Therefore positive adaptation is not uniform across all areas of functioning. As a result, broad phenomena may be studied under the umbrella of resilience. In developmental literature Masten (2007) identified three categories studied in resilience research: (a) following a typical developmental trajectory despite cumulative risks, (b) showing stress-resistance or coping during adverse situations, and (c) self-regulating and recovering after adversity or deprivation.

Resilience is not a personality trait or a coping mechanism. Certain personality traits or dispositional attributes, such as ego-resilience or hardiness, contribute to resilience and may serve as assets or protective factors. Luthar et al. (2000) point out that some confusion may arise from using the term resilience and resiliency interchangeably. Resiliency refers to a personal attribute whereas resilience connotes presence of a threat to adaptation and evidence of healthy adjustment in at least one domain of functioning. Characteristics of a person alone do not account for adaptive developmental outcomes. Adaptation emerges as a result of how an individual interacts with his or her environment and develops competence in age-appropriate and sociocultural defined tasks (Roisman et al. 2004).

The role of implementing personality testing in determining the validity of instruments measuring resilience is to identify how particular traits may co-vary with the resilience construct. Whereas correlating a resilience instrument with measures of personality contributes to construct validity, Friborg et al. (2005) point out that high redundancy is problematic. The more a particular factor of an instrument correlates with a personality trait, the less it contributes uniquely in measuring resilience. For example, optimism, a disposition measured in resilience instruments, was not correlated with other resilience variables in a sample of women with a family history of breast cancer (Bowen, Morasca & Meischke 2003). Another limitation of using personality inventories to validate resilience is that in adults, personality traits are not malleable to change.

Using measures of stress and anxiety also has inherent limitations in determining the validity of instruments measuring resilience. Some individuals may be more vulnerable to stress than others. Perception of stress, however, remains contextual. Environmental conditions and previous experience will determine which stressors are more or less challenging for particular individuals. Using measures of symptomatology or measures assessing healthy outcomes also has pitfalls. Knowing how a person deals with traumatic or negative life experiences may reveal more about the stressor itself rather than the adaptive capacity of the individual (Roisman 2005). Moreover, absence of symptoms is one way of coping with stressful situations. However, Roisman (2005) states that recovery may also be a form of resilience; individuals may experience a period of maladaptive coping prior to successful adaptation. Lastly, correlating scores obtained using instruments of resilience with scores obtained using instruments of social domain functioning is pivotal as healthy interpersonal relationships contribute to adaptation. Even though Wallace, Bisconti and Bergeman (2001) found that hardiness (which is relevant to resilient coping) mediated the relationships between social support and healthy

outcomes in a sample of older adults, they recommend considering both internal personality characteristics and external supports as relevant to wellbeing.

Given the above information, the task of creating a measurement instrument that captures the process of, capacity for, or outcome of successful adaptation may seem 'mission-impossible.' As cumulative risks increase, resources also decrease, making resilience harder to attain (Sameroff & Rosenblum 2006). Thus, if individuals who experience multiple risks score high on a resilience instrument, then that instrument is more likely to identify resilient individuals. An important realisation is that creating and using a measurement instrument will only measure some aspect of what contributes to resilience. Administering a resilience instrument (or measurement scale) is not a developmental analysis and cannot predict with absolute confidence an individual's trajectory. Findings in research literature indicate that resilient adaptation is fluid and can occur at any point during a person's developmental trajectory as a result of life experiences or in the context of relationships with others (Rutter 2006).

Regardless, resilience measurements are needed for various purposes. For example, measurement instruments can identify individual capacity for resilience, predicting difficulties in adaptation. Thus, mental health workers or health professionals may use such instruments in client assessment prior to therapy for gauging strengths and needs or for predicting ability to cope with forthcoming difficulties, tailoring interventions accordingly (Ahern et al. 2006; Connor & Davidson 2003; Friborg, Hjemdal et al. 2003). Moreover, psychometric study outcomes may aid researchers in identifying risk, promotive, protective and vulnerability factors affecting resilience.[1] In this paper we identified sources by conducting a formal overview of related literature.

METHOD

Identification of sources

A formal review of the music therapy, nursing and allied health primary research online databases using separate keyword searches ("resilience scale", "resilience measurement", "resilience psychometric study" and "resilience instrument") yielded 307 records. Each search was refined and limited to peer-reviewed sources. The primary database search included EBSCOHost, PsychINFO, CINAHL, ERIC and Ovid. We removed duplicates, book reviews, articles published in a language other than English, studies without a psychometric focus, studies in which the researchers did not measure resilience as the ability to adapt from adversity and studies in which researchers used storytelling or projective exercises (because they did not provide a quantitative objective measure of resilience). A total of 61 studies remained for additional screening. Subsequently, a secondary database search using names of resilience instruments or names of specific authors was conducted. The secondary search yielded an additional 66 records. To find additional sources we reviewed reference lists of book chapters and peer-reviewed articles about resilience measurement. Identification of sources concluded in April 2015.

Inclusion criteria

We screened 127 manuscripts and identified that researchers developed and used a total of 50 resilience measurement instruments. We selected and reviewed in detail only those measurements with at least four psychometric validation studies beyond the original research report, along with a minimum of four additional reported uses in the literature. The above criteria provided a subjective method of ensuring we were reviewing measures with reputable uses of social research. Table 1 includes the names of all the measures that met the inclusion criteria, a description of the theoretical

[1] Risk factors are variables that contribute to negative outcomes, whereas promotive factors are variables that contribute to positive outcomes regardless if an individual belongs to a high risk or a low risk group (e.g. parental school involvement). In essence, promotive factors have an overarching compensatory effect contributing to adaptation across various levels of risk. It is important to note that some factors may have a reactive effect; being effective under low levels but ineffective under high levels of risk fosters competence. Protective factors contribute to positive outcomes particularly in an individual belonging to a high-risk group. Protective factors may have an enhancing effect, facilitating adaptation as risk increases. Vulnerability factors contribute to negative outcomes only for low-risk groups. A vulnerability factor reduces positive outcomes in high-risk groups, but not in low-risk groups. When considering measurement instruments, it is critical to understand the above definitions. It also is important to recognise that what may constitute a protective factor in one domain may be a risk factor in another (Gutman, Sameroff & Cole 2003; Luthar 1993).

construct and the reference to the original validation study. Table 2 includes the names of all the measures that did not meet the inclusion criteria as well as the reference to the original validation study. Both tables are included in an appendix at the end of this paper.

Analysis approach

We retrieved information pertinent to discussing each measurement instrument by reading the main text of identified sources. For each measurement we discussed its development and relevant psychometric properties (scoring, administration, factor analysis, reliability and validity). When appropriate we differentiated our own opinions and interpretations from those of the original authors of each measure or from subsequent users. We also included a discussion of possible uses of each measure in music therapy research or clinical work.

RESULTS

We focused the discussion on the development of construct validity, as well as any other salient psychometric characteristics of each measure. In addition, we explored uses of those instruments in music therapy for screening, profiling for intervention and monitoring or measuring change. Seven measurement instruments met the inclusion criteria:

- Connor-Davidson Resilience Scale (CD-RISC)
- Child and Youth Resilience Measure (CYRM)
- Devereux Early Childhood Assessment (DECA)
- Dispositional Resilience Scale (DRS)
- Resilience Scale (RS)
- Resilience Scale for Adults (RSA)
- Resilience Scale for Adolescents (READ)

The first author of this paper has used the DECA and the CD-RISC in research and clinical work.

Connor-Davidson Resilience Scale (CD-RISC)

Overview

Connor and Davidson (2003) developed CD-RISC for screening typical functioning adults or adults with mental health problems as well as a method for evaluating treatment effectiveness. Inspired when reading about Sir Edward Shackleton's heroic expedition in the Antarctic in 1912 (Alexander 1998), they brainstormed on what type of personal characteristics would have contributed to resilience. Spirituality was one theoretical construct for this scale. They also derived theoretical information from a variety of other sources (Kobasa 1979; Lyons 1991; Rutter 1985) and included characteristics such as hardiness, seeking help, having secure attachments, patience, viewing change as a challenge and persevering to attain goals.

The CD-RISC scale has 25 items using a five-point Likert scale. It is a self-reported measurement that participants complete based on how they felt over the past month. The scoring is a summation of all the items. Scores range from 0-100 with higher scores equalling higher resilience (Connor & Davidson 2003). Standardisation scores do not exist in the literature and mean scores have varied among different populations. For example, reported means of different samples were US general population =80.7; primary care patients =71.8; psychiatric outpatients =68.0; generalised anxiety =62.4; two post-traumatic stress disorder (PTSD) samples =47.8 and 52.8 (Connor & Davidson 2003) and older-women =75.7 (Lamond et al. 2008). The scale has been translated into multiple languages such as Italian (Di Fabio & Palazzeschi 2012), Korean (Jeong et al. 2015; Jung et al. 2012), Turkish (Karaırmak 2010), Chinese (Wang et al. 2010) and Spanish (Notario-Pacheco et al. 2014). The reported test-retest correlation coefficient was 0.87 (Connor & Davidson 2003). Reliability properties have remained consistent and similar across different groups (Gillespie, Chaboyer & Wallis 2009; Yu & Zhang 2007a, 2007b). Cronbach's coefficients reported include 0.89 for Chinese adolescents (Yu et al. 2011) and 0.88 for Spanish patients with fibromyalgia who also demonstrated test-retest reliability of r=0.89 for a six-week interval (Notario-Pacheco et al. 2014).

Even though an exploratory factor analysis in the initial psychometric study indicated five possible factors (Connor & Davidson 2003), confirmatory factor analysis with different populations showed variations in the factor structure, indicating possible cultural differences and dissimilarities among different ethnic groups (Campbell-Sills & Stein 2007; Gillespie et al. 2009; Hartley 2008; Jorgensen & Seedat 2008; Khoshouei 2009). Due to the factor model instability, researchers recommend not scoring the subscales separately as originally reported by Connor and Davidson (2003) and score the CD-RISC as unidimensional (Burns & Anstey 2010). A shorter 10-item version of

the CD-RISC exists in the literature (Campbell-Sills & Stein 2007; Davidson et al. 2008; Gucciardi et al. 2011). Furthermore, researchers explored using a simple two-item scale as a method for evaluating pharmacological treatment of PTSD, depression and generalised anxiety disorder (Vaishnavi, Connor & Davidson 2007).

In order to verify the degree to which the CD-RISC evaluated resilience, Connor and Davidson (2003) correlated the instrument with measures of hardiness, perceived stress and stress vulnerability, as well as measures of disability and social support. A positive correlation between CD-RISC scores and the hardiness measure indicated that certain personality attributes contribute to resilience. A significant negative correlation with the stress scale indicated that people who are resilient have less perceived stress and thus are less vulnerable. In psychiatric patients, higher CD-RISC scores were related to lower scores of disability. Lastly, higher levels of social support also meant higher levels of resilience. Connor and Davidson (2003) correlated the CD-RISC with an unrelated measure (a sexual experience scale) and found no significant correlations, indicating divergent/ discriminant construct validity.

Additional researchers have assessed construct validity of the CD-RISC by comparing it against other measures. For example, Campbell-Sills, Cohan and Stein (2006) identified the relationship between coping styles, personality measures, psychiatric symptoms and resilience resulting in a positive correlation between CD-RISC scores and (a) extroversion (ability to thrive in social contexts) and (b) conscientiousness (planning and working systematically) personality characteristics. A negative correlation with neuroticism (lack of emotional stability) was found. Moreover, a high score on CD-RISC moderated the relationship between childhood trauma and adult psychological symptoms. Noteworthy, Campbell-Sills et al. (2006) found ethnicity effects; correlation between resilience and conscientiousness was significantly higher for members of ethnic minority groups when compared with scores of other participants. Similarly, other researchers found positive correlations of high CD-RISC scores with self-esteem and life-satisfaction (Yu & Zhang 2007a, 2007b), less athlete burnout (Gucciardi et al. 2011) and higher coping skills (Sexton, Byrd & von Kluge 2010). Finally, researchers using a sample of older women found a negative association between current psychiatric disorder and high resilience compared to low resilience level (Scali et al. 2012).

Recommendations for uses in music therapy

We recommend that researchers using the CD-RISC should currently consider it as a unidimensional measure, examining personal attributes, including faith and optimism. It is a self-report of personal qualities relevant to resilience. The first author has previously used the CD-RISC with non-clinical populations and found it easy to administer and score. The findings in studies we reviewed indicate that reliability has remained consistently high and with solid construct validity. We would like to caution researchers that CD-RISC scores may indicate specific characteristics of individuals that lead to resilience and may not provide information about the resilience process, which can be highly context-dependent. Thus, it may not capture changes resulting from participation in music therapy treatment.

The CD-RISC is not suitable for profiling for intervention. Clinicians may use CD-RISC as a quick screening scale of personal attributes that may buffer an individual during adverse life events. Such screening may allow triaging of individuals who may need additional support and focusing on bolstering personal strengths relevant to resilience. The CD-RISC also may be used as a screening tool to determine outpatient referrals when a patient is discharged from inpatient treatment or to evaluate emotional readiness for outpatient treatment. Even though we did not identify any examples of researchers using the CD-RISC measure with military personnel, this scale might be used to assess personnel being repatriated. Music therapists using the CD-RISC as a self-assessment screening tool for clients should be aware that there is limited information regarding gender, ethnicity and socioeconomic status in scoring variations. Moreover, its factor structure is unstable and the refined 10-item version might be the preferred version to use in research. In addition, the CD-RISC does not contain any reverse wording items, thus there is the possibility of self-reporting bias.

Child and Youth Resilience Measure (CYRM-28)

Overview

The creators of this measure conceptualised resilience as the ability of individuals, their families and their communities to navigate and negotiate resources in their environment, to have access to resources and to develop meaningful ways to share

resources. In creating the measure, researchers conducted a pilot study using a five-point Likert scale comprised of 58 unidirectional questions. Youth (n=1451) aged 12-23 years from 14 communities (spanning 11 different countries including Canada, China, Colombia, southern USA, India, Israel, Palestine, Russia, South Africa, Tanzania and The Gambia) completed the scale that was translated into their native language. Based on the results, the CYRM was reduced to 28 items (Ungar et al. 2008; Ungar & Liebenberg 2009, 2011). Subsequently, researchers developed four versions of the CYRM-28 suitable for children (aged 5-9), youth (aged 10-23), adults (aged 24 and older) and a version that someone who is familiar with the child/youth can complete (Resilience Research Center, no date). Results from other studies further reduced the CYRM to a 12-item instrument (Liebenberg, Ungar & LeBlanc 2013) and a seven-item simplified CYRM (Montoya et al. 2011).

The CYRM-28 is composed of 28 questions that evaluate youth resilience using a Likert scale from one (does not describe me at all-low resilience) to five (describes me quite a lot-high resilience). Total scores range from 28 to 140 (Daigneault et al. 2013; Ungar & Liebenberg 2011). All but five of the initial piloted 58 questions had means between 3.0 and 3.99 with SD (0.98 to 1.54), which was "enough variability for inclusion in a factor analysis" (Ungar & Liebenberg 2009: 2). The analysis indicated four nested factors: micro/individual, meso/relational community, culture and social context (ecology). Although a valid factor structure on the cross-cultural construct could not be determined using a non-nested approach, this outcome was expected due to the wide variety of cultures represented among the 11 different countries (Ungar et al. 2008; Ungar & Liebenberg 2009). Results in other studies confirmed a three component (1) Individual, (2) Relational (family), (3) Community (context) factor of the CYRM-28 (Collin-Vézina et al. 2011; Daigneault et al. 2013; Liebenberg, Ungar & Van de Vijver 2012; Zahradnik et al. 2010).

The structure of the piloted 58-item CYRM had reliability with the Cronbach's alpha of each construct: 0.84, individual/micro (23 items); 0.66, relational/meso (7 items); 0.79, community (15 items); and 0.71 cultural (12 items) (Lee et al. 2009; Ungar & Liebenberg 2009). The CYRM-28 has internal reliability with Cronbach's alphas ranging from 0.65 to 0.91 (Liebenberg et al. 2012), 0.72 family, 0.79 individual, 0.86 community and 0.78 family, 0.84 individual, 0.64 community (Zahradnik et al. 2010). The total of 28 items had a Cronbach's alpha of 0.90 (Zahradnik et al. 2010) and 0.88 (Daigneault et al. 2013). High interclass correlation coefficients for all three factors ranged from 0.583 to 0.773 and had cross-temporal stability when measured from time one to time two (Liebenberg et al. 2012). Test-retest correlation coefficients at two-week intervals were 0.82, 0.76, 0.84 and 0.73 and three-month 0.75, 0.70, 0.76 and 0.70 for the Total, Individual, Family and Community scores respectively (Daigneault et al. 2013) which were comparable to results in a study by Liebenberg et al. (2012).

Concurrent validity was not established using traditional means of comparing the CYRM-28 with other scales. Instead, the use of interviews and focus group research supported content validity of the CYRM-28 (Ungar & Liebenberg 2011). Face validity of the CYRM-28 was determined through the use of multiple child experts and researchers from around the world (Daigneault et al. 2013; Ungar 2008; Ungar & Liebenberg 2011). The total resilience CYRM-28 score was protective (negatively associated) with PTSD and moderately correlated with exposure to violence (Zahradnik et al. 2010). The French-Canadian version of the CYRM-28 has construct validity because researchers found positive correlation between high scores in CYRM (indicating high resilience) were positively correlated with measures of self-esteem and self-acceptance (Daigneault et al. 2013). The construct validity of resilience was also supported as a negative correlation with PTSD (Zahradnik et al. 2010). Moreover, experiencing multiple forms of trauma was negatively correlated with resilience scores (Collin-Vézina et al. 2011).

Recommendations for uses in music therapy

The CYRM-28 has been used as a measure of resilience of in both clinical practice and in research (Liebenberg et al. 2012). For example, researchers assessed resilience for youth with traumatic experiences (Collin-Vézina et al. 2011) and at-risk youth (Lee et al. 2009). Furthermore, the CYRM-28 results were used as a basis for developing resilience school and public programmes aiming to increase positive emotional development (Lee et al. 2009; Montoya et al. 2011). In addition, the CYRM-28 may be used longitudinally to measure effectiveness of programmes and affect social policy (Liebenberg et al. 2012). The CYRM-28 was condensed to 12 items for use as a screening for resilience characteristics to be included in surveys

that gather a wide amount of data (Liebenberg et al. 2013), although more psychometric analysis is needed for this tool.

In psychometric studies for the CYRM, researchers used large sample sizes (N = 1451, Ungar et al. 2008; N = 843, Lee et al. 2009; n_1 = 589 and n_2= 246, Collin-Vézina et al. 2011; n_1= 497 and n_2 = 410, Liebenberg et al. 2012) increasing the likelihood that results are representative of the general population. Researchers noted that CYRM is intended to be a cross-cultural measure, thus additional psychometric studies internationally are needed to determine cut-off scores (Daigneault et al. 2013; Liebenberg et al. 2012; Ungar & Liebenberg 2011). A specific limitation is that one item of the 28 items may have a negative (instead of the expected positive) correlation, in that it asks about parental supervision. Some youth may view this question as a negative or they may not have parents causing a non-response (Daigneault et al. 2013).

Noteworthy is the purposeful selection of participants in psychometric studies of the CYRM (Collin-Vézina et al. 2011; Daigneault et al. 2013; Lee et al. 2009; Liebenberg et al. 2013; Liebenberg et al. 2012; Montoya et al. 2011; Ungar & Liebenberg 2009, 2011; Ungar et al. 2008; Zahradnik et al. 2010). Such purposeful selection allowed researchers to focus on particular characteristics of participants and answer specific research questions. Because the full version of the CYRM has a mixed methods component (focus interview, panel of experts, developing additional site specific questions) purposive sampling is an essential component of administering this measure.

Researchers claim that the CRYM-28 is short, yet detailed enough to use quickly in the clinical arena and to build on youth's strengths and support those areas that are weak (Liebenberg et al. 2012). The first author of this paper has read the manual of CYRM and has determined that the process of administrating the full measure is complex. The CYRM contains a section in which researchers and clinicians can write their own site-specific questions. In order to develop the site questions the creators of CYRM recommend consulting with an advisory local committee or holding interviews with small groups of people familiar with the individuals who will be completing the CYRM (Resilience Research Center 2013). We believe that the CYRM is a versatile measurement tool. In addition to being used as a screening tool, it is conducive to profiling for intervention because of its global nature of documenting personal skills, peer support, social skills, caregiver relationships, spirituality, education and cultural components. Clinicians may find the CYRM useful for monitoring and measuring change as a result of interventions if they provide music therapy within the auspices of prevention and strength-based programmes with strong components of community and family involvement.

Devereux Early Childhood Assessment (DECA)

Overview

The DECA is part of a suite of assessments that has been expanded to measure within-child protective factors for children ages one month through 14 years (LeBuffe et al. 2013). Because Kaplan Press offers companion pieces for the DECA that are geared towards early childhood educators, researchers have evaluated the use/effectiveness of the DECA programme (Jaeger-Sash 2006; Layburn 2005; Lowther 2004). Researchers have used DECA scores to assess: (a) treatment intervention effectiveness (Dobbs et al. 2006; Perel 2006), (b) how behavioural problems may affect learning outcomes (Escalon & Greenfield 2009) and (c) how presence or absence of protective factors affects the parent-child relationship (Fiore 2008). The DECA is a standardised norm-referenced assessment that measures protective strength-based behaviours and behavioural concerns in children (ages two to five). It is a screening instrument aimed to assess and remediate socioemotional problems prior to developing into disorders. The actual assessment scale is linked to the DECA programme, published by Kaplan Press, which provides several materials for early childhood educators (such as observation manuals, tracking sheets and classroom strategies), targeting and promoting development of within the child protective factors (Reddy 2007).

In order to develop the instrument, LeBuffe and Naglieri (1999a) reviewed resilience literature and identified how children considered resilient behaved. In addition, focus groups were conducted with preschool teachers and parents to give behavioural descriptions of children with good emotional and social health. A preliminary version of the instrument was submitted to the Culturally and Linguistically Appropriate Services programme of the Educational Resources Information Center [ERIC:CLAS] to screen for culturally-biased language. Using this analytic method the researchers created 53 items pertaining to within-child strength-based/protective behaviours that promote resilience. Moreover, the researchers also

aimed to use DECA to screen for problem socio-emotional behaviours. Naglieri, LeBuffe and Pfeiffer (1994), selected 77 problem behaviours by pooling items from five different scales that measured attention problems, emotional control problems, withdrawal/depression and dangerous behaviours. Thereafter a pilot factorial analysis study of the scale was conducted which resulted in further pruning and refining of scale items.

The finalised version of the DECA contains 37 items and has two composite scales: Total Protective Factors and Behavioral Concerns. The Total Protective Factors scale contains three dimensions (initiative, self-control, attachment). Initiative measures the child's ability to use independent thought and action and contains 11 items. Self-control measures ability to experience a range of feelings while engaging in appropriate behaviours and contains eight items. Attachment measures mutual, strong and long-lasting relationships between a child and significant adults such as parents, family members and teachers and contains eight items. Parents and/or teachers of individual children can complete the DECA based on their direct observations in order to create an individual child profile or a classroom profile. Each DECA item has Likert-type answers (Reddy 2007). Further directions on scoring, administration and interpretation are included in the User's Guide (LeBuffe & Naglieri 1999b).

Participants from 95 preschool programmes from across the US, as well as additional parents recruited from advertising in magazines or newspapers in five major metropolitan areas, participated in the standardisation samples. LeBuffe and Naglieri (1999a) stratified the samples, based on demographic data from the US Bureau of the Census, to reflect age, gender, race, geographic region and socioeconomic status. For the strength-based behaviours, some scale items were deleted to retain a total of 27 items that maintained the best psychometric and interpretive solution resulting in a three-factor model. Those factors were labelled Initiative, Self-Control and Attachment. From the 77 problem behaviours items, the researchers retained ten items. Hence, the final version of the DECA measures three protective factors of resilience: attachment (AT), self-control (SC) and initiative (IN). Added together a total composite score was named Total Protective Factors (TPF). The DECA also measures and gives a separate composite score for Behavioral Concerns (BC).

However, there is emerging evidence that even though DECA retains the three protective factors structure, item loadings may not be stable. Lien and Carlson (2009) attempted to acquire validity evidence for the DECA use within a Head Start sample of 1208 children and their parents in a mid-Michigan city. The DECA screening was compared with the current screening tool of the programme, a scale identifying risk factors. The parents completed both scales. In the exploratory factor analysis of the DECA three items loaded onto different factors (Lien & Carlson 2009). Jaberg, Dixon and Weis (2009) sought to replicate psychometric properties of the DECA with a sample of 780 kindergarten students in a rural Midwestern area of the US using both parent and teacher ratings. Confirmatory factor analysis replicated LeBuffe and Naglieri's (1999b) findings, but similarly to Lien and Carlson's (2009) findings, items loaded onto different factors. Noteworthy is that in the studies mentioned above the samples were dissimilar to the DECA standardisation sample, which may explain factorial differences. Other researchers (Barbu et al. 2013; Ogg et al. 2010) also found adequate support for the original factor structure.

The authors of the scale found that alpha coefficient scores for TPF dimensions were 0.91 for parents and 0.94 for teachers. For the remainder dimensions, alpha ranged from 0.71 to 0.90. Test-retest reliability for the TPF score was 0.74 for parents and 0.94 for teachers. The researchers pointed out that teacher-teacher dyads tended to have higher inter-rater reliability because the teachers observed the child at the same environment and time of day (LeBuffe & Naglieri 1999a). Parent-teacher agreement in ratings tends to be moderate (Crane, Mincic & Winsler 2011). Internal consistencies on the DECA for Lien and Carlson's (2009) sample and Jaberg et al.'s (2009) sample resembled those from the DECA standardisation sample.

LeBuffet and Naglieri (1999a) used a comparison group method for conducting three validity studies. For these studies two samples were used: 95 children identified as having socioemotional and behavioural problems and a community sample of 300 typically developing children, referred to as the problem-identified sample and community sample. Minority, sex and ethnicity discrimination biases were ruled out (LeBuffet & Naglieri 1999a; LeBuffe & Shapiro 2004). Moreover, in determining construct validity it was found that children with high risk and high TPF scores had lower problem behaviour scores in comparison to children with high risk and low protective factors. Thus, protective factors, as

measured by DECA moderated the effects of risk (LeBuffe & Naglieri 1999a; LeBuffe & Shapiro 2004). For content related validity, Lien and Carlson (2009) correlated the DECA Total Protective Factors Scale and the DECA Behavior Concerns scale and found a smaller inverse relationship in comparison to the one reported in the original standardisation study; the difference, however, was not statistically significant.

Researchers conducting three independent studies using DECA with Head Start children found that parental reported Behavior Concerns scores were significantly higher than those reported in the national standardisation sample of DECA (Brinkman et al. 2007; Lien & Carlson 2009; Rosas, Chaiken & Case 2007). Results of one independent study with 474 children ages 2-5 attending Head Start affiliated preschools in Delaware, indicated possible gender biases/differences in ratings of teachers. Teachers tended to rate the girls higher across all the three protective factor subscales and lower on the behavioural concerns scale. Parents, on the other hand, rated girls higher than boys only in the Initiative Protective Factor; remaining factors' subscales were scored similarly (Rosas et al. 2007). Gender differences in the DECA norms may need further investigation. The challenge is to identify whether differences exist because of variations in topography of behaviours or because of parental or teacher socialisation processes. Researchers also cautioned that additional studies are needed in determining discriminant validity (Barbu et al. 2013).

Recommendations for uses in music therapy

In our opinion, the DECA has good standardised validity and reliability measures and it is easy to administer and score. The first author has used this measure as a screening tool in early intervention and as a method for guiding treatment intervention in family-based therapy. In general, this instrument might be useful for clinicians as an assessment tool in order to guide early intervention and strategies. It also may be used to assess the effectiveness of overall treatment programming if used as a pre-post-treatment measure. Therapists may find the Devereux Early Childhood Assessment Clinical Form (DECA-C) to be a more extensive tool in assessing socioemotional resilience prior to implementing treatment. The first author is familiar with the DECA-C, but has not used it for clinical assessment. While working as a music therapist in agencies that provided early intervention, family-based therapy and inpatient behavioural health services for children, she relied on information that other related-professionals collected from diagnostic assessments.

Dispositional Resilience Scale (DRS)

Overview

Bartone, a military psychologist, is the author of DRS. He relied immensely on the theoretical construct of hardiness to create items for this scale. Thus, the DRS measures capacity for resilience and focuses on specific personality traits/dispositional attributes that help individuals cope with illness, challenging jobs, or stressful situations. The original version of this scale contained 45 items and was based on the author's doctoral work at the University of Chicago (Bartone 1989). The scale has been revised continually and has four versions; the author allows non-commercial use of the DRS instruments for a licensing fee. Refinement of the scale was the result of studies on stress, health and performance in various groups examining patterns of resilient responding to stressors (Bartone 2008a, 2008b). The final revision was the result of a differential item analysis with samples of US and Norwegian military cadets (Bartone et al. 2007).

The scale contains 15 items; six items are negatively keyed. Bartone (2008a) has compiled normative data for female and male adults and college students allowing conversion of raw scores to T scores for comparisons (Bartone 2008a). The scale has been translated to Norwegian (Hystad et al. 2010), Chinese (Wong et al. 2014) and Italian (Picardi et al. 2012). The DRS15-R has three dimensions that measure hardiness: commitment (consider life and world as meaningful), control (self-determination, believing that a person influences his/her own fate and situations) and challenge (viewing change as an opportunity, seeking new experiences) (Bartone 2008c). The three factor structure was confirmed by researchers (e.g. Sinclair & Tetrick 2000) but cross-culturally, items may load in differing ways (Wong et al. 2014). Researchers using the scale to explore hardiness of employees in different companies found evidence of a unidimensional abridged 12-item scale (Kardum, Hudek-Knežević & Krapić 2012).

Three-week test-retest reliability with a sample of 104 military academy cadets was 0.78 and Cronbach's alpha coefficient values were 0.83 (Bartone 1995), 0.82 (Bartone 2007). The alpha coefficient with a sample of Chinese women was

satisfactory at 0.78 (Wong et al. 2014). Results in several studies exemplify criterion-related validity of DRS. For example, low DRS scores predicted higher incidence of psychiatric symptoms in Army reserve personnel mobilised for the Persian Gulf War (Bartone 1999). DRS can distinguish individuals who have health risk factors from those who do not. In a study with 321 healthy adults working in demanding military related jobs, high DRS scores predicted increased levels of high-density lipoprotein (good cholesterol) (Bartone et al. 2011). Higher DRS scores in a group of US Army Special Forces candidates (n=1138) predicted successful completion of a US special-forces course (Bartone et al. 2008). Regarding construct validity, results in a study indicated a positive correlation between the DRS scores individual characteristics of openness, conscientiousness, positive emotionality and lower psychoticism (Ramanaiah, Sharpe & Byravan 1999). Hystad (2012) found minimal evidence of gender bias in the 15-item version of the scale in that women may tend to rate some items different than men; that tendency did not affect overall results. Wong et al. (2014) found that the total resilience score was negatively correlated with depression. Researchers found that higher scores were predictive of positive affect and fewer subjective physical symptoms (Kardum et al. 2012) and more adaptive neuroendocrinal responses to stress (Asle et al. 2013).

Recommendations for uses in music therapy

The use of the DRS in the literature focused on predicting ability to tolerate stress, negative affect, or selection of personnel who will manage job demands. Participants included both military and civilians. Because of the required fees, we were not able to obtain access to this measurement tool directly. We believe that this scale can be used to examine human organisation behaviour, predict psychosocial adjustment or examine the correlation of personal hardiness and resilient individual responses in work settings or highly stressful situations and predicting adaptation.

Critics of the DRS believe the instrument may be highly related to neuroticism. Hardiness, an attribute considered in measuring resilience, may only buffer stress for adults in stressful work settings, or for adults who engage in considering future outcomes or solutions (Funk 1992). The authors of this paper believe that this instrument does not appear to have been used to measure resilience for clinical or psychoeducational purposes such as assessing response to treatment intervention or identifying individuals at risk for developing psychopathologies. As explained in the background section of this paper, resilience is a complex dynamic construct involving adaptation and growth, not a simple dispositional attitude. A person may exhibit resilient responses in the workplace and not in interpersonal relationships. Thus, the DRS can identify capacity for resilience based on personal attributes and predict resilient individual outcomes, but is limited in scope in that it does not assesses other aspects (such as interpersonal skills) contributing to resilience.

Resilience Scale (RS)

Overview

Wagnild and Young (1993) developed the Resilience Scale (RS) in order to measure resilience as a combination of positive personal attributes that lead to individual adaptation. The scale items were developed by examining data collected through interviews with 24 women who showed healthy socioemotional functioning following loss. Wagnild and Young (1993) identified five personal attributes that lead to resilience: equanimity (appraising one's experiences as part of life), perseverance (persisting against odds), self-reliance (knowing strengths and personal limitations), meaningfulness (having a purpose in life) and existential aloneness (understanding that each person's experiences are unique even though they can be shared with others).

The RS is a 25-item questionnaire with a seven-point Likert scale with higher scores indicating stronger resilience. There are no reversed score items. In the psychometric pilot the mean score was 147.91. Scores above 146 were considered high (Wagnild & Young 1993). The RS has been translated in at least 36 languages (Wagnild 2013). Although the content validity was subjective (results of the qualitative study and consultation with experts), Wagnild and Young (1993) hypothesised the data would fit a five-factor model. Results of the initial psychometric study indicated ambiguity in the loading of factors resulting in two categories. Lundman et al. (2007) were able to confirm a five-factor dimensionality analogous to the themes reported by Wagnild and Young in 1993. Cultural variations to the dimensionality of the RS may exist. For example, results in a study with Russian immigrants failed to confirm a two-factor structure and resulted in a modified 12-item version of the

scale (Aroian et al. 1997). Similarly, in a study with Mexican immigrants, the two-factor structure was not confirmed and resulted in a modified 23-item version (Heilemann, Lee & Kury 2003). Lei et al. (2012) used the scale with Chinese college students who experienced a natural disaster and found that results fit a four-factor model. Researchers have validated a 15-item version of the RS with geriatric population (Wilks 2008), a 14-item scale with general population (Damásio, Borsa & da Silva 2011) and a 14-item scale with college students and individuals seeking mental health services (Aiena et al. 2015). Others have modified the scale to 18 items in order to measure the protective role of resilience in coping with pain (Ruiz-Párraga et al. 2015). Wagnild (2013) recommends using the RS scale as a unidimensional measure.

According to Wagnild (2013) alpha coefficients range between 0.85 and 0.94. In Wagnild and Young (1993) the coefficient alpha was 0.91. In Nygren et al. (2004) test-retest reliability was 0.78. Moreover, in Lei et al. (2012) researchers found the Cronbach's coefficient was 0.94 ($P < 0.01$), split-half reliability coefficient was 0.92 ($P < 0.01$) and the test-retest reliability coefficient was 0.82 ($P < 0.01$). Lövheim, Lundman and Nygren (2012) used the Swedish version of the RS and recommended that a change of 16 points or more on the RS is needed in order to use the RS scale for assessing pre- and post-treatment differences. Researchers using a translated version in Creole found Cronbach's alpha coefficient for the RS was 0.77; the split-half coefficient was 0.72 amongst child and adolescent survivors of the 2010 earthquake. The mean score of the RS was as 131.46 (SD=21.01) (Cénat & Derivois 2014).

In the 1993 psychometric pilot there were no significant correlations between the RS and age, education, income, and gender of responders. Construct validity was evaluated by correlating the RS scores with theoretically relevant instruments. The results indicated that higher resilience scores as measured by the RS were associated with high morale, life satisfaction, better physical health, and lower depression (Wagnild & Young 1993). Similarly, in a psychometric study with 142 adults, 19-85 years of age (Nygren et al. 2004), the RS was positively correlated with measures of coherence and self-esteem. Furthermore, in a study with Mexican immigrants, RS correlated positively with a measure of life satisfaction and negatively with a measure of depression (Heilemann et al. 2003). The RS was compared to the Adolescent Scale of Resiliency Belief System (Jew, Green & Kroger 1999) in a study with 172 Japanese young adults (Araki 2000) focusing on adjustment to the effects of being bullied. The researcher found both scales comparable to each other, indicating evidence of construct validity. Researchers found negative correlations between RS scores and psychological symptoms (Lei et al. 2012). Nygren et al. (2005) found that older adult scores on RS are positively correlated with scales that measure inner strength.

Recommendations for uses in music therapy

Being the first instrument reported in the literature to measure resilience, the RS has had extensive use in the literature. Because it contains no reverse scoring items, self-reporting bias is a limitation of using this scale. In fact, Lundman et al. (2007) have found tendencies to overestimate the RS score. One of the original creators of the scale has published guidance manuals and an updated review of the scale that readers may find useful (Wagnild 2009a, 2009b, 2010). Wagnild and Young (1993) proposed that the RS could measure personal resources that may help individuals cope with difficult life events. The literature includes uses of the RS to measure personal resources of individuals who face: a challenging illness, homelessness, unemployment, or who survived trauma. Researchers who investigated religiosity, spirituality, and resilience have also used the RS. We believe that this scale has consistent psychometric properties, as a unidimensional measure of resilience, and it is straightforward to administer as a questionnaire. Because this scale has specific questions about spirituality it may provide a springboard to address transpersonal meanings. Clinicians may find this scale useful in screening individuals who are vulnerable to poor adaptive outcomes. In addition, clinicians may use the scale to identify clients' inner sources of strength. Researchers may also use this scale to identify differences between pre- and post-treatment.

Resilience Scale for Adults (RSA)

Overview

The researchers developing this scale evaluated resilience as a multifaceted construct. Thus, they sought to measure resilience without focusing solely on individual psychological attributes by including how an individual uses family members

and social support to cope with life stress. They derived their items by looking at literature descriptions of protective factors (e.g. personal attributes, intrapersonal and interpersonal skills) associated with resilience. They categorised the protective factors in a total of 15 categories and created a total of 295 positively worded items. Professors, graduate students, psychologists and laypersons subsequently reviewed those items. The reviews lead to a reduction to 195 items. An additional exploratory analysis led to a development of a pilot scale containing 45 items. The finalised 33-item scale contains both intrapersonal and interpersonal factors relevant to adaptation to adversity (Friborg et al. 2003; Hjemdal 2007).

Previous versions of the scale contained 37-items using a Likert format. The final version of the RSA contains 33-items using a five-point semantic-differential response format alternating the positioning of positive and negative items to reduce bias (Friborg, Martinussen & Rosenvinge 2006). For the semantic-differential version, each item has a positive and a negative attribute at the end of the scale continuum (e.g. easy for me/difficult for me). For half of the items, the positive attribute is keyed to the right and for the other half to the left (Friborg et al. 2005). Such version requires additional cognitive engagement and reduces acquiescence bias, that is, the tendency to respond with a yes or no (Friborg, Martinussen, et al. 2006). The responses for each item are tallied to obtain subscale scores and a total resilience score (Hjemdal, Friborg et al. 2006). There are no gender differences for the total score (Hjemdal 2007). The scale has been translated into French (Hjemdal et al. 2011), Farsi (Jowkar, Friborg & Hjemdal 2010) and Lithuanian (Hilbig et al. 2015).

The pilot version of this psychometric scale included 45-items and a total of five dimensions. The authors had planned to include items identifying locus of control, a construct relevant to resilient outcomes, but those items did not load into the factorial analysis (Hjemdal, Friborg et al. 2001). In the first formal psychometric study, Friborg et al. (2003) contrasted the responses of participants who were scheduled to have their first psychotherapy appointment at an outpatient clinic in Norway to those of a controlled sample. Those who agreed to participate constituted the patient sample; ages ranged from 18-75. The analysis led to further refinement of the items, reducing them to 37. In a subsequent study with 482 applicants to military college (Friborg et al. 2005) added three additional items and conducted additional factor analysis leading to a finalised version of the scale that includes 33 items and six dimensions: (1) positive perception of self, (2) positive perception of future, (3) social competence (i.e. making new friends, comfort in social situations), (4) structured style (i.e. setting goals, planning and organising time), (5) family cohesion (i.e. strong bonds, sharing time), and (6) social resources (i.e. having friends who value, trust and help you). A subsequent study with 201 Norwegian college students confirmed this six-factor model (Hjemdal, Friborg et al. 2006).

The internal consistency of the subscales of the RSA was satisfactory, ranging from 0.67 to 0.90. The test-retest (with a three month lapse) correlations were all satisfactory for the subscales of RSA, ranging from 0.69 to 0.84 ($p < 0.01$) (Friborg et al. 2003). In the revised version of the scale (Friborg et al. 2005) structural equations for estimating reliability indicated alpha ranging from 0.76 to 0.87 for all factors. Results in subsequent studies indicated similar reliability measurements (Hjemdal, Friborg et al. 2006). Friborg et al. (2003) found that RSA scores were positively correlated with the adaptation skills/sense of coherence scores and negatively correlated with a psychiatric inventory score, indicating convergent and discriminant validity. They contrasted the responses between adults with and without psychological problems and found that the differences between the two groups were largest for the personal competence and family coherence dimension. The only reported gender difference was that women tended to have a higher score on the social resources dimension than men did. Their findings indicated that RSA scores can discriminate between healthy adults and those that may develop psychosocial problems (Friborg et al. 2003).

To assess RSA construct validity, Friborg et al. (2005) correlated the factors of the RSA with a Norwegian measure of personality, a measure assessing social intelligence, and a battery of tests assessing cognitive intelligence. Social competence as measured by RSA predicted a more positive social orientation rather than competitiveness. Personal strength (perception of self and perception of future) had a positive correction with emotional stability/lack of neuroticism, perception of future had a strong correlation with conscientiousness. The social intelligence measure was strongly related to RSA-personal strength, RSA-social competence and RSA-social support. No correlational patterns existed between the RSA factors and cognitive

intelligence measures. Overall, personality characteristics accounted for 57% of the variance indicating that RSA is not simply a personality traits/characteristics assessment.

Because individuals with mental health difficulties often show increased discomfort to pain, Friborg, Hjemdal et al. (2006) conducted a predictive validity study of the RSA in relation to pain and stress with 84 healthy adults. The procedure included inducing ischemic pain in a hospital laboratory. The participants completed the RSA prior to the beginning of the experiment. During the experiment, individuals were randomised in a high stress and a low stress condition. Participants in the high stress group received no additional information about the experiment (other than what was included in informed consent) and the experimenter was formal. On the other hand, participants in the low stress group received empathetic comments and were constantly reassured by the experimenter. During the 45-minute experiment, the researchers collected data about perceived pain and stress every five minutes. For pain they used the 10cm visual analogue scale. For stress, they used two adapted visual analogue scales, one using the paired words relaxed-tensed, and the other calm-nervous. The responses on the perceived stress scales were combined to give a composite stress score for each participant. For identifying low versus high resilience participants, the researchers used the total RSA score and used the median as the split point. Results indicated participants in both groups perceived pain and stress as increased during the experiment. For participants in the low stress condition there were no effects on perceived pain or stress. Stated differently, participants responded the same when assessing their stress and pain regardless of their resilience score. For participants in the high stress condition, however, resilience had an overall protective effect moderating pain intensity and perceived stress. Participants with high resilience scores had less perceived pain during the beginning and middle phase, but not at the end. On the other hand, high resilience RSA scores had a protective effect for perceived stress throughout the experiment. In addition to providing evidence of predictive validity for RSA, these results have clinical relevance (Friborg, Hjemdal, et al. 2006)

Hjemdal, Friborg et al. (2006) conducted another predictive validity with 201 Norwegian college students. Participants completed a psychiatric symptom scale, the RSA, and a stressful life event questionnaire as pre-test, and then as post-test three months later. Students who obtained a high score on the psychiatric symptoms scale were not included in the data analysis for the predictive portion of the study. Thus, only the psychologically healthy sample (n=159) was used for the predictive validity of RSA. Results indicated that when exposed to stressful life events at post-test, individuals who reported high levels of resilience remained unchanged, whereas, individuals who reported low levels of resilience exhibited increased psychiatric symptoms. The RSA-total Score, RSA-Social competence score and RSA-planned future score at pre-tests were unique predictors of psychiatric problems mediating the relationship between stressful life events and psychopathology (Hjemdal et al. 2006).

Researchers also examined if RSA, as a psychometric measure, can identify individuals who are more likely to exhibit positive adaptation in the face of adversity beyond existing methods of psychological assessment. For example, individuals with mental health symptoms or a tendency to think negatively are vulnerable to poor psychosocial adjustment. Researchers found that RSA scores can predict susceptibility to poor adaptation both for individuals with affective/cognitive symptoms as well for those who do not. Thus, low RSA scores are not simply indicators of poor mental health but reflect inter/intrapersonal factors that lead to resilience (Friborg, Hjemdal et al. 2009). Contributing to a further understanding of the relationship between vulnerability and mental health researchers found that RSA scores predict vulnerability to hopelessness beyond accounting personality differences, stressful life events, and depressive and anxiety symptoms (Hjemdal, Friborg & Stiles 2012). The results of these two studies illustrate that RSA is a measurement tool that may effectively assess factors related to positive health and predict adaptation beyond merely assessing presence or absence of symptomatology. Moreover, researchers found that resilience, as measured by RSA scores, predicts ability of adults to adjust to the demands of a new job or organisational changes (de Carvalho et al. 2011).

Recommendations for uses in music therapy

We believe that the authors of RSA have followed a systematic approach to collecting psychometric information. They have confirmed and revised the factor structure, identified its relationships with relevant and unrelated measures for convergent

and discriminant validity. For criterion validity, RSA differentiated between participants with psychiatric conditions and non-help seeking controls and predicted development of psychiatric problems. The RSA has promise for applications in health and clinical psychology and is the only scale in the literature that assesses both personal attributes and interpersonal skills. The RSA has clinical relevance because, as Hjemdal (2007: 313) states, it provides support "for a protective model rather than a compensatory model of the measured protective factors". This scale can be used for screening or profiling for intervention. There are no reported uses in the literature of using this scale as a pre-post test for assessing intervention effectiveness.

Resilience Scale for Adolescents (READ)

Overview

Derived from the Resilience Scale for Adults (RSA), the Resilience Scale for Adolescents (READ) was designed as a direct measure that "may facilitate exploration of resilience factors as either compensatory or protective" (Hjemdal et al 2007: 94). Development of the scale began in 2004 following a pilot study exploring whether the semantic differential items would be developmentally appropriate for adolescents. The results indicated that using a five-point Likert-type scale with simplified items that are positively phrased would be more effective. The scale is self-administered and consists of 28 items. There is also a parental version (READ-P) that uses the same items as the adolescent version (Hjemdal 2007; Hjemdal, Friborg et al. 2006). A modified 23-item version also exists (von Soest et al. 2009). The READ scale has been translated in Italian (Stratta et al. 2012).

Similar to the RSA scale, READ consists of five factors named: (1) personal competence, (2) social competence, (3) structured style, (4) family cohesion, and (5) social resources. There are no gender differences with the total score. However, gender differences exist with boys reporting a higher level of personal competence and girls reporting higher levels of social resources (Hjemdal 2007; Hjemdal, Friborg et al. 2006). In 2009, von Soest et al. further explored the validity of READ using a sample of 6,723 Norwegian senior high school students. They created a modified 23-item version of the scale but maintained the same factor structure. Females tended to score higher in structured style and social resources.

Hjemdal et al. (2006) found Cronbach's alpha values between 0.70 and 0.90 for the total score and all the factors. Cronbach's alpha for all items was 0.94, and for the factors it ranged from 0.85-0.69). Similar Cronbach's alpha scores were found in other studies (von Soest et al. 2009). Hjemdal, Friborg et al. (2006) investigated the relationship between READ scores and severity of depression symptoms. A total of 425 adolescents participated by completing the READ and an assortment of measures that provided demographic and personal information. Total READ scores were negative correlated with depression, experiences of bullying, and exclusion/slandering. The personal competence factor had the highest negative correlation with depression. Being beaten or kicked was negatively correlated with the social resources factor. There was a positive correlation between total READ scores and frequency of physical activity outside the school or membership in an athletic club. Participation in team sports had a positive correlation with the personal and social competence factor. Negative life effects did not affect the adolescents' social competence and social resources. However, negative life effects showed a significant negative correlation with the total score and all the other factors.

Similarly, Hjemdal et al. (2007) explored whether READ scores could predict symptoms of depression in young adolescents. Adolescents who scored high on READ reported lower levels of depression, even when controlling extraneous factors such as age, gender, number of stressful life events, and social anxiety. For the adolescent sample in the study, the items of the social competence, social resources, and personal competence were a predictor of social anxiety symptoms; the social competence factor was a significant predictor for symptoms of depression. The researchers noted that contrary to the protective model of the RSA scale, READ scores may fit a compensatory model of resilience. Such a statement implies that the READ may identify positive factors that can neutralise or counteract the effects of risk factors for adolescents. Those factors promote adaptive outcomes regardless of risk exposure. Noteworthy is that READ scores of family cohesion and structured style were not significant predictors of depression. Thus, interventionists may use the results to differentiate treatment for adolescents with depression by focusing on social competence. Administering the READ-P version showed that younger adolescents are a more reliable source of information than the parents regarding scores on the READ and ability

to predict depression.

Moljord et al. (2014) also found an association between high READ scores and lower depression symptoms in adolescents. The findings in this study were important in planning and developing health promotion programmes. Girls with higher physical activity exhibited fewer depressive symptoms; there was no such association amongst boys. Results of the READ scores also indicated that the frequency of physical activity might moderate the relationship between structured style (planning, structure, and daily routines) and depression for boys.

von Soest et al. (2009) used the results from a national survey study with using a stratified sample of Norwegian adolescents for convergent validation of the READ scale. They found small to moderate positive correlations between READ scores, socioeconomic status and school grades. There was a strong negative correlation between personal competence and anxiety/depression. Unhealthy behaviours such as alcohol use, violent behaviour, and being bullied were negatively correlated with READ scores. Hjemdal, Vogel et al. (2011) found that higher READ schools predicted fewer symptoms of anxiety, depression, stress, and obsessive-compulsive behaviours. In adolescents who are screened negative for suicidal ideation, the total READ score correlated with problem-focused coping skills (Stratta et al. 2014).

Recommendations for uses in music therapy

Because the READ has the same factor structure as the RSA, it can be used as a measure in longitudinal studies of resilience (Hjemdal et al. 2007). Researchers have made recommendation for using this scale as a measure of screening and developing a prevention programme (Moljord et al. 2014). The authors of this paper recommend that READ be implemented as a screening tool in order to identify adolescents' exposure to factors promoting resilience. Therapists may use READ as a measure for planning individualised prevention interventions with particular focus of strengthening social competence as well as recommending specific support strategies.

DISCUSSION

Luthar et al. (2000) noted a surge in resilience related literature. That surge is reflected in the emergence of various instruments that measure resilience: 33 out of 50 identified instruments (listed in tables 1 and 2, see appendix) were published within the last 10 years. With so many measurement tools, construct validity concerns, or the extent to which the scores obtained with these instruments relate to resilience versus other characteristics is important. Using instruments to measure exposure to risks or adversity is congruent with the theoretical construct of resilience, which postulates adjustment in one or more domains despite significant threats to adaptation (Luthar et al. 2000; Masten et al. 1990). In this paper our purpose was to conduct a critical analysis of tools developed for measuring resilience for practical purposes (screening, profiling for intervention, and measuring effects of treatment), identify psychometric properties, salient validity or reliability strengths or concerns, and draw conclusions about practical uses in music therapy.

We reviewed a total of seven measures that met inclusion criteria (CD-RISC, CYRM, DECA, DRS, RS, RSA & READ). The CD-RISC, DRS, RS, and RSA are self-report scales appropriate for measuring resilience in adults. The DECA is appropriate for young children (ages two to five); parents or teachers provide the ratings. The CYRM can be administered with children as young as five as a self-report measure. Different versions exist for different age groups. The READ was designed for adolescents and has the same factors as the RSA. Thus, researchers can use READ scores and RSA scores in longitudinal studies. The READ also has a parent rating version. The RSA has semantic-differential items. All remaining measures have Likert ratings. The authors of the CYRM recommend a mixed-methods process allowing researchers and clinicians to add items specific to their sites.

In the measurement instruments we reviewed, the tendency was to either attempt to measure resilience by considering assets and resources within the person or adopting a more analytic process of situating individuals within their ecological environments. The CD-RISC, DRS and RS centre on concepts such as hardiness, perseverance, spirituality and optimism. Even though the aforementioned measures have been translated in other languages and used internationally, they likely do capture sociocultural factors that affect resilient trajectories. The DECA scale also captures characteristics within children who are protective when exposed to adversity. Since the actual assessment is linked to an entourage of materials for early childhood educators, the creators of the scale provide the opportunity of establishing external supports to reinforce development of strength-based skills

within individual children. Furthermore, the family members or caregivers can be directly involved in intervention planning. Adopting a more analytic process, the CYRM, RSA and READ are scales that encompass a broader scope of interpersonal and intrapersonal strengths that affect resilience. Windle, Bennett and Noyes (2011) also recognised the CYRM, RSA and READ as measures that capture resilience across multiple domains.

Regarding specific uses of those instruments in music therapy for screening, profiling for intervention, and monitoring/measuring change, we reached the following conclusions:

(a) CD-RISC: This measure should be administered as a unidimensional screening tool that may provide clinical insight regarding a person's personal qualities relevant to resilience. Researchers may use this instrument to capture treatment effects but need to be aware that this instrument does not have contextual sensitivity and may not adequately capture change resulting from participation in music therapy interventions. The examples we found in the literature indicate that the CD-RISC may capture changes following administration of medications addressing psychological symptoms.

(b) DRS: Music therapists working with individuals who are active military personnel may find this scale useful as a screening tool for triaging who may need additional supports in order to cope with the high demands of their work environments. The conceptualisation of this instrument is based on hardiness and attributes within the person, thus it may not capture resilience across multiple domains.

(c) RS: This measure can be used as a screening tool evaluating an individual's personal resources for coping with life events. It also can be used as a pre-post test in research evaluating treatment effectiveness. Again, we would like to caution readers that this measure lacks contextual sensitivity.

(d) DECA: This measure will be useful for music therapists working in early intervention or family-based therapy. It may be used as a screening tool providing a platform to discuss with parents or caregivers which areas within a child are strengths or may need to be proactively cultivated. Thus, the scale is suitable for intervention profiling. It can also be used as a pre-post test in research evaluating treatment effectiveness. While the measure captures attributes within a child, clinicians may use the results of this assessment as a springboard to plan holistic preventative interventions.

(e) CYRM: This scale seems suitable for screening and profiling for intervention. The music therapist choosing to use this scale will need to be a member of an interdisciplinary team and familiar with contextual dynamics affecting individual clients. The parent version allows for research comparisons, inclusion of caregivers in treatment planning or both. The shorter version may be more appropriate for monitoring changes in response to the intervention. The possibility of adding site-specific questions affords cultural and contextual relevance when administering this measure.

(f) RSA: The comprehensive nature of the six dimensions of this scale will allow music therapists to use it either for screening or profiling for intervention. There are no reported uses in the literature of using this scale as a pre-post test for assessing intervention effectiveness. As previously mentioned, the RSA has a broader scope of conceptualising and measuring resilience.

(g) READ: Similar to the RSA, music therapists may use the self-reported version, or the parent version of this scale for screening or profiling for intervention. There are no reported uses in the literature of using this scale as a pre-post test for assessing intervention effectiveness. Since the READ has the same subscale dimensions as the RSA, clinicians may use this version for adolescents and later transition to using the RSA in order to monitor treatment responses over time.

In general, using psychometric scales to measure resilience can be useful in development strength-based prevention strategies and interventions. Clinicians and researchers, however, should be aware that items in scales might not generalise to different age groups, socio-economic frameworks, or cultural groups. Thus, similar to other researchers who explored uses of psychometric measures to capture resilience, we caution vigilance to avoid emic interpretations of the results (c.f. Reppold et al. 2012; Windle et al. 2 011). Moreover, resilience is a transactional process of learning and development. Thus, current resilience self-report measures only capture positive adaptation patterns that may decrease the likelihood of biopsychosocial maladjustments developing when that individual faces significant adverse conditions.

As Reppold et al. (2012) pointed out, resilience is not an adjustment variable within each individual that represents temporal stability over time. Researchers identified that most measures assess trait variables or individual personal characteristics associate with resilience. They argued that most

measures are limited because individual, historical, cultural, and developmental contexts play a significant role in resilient trajectories (Pangallo et al. 2015; Smith-Osborne & Bolton 2013). Specifically, internal resources included "adaptability, self-efficacy, active coping, positive emotions, master, and hardiness" and external resources within the immediate environment or wider community included availability of "social support and structured environment" (Pangallo et al. 2015: 10). Researchers have even challenged the validity of using resilience measures as indicators of human adaptation arguing that personality scales are a better predictor of avoidance of disturbance (Waaktaar & Torgersen 2010).

We believe that pathways by which personality traits contribute to resilience need to be further explored under the assumption that what may contribute to resilience in one domain, may be a vulnerability or risk factor in another, and that capacity for resilience within a person may increase or decrease as a response to extraneous variables. Resilience is not an innate trait, but rather is something that develops as an individual interacts with their environment. We urge clinicians and researchers who choose to administer resilience measures to carefully examine how the authors of the psychometric tool conceptualised resilience, consider its psychometric properties (validity and reliability), and interpret findings with caution.

A potential limitation of this study is that we did not evaluate each measure against clear criteria but relied more on providing an overview of psychometric measures. Similar to other authors who have conducted systematic reviews, we placed a restriction on the timeframe within which to identify sources. Readers may wish to conduct additional database searches from April 2015 onwards to determine if additional measures have been developed or new evidence supporting the use of the measures reported in this study were published.

In the future, we encourage researchers who use resilience scales to report psychometric information when possible. In addition to conducting additional psychometric studies of existing measurement tools, researchers should perhaps correlate scores between instruments identified in this study. Such will provide additional construct validity results. Moreover, researchers interested in resilience should collaborate across disciplines and join efforts in identifying ways these measurement tools can be used in prevention efforts.

Music therapy clinicians using resilience instruments should keep in mind that obtained scores are not a fixed representation of a person being destined to succeed or fail, adapt or develop psychopathological outcomes. It may, however, provide a snapshot of an individual's capacity for adaptation at a particular point in time. As such, resilience measurement may aid clinicians to proactively address potential obstacles to adaptation through holistic interventions. Clinicians should therefore focus on assets and contextual resources as well as possible underlying environmental and individual differences.

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the Connor-Davidson Resilience Scale among Chinese adolescents. *Comprehensive Psychiatry, 52*, 218-224.

Zahradnik, M., Stewart, S. H., O'Connor, R. M., Stevens, D., Ungar, M., & Wekerle, C. (2010). Resilience moderates the relationship between exposure to violence and posttraumatic reexperiencing in Mi'kmaq youth. *International Journal of Mental Health and Addiction, 8*, 408-420.

APPENDIX: LISTS OF MEASURES OF RESILIENCE

Name of instrument	Authors/original study	Theoretical basis/ Measured construct
1. Connor-Davidson Resilience Scale (CD-RISC)	Connor, K. M. & Davidson, J. R. T. (2003). Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). *Depression and Anxiety, 18*, 76-82.	Measures resilience in typical functioning adults or adults with mental health problems. It may be used as a post-test in order to assess change following treatment. The focus is on individual characteristics (e.g. hardiness, patience) as well as psychological traits (e.g. attachment, spirituality) that contribute towards resilience.
2. Child and Youth Resilience Measure-28 (CYRM-28)	Ungar, M., Liebenberg, L., Boothroyd, R., Kwong, W. M., Lee, T. Y., Leblanc, J., . . . Makhnach, A. (2008). The study of youth resilience across cultures: Lessons from a pilot study of measurement development. *Research in Human Development, 5*, 166-180. doi:10.1080/15427600802274019 Ungar, M., & Liebenberg, L. (2009). Cross-cultural consultation leading to the development of a valid measure of youth resilience: The international resilience project. *Studia Psychologica, 51*(2-3), 259-268.	Developed through a process of soliciting interviews with youth and adults from countries around the world this instrument measures individual characteristics as well as factors of connectedness to others that support the resilience process. Four versions exist for using the instrument across different ages.
3. Devereux Early Childhood Assessment (DECA)	LeBuffe, P. A., & Naglieri, J. A. (1999a). *Devereux Early Childhood Assessment (DECA): Technical manual*. Lewisville, NC: Kaplan Press.	Measures observable behaviours of children ages 2-5 pertinent to resilience and behavioural concerns. Functions as a screening tool for socio-emotional difficulties that may lead to maladjustment later in life. Assessment is linked with the DECA program, which is designed to identify, address, and ameliorate socioemotional difficulties.
4. Dispositional Resilience Scale – 15 (DRS-15)	Bartone, P. T. (1989). Predictors of stress-related illness in city bus drivers. *Journal of Occupational Medicine, 3*, 657-663.	Developed for use with adults, particularly those engaged in challenging professions (e.g. military cadets), the measure focuses on specific personality traits/dispositional attributes relevant to stress, health, and adjustment.
5. Resilience Scale	Wagnild, G. M., & Young, H. M. (1993). Development and psychometric evaluation of the Resilience Scale. *Journal of Nursing Measurement, 1*, 165-178.	Measures personal attributes that contribute to resilience such as reflecting on personal experiences, understanding personal strengths, finding meaning and purpose in life, understanding that each person has unique experience, knowing personal limitations and not giving up easily.
6. Resilience Scale for Adults (RSA)	Friborg, O., Hjemdal, O., Rosenvinge, J. H., & Martinussen, M. (2003). A new rating scale for adult resilience: What are the central protective resources behind healthy adjustment? *International Journal of Methods in Psychiatric Research, 12*(2), 65-76.	Measures resilience as a multifaceted construct that precludes social competence, personal competence, social support, family adjustment, and dispositional attitudes.
7. Resilience Scale for Adolescents (READ)	Hjemdal, O., Friborg, O., Stiles, T. C., Martinussen, M., & Rosenvinge, J. H. (2006). A New Scale for Adolescent Resilience: Grasping the Central Protective Resources Behind Healthy Development. *Measurement and Evaluation in Counseling and Development,* 39(2), 84-96.	Created based on the research for the Resilience Scale for Adults – adapted for adolescent population. Resiliency Scales for Children and Adolescents (RSCA) (Prince- Embury 2006a, 2006b, 2006c, 2007).

Table 1: List of measures of resilience (meeting inclusion criteria) in alphabetical order

Name of instrument	Authors/Original study
1. Academic Resilience Inventory (ARI)	Samuels, W. E., & B. (2005). *Development of a non-intellective measure of academic success: Towards the quantification of resilience.* ProQuest Information & Learning, US.
2. Adolescent Resilience Questionnaire	Gartland, D., Bond, L., Olsson, C. A., Buzwell, S., & Sawyer, S. M. (2011). Development of a multi-dimensional measure of resilience in adolescents: The adolescent resilience questionnaire. *BMC Medical Research Methodology, 11*, 134.
3. Adolescent Resilience Scale	Oshio, A., Nakaya, M., Kaneko, H., & Nagamine, S. (2002). Development and validation of an adolescent resilience scale. *Japanese Journal of Counseling Science, 35*(1), 57-65.
4. Adolescent Scale of Resiliency Belief System	Jew, C. L., Green, K. E., & Kroger, J. (1999). Development and validation of a measure of resiliency. *Measurement and Evaluation in Counseling and Development,* 32, 75-89.
5. Adult Resilience Indicator (ARI)	Kotzé, M., & Nel, P.. (2013). Psychometric properties of the adult resilience indicator. *SA Journal of Industrial Psychology*, *39*(2), 1-11.
6. Asian Resilience Scale	Liu, X.-l., & Lu, G.-h. (2010). Asian Resilience Scale's preliminary revision, reliability, and validity in Chinese college students. *Chinese Journal of Clinical Psychology, 18*(1), 24-25.
7. Assessment of Core Resilience (ACR)	Shores, E. K. U. (2004). *The development of a measure to assess core resilience in adults.* Unpublished doctoral dissertation, The University of Utah, United States -- Utah. Shores, E. K. U., & B. (2005). *The development of a measure to assess core resilience in adults.* ProQuest Information & Learning, US.
8. Baruth Protective Factors Inventory (BPFI)	Baruth, K. E., & Caroll, J. J. (2002). A formal assessment of resilience: The Baruth Protective Factors Inventory. *The Journal of Individual Psychology, 58*(3), 235-244. Baruth, K. E. (2005). *The Baruth protective factors inventory as a clinical assessment of resilience.* ProQuest Information & Learning, US. Baruth, K. E. (2004). *The Baruth protective factors inventory as a clinical assessment of resilience*. Doctoral dissertation, New Mexico State University.
9. Bharathiar University Resilience Scale (BURS)	Annalakshmi, N. (2009). Probabilistic orientation, Materialism and spiritualism. In A. Husain (Ed.), *Twenty first century psychology: Spiritual perspectives*. New Delhi: Global Vision Publication House.
10. Brief-Resilient Coping Scale (BRCS)	Sinclair, V. G., & Wallston, K. A. (2004). The Development and Psychometric Evaluation of the Brief Resilient Coping Scale. *Assessment, 11*(1), 94-101.
11. Brief Resilience Scale (BRS)	Smith, B. W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The brief resilience scale: Assessing the ability to bounce back. *International Journal of Behavioral Medicine, 15*(3), 194-200.
12. College Resilience Questionnaire (CRQ)	Carlson, D. J. A. (2001). *Development and validation of a College Resilience Questionnaire.* ProQuest Information & Learning, US.
13. Devereux Early Childhood Assessment for Infants and Toddlers (DECA-I/T)	Powell, G., Mackrain, M., & LeBuffe, P. A. (2007). *Devereux Early Childhood Assessment for Infants and Toddlers - Technical Manual*. Lewisville, NC: Kaplan Press.
14. Deployment Risk and Resilience Inventory (DRRI)	King, L. A., King, D. W., Vogt, D. S., Knight, J., & Samper, R. E. (2006). Deployment Risk and Resilience Inventory: A Collection of Measures for Studying Deployment-Related Experiences of Military Personnel and Veterans. *Military Psychology, 18*(2), 89-120.
15. Family Protective Factors (IFPF)	Gardner, D. L. B. (2007). *Family resilience: The development of the Inventory of Family Protective Factors.* ProQuest Information & Learning, US. Gardner, D. L., Huber, C. H., Steiner, R., Vazquez, L. A., & Savage, T. A. (2008). The development and validation of the inventory of family protective factors: A brief assessment for family counseling. *Family Journal, 16*(2), 107-117.
16. Family Resilience Assessment Scale (FRAS)	Sixbey, M. T. (2005). *Development of the family resilience assessment scale to identify family resilience constructs* (Doctoral dissertation, University of Florida).

17. Indigenous Resilience Scale	Madeha, N., Saleem, S., & Mahmood, Z. (2010). Development of Indigenous Resilience Scale for Rescue 122 workers. *Pakistan Journal of Psychological Research, 25*(2), 149-163.
18. Inner Strength Scale	Lundman, B., Viglund, K., Aléx, L., Jonsén, E., Norberg, A., Fischer, R. S., ... & Nygren, B. (2011). Development and psychometric properties of the Inner Strength Scale. *International journal of nursing studies*, *48*(10), 1266-1274. . (2011). Development and psychometric properties of the Inner Strength Scale. *International Journal of Nursing Studies, 48*(10), 1266-1274.
19. Measures and Correlates of Resilience	Bowen, D. J., Morasca, A. A., & Meischke, H. (2003). Measures and Correlates of Resilience. *Women & Health, 38*(2), 65-76.
20. Measures of resilience	Hsieh, M. O., & Shek, D. T. L. (2007). Measures of resilience and adaptation of adolescents in single parent families in Taiwan: Psychometric properties and related profiles. *International Journal of Adolescent Medicine and Health, 19*(4), 485-495.
21. Middle School Students' Resilience Scale	Gao, X., & Zheng, R.-c. (2009). Research on three perspectives measurement of middle school students' resilience. *Chinese Journal of Clinical Psychology, 17*(1), 1-4.
22. Multidimensional Trauma Recovery and Resiliency Scale MTRR	Harvey, M. R. (1996). An ecological view of psychological trauma and trauma recovery. *Journal of Traumatic Stress, 9*(1), 3-23. Harvey, M. R., Liang, B., Harney, P. A., Koenen, K., Tummala-Narra, P., & Lebowitz, L. (2003). A multidimensional approach to the assessment of trauma impact, recovery and resiliency: Initial psychometric findings. *Journal of Aggression, Maltreatment & Trauma, 6*(2), 87-109.
23. Multiracial Challenges and Resilience Scale (MCRS)	Salahuddin, N. M. (2009). *Challenges and resilience in the lives of multiracial adults: The development and validation of a measure.* ProQuest Information & Learning, US. Salahuddin, N. M., & O'Brien, K. M. (2011). Challenges and resilience in the lives of urban, multiracial adults: An instrument development study. *Journal of Counseling Psychology, 58*(4), 494-507.
24. Physical Resilience Scale	Resnick, B., Galik, E., Dorsey, S., Scheve, A., & Gutkin, S. (2011). Reliability and validity testing of the Physical Resilience Measure. *The Gerontologist, 51*(5), 643-652.
25. Population-based resilience measures in the primary school setting	Sun, J., & Stewart, D. (2007). Development of population-based resilience measures in the primary school setting. *Health Education, 107*(6), 575-599.
26. Preschool children's resilience in daily life	Takatsuji, C. (2002). Preschool children's resilience in daily life: Creation and validation of a Scale of Reactions to Interpersonal Conflict. *Japanese Journal of Educational Psychology, 50*(4), 427-435.
27. Resilience Development Scale (RDS)	Laird, N. W. A. (2005). *The construction of a measure to assess the development of resilience in adolescents of African descent.* ProQuest Information & Learning, US.
28. Resilience Factors Scale for Thai Adolescents	Takviriyanun, N. (2008). Development and testing of the Resilience Factors Scale for Thai adolescents. *Nursing & Health Sciences, 10*(3), 203-208.
29. Resilience in adults	Strümpfer, D. J. W. (2001). Psychometric properties of an instrument to measure resilience in adults. *South African Journal of Psychology, 31*(1), 36-44.
30. Resilience Inventory (RI)	Noam, G. G., & Goldstein, L. S. (1998). The resilience inventory. *Unpublished protocol*. Song, M., & B. (2004). *Two studies on the Resilience Inventory (RI): Toward the goal of creating a culturally sensitive measure of adolescence resilience.* ProQuest Information & Learning, US.
31. Resilience Scale	Dai, B.-B., Li, J., & Liu, S.-X. (2011). Development of Resilience Scale. *Chinese Mental Health Journal, 25*(5), 385-388.
32. Resilience Scale for Early Adolescents	Baltaci, H. S. & Karatas, Z. (2014). Validity and reliability of the resilience scale for early adolescents. *Procedia-Social and Behavioral Sciences, 131,* 458-464.
33. Resilience Scale for Chinese Adolescents	Hu, Y.-Q., & Gan, Y.-Q. (2008). Development and psychometric validity of the Resilience Scale for Chinese Adolescents. *Acta Psychologica Sinica, 40*(8), 902-912.

34. Resiliency Scales for Children and Adolescents (RSCA)	Prince-Embury, S. (2008). The resiliency scales for children and adolescents, psychological symptoms, and clinical status in adolescents. *Canadian Journal of School Psychology*, *23*(1), 41-56.
35. Response to Stressful Experiences Scale (RSES),	Johnson, D. C., Polusny, M. A., Erbes, C. R., King, D., King, L., Litz, B. T., . . . Southwick, S. M. (2011). Development and initial validation of the Response to Stressful Experiences Scale. *Military Medicine, 176*(2), 161-169.
36. R-PLA: A resiliency measure	Mosack, K. E. B. (2002). *Development and validation of the R-PLA: A resiliency measure for people living with HIV/AIDS (immune deficiency).* ProQuest Information & Learning, US.
37. Singapore Adolescent Resilience Scale (SYRESS)	Lim, M.-L., Broekman, B. F. P., Meng Wong, J. C., Wong, S.-T., & Ng, T.-P. (2011). The development and validation of the Singapore Adolescent Resilience Scale (SYRESS). *The International Journal of Educational and Psychological Assessment, 8*(2), 16-30.
38. Stress Resilience Quotient Scale (SRQS)	Hu, H.-c., Deng, Y.-l., Pan, C., Liang, Y.-J., & Tang, Q.-p. (2009). Preliminary study on Stress Resilience Quotient Scale among the elderly community-dwellers in Zhuzhou City. *Chinese Journal of Clinical Psychology, 17*(3), 318-320.
39. Social-Emotional Assets and Resilience Scales, Teacher rating form (SEARS-T).	Merrell, K. W., Cohn, B. P., & Tom, K. M. (2011). Development and validation of a teacher report measure for assessing social-emotional strengths of children and adolescents. *School Psychology Review, 40*(2), 226-241.
40. Suicide Resilience Inventory–25 (SRI–25)	Osman, A., Gutierrez, P. M., Muehlenkamp, J. J., Dix-Richardson, F., Barrios, F. X., & Kopper, B. A. (2004). Suicide resilience inventory-25: Development and preliminary psychometric properties. *Psychological Reports, 94*(3 Pt2), 1349-1360.
41. Trauma Resilience Scale	Madsen, M. D., & Abell, N. (2010). Trauma Resilience Scale: Validation of protective factors associated with adaptation following violence. *Research on Social Work Practice, 20*, 223-233.
42. Trauma Resilience Scale for Children (TRS-C)	Thompson, M. D. (2012). *Trauma resilience scale for children: Validation of protective factors associated with positive adaptation following violence.* ProQuest Information & Learning, US. Retrieved from http://pqdtopen.proquest.com/pubnum/3458682.html
43. Washington Resilience Scale	Ahn, R. L. (1992). *Development and validation of the Washington Resilience Scale.* ProQuest Information & Learning, US. Retrieved from http://hdl.handle.net/1773/9075

Table 2: List of measures of resilience excluded from the review in alphabetical order

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