

Measuring Protective Factors: The Development of Two Resilience Scales in Norway

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This article provides a summary of research related to the development of two scales that measure protective factors associated with resilience. These scales were developed in Norway by one research group with members from the Departments of Psychology at the University of Tromsø and the Norwegian University of Science and Technology. (Members of the research team include Oddgeir Friberg, Odin Hjemdal, Monica Martinussen, Jan H. Rosenvinge, and Tore C. Stiles.) The work was begun in 1998. Because resilience research is a response to mental health problems, it is important to bear in mind some facts regarding the prevalence and future estimates of mental disorders globally.

Mental disorders estimates

The World Health Organization estimates that mental disorders affect approximately 450 million people at any given moment [1]. Mood disorders are the most frequent, affecting an estimated 121 million people worldwide, and they contribute to 850,000 suicides per year. The extent of mental disorders is growing. Depression has been found to be the leading cause of disability as measured by years lived with disability and is the fourth leading contributor to the global burden of disease (DALYs) in 2000. By the year 2020, depression is projected to reach second place in the ranking of DALYs calculated for all ages and both sexes. Currently, depression is already the second cause of DALYs in the age category 15 to 44 years for both sexes combined.

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Mental health in adults

Researchers with the Epidemiologic Catchment Area Study [2] estimated that one in every five persons in the United States suffers from a psychiatric disorder in any 6-month period and that one in every three persons suffers a disorder in his or her lifetime. Less than 20% of persons with a recent mental disorder reported that they seek help for their problem. Another study with 8098 participants in the United States found that the prevalence of at least one lifetime psychiatric disorder was close to 50% and that the 12-month prevalence was close to 30% [3]. The most common disorders were major depressive episode, alcohol dependence, social phobia, and simple phobia. Less than 40% of people with a lifetime disorder had ever received professional treatment. Approximately one sixth of the sample had a history of three or more comorbid disorders.

A random Norwegian sample of 2066 residents of Oslo between the ages of 18 and 65 were included in a psychiatric epidemiologic study. More than half of the sample was interviewed with the Composite International Diagnostic Interview. The 12-month prevalence of all mental disorders was 32.8%, and the lifetime prevalence was 52.4%. Major depression and alcohol abuse/dependence had the highest prevalence [4]. With the exception of drug abuse/dependence, all diagnostic categories were similar to those found in the United States Comorbidity Survey. These findings indicate that psychiatric disorders influence many people and that only a minority receive professional help. Understanding how psychiatric disorders develop to improve prevention and treatment is of the utmost importance.

Mental health in adolescents

The point prevalence of any psychiatric disorder in adolescents is generally estimated to be approximately 20% [5–7]. Depressive problems are the most common in girls, whereas conduct problems are found more often in boys [8]. Studies indicate that the presence of comorbid conditions is associated with more at-risk behavior, which contributes to more serious outcomes [9–13].

Norway is a small country with 4.5 million inhabitants, and there are few nationwide studies of mental health indicating the prevalence of psychiatric morbidity among adolescents. Published studies typically are heterogeneous in choice of mental health measures, and there is a general shortage of thoroughly validated diagnostic instruments, particularly for children and adolescents. Some caution must be taken in the interpretation of findings.

Findings from the Oslo Health study in 2000–2001 yielded a prevalence of distress symptoms of 26% among adolescent girls and 10% among boys [14]. An earlier interview study from 1976 indicated a prevalence of maladjustment and mental disorders of 19.6% among 15- to 16-year-old adolescents from the city of Oslo, compared with 7.9% in a rural area [15]. In

Norway, the same gender differences reported in other countries exist, with boys reporting more externalizing problems than girls [16,17] and girls reporting more internalizing problems than boys [17–19]. Similar to adults, the prevalence of psychiatric disorders among adolescents in Norway exceeds the national access to treatment capacity. Norway, along with other countries, is faced with serious challenges regarding the etiology, prevention, and treatment of mental health issues.

Discovering individual differences

The research field of developmental psychopathology initially set out to identify the risk and vulnerability contributing to the development of psychopathology. Early publications from research on the consequences of living with parents diagnosed with schizophrenia or maternal deprivation showed that these children had a significantly increased likelihood of having a psychological difficulty [20–22]. These three publications also highlighted the individual differences among children exposed to these stressors because some children did not develop psychological disorders despite such exposure. Other longitudinal prospective studies of children aimed at identifying risk and vulnerability generally have found similar results. The accumulation of risk heightens the probability of developing psychiatric disorders. These studies, however, also identified subgroups that were less likely than the rest to develop psychiatric disorders despite exposure to risk [23–30].

Upon the discovery of resilience, researchers became intrigued by the differences between well-adapted children and children who developed psychiatric disorders in the face of adversity. The findings of subgroups of children or individuals with a higher stress tolerance are particularly noteworthy. It seems that this subgroup learns strategies or makes adjustments that facilitate positive adaptation in the face of adversity. By supplementing risk and vulnerability theories, researchers could better account for the individual differences in the adaptation of individuals to adversity. The most important task has been and still is to identify the most influential vulnerability and protective factors and processes [31]. An in-depth understanding of the interaction between individual and social risk, vulnerability, and protection may expand our understanding of mental health.

What is resilience?

The study of resilience is receiving increased attention, as illustrated with 85% of the publications on the theme being published during the last decade [32]. The construct is relatively new, however, and issues such as clear taxonomy and generally accepted definitions are still in the process of development. Normally a definition sums up and captures the essence of a construct, but

defining resilience has proved to be a challenge, and several different definitions exist. In the 1980s, the main focus was aimed at identifying personal characteristics. Rutter [33] defined resilience as “Firstly, a sense of self-esteem and self-confidence; secondly, a belief in one’s own self-efficacy and ability to deal with change and adaptation; thirdly, a repertoire of social problem-solving approaches.” A second class of definitions emphasizes the power of recovery and readjustment. One of the well-known definitions comes from Wolin and Wolin [34], who defined resilience as the ability to bounce back, defy challenges, and repair oneself in the face of hardship.

At the same time in the 1980s and 1990s, there were changes in the understanding of the construct, and efforts to identify personal characteristics, such as internal locus of control and autonomy, were supplemented with an awareness of social external factors playing an important part in negotiating the effects of adversity and facilitating resilient adaptation.

The construct of resilience was adopted by systemic family theoreticians [35–37]. Hawley and DeHaan [36] defined family resilience as “... the path a family follows as it adapts and prospers in the face of stress, both in the present and over time. Resilient families positively respond to these conditions in unique ways, depending on the context, developmental level, the interactive combination of risk and protective factors, and the family’s shared outlook.” Beyond the immediate family level, social systems that support and reinforce resilient skills are commonly accepted as important [38–40]. Longitudinal research such as Werner and Smith’s [29,30] and research from Garmezy [41] and Rutter [42] indicated that personal and social aspects were involved. They proposed three overarching protective categories: (1) attributes or dispositions of the individual, (2) aspects of the family, and (3) characteristics of their wider social environment. These categories are generally accepted by resilience researchers. Because of the various facets of resilience, it is considered a multidimensional construct [43–45].

Individual characteristics of resilience have been associated with displaying more positive affect, being more socially skilled, more popular among peers, more empathic, and more cooperative, and being more compliant with adults than more vulnerable children [46]. Although intelligence is a protective factor, high intelligence is not a necessity to adapt adequately. Rather, resilient individuals effectively use skills available to them, such as high social maturity, achievement orientation, social perceptiveness [30], and prosocial behavior [47] to adapt well. They also hold a positive self-concept and a high degree of internal locus of control [23,48]. Among the well-adapted in Werner and Smith’s [49] Kauai-study, women and men pursued more education, and almost all held more skilled jobs in their early 30s and 40s. This success often has been related to resilient individuals’ well-developed ability to plan and organize [50]. They seem to have a constitutional robustness, sociability, smartness, good communication skills, and various personal positive attributes that may facilitate survival when faced with adversity [51]. An individual does not necessarily need all these factors to adapt well.

Research on family characteristics shows that families are the primary source of emotional support [36]. A follow-up study of individuals in late adulthood found that a trusting and intimate relationship with at least one parent, consistent and clear rules and norms in the family, and shared values were most frequently associated with family resilience [52]. Having at least one warm and caring parent or adequate and stable parental substitute seems vital [36,53–55]. Lavee and colleagues [56] explored the relations between stressors, marital adjustment, family well-being, and coherence. They found family coherence to be the most potent predictor of family well-being.

External support systems that promote resilience are often reported as peers [36,38,40,45,57], neighbors, teachers, coaches, priests, or consultants [38] who support an individual's attempts at mastery. Having someone outside the family who is available during difficult times and having a supporting educational environment may be crucial in times of trouble [58]. Studies often report more resilience among children who grow up in a residential environment characterized by solidarity, cohesiveness, and fewer conflicts [59].

Although prospective longitudinal studies have identified factors that promote resilience, it is important to keep in mind that factors found to promote resilience are not extraordinary [23,26,28,49]. They consist of factors known to be required for ordinary developmental growth [60].

More recent research has highlighted the fact that the presence of protective factors is not sufficient alone to explain individual differences in adapting to adversity. Research findings from studies of seemingly healthy children of depressed mothers indicated that the children suffered negative consequences over time, which may be related to a child adopting a caretaker role with too much responsibility too early [61,62]. Preschoolers of alcoholics who initially were identified as resilient later showed levels of internalizing symptoms as high as preschoolers who initially were identified as the most troubled [63]. Studies such as these show the complexity of resilience research and indicate that the presence of seemingly healthy adaptation at one developmental stage may change during later developmental stages. It also draws attention to the need to include behavioral and psychological measures when evaluating adaptation. The label "invulnerable" [64], which indicated an absolute avoidance of negative consequences of adversity, has been replaced by a growing understanding that positive adaptation is never permanent. It is a process of negotiating vulnerabilities and strengths with changing developmental stages and life circumstances [29,65].

This change toward an understanding of resilience as potentially fluctuating has generated a different and widely used definition of the construct resilience as the individuals' positive adaptation or demonstration of a pattern of normal development despite significant risk and adversity [66–68]. A problem with this definition of resilience is that it leaves little room for prediction. It defines the final outcome but not what contributes to the outcome. One of the most interesting potentials of resilience research is

exploring if protective factors can contribute to an improved prediction of good outcomes and healthy adaptation. To include the predictive perspective and facilitate research on processes, resilience was alternatively defined as the protective factors and processes that contribute to a good outcome despite experiences with stressors shown to carry significant risks for developing psychopathology [69].

Empirical research on protective factors

Resilience has become the conceptual umbrella or a superordinate construct that subsumes a rich source of protective factors that lead to adaptive development in the face of adversities. This is reflected in the wide variety of scales used in studies reporting resilience, such as the Nowicki-Strickland [70] Locus of Control Scale, Harter's [71] Self-Perception Profile, Antonovsky's [72] Sense of Coherence, Kobasa and Puccetti's [73] Hardiness Scale, and Hightower and colleagues' [74] Child Rating Scale for school adjustment. This variety of scales makes it difficult to compare results from different studies. This diversity of scales also makes it difficult to identify which factors are involved in which processes and how they contribute to boost adaptive adjustment. Identifying individuals with a high degree of resilience by using a large variety of scales is impractical and an expensive process. On the other hand, a valid and reliable scale of influential protective factors would facilitate identifying and tracking changes in protective factors for individuals and groups. Such a scale could potentially facilitate the exploration of protective factors in traditionally less used designs, such as experimental studies, facilitate the identification of particularly interesting subgroups for prospective designs, and potentially be economical and time saving. Another contribution of a direct measure may help clarify the debate of whether protective factors provide protection regardless of stress (compensation model) or whether the negative impact of specific risks or vulnerabilities is moderated by resilience (protective model) [75].

The development of the resilience scale for adults

In 1998, I was introduced to the construct of resilience, which contrasted with other constructs found in the general literature in clinical psychology. The adversities reported by resilient and psychiatric patients were similar, however, but the outcome was highly different. With youthful enthusiasm, a colleague, Oddgeir Friberg, and I wanted to evaluate fluctuations in level of protective and vulnerability factors among adults. Generally a field of research generates a stringent testable definition and makes efforts to operationalize its concept to facilitate further exploration of the construct. Much to our surprise, however, only one measure directly related to

resilience among adult populations was located. The Resilience Scale developed by Wagnild and Young [76] was based on interviews with 24 elderly women who had adapted successfully to various losses typical of old age. From this material, they developed a scale that consisted of 25 items covering two factors: personal competence and acceptance of self and life. The scale was found highly reliable with an elderly sample and showed initial construct validity. A follow-up study on a Russian sample did not confirm the factor structure [77]. There was a restricted range of stressors (single traumas) and a sample not representative of the total age range of the adult population. The scale included only one of the three overarching categories—dispositional positive attributes—and none of the two social dimensions of resilience. Based on this finding, the scale was not found appropriate for measuring adult resilience for our purpose.

There are several ways of constructing questionnaires. Items can be derived from qualitative research with key informants, as in the case of Wagnild and Young [76]. The development of items also can be based on interviews or observations of particular focus or expert groups. Another alternative is developing items based on an established theory [78]. Resilience is mainly based on empirical findings and not on an established theory. It was clear, however, that a direct measure of protective factors associated with resilience should include indicators of protective factors associated with these three consensus-based overarching categories. A pragmatic solution was chosen. A literature review of protective factors was undertaken. The review process continued until no new protective factors were identified. These factors were then categorized into 15 types of protective factors, which were named (1) personal competence, (2) self-efficacy, (3) social support, (4) social competence, (5) family and youth, (6) internal locus of control, (7) temperament, (8) hope, (9) structure and rules, (10) ego strength, (11) education and vocational life, (12) religion, (13) self-actualization, (14) amount of stress, and (15) problem-solving abilities/intelligence. For the latter two categories there already exists various reliable and valid measures, and creating new ones was considered redundant. Based on the remaining 13 categories, 295 positively worded items were generated. These items were reviewed by three clinical psychologists and assistant university professors, eight master psychology students, and five laypersons, resulting in the removal of 100 items. The remaining 195 items were distributed among university students and ultimately subjected to an exploratory principal component analysis that resulted in a five-factor solution consisting of 45 items. The psychometric properties of the resilience scale for adults (RSA) were adequate, showing Cronbach alphas between 0.92 and 0.74 and a total alpha of 0.93 [79]. The five factors were named (1) personal competence, (2) social competence, (3) structured style, (4) family cohesion, and (5) social resources. These five factors cover the three overarching categories previously mentioned but also include the social aspects of protective factors associated with resilience.

The factor solution was replicated in a nonclinical random sample of 276 adults in Norway selected by the central statistical bureau [80]. The number of items was reduced further to 37, and the 4-month test-retest with 217 of the participants yielded acceptable significant correlations ranging from 0.69 to 0.84 ($P < .001$). In the same study, construct validity was explored by including 59 individuals seeking psychiatric outpatient treatment. If the RSA measured influential protective factors, it was expected that the scale would differentiate between a nonclinical sample and a clinical sample. The results indicated that the RSA total score and all of the factor scores significantly differentiated between these two samples [80]. Both samples filled out a measure of healthy adaptation named Sense of Coherence scale (SOC-29) [72] and a measure of general anxiety and depressive symptoms, the Hopkins Symptom Check List (HSCL-25) [81]. The correlations between RSA factors and SOC-29 were as expected all positive and significant, ranging from 0.29 to 0.75. The correlations between RSA factors and the HSCL-25 were as expected all negative and significant, ranging from -0.19 to -0.61 . These findings further supported the construct validity of the RSA.

Some interesting gender differences for the RSA factors were found, with men scoring significantly higher on factor 1 (personal competence) and women scoring higher on factor 5 (social resources). These gender differences are consistent with previously reported results [82]. For the total score of RSA there was no gender difference, however. The internal consistency and the three explorations of the construct validity from this study indicated that the RSA was a promising measure of resilience.

The factor structure was explored using confirmatory factor analyses, which yielded a relative good fit for the five-factor model in a random sample of 994 individuals [83]. This study also supported the divergent validity with expected negative correlations between all RSA factors and a measure of negative automatic thoughts frequently associated with depression and depressive symptoms (range, $r = -0.31$ to -0.68) (Automatic Thought Questionnaire [84]) and hopelessness (range, $r = -0.25$ to -0.63) (Beck Hopelessness Inventory [85]). Expected convergent validity was found with positive correlations between all RSA factors and a measure of optimism (range $r = 0.32$ – 0.70) (Dispositional optimism/Life Orientation Test [86,87]) and self-confidence (range $r = 0.27$ – 0.75) (Rosenberg's Self-Esteem Scale [88,89]). All correlations were significant with a two-tailed test ($P < .01$) in a sample of 185 participants. The large variations in correlations of each RSA factor and the mentioned measures seemed to support the notion that although all factors measure positive attributes, they measure attributes that differ.

The positive wording of the RSA items was consistent with resilience research because items indicate presence of a protective factor rather than the absence of risk. After the initial studies, however, there was a particular methodologic concern regarding this Likert-type response format. Research on response styles or biases on scales with only positively or negatively

phrased items highlights the acquiescence bias as a potential problem [78]. Acquiescence bias is the consistent tendency to respond in a “yea or nay” fashion. To limit possible influences of such a bias, the response format was changed from a Likert to a semantic differential-type response format, but the psychometric properties remained acceptable [90].

Using a sample of 482 applicants to a military college, additional efforts were made to optimize the psychometric properties of the measure using a confirmatory factor analysis. The number of items was further reduced to 33 items, and the first factor, personal competence, was split into two factors, which resulted in a better relative fit. The RSA consequently consists of six factors: (1) perception of self (six items), (2) planned future (four items), (3) social competence (six items), (4) structured style (four items), (5) family cohesion (six items), and (6) social recourses (seven items) [91]. The Cronbach alphas remained within acceptable levels, whereas the confirmatory factor analysis showed good relative fit for the six-factor RSA model.

Studies from other researchers on individual positive dispositions have explored personality constructs along with resilience. Results indicate that faster recovery and less symptomatology after trauma has been associated with lower scores on neuroticism, along with higher scores on extraversion, openness and conscientiousness [92], and agreeableness [93]. Subjective ratings of resilience by trained psychologists also have shown strong negative correlations with neuroticism ($r = -0.71$) [94]. These findings have opened up the possibility of using these “big five” personality measures to cluster individuals into well-adjusted and more vulnerable subgroups [95,96]. Generally the results indicate that lower scores on neuroticism and higher scores on the other factors indicate a resilient personality profile.

Based on these research findings, a study with 482 applicants to a military college used the five-factor personality model (Big five/5PF) to discriminate between well-adjusted and more vulnerable personality profiles. The results from the study indicated that the RSA with its factors were significantly positively correlated with well-adjusted personality profiles, which further supported the construct validity of the scale [91]. The results indicated that individuals who scored high on the RSA were psychologically healthier and better adjusted. It was expected that the two last RSA factors, family cohesion and social resources, would be less associated with the big five, but this was only partly true because these factors loaded equally strongly on agreeableness and social competence. The results are interesting because they indicate that socially competent individuals also have a wider social network that potentially serves as a source of social support that can help in overcoming adversity. The question is whether a rich social support in early life influences the development of agreeable personality traits or if personality traits enhance such sources [91] or if mutual transactional processes are involved. All in all, the results from this study support aspects of the

construct validity by indicating that individuals with high scores on RSA were psychologically healthier.

One interesting aspect of having a direct measure of protective factors is that it makes it possible to use traditionally less used designs in exploring the resilience construct. Experimental designs are particularly interesting because of their level of control regarding induction of stress levels. One important criticism toward resilience research has been the uncertainty with regards to level of exposure to stress or adversity. Critics argue that subgroups showing positive adaptation may have been exposed to fewer or less severe stressors than groups that develop pathology. Experimental studies exposing individuals to severe adversity are unethical and should not be undertaken. Experimental design may lack the external validity with regards to the adversities reported in resilience literature, but experiments with moderate stress inductions may explore the predictive validity for particular protective factors and possibly potential variations in level of protection.

The levels of protective factors associated with resilience were measured with RSA before an experimental study of subjective pain and stress. The experiment was approved by the Regional Ethics Committee in Norway, and participation was voluntary and could be stopped at any time during the experiment. A standardized submaximum tourniquet method was used to induce ischemic pain and stress. In all, 84 participants were randomized to a low (information regarding the experimental procedure) or a high (no information regarding the procedure) stress group. The results showed that perceived pain and stress significantly increased for all 84 participants, which indicated that the manipulation was successful in inducing subjective stress and pain. Individuals with high scores on the RSA reported less subjective pain and stress, however [97]. The protective effect was larger for the high-stress condition and was viewed as a support for a protective effect rather than a compensatory one. If the results were to support a compensatory model, the protection should have been equal in the high- and low-stress condition, which was not the case. This experiment demonstrated support for the predictive validity of the RSA, but it also exemplified how protective factors may be explored in an experimental design.

Predicting positive adaptation is probably one of the most interesting aspects of a direct measure of protective factors associated with resilience. A prospective study explored the RSA as a predictor of the development of depressive and anxiety symptoms. A healthy sample of 159 participants who scored below the suggested cut-off mean score of 1.75 on the pretest of the 25-item Hopkins Symptom Check List (HSCL-25) [98] was included. HSCL-25 is a previously mentioned checklist that measures psychiatric symptoms, particularly anxiety and depressive symptoms. Participants completed the RSA, HSCL-25, and the occurrence of negative stressful life events twice over a 3-month period. The main result was that individuals who reported higher scores on the RSA total score were essentially

unchanged regarding level of depressive and anxiety symptoms despite exposure to naturally occurring stressful life events. This finding indicates that these events did not impact negatively upon the individuals who had more protective resources available. On the other hand, individuals who reported lower levels of resilience developed higher levels of psychiatric symptoms at follow-up when exposed to stressful life events. Besides the total RSA score, there were significant results for the two RSA factors: planned future and social competence [69]. The latest study on the RSA explored its predictive value in relation to the well-known construct of hopelessness in a sample of 535 participants [99]. Hopelessness is particularly interesting because it is among the core features of depression [100–102] and central in the development and predisposition of suicide ideation [103,104]. Even when controlling for age, gender, and levels of depressive and anxiety symptoms, the RSA and all factors were significant negative predictors of levels of hopelessness [105], indicating that the scale may have relevance as a measure of protective resources toward thoughts identified in cognitive therapy as antecedents for depression and suicide ideation.

Taken together, the experimental and prospective studies added to the predictive validity of the RSA and indicated support for a protective model rather than a compensatory model of the measured protective factors.

The development of the resilience scale for adolescents

Because of previously mentioned results and increased interest in the RSA, an adolescent version was made. Taking advantage of the developmental work of the RSA seemed a reasonable and parsimonious point of departure. The development started in 2004 with a pilot study exploring if adolescents would have difficulty understanding the semantic differential-type RSA items. The response format proved to be too complicated, and the simpler Likert scale response format was preferred. Items were simplified and adapted to facilitate comprehension among adolescents and all were positively phrased. The first study included 425 young adolescents. A confirmatory factor analysis indicated good relative fit for a five-factor model that consisted of 28 items. This scale was named the Resilience Scale for Adolescents (READ) (Cronbach's alpha for all items = 0.94). The factors were named (1) personal competence (eight items), (2) social competence (five items), (3) structured style (four items), (4) family cohesion (six items), and (5) social resources (five items). The reliability for each of the factors was also within the acceptable range (Cronbach's alphas from 0.85–0.69) [106]. Gender differences were found as girls reporting higher levels of social resources than boys and boys reporting higher scores on personal competence than girls. No gender differences were found for the total READ score, however. These gender differences are similar to those in studies with the RSA and are consistent with results from other studies of resilience [30].

The READ factor structure resembles the factor structure of the RSA, and although the items have been altered, the content of the items in READ and RSA are highly similar.

The most recent study explored READ as a predictor for depressive symptoms among 387 young adolescents. Parents ($N = 240$) also evaluated their adolescents' resilience levels by filling out a modified parental version (Resilience Scale for Adolescents—Parental version; READ-P) in a correlational design. Measures that can reliably identify protective factors for psychiatric disorders with a high prevalence, such as depression [107], are of general interest, especially because an early onset of depression predicts a poor prognosis [108–110]. Depressive symptoms were measured with the Short Mood and Feeling Questionnaire [111] and social anxiety symptoms were measured with Social Phobia Anxiety Index for Children (SPAI-C) [112]. As expected, the correlations between READ and Short Mood and Feeling Questionnaire were high and significant ($r = -0.69$), between READ and SPAI-C they were moderate and significant ($r = -0.51$), and for Short Mood and Feeling Questionnaire and SPAI-C the correlation was moderate and significant ($r = 0.55$). The READ total score and all READ factors significantly predicted levels of depressive symptoms, even when controlling for age, gender, stressful life events, and symptoms of social anxiety disorder for children (SPAI-C) [112]. Personal competence turned out to be the best predictor for depressive symptoms, which explains 17% of the variance, whereas family cohesion explained 15% and social resources explained 10%. The result was partly unexpected because social competence was expected to be a stronger predictor. An additional analysis checked if social competence and SPAI-C measured overlapping constructs. By omitting SPAI-C in the regression analysis, social competence predicted depressive symptoms and family cohesion. This finding indicates that social competence (5 items) and SPAI-C (26 items) measure related constructs.

READ-P did not predict levels of depressive symptoms reported by the adolescents themselves, however, which may indicate that young adolescents seem to be a better source of information regarding resilience factors and their ability to predict depressive symptoms. Although somewhat unexpected, many studies have reported low to moderate agreement between adolescents and their parents for psychiatric symptoms such as depression [113–116]. Consistent with research on depressive symptoms, the young adolescents seem to be a better source of information regarding resilience factors and their ability to predict depressive symptoms.

To explore if READ was just a positively phrased measure of depressive symptoms, additional analyses were undertaken exploring READ as a predictor of levels of social anxiety symptoms when controlling for depressive symptoms. READ was also found to predict levels of social anxiety symptoms, which means that READ measures protective factors that are not limited to depressive symptoms alone [32]. This may be an indication that the measured READ factors are protective in a broader way relevant for

predicting levels of different psychiatric symptoms. These results are considered as an initial indication of the construct validity of READ.

Summary

The prevalence of mental disorders among adults and adolescents is high, and WHO estimates indicate an increase in the near future, especially depressive disorders. Clarifying the development of psychopathology and preservation of mental health is of the utmost importance. Luthar [31] emphasizes identification of influential protective and vulnerability factors as a primary focus. The development of valid and reliable operationalizations of protective factors may be one step toward determining which factors are important and influential in preserving good mental health and preventing the development of psychopathology.

The RSA and READ are based on empirical resilience research and measure protective factors in accordance with the three overarching categories of resilience factors [29,30,41,42]: (1) positive characteristics and resources of the individual, (2) a stable and supportive family environment marked by coherence, and (3) external social networks that support and reinforce healthy adaptation. Our recent findings indicate substantial support for the reliability for the RSA with regards to internal consistency and test-retest reliability. The convergent and divergent validity of the RSA has received repeated support, whereas READ shows promising results for internal consistency. The construct validity of the RSA has been repeatedly supported because it differentiated between psychiatric outpatients and a random healthy control sample and between resilient and vulnerable personality profiles. Our studies also indicated the predictive validity of the RSA because it reliably predicted the level of experienced pain and stress in an experimental study and the development of psychiatric symptoms after occurrence of stressful life events and predicted levels of hopelessness.

The most recent study indicated that READ predicts level of depressive and social anxiety disorder symptoms, whereas the parents' report of the young adolescents level of resilience (READ-P) did not predict levels of depressive symptoms among the adolescents. The adolescents' self-reports of resilience seem the most reliable source for registering protective resources relevant for depressive and anxiety symptoms.

Further research is needed, particularly with regards to exploring the validity of READ in prospective designs with repeated measures. For the RSA and READ, such studies are ongoing and may be particularly interesting with respect to cross-generational studies because the RSA and READ are based on the same empirical resilience research, have similar factor structure, and contain items with similar content. These scales, developed in Norway, require further cross-cultural study to explore the cross-cultural validity of the scale. Several such projects are underway in English-, French-, and Portuguese-speaking countries. Until this point, studies combining the RSA

or READ and biologic processes underlying vulnerability and protective factors have not been undertaken. The biologic processes potentially may be of great importance, however [117]. Biologic processes that influence resilience may range from neural plasticity with structural and functional changes of the brain based on environmental inputs, to neuroendocrinologic regulations of emotions [118]. Possible physical changes in brain structures and neuroendocrinologic regulations can have considerable implications in shaping vulnerability and protective processes to potential psychopathology [119].

Norway, along with other counties, is facing a considerable challenge within mental health care. Treatment centers are struggling to meet current needs with the capacity they have, and the estimated increase indicated by the WHO (2003) may be a warning of worse demands on the mental health care system to come. Future research needs to unpack the relative contributions of vulnerability and protective factors and how they operate and influence each other. This process is critical for the development of theory and research and for designing interventions [31]. The results from resilience research might reveal promising knowledge useful in designing health-promoting and treatment interventions for particular high-risk individuals. As indicated by Luthar [31], the most important task is to identify the most influential vulnerability and protective factors. Thereafter she emphasizes the importance of differentiating between highly modifiable and less likely modifiable factors (modifiers). In designing prevention or treatment interventions, choosing modifiable factors would increase the likelihood of a good outcome and healthy adaptation [31]. Ongoing studies will indicate whether and possibly to what extent the measured factors in the RSA and READ are modifiable.

A research question still to be answered is which protective factors are essential for whom under which conditions or adversities? Does a certain set of protective and vulnerability factors interact with certain personal dispositions and competences, and do they lead to healthy adaptation only for a specific set of adversities? Answering these questions is a complex and timely venture, but thoroughly developed and extensively examined measures of protective factors associated with resilience can potentially contribute to illuminate the journey.

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