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ADOLESCENT PSYCHOLOGICAL RESILIENCE SCALE: VALIDITY AND RELIABILITY STUDY

Sefa Bulut

Department of Counseling Psychology and Guidance
Abant İzzet Baysal University
A.İ.B.Ü. Eğitim Fakültesi, P.D.R Bölümü Gölköy Bolu
Turkey
sefabulut22@hotmail.com

Uğur Doğan

Bolu High School of Fine Arts and Sport
Kürkçüler Köyü, Bolu
Turkey
ugurdogan@gmail.com

Yunus Altundağ

Bolu Atatürk Anatolian High School
yunusaltundag14@hotmail.com

Abstract

The purpose of this research was the development of an Adolescent Psychological Resilience Scale. Validity and reliability studies were completed. Participants in the study were 347 high school students. Exploratory factor analyses of construct validity explained 56.99% of the total variance of the scale and found 29 items and 6 factors. The criteria for the validity of the study included the Problem Solving Inventory with 0.47, the Beck Hopelessness Scale with 0.61 and the Locus of Control Scale, in which a 0.46 correlation was found. In a reliability study, the Cronbach's alpha was 0.87, 0.61, and 0.89 for the subscales-ranged alpha values. After an interval of 1 month, a result of the test-retest correlation coefficient was found to be 0.87. In another reliability study, 27% of bottom-top group comparisons revealed significant differences in all items. Finally, the item-total correlation analysis of the relationship was examined and found to vary between 0.59 and 0.81. Based on these findings, we can say that the Adolescent Resilience Scale can be used in the field of education and psychology and that it is a reliable and valid measurement tool.

Key words: psychological resilience scale, adolescent, validity, reliability

Adolescent Psychological Resilience Scale

Today's adolescents, like all individuals, may often face challenging life events. They may face serious problems, including natural disasters, such as floods and earthquakes, the loss of a loved one, the separation of parents, or a move to a different home or school. Many adolescents may have difficulties in dealing with these challenging life events; some are able to quickly adapt to difficult situations, but some can recover only partially or remain overly affected. The phenomenon of psychological resilience is the most basic factor in alignment of this ongoing, multistep process, which requires people to devote much time and effort (Masten, 2001).

In English, the term *resilience* refers to the power of resilience, which enables one to overcome challenges with strength, flexibility, and durability (Bezmez, Blakney & Brown, 1999). There is no common point from which to explain this term in Turkish and with one exact word; however, the following characteristics are associated with the concept: *robustness*, *durability*, *resilience*, *strength*, *recovery*, *psychological resistance* and *psychological stability*. In one of their studies, Basım and Çetin (2011) developed a method to eliminate excess use of this term and sent questionnaires to 23 faculty members in this country. Associate professors and professors working on the concept of resilience were asked which concept is more appropriate. Based on the responses and evaluations from faculty members who completed the questionnaire, Basım and Çetin decided to use the term *psychological resilience*. An examination of the international literature also reveals that a common definition of the concept of *psychological strength* cannot be reached. In describing this strength, Walsh (2006) said, "When faced with a challenge, a more powerful way to go out of this situation, in the event of a crisis, and to be tough to show the active development as a process." Masten (1994) described psychological strength as "adapting to risky situations successfully despite the difficulties." Strength is formed by the interaction of risk factors and protective factors. Risk factors, including stressful life events and harmful environmental factors, can increase psychological damage to an individual. Protective factors are personal, familial, social and environmental, or ignited, and serve as a support for at-risk individuals and function protectively to reduce the harmful effects of risk factor (Kumpfer, 1999; Norman, 2000). For children and adolescents, especially, high-risk factors, such as family and social violence, poverty, divorce, physical and mental torture, have a negative effect on the inclination to search for ways to overcome life's difficulties (Greene, 2002).

It has been demonstrated that resistant-strong individuals have a structure that is internally supervised, capable of problem solving and interpersonally communicative. Additionally, these individuals have high self-esteem and a positive personal design. Moreover, they never give up when facing difficulties – in fact, their struggles actually benefit them by inducing internal loadings that are capable of creating empathy.

Several measurement tools have been developed to measure and explain psychological strength, which has a complicated structure (Baruth & Carroll, 2002;

Connor & Davidson, 2003; Friborg, Hjemda & Rosenvinge, 2003; Oshio, Kaneko & Nagamine, 2003; Sinclair & Wallston, 2004). An examination of our country's literature reveals that the notion of psychological strength has not been researched until recently and the number of studies is limited. Generally, researchers have used translated texts for evaluating the idea of psychological resilience (Basım & Çetin, 2011; Gizir & Aydın, 2006; Kararmak & Çetinkaya, 2009; Özcan, 2005). The literature also clearly illustrates that two scales have been developed to measure psychological strength which are suitable for our culture. The first scale was developed to evaluate the psychological strength of adults (Bayraklı & Kaner, 2010). The other, a 50-item scale, was developed by Gürgan (2006) in a study with university students. This scale is not useful for high school students, as it was developed for university students. As a result of this deficiency, there is a great need for a measurement tool, suitable for our culture, to evaluate the psychological resilience of high school students, since high school students and university students have different growth terms, psychologically. The purpose of the study is to respond to this necessity and to develop a scale to determine the measure of psychological resilience in adolescents of high school age.

METHOD

Participants

The research was conducted on high school students who attended different high schools in Bolu during the 2011-2012 school year. The age range was 14 to 17, with an average age of 15.56. Of the 347 students who participated, 133 (38%) were boys and 214 (62%) were girls.

Instruments

Problem Solving Inventory, Form-A. The form was developed by Heppner and Peterson (1982); the Turkish version of the scale was created by Şahin, Şahin & Heppner (1993). In a reliability study, The Cronbach's alpha internal consistency was 0.88. The reliability coefficient was 0.81 through the split-half reliability study. In a criterion-validity study, the correlation coefficient between the total points of the scale and the Beck Hopelessness Inventory was 0.33, and the correlation coefficient between State-Trait Anxiety Inventory point total was 0.45 (Şahin et al., 1993). The number of points that could be achieved in the Problem Solving Inventory varies between 32 and 192. An increase in number of points indicates a decrease in the level of problem solving.

Beck's Hopelessness Scale. The scale, developed by Beck, Lester and Trexler to research psychopathological situations reflecting hopelessness (1974), was adopted by Seber (1991) and Durak (1993). In an internal-consistency evaluation

of this study, the Cronbach's alpha was 0.86 (Seber, 1991) in a study conducted on 37 patients with depression and 0.85 in a study conducted on 373 people with and without psychiatric illness (Durak and Palabıyıköğlü, 1994). The item total-point correlations between the points gained from the scale as a whole and the points gained from each item in Seber's study (1991) was between 0.07 and 0.72 and between 0.31 and 0.67 in Durak and Palabıyıköğlü's study (1994). The split-half reliability for the whole the scale was 0.852 (Durak and Palabıyıköğlü, 1994). Test-retest reliability was 0.74 (Durak and Palabıyıköğlü, 1994; Seber, 1991). The points that could potentially be achieved from the Hopelessness Scale range between 0 and 20. A positive number of points indicates hopelessness.

Rotter's Internal-External Locus of Control Scale. This scale was developed by Rotter (1966), adapted to Turkish in 1991 by Dağ, and revised by the writer in 2002. The item-total correlation ranged between 0.20 and 0.70. The test-retest correlation was 0.88. In a criterion-validity study, calculations were 0.67 using Rotter's Internal-External Locus of Control Scale, 0.39 on the Rosenbaum Learnt Strength Scale, 0.25 on the general GSI with Symbol Scanning Test (SCL-90-R) and 0.46 on the Paranormal Belief Scale (Dağ, 2002). The number of points that could be achieved in Rotter's Internal-External Locus of Control Scale range between 47 and 235. An increase in the number of points indicates an external locus of control.

Procedure

The literature on psychological resilience has been examined and attempts have been made to determine the dimensions of and concepts surrounding this term. National and international scales have been examined, adopted, or developed about the notions of psychological strength and durability. In this study, psychological resilience was explained, orally and in written form, to a group of 30 adolescents who were asked to write a composition or story about the concept, or about people who have varying degrees of psychological resilience. Written feedback provided by the adolescents was evaluated and some of their expressions were used in some of the items. A 110-item pool was formed with the data from similar scales that collected feedback from adolescents. Three academicians from Psychological Counseling and Guidance departments, three psychological counselors and two experts in their field were consulted and, finally, four Turkish language and literature experts were consulted for appropriateness and suitability to Turkish grammar, in particular whether the items were sufficiently clear, 20 items were omitted from the item pool. Of the 90-item pretrial forms distributed to 50 adolescents for pilot application, 9 items, which were determined to be *not understood* by adolescents (as they were generally not answered), were omitted (after review, these items were presumed nonfunctional); 81 items remained in the trial form. The scale used a four-level format: (1) *not exactly suitable for me*; (2) *not suitable for me*; (3) *suitable for me*; and (4) *exactly suitable for me*. For the structure validity of the APRS, an Exploratory

Factor Analysis (EFA) test-retest method was used for reliability, Cronbach's alpha internal consistency, item bottom-top group comparisons and item total correlations were reviewed. For criterion validity, the Problem-Solving Inventory, Beck's Hopelessness Scale and Rotter Internal-External Locus of Control Scale were used.

RESULTS

Validity

Structure validity. According to Şencan (2005), regardless of whether a researcher ascertains from literature that a scale is multidimensional, his or her aim is to develop a scale which measures complex structures and uncovers hidden structures that require applied factor analysis before reliability analysis. Based on this vision, the factor-analysis method is applied first. To understand the structure validity of the APRS, the correlation matrix of all items in the Commentary Factor Analysis is observed to determine whether there are important levels of significant correlations. The Kaiser, Mayer, Olkin (KMO) score must be higher than 0.60 and Bartlett's test must be meaningful (Büyüköztürk, 2010). In this study, the KMO score demonstrated suitability coefficient was 0.86 and Bartlett's Test of Sphericity χ^2 value was found to be 3,652, 893 ($p < 0.001$); the answers for scale items can be factorable. The literature holds the common view that factor loading of an item must be at least 0.32 (Büyüköztürk, 2010). Furthermore, Büyüköztürk states that the researcher's view and preference determines what the cutting point must be for the height of loading with the aim of evaluating factor loading. According to this view, a 0.32 factor-loading value is accepted. Before starting the factorizing process to determine the factor-loading value, a factor analysis is limited to six factors as a result of scree plot, varimax rotating technique and EFA basic-components technique. The item elimination started with those that were identical in more than two factors and continued until none of the items were the same. According to Tabachnick and Fidell (2007), there is a wide variety of methods for determining factors, but the most popular method is to use the magnitude of the eigenvalue. The number of eigenvalues less than one factor should not be considered as a result of the EFA. If the number of items is less than 40 and the sample is large, this method gives better results. The Scree Plot Size Chart and eigenvalue will result in parallels to each other. The Scree Plot Chart listed on the vertical axis as a sharp decrease in the size of the eigenvalue ends and is used to determine the number of factors pointing to the landscape passes (Stevens, 2001). This is the proposed number of intermediate points in the space between the numbers of factors. In the Scree Plot Chart, a flattened slope begins with seven factors. By considering the Scree Plot and eigenvalue, factor analysis is limited to six factors. As a result of the analysis, there was a six-factor structure with 30 items, but one item was removed from the scale because it damaged the entitle. At the final stage, 52 items whose factor loadings were below

0.32 and same meaning items, a scale was constructed with 29 items with a six-factor structure, explaining the 56.99% total variance. Those six eigenvalues (% explained variances) are: 6.73 (23.22.%), 2.84 (9.81%), 2.34 (8.06), 2.1 (7.25), 1.31 (4.54) and 1.18 (4.08%).

Factor loading of each items and the eigenvalues and explain variance that occurred after varimax rotation are presented in Table-1.

Table.1. Adolescent Psychological Resilience Scale's Factor Loadings and Factor Variances

Item No	Family Support	Confidant-Friend Support	School Support	Adjustment	Sense of Struggle	Empathy
I9	0.79	0.08	0.13	-0.03	0.07	0.03
I24	0.79	0.09	0.10	0.09	0.09	0.13
I11	0.76	0.17	0.15	0.01	0.09	-0.01
I10	0.74	0.13	0.17	0.04	0.09	0.01
I 12	0.73	0.05	0.07	0.03	0.10	0.06
I 25	0.72	0.08	0.09	0.11	0.02	0.07
I 33	0.71	0.24	0.09	0.01	0.19	0.03
I 71	0.10	0.78	0.09	0.02	0.10	0.11
I 80	0.13	0.77	0.12	0.13	0.17	0.05
I 79	0.18	0.76	0.06	0.00	0.18	-0.01
I 81	0.18	0.76	0.08	0.02	0.06	0.00
I 70	0.10	0.67	0.09	0.07	-0.06	0.15
I 30	0.12	0.04	0.78	-0.10	0.17	0.00
I 31	0.17	-0.04	0.77	-0.10	0.20	0.03
I 54	0.06	0.17	0.71	-0.08	0.20	0.08
I 66	0.17	0.13	0.68	0.02	0.14	0.03
I 65	0.17	0.14	0.67	0.12	-0.05	-0.02
I 13	0.10	0.06	-0.01	0.82	0.07	0.04
I 14	0.08	0.11	0.01	0.79	0.03	0.00
I 29	-0.02	0.02	-0.09	0.60	0.07	0.23
I 37	0.02	0.01	-0.02	0.57	0.14	0.22
I 51	0.06	-0.05	0.16	0.13	0.70	-0.01
I 50	0.06	0.03	0.22	0.04	0.67	0.14
I 77	0.08	0.25	0.10	0.07	0.57	0.04
I 57	0.21	0.18	-0.03	0.14	0.53	0.22
I 52	0.23	0.14	0.28	0.00	0.51	-0.14
I 62	0.07	0.07	-0.01	0.29	-0.05	0.76
I 64	0.02	0.16	0.06	0.18	0.03	0.71
I 63	0.15	0.03	0.05	0.03	0.20	0.64
Factor Variances	4.28	3.15	2.94	2.22	2.17	1.75
Explained Variance	14.78	10.88	10.14	7.66	7.48	6.04

In the process of naming these six subdimensions, the content of the items and the literature were taken into consideration. As the first three emerging items consist of more external support dimensions of the person, the other three factors consist of more internal dimensions. The six factors are named and defined as follows:

Factor 1 – *Family Support*: Items relate to communication in the family and support given to the adolescent by the family.

Factor 2 – *Confidant-Friend Support*: Items relate to support given to the adolescent by friends and confidants.

Factor 3 – *School Support*: Items relate to support given to the adolescent by teachers and school staff members.

Factor 4 – *Adjustment*: Items relate to the adolescent's abilities of adjustment to new conditions they meet.

Factor 5 – *Sense of Struggle*: Items relate to the adolescent's having a future target that includes a sense of struggle.

Factor 6 – *Empathy*: Items relate to the adolescent's ability or tendency to understand other people.

Criterion Validity

To test the criterion validity of the Adolescent Psychological Resilience Scale, the Problem-Solving Inventory, Beck's Hopelessness Scale and Rotter's Internal-External Locus of Control Scale are used.

As a result of the analysis, a 0.47 ($p < 0.001$) correlation was found in points scored in Adolescent Psychological Resilience Scale and the points scored in the Problem-Solving Inventory. Because high points scored in the Problem-Solving Inventory indicate a low problem-solving ability, a negative midlevel relation is found. Again, the result of the analysis for criterion validity illustrates that there is a -0.46 ($p < 0.001$) correlations between the Adolescent Psychological Resilience Scale and Rotter's Internal-External Locus of Control Scale; and a -0.61 ($p < 0.001$) correlation is found between the Adolescent Psychological Resilience Scale and the Beck's Hopelessness Scale. Higher points scored in Rotter's Internal-External Locus of Control Scale indicate external controlling.

The results taken from Beck's Hopelessness Scale indicate hopelessness. A midlevel negative aspect correlation is found between the Adolescent Psychological Resilience Scale, Beck's Hopelessness Scale and Rotter's Internal-External Locus of Control Scale.

Reliability

Test-Retest reliability. To evaluate the reliability of the scale, a test-retest was conducted on 38 students, chosen randomly, after a 1-month interval. The correla-

tion was found to be 0.87 between points scored from the first and second applications ($p < 0.001$, $N = 38$). This result can be seen as a proof for the determination of the scale.

Cronbach's alpha reliability. To determine the internal consistency, Cronbach's alpha internal consistency coefficient values were examined. Findings were as follows: 0.81 for the scale as a whole; 0.89 for the *Family Support* subdimension; 0.84 for the *Confidant/Friend Support* subdimension; 0.81 for the *School Support* subdimension, 0.70 for the *Adjustment* subdimension, 0.67 for the *Sense of Struggle* subdimension and 0.61 for the *Empathy* subdimension. These findings show that the internal consistency of the scale is at an acceptable level.

T-Test. In reliability studies, one of the methods is formed as a comparison of the bottom 27% of the groups. Results of the test of the top 27% ($N = 193$) and bottom ($N = 93$) were viewed to determine whether there is a meaningful correlation between the groups. It was found that there was a meaningful difference ($p=0.005$) between the top and bottom percentages, according to the results of the T-Test.

DISCUSSION

The aim of this study was to develop a tool to measure the psychological resilience level of adolescents at the high school level. In addition, some statistical studies were done related to validity and reliability. A scale was created to explain the 56.99% total variance, with six factors and 29 items formed as a result of an explanatory factor analysis of an 81-item scale form in a study conducted with 347 continuing high school students. The Problem-Solving Inventory and Rotter's Internal-External Locus of Control Scale and Beck's Hopelessness Scale were used to test criterion validity. High Problem-Solving Inventory scores indicated a decrease in problem-solving ability; high Rotter's Internal-External Locus of Control Scale scores demonstrated external controlling and high Beck's Hopelessness Scale scores demonstrated a high level of hopelessness. Individuals with a high level of psychological resilience have higher problem-solving ability, are internally controlled and have hope for their future. A midlevel negative aspect (-0.47) correlation is found between the Adolescent Psychological Resilience Scale and the Problem-Solving Inventory and again, a midlevel negative aspect (-0.47) relation is found between the Adolescent Psychological Resilience Scale and the Beck's Hopelessness Scale. These correlation findings, therefore, are at an acceptable level.

In reliability studies, *Cronbach's alpha internal consistency* coefficients are examined. Findings for the subdimensions were as follows: 0.89 for *Family Support*; 0.84 for *Confidant/Friend Support*; 0.81 for *School Support*; 0.70 for *Adjustment*; 0.67 for *Sense of Struggle*; and 0.61 for *Empathy*. For the scale as a whole, the alpha value was found to be 0.87.

Furthermore, a 0.87 correlation was calculated between the first and last measurement, which was conducted via a test-retest method in 1-month intervals with

38 students from the study group. Comparisons between the bottom and top 27% of the group were applied as another reliability method. According to the T-Test results, there was a significant difference ($p < 005$) between the top 27% group and bottom 27% group. An item-total correlation analysis was made as a final reliability study. In this analysis, it was seen that the correlation of the items within the factors varied between 0.59 and 0.81. The values derived from the item analysis were significantly over 0.30

Adolescent Psychological Resilience Scale consisted of six sub-dimensions and was named in the light of current literature. It appeared that the concept of psychological resilience mechanism basically consists of internal and external support sources. While the former one was about a sense of struggle, adjustment and empathy the later one is used for the family, school and confidant-friend support.

“Sense of struggle” sub-dimension was named for the individuals who are resilient and able to struggle against difficulties (Begun, 1993). Resilient individuals are known to be strong in the face of difficult living conditions.

The “adjustment” sub-dimension was used for resilient individuals who are able to adjust quickly after difficult life events or new situations. Masten (1994) defined resiliency as a successful adaptation ability in spite of the risky situations and adversarial conditions.

Although psychological resiliency is an ability to struggle against difficulties, it has also optimism, self-confidence, self-esteem and empathy elements (Gürkan, 2006). Therefore, these points are taken into consideration while naming the “empathy” sub-dimension.

Psychological resilience occurs when the risk and protective factors interact. Risk factors are stressful life events and harmful environmental factors that can hamper an individual’s life. On the other hand, the protective factors can be personal, familial, social and environmental resources and they serve as support for the at-risk individuals that have a protective function and ease the harmful effect of negative events (Kumpfer, 1999; Norman, 2000). Resiliency usually happens in the event of environmental support sources which include family, school and confidant-friend support. Thus, this sub-dimension is called “external support”.

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LJESTVICA PSIHOLOŠKE OTPORNOSTI KOD ADOLESCENATA: ISTRAŽIVANJE VALJANOSTI I POUZDANOSTI

Sažetak

Cilj ovog istraživanja bio je razvoj Ljestvice psihološke otpornosti kod adolescenata. Provedena su istraživanja valjanosti i pouzdanosti. U istraživanju je sudjelovalo 347 učenika srednjih škola. Faktorska analiza konstruktne valjanosti objasnila je 56,99% ukupne varijance, te otkrila 29 čestica i 6 faktora. Kriteriji za provjeru valjanosti uključili su Inventar rješavanja problema s korelacijom od 0,47, Beckovu ljestvicu beznađa s 0,61 i Ljestvicu lokusa kontrole, u kojoj je utvrđena korelacija od 0,46. Provjera pouzdanosti pokazala je da je Cronbachov alfa 0,87, 0,61 i 0,89 za vrijednosti dobivene na podljestvicama. Poslije jednomjesečnog razdoblja, rezultati test-retest korelacije bili su 0,87. U drugom istraživanju pouzdanosti, 27% usporedbi gornjih i donjih skupina otkrilo je značajne razlike na svim česticama. Na kraju, provjerena je korelacijska analiza ukupnih čestica te je utvrđena razlika između 0,59 i 0,81. Na temelju tih nalaza, možemo zaključiti da se Ljestvica psihološke otpornosti kod adolescenata može primijeniti u područjima obrazovanja i psihologije te da je pouzdan i valjan mjerni instrument.

Ključne riječi: ljestvica psihološke otpornosti, adolescent, valjanost, pouzdanost

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		not exactly suitable for me	not suitable for me	suitable for me	exactly suitable for me
1	My family really cares about me.	(1)	(2)	(3)	(4)
2	My family believes that I will be successful.	(1)	(2)	(3)	(4)
3	I have enjoyable time with my family.	(1)	(2)	(3)	(4)
4	My ideas are taken into account in family decisions.	(1)	(2)	(3)	(4)
5	I am invulnerable to life's challenges/difficulties.	(1)	(2)	(3)	(4)
6	I can stay cool even in difficult times.	(1)	(2)	(3)	(4)
7	I usually have a pessimistic attitude toward life events	(1)	(2)	(3)	(4)
8	My family will listen to me when I have something to share.	(1)	(2)	(3)	(4)
9	My family will recognize it when I have problems.	(1)	(2)	(3)	(4)
10	None of my teachers really cares about me.	(1)	(2)	(3)	(4)
11	None of my teachers appreciate what I do.	(1)	(2)	(3)	(4)
12	I feel happy to be with my family.	(1)	(2)	(3)	(4)
13	I quickly realize what I have to do when conditions have changed.	(1)	(2)	(3)	(4)
14	I can't find the determination in myself to reach my goals.	(1)	(2)	(3)	(4)
15	It is difficult for me to take responsibility.	(1)	(2)	(3)	(4)
16	Life is not quite livable to me.	(1)	(2)	(3)	(4)
17	There is no one among my teachers to listen to me	(1)	(2)	(3)	(4)
18	I believe that I can attain the future I have been dreaming of.	(1)	(2)	(3)	(4)
19	I am good at understanding how someone feels when faced with a particular event or situation.	(1)	(2)	(3)	(4)
20	I like to show interest in other people.	(1)	(2)	(3)	(4)
21	I can understand how a person feels at the very moment.	(1)	(2)	(3)	(4)
22	If I were not at school, none of my teachers would recognize it.	(1)	(2)	(3)	(4)
23	No one appreciates me when I do something good at school.	(1)	(2)	(3)	(4)
24	I have friends that would recognize my absence.	(1)	(2)	(3)	(4)
25	I have friends with whom I can share my problems.	(1)	(2)	(3)	(4)
26	I feel that I don't have enough control over the course of my life.	(1)	(2)	(3)	(4)
27	I have friends that I can rely on them in my difficult times.	(1)	(2)	(3)	(4)
28	My friends will help me when I am in difficult situations.	(1)	(2)	(3)	(4)
29	I have friends with whom I spend good time.	(1)	(2)	(3)	(4)

Family Support: 1, 2, 3, 4, 8, 9, 12

Confidant-Friend Support: 24, 25, 27, 28, 29

School Support: 10*, 11*, 17*, 22*, 23*

Adjustment: 5, 6, 7, 13

Sense of Struggle: 14*, 15*, 16*, 18, 26

Empathy: 19, 20, 21

Reverse scoring of items with *