

**Development of the Adolescent Concerns Evaluation (ACE)
Rapid Assessment Instrument: Detecting Risk Indicators of
Runaway Behavior in Adolescents**

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Statement of the Research Problem

Explanations of why young people run away from home and the meaning and significance attached to this behavior have varied over time, reflecting changing social, historical, political and economic contexts. Today, much of the literature (Grigsby, 1992; Kurtz, Kurtz, & Jarvis, 1991; Maxwell, 1992) emphasizes multiple factors in an attempt to understand the behaviors of runaway youth. Not surprisingly, close inspection of various explanations about why adolescents run away from home reveals several themes that point to situational determinants that contribute to the runaway phenomenon. These factors include, but are not limited to, levels of depression and suicidality (Rotheram-Borus, 1993), low self-esteem (Maxwell, 1992), family structure and interactions (Crespi & Sabatelli, 1993), impaired peer relations and school problems (Post & McCoard, 1994), and social policy (Kurtz, Jarvis, & Kurtz, 1991). The U. S. Department of Health and Human Services, Family and Youth Services Bureau and the National Network of Runaway and Youth Services estimate that annually between 750,000 and two million youth run away from home (Shane, 1991). Such figures warrant the attention of social work practitioners, researchers and educators.

One of many barriers to practice and research with runaway youth has been the lack of an easily administered measurement instrument which specifically addresses runaway behavior. Post and McCoard (1994) developed an instrument (Needs of Adolescent Runaways [NAR]) that serves as a post hoc assessment of the needs of runaway youth after they have runaway. Prior to this study, however, the research problem remained that no instrument had been developed which serves as an a priori indicator of adolescents who may be at-risk of running away from home, or which has the capacity to track progress of treatment with runaway youth. Such an instrument has potential to lead to a subsequent increase in primary, secondary, and tertiary preventive social work practice with this population. The development of such an instrument, the Adolescent Concerns Evaluation (ACE), is presented in this study, as are preliminary psychometric properties of the instrument. The ACE is a 40-item multi-dimensional instrument that measures the degree of risk of a youth running away. Items are measured on a 5-point Likert scale, and there are four (4) separate yet interdependent domains: Family, School, Peer, and Individual (depression).

Research Questions

The development of the ACE was guided by two theoretical frameworks: the ecological perspective (Germain & Gitterman, 1980; 1986) and the domain sampling model of measurement (Nunnally & Bernstein, 1994). Using the ecological perspective, runaways may be viewed as lacking a goodness-of-fit with their environment. Under the domain sampling model of measurement, theoretically there are an infinite number of items that could have been used to create an instrument like the ACE. The challenge is to select items that are representative of this infinite number.

The purpose of this study was to resolve the research question: To what extent does the ACE meet the criteria of the domain sampling model of measurement?

Methodology

A nonprobability, purposive sample was used to research the initial reliability and validity of the instrument. The total sample ($N = 227$) was composed from two groups: a nonclinical sample ($n = 117$) and a clinical sample ($n = 110$). The clinical sample consisted of youth housed at a runaway shelter in Tallahassee, Florida as well as youth detained at three juvenile assessment centers (JACs) in three Florida cities. The nonclinical sample was made up of students in grades 6 through 12 at a high school in Tallahassee.

Prior to administering the ACE to the clinical and nonclinical samples described above, it was pilot tested on a convenience sample of students ($N = 112$) enrolled in undergraduate classes in the School of Social Work at Florida State University. The initial pool of items was generated from relevant literature. Following this administration, reliability and validity analyses were conducted, the instrument was revised, a second literature review was conducted, the instrument was subjected to focus groups of runaways and staff at a runaway shelter, and finally the instrument was administered to the subjects in the clinical and nonclinical samples.

Parents or guardians of the youth participants completed an informed consent form, and participants signed an assent form. Those who agreed to participate were asked to complete a short background sheet providing demographic information and four measurement instruments: (1) the Adolescent Concerns Evaluation (ACE); (2) the Index of Family Relations (IFR) (Hudson, 1982); (3) the Generalized Contentment Scale (GCS) (Hudson, 1982); and the Hare Self-Esteem Scale (HSS) (Hare, 1980). The IFR, GCS and HSS were used to test the convergent construct validity of the ACE. The reliability and validity of the HSS has been demonstrated in independent studies (see Hare, 1980), as has the reliability and validity of the IFR and GCS in Hudson's (1982) *Clinical Measurement Package*.

To estimate reliability of the ACE, Cronbach's coefficient alpha was computed and a standard error of measurement (SEM) was computed for each of the ACE domains. Five types of validity were used in validation efforts associated with the ACE: (1) content validity; (2) convergent and discriminant construct validity; (3) known-groups discriminant validity; (4) factorial validity; and (5) a descriptive discriminant function analysis.

Results

Sample Characteristics

The subjects had a mean age of 14.91 with a variance of 3.03. Subjects ranged in age from 11 to 18 years. The mean age of subjects was nearly identical when comparing the nonclinical (mean = 14.79, variance = 3.83) and clinical (mean = 15.04, variance = 2.17) groups. The subjects were evenly distributed by gender, with 114 males (50.2%) and 113 females (49.8%). Forty subjects identified themselves as African American (17.9%); 18 (8%) as Hispanic, 9 (4%) as American Indian, 147 (65.6%) as white, 6 (2.7%) as Asian, and 4 (1.8%) fell into the "other" category.

As expected, the sample with which a youth was affiliated predicted the likelihood of that youth being a runaway or throwaway (youth ejected from their homes). In the nonclinical sample, only one subject reported ever having run away (for one day) and none reported ever being a throwaway. By contrast, the clinical sample contained 76 runaways (69.1%) and 54 throwaways (49.1%). Treating the sample (clinical or nonclinical) as the independent variable, and status as a runaway or throwaway as the dependent variable, Lambda values indicated that sample affiliation predicted status as a runaway (Lambda = .626) or throwaway (Lambda = .329).

Reliability Analyses of ACE

The internal consistency of the instrument is reflected in the item-to-item correlations. The item-to-item correlation matrix was inspected first to detect the existence of negative correlations between items. The inter-item correlations mean was .2712, with a range of -.8242 to .8845 and a variance of .1162.

A commonly accepted rule of thumb for nomothetic research is an alpha coefficient of .60 or greater (Hudson, 1982). A coefficient of .80 to .85 is usually considered to be the acceptable range for application with individual clients (Fischer & Corcoran, 1994). Reliability analyses using this criteria were conducted on each domain of the ACE, with the results as follows: Family alpha = .9497; School alpha = .8884; Peer alpha = .9048; Individual alpha = .9491. This indicates high levels of internal consistency for each domain.

In addition to computing alpha levels to determine the reliability for each domain of the ACE, the Standard Error of Measurement (SEM) was computed for each domain. Each domain had an excellent (low) SEM (Family SEM = .206; School SEM = .265; Peer SEM = .222; Individual SEM = .214), indicating that the change in scores was not likely due to error.

Validation Analyses of ACE

Content Validity: Content validity was established through focus groups with runaway youth and staff at a runaway shelter. Focus group members provided feedback about items and domains, and agreed that items appeared to capture the domains for which they were intended.

Confirmatory Factor Analysis - Multiple Groups Centroid Method: A confirmatory factor analysis using the Multiple Groups Centroid Method (Nunnally & Bernstein, 1994) was conducted on the revised version of each domain. The number of factors was fixed at four. As a general rule of thumb, item correlations with factors are considered moderately high when they fall around .60 (Nunnally & Bernstein, 1994). Using this criterion, those items which correlated poorly (less than or approaching .60) with their respective domain, which had a stronger association with another domain, which had a relatively equal degree of association between more than one domain, and which did not represent a major conceptual loss to that domain were deleted from the ACE. Results for the final factor analysis revealed that items load well onto the domains with which they were intended, providing evidence for factorial validity of the ACE.

Convergent Construct Validity: Convergent construct validity (Campbell & Fiske, 1959) was established by examining correlations using Pearson's r between the domains of the ACE and the respective instruments with which they were expected to associate. It was anticipated that the domains of the ACE would correlate with certain measurement instruments, namely, the Hare Self-Esteem Scale (HSS), the Index of Family Relations (IFR), and the Generalized Contentment Scale (GCS).

Evidence of convergent construct validity was established based on the following results: the Family domain of the ACE correlated with the Index of Family Relations (IFR) ($r = .891$, $p = .01$) and the Home subscale of the Hare-Self Esteem Scale (HSS) ($r = .848$, $p = .01$); the School domain of the ACE correlated with the School subscale of the HSS ($r = .476$, $p = .01$); the Peer domain of the ACE correlated with the Peer subscale of the HSS ($r = .739$, $p = .01$); and the Individual domain of the ACE correlated with the Generalized Contentment Scale (GCS) ($r = .826$, $p = .01$). All findings were significant at the .01 level.

Evidence of convergent construct validity was further supported by examining the Pearson's r correlations between the global domain (which is defined by all items on the

ACE) and specific demographic characteristics acquired through respondents' self-report which they provided when completing the ACE. The strongest correlations were attributed to whether a youth had been thrown out of the home ($r = .713$, $R^2 = .508$, $p = .01$) or had runaway from home ($r = .694$, $R^2 = .482$, $p = .01$). All findings were significant at the .05 level.

Discriminant Construct Validity: Specific demographic indicators were also used to establish discriminant construct validity with the expectation that these indicators would not correlate with the global domain of the ACE. Demographic indicators had weak correlations with the global domain, with the strongest correlation attributed to who the youth lived with ($r = .297$, $R^2 = .088$, $p = .01$) and the weakest attributed to ethnic group ($r = -.008$, $R^2 = .000$, $p = .90$). All findings were significant ($\alpha = .05$), supporting the existence of discriminant construct validity.

Known-Groups Discriminant Validity: Known-groups discriminant validity was conducted on each of the domains of the ACE, treating the known-groups (clinical or nonclinical) as the independent variable and each domain score as a dependent variable. A One-Way Analysis of Variance (ANOVA) was conducted for each domain, using the Eta statistic produced by ANOVA as the known-groups discriminant validity coefficient and using the Eta^2 statistic to examine the proportion of variance in the dependent variable (the domain scores) explained by differences among groups. According to Nurius and Hudson (1993), validity coefficients tend to be smaller than reliability coefficients and tend to range between .40 and .60 with a median of about .50.

Prior to conducting ANOVAs, however, results from the Two-Independent-Samples Kolmogorov-Smirnov Z Test, a graphical examination (inspecting stem and leaf plots) and the Levene Test for Homogeneity-of-Variations revealed that core assumptions (normally distributed observations on the dependent variable and equal population variances for both groups) of ANOVA (Stevens, 1996) had indeed been met for each domain of the ACE.

Computing the Eta statistic in ANOVA revealed evidence of known-groups discriminant validity for all four of the ACE domains (Family - $\text{Eta} = .656$, $\text{Eta}^2 = .431$; School - $\text{Eta} = .630$, $\text{Eta}^2 = .397$; Peer - $\text{Eta} = .528$, $\text{Eta}^2 = .279$; Individual - $\text{Eta} = .610$, $\text{Eta}^2 = .372$). All findings were significant ($\alpha = .05$) and fell within the acceptable range for validity coefficients (Nurius & Hudson, 1993), providing evidence of known-groups discriminant validity.

Discriminant Function Analysis: The primary purpose of this analysis was the classification of subjects into groups on the basis of a discriminant function created from the domain scores of the ACE. Discriminant function analysis determined the correct number of classifications (the hit rate) based upon the discriminant function derived from the domain scores of the ACE.

The Wilks' Lambda revealed no significant findings ($\alpha = .05$), indicating that the two populations were multivariate normal. Likewise, the Box's M Test found no significant differences at the .05 level ($F = 5.711$, $p = .01$), leading to a decision to fail to reject the null hypothesis of equal population covariance matrices. Additionally, as a partial check on multivariate normality, the scatterplots for pairs of variables were examined and found to be approximately elliptical. It is important to note that eight (8) outlier items were dropped from this analysis based upon Squared Mahalanobis Distance to Centroid (Mahalanobis D^2) and Cook's Distance (Cook's D) statistics.

The sample was randomly split, with approximately half (46%) of the sample used for cross-validation, as a means of providing a check on the external validity of the classification function. The prior probabilities for the nonclinical (.526) and clinical (.474) groups were approximately equal. Equal prior probabilities are critical, as different a priori group probabilities can have a substantial effect on the classification function (Tatsuoka, 1971).

The Bartlett's Chi-Square test was conducted to determine the number of significant discriminant functions. Since there were only two groups (clinical and nonclinical), it was only possible to have one discriminant function in this study. The eigenvalue (.936, variance = 100%) for the one discriminant function yielded a significant χ^2 value (74.009, $df = 4$, $p = .01$) at the .01 level, revealing that there was significant overall association. A canonical correlation (.695) was also produced at this time.

The correlations between the domains and the discriminant function were as follows, presented here in descending order of the absolute size of the correlation within the function: Family (.719); School (.717); Individual (.662); and Peer (.426). It is clear that the Family domain primarily defines this function, with secondary (School and Individual domains) and tertiary (Peer) help from the remaining domains.

The discriminant function derived defined from the domain scores of the ACE did an overall excellent job of classifying subjects correctly. The original and cross-validation groups reached comparable percentages (86.3% and 88.2%, respectively) of correct classifications. The percentage of nonclinical subjects in the original development sample (91.8%) and the cross-validation group (92.9%) who were correctly classified was extremely high, and the percentage of clinical subjects in the original development sample (80.4%) and the cross-validation sample (82.6%) who were correctly classified was very high. The percentage of times that a subject was placed in the clinical group when in fact he or she should have been classified into the nonclinical group (false-positives) was low for both the original (8.2%) and cross-validation (7.1%) groups. A subject was placed in the nonclinical group fairly often, when in fact he or she should have been classified into the clinical group (false-negatives), in both the original (19.6%) and cross-validation (17.4%) samples.

Implications for Social Work Practice

At this point, the ACE should serve as a research instrument, if not as a diagnostic tool of treatment. It therefore shows promise as a measure of practice and program evaluation. The ease of administration and its applicability across theoretical perspectives makes it suitable for use as a means of comparing the performance of various programs. The ACE has heuristic value in terms of social work practitioners being able to discern from an individual client's responses what areas of that client's life need to be addressed in treatment. To this heuristic value, it is hoped that clinical cutting scores for the ACE can be established after the ACE has proven itself as a reliable and valid tool in future studies. To report such cutting scores after this initial study would be premature. Construct validity is not something achieved after one study, but is aspired to through several validation studies and even then is rarely pinpointed with accuracy. Therefore, future research needs to maintain focus on establishing construct validity and clinical cutting scores of the ACE. Additionally, predictive validity of the ACE needs to be established in future studies.

The ACE is the only instrument known to address runaway behavior in this manner and to possess reliability and validity estimates, which dramatically increases its worth. The social work literature has reflected the professional concern that interventions be empirically demonstrated as effective (Fischer, 1973; Harrison & Thyer, 1988; Rubin, 1985). In order to evaluate the effectiveness of practice and programs, social workers need to be prepared to measure what they and other practitioners consider to be the goals of their activities. It is hoped that valid, reliable and sensitive measures like the ACE may provide one means of measuring whether interventions used with runaway youth are effective.

References

- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin, *56*, 81-105.
- Crespi, T. D., & Sabatelli, R. M. (1993). Adolescent runaways and family strife: A conflict-induced differentiation framework. Adolescence, *28*(112), 867-878.
- Fischer, J. (1973). Is casework effective? A review. Social Work, *18*, 5-20.
- Fischer, J., & Corcoran, K. (1994). Measures for clinical practice: Volumes I & II. New York: The Free Press.
- Germain, C. B., & Gitterman, A. (1980). The life model of social work practice. New York, NY: Columbia University Press.
- Germain, C. B., & Gitterman, A. (1986). The life model approach to social work practice revisited. In F. J. Turner (Ed.), Social work treatment: Interlocking theoretical approaches (3rd Ed.) (pp. 618-643). New York, NY: The Free Press.
- Grigsby, R. K. (1992). Mental health consultation at a youth shelter: An ethnographic approach. Child and Youth Care Forum, *21*(4), 247-261.
- Hare, B. R. (1980). Self-perception and academic achievement: Variations in a desegregated setting. American Journal of Psychiatry, *137*(6), 683-689.
- Harrison, D. F., & Thyer, B. A. (1988). Doctoral research on social work practice: A proposed agenda. Journal of Social Work Education, *24*(2), 107-114.
- Hudson, W. (1982). The clinical measurement package: A field manual. Homewood, IL: The Dorsey Press.
- Kurtz, P. D., Jarvis, S. V., & Kurtz, G. L. (1991). Problems of homeless youth: Empirical findings and human services issues. Social Work, *36*(4), 309-314.
- Kurtz, P. D., Kurtz, G. L., & Jarvis, S. V. (1991). Problems of maltreated runaway youth. Adolescence, *26*(103), 543-555.
- Maxwell, B. M. (1992). Hostility, depression, and self-esteem among troubled and homeless adolescents in crisis. Journal of Youth & Adolescence, *21*(2), 139-150.
- Nunnally, J. C., & Bernstein, I. H. (1994). Psychometric theory. New York: McGraw-Hill.

- Nurius, P., & Hudson, W. (1993). Human services: Practice, evaluation, and computers. Pacific Grove, CA: Brooks/Cole.
- Post, P., & McCoard, D. (1994). Needs and self-concept of runaway adolescents. The School Counselor, 41(3), 212-219.
- Rotheram-Borus, M. J. (1993). Suicidal behavior and risk factors among runaway youth. American Journal of Psychiatry, 150(1), 103-107.
- Rubin, A. (1985). Practice effectiveness: More grounds for optimism. Social Work, 30(6), 469-476.
- Shane, P. G. (1991). An invisible health and social policy issue: Homeless/runaway youth. Journal of Health & Social Policy, 2(4), 3-14.
- Stevens, J. (1996). Applied multivariate statistics for the social sciences (3rd ed.). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.
- Tatsuoka, M. M. (1971). Multivariate analysis: Techniques for educational and psychological research. New York, NY: Wiley.