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Empirical fear profiles among American youth

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Abstract

Fears among children can range from relatively innocuous fears of simple objects to significant phobias that affect youths' everyday functioning in the home, school, or community environments. This study investigated empirically derived fear profiles among American youth ages 7–19 (N = 556). Based upon youths' scores on the 5 factors of the Fear Survey Schedule for Children—II (FSSC—II; Burnham & Gullone (Behav Res Ther, 35, 1997)), multistage Euclidean grouping was applied and produced 5 replicable fear cluster profiles with unique contours. Logistic regression odds ratios revealed specific associations of profile group membership with demographic characteristics such as child age, sex, and ethnicity.

Keywords: Fear; Assessment; Self-reports; Children; Adolescents

Patterns of fears and anxieties among youth have been documented from early childhood into adulthood. Some children may exhibit mild fears that emerge and subside at age-specific points, whereas other children's fears may be relatively stable across time (Morris & Kratochwill, 1998). At the extreme, disproportionate, irrational, involuntary fear reactions may be categorized as phobias and can severely impact individual functioning. To a lesser degree, non-pathological or more typical fears among youth can also influence their comfort level and reactions to people, objects, and situations in the school and community environments.

Fears have been defined from many theoretical approaches (e.g. psychoanalytic, behavioral, integrative, and developmental theories). The psychoanalytic theory claims fears and phobias originate in the unconscious due to libidinal conflicts (Ollendick, 1979), whereas behavioral theorists

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assert that fears and phobias are learned behaviors (Graziano, DeGiovanni & Garcia, 1979; King, Hamilton & Ollendick, 1988). The behavioral paradigms through which fears can emerge include: classical conditioning, operant conditioning, and observational learning explanations. The social learning theory can also be used to explain the acquisition of fear (King, Ollendick and Gullone, 1988). Through the years, a trend to combine theoretical positions has developed, allowing for integrative theoretical perspectives to become popular ways to define, treat, and alleviate fear. In fact, the leading researchers in the field advocate integrative assumptions. King, et al. (1990) offered the cognitive–behavioral perspective to define fear, to describe fear acquisition and etiology, and to identify treatment strategies. In addition, Graziano et al. (1979) and Gullone and King (1993) offered the cognitive–developmental perspective. According to Gullone and King (1993) some infant fears (e.g. loud noises, loss of support) are biologically programmed or prepotent in nature. Yet, other fears take cognitive maturation to develop (e.g. fear of the supernatural, school-related fears).

Although the etiology of fears can be uncertain (Poulton & Menzies, 2002), fear assessment can be accomplished using a number of self-report instruments. These measures include the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985), the Multidimensional Anxiety Scale for Children (MASC; March, Parker, Sullivan, Stallings, & Conners, 1997), and the Screen for Child Anxiety Related Emotional Disorders (SCARED; Birmaher, Brent, Chiappetta, Bridge, Monga & Baugher, 1999). For several decades, the most commonly used method for assessing fears has been the Fear Survey Schedule (Gullone, 2000). The original Fear Survey Schedule for Children (Scherer & Nakamura, 1968) was revised in 1983 by Ollendick (FSSC—R; Fear Survey Schedule for Children—Revised) and again in 1992 by Gullone and King (FSSC—II; Fear Survey Schedule for Children and Adolescents—II).

The FSSC—R and FSSC—II have been applied in a variety of countries with diverse youth (Burnham & Gullone, 1997; Elbedour, Shulman, & Kedem, 1997; Gullone & King, 1993; Ingman, Ollendick, & Akande, 1999; Mellon, 2000; Muris, Merckelbach, & Collaris, 1997; Ollendick, Yule, & Ollier, 1991). Considered individually, self-reported fears may be differentially experienced by youth as a function of age, gender, mental disorder, cognitive ability, and other demographic characteristics (Burnham & Gullone, 1997; Gullone, King, & Cummins, 1996; Weems, Silverman, Saavedra, Pina, & Lumpkin, 1999). However, individual survey items tend to be unreliable and considerable covariation exists among items. This suggests that fewer latent constructs might be responsible for the observed variability of items.

This supposition was supported by factor analyses of the FSSC—II which have consistently found five factors which parsimoniously account for its underlying item correlations (Gullone & King, 1992). When youth were compared and contrasted on these factors, they were also found to differentially experience fears based on such demographic factors as gender and age (Burnham & Gullone, 1997). Unfortunately, the factors are also correlated and consideration of demographic differences in a factor-by-factor sequence fails to take into account this multivariate relationship. Consequently, a multivariate method is necessary to adequately detail how fears associate among youth as well as to determine the demography within which particular fear profiles are more likely to emerge.

One multivariate approach to fear classification is cluster analysis, which works to resolve empirically based, naturally occurring profiles within a sample of the population. Conceptually, cluster analysis is the formation of "groups of highly similar entities" (Aldenderfer & Blashfield,

1984, p. 7) from a sample data set that includes information about these entities. Youths' self reports of fears on the FSSC—II comprise the data set in this study. Rather than clustering on the basis of individual items, standardized factor scores can be used as the basis of the clustering procedures. Each individual in the sample has a unique "profile" of scores across the five fear factors. For example, one child may have a high level of fear of animals, but minimal fears reported for the other four factors, whereas another child may have a high level of fear across all five factors. In essence, cluster analysis seeks to identify groups of children (i.e. clusters) with highly similar profiles across the five factors.

Sneath and Sokal (1973) identified several particularly useful descriptors of cluster properties: density, variance, shape, and separation. Density reflects the swarming of data points around a specific value; variance is the degree of dispersion from the center of the cluster; shape is the specific conglomeration or profile of data points in space; and separation is the extent to which clusters may overlap (Sneath & Sokal, 1973). Formation of clusters can be accomplished using various methods, but the most common method is hierarchical agglomerative. This approach begins with each case as a separate cluster and attempts to match individual member cases/clusters to form larger clusters in which the individual cases closely mirror one another (e.g. all are youth with a high fear of animals only). This clustering is based on algorithms designed to maximize particular cluster properties. In the case of Ward's (1963) method, clusters combine so as to minimally increase variance within the identified cluster. An iterative process of clustering continues in hierarchical agglomerative clustering until all cases are combined in one monolithic cluster.

According to Aldenderfer and Blashfield (1984), care must be taken to avoid undue influence of cases with outlier data points, and appropriate formal tests should be applied to determine the number of clusters selected as the final solution. Of the tests used to identify cluster solutions, fusion coefficients are the most common. They tend to conspicuously 'jump' when dissimilar clusters are combined. For example, in the case of Ward's minimum variance method, this jump reflects the point at which the error sum of squares increases, indicating that notably dissimilar clusters were forced to combine in that iteration. Selection of the cluster solution prior to this merge is considered viable. In addition, Aldenderfer and Blashfield (1984) noted that cluster solution validation techniques include the "estimation of the degree of replication of a cluster solution across a series of data sets" (p. 65). If replicability is acceptable, (i.e. the sample number of clusters are supported across multiple analyses) then this reflects the consistency of the solution selected.

Multistage Euclidean Grouping (MEG; McDermott, 1998) is an SAS cluster analysis code that adopts the empirically supported approaches advocated by Aldenderfer and Blashfield. MEG randomly divides a large sample into smaller subsamples and omits outliers to provide for multiple cluster analyses and possible replication of solutions from a single larger data set. Cluster solutions are identified via hierarchical agglomerative clustering using Ward's minimum variance method and appropriate stopping rules to identify plausible cluster solutions. Prior to final cluster determination, a divisive clustering pass provides for relocation of cases to optimize cluster solution and cluster membership. Output from this program includes cluster membership for each case and permits further investigation of cluster membership characteristics.

Accordingly, this study aimed (a) to identify empirical fear profiles within the FSSC—II American norm sample participants and (b) to delineate the cluster profiles' associated demography.

Prior to the study, it was hypothesized that viable cluster solutions would be evident and replicable within the sample. Furthermore, cluster membership was predicted to systematically vary based upon the demographic characteristics of cluster member participants such as sex, age, and ethnicity.

1. Method

1.1. Participants

A subset (N = 556) of the American norm sample for the FSSC—II was used for this study. Participants ranged in age from 7–19 years, attended grades 2–12, and resided in the southeastern region of the United States. Males comprised 41.7% of the sample, females 55.6%, with 2.7% unidentified. Approximately 35–65 students per grade level participated. The age by sex breakout of participants' is presented in Table 1. Whites comprised 59.2% of the sample, African Americans comprised 33.5% of the sample, and other ethnicities (e.g. Hispanic, Asian American, American Indian, or other) represented the remaining 7.3% of the sample. A mix of locales were represented by sample participants' school sites (44.8% rural, 32.2% urban, and 23.0% suburban; as per Burnham & Gullone, 1997).

1.2. Instrument

The American version of the FSSC—II (Burnham & Gullone, 1997) is a 75-item, paper-and-pencil self-report instrument for use with school-aged individuals. Respondents are instructed to

Table 1
Sample participants by age and sex

Age in years	Sex			
	Females	Males	Unknown	Subtotal
7	10	14	0	24
8	21	16	0	37
9	18	18	0	36
10	24	21	0	45
11	18	11	0	29
12	26	22	1	49
13	31	18	1	50
14	45	22	3	70
15	33	26	1	60
16	35	30	4	69
17	42	28	4	74
18	6	5	0	11
19	0	1	0	1
Unknown	1	0	0	1
Subtotal	310	232	14	556

consider the situations or things that may make some people scared (e.g. being alone, spiders, taking a test), and to rate their typical level of discomfort on a 3-point Likert scale (*Not scared, Scared, Very scared*). Five previously identified factors are scored: Fear of Death and Danger, Fear of the Unknown, Animal Fears, School/Medical Fears, and Fear of Failure/Criticism. These five factors were very similar to those extracted from the Australian normative sample (Gullone & King, 1992).

Scores on the FSSC—II have been reported to have good reliability and validity. For example, FSSC—II scores' average item-total correlation coefficient was .96, and one week test-retest coefficient was 0.90. See Gullone and King (1992) for additional information. For the American sample, total scale coefficient alpha was 0.96 and factor coefficient alphas ranged from 0.75–0.94 with a median of 0.84.

1.3. Procedure

A revised FSSC—II comprised of 75 items was administered to participants after completion of initial piloting work (see Burnham & Gullone, 1997). Based on previous factor analytic work, five factor raw scores were calculated by summing component item unit scores (Wainer, 1976). Linear conversion of raw scores to *T* scores ($M = 50$, $SD = 10$) was accomplished for each factor. Individuals who failed to respond to all scored items were omitted from further analyses, leaving 556 usable cases. Participant profiles on the five factor scores were established, and profiles were randomly assigned to one of four mutually exclusive, approximately equivalent size blocks (*n*s = 138–140).

Multistage Euclidean Grouping (MEG; McDermott, 1998) was applied to resolve the fear profiles based on clustering techniques. MEG operates by conducting cluster analyses on multiple small subsamples from the same larger sample in a three-stage process. Following omission of the most extreme 3% of the cases (outliers defined using SAS command TRIM = 3), stage 1 analyses were conducted independently for each of the four blocks and cluster solution selection was based on fusion statistics at various iterations. Fusion statistics reflect formal tests at each point in the cluster analysis where clusters and/or cases are merged to form a larger cluster. Such statistics assist the researcher in selecting viable cluster solutions. Fusion statistics applied include (a) Mojena's stopping criterion in which the optimal hierarchical clustering solution satisfies the inequality $z_{j+1} > z+ks_z$ (z = fusion coefficient; z_{j+1} = coefficient at the next stage [i.e. $j + 1$]; k = the standard deviate; z = fusion coefficient mean; and s_z = fusion coefficient standard deviate; Aldenderfer & Blashfield, 1984; Mojena, 1977); (b) increase in error variance; and (c) pseudo-F statistic simultaneously elevated over the pseudo-t^2 statistic (Cooper & Milligan, 1988).

Stage 2 clustering was applied to determine the consistency of selected cluster solutions' replication across each of the four blocks. Stage 3 clustering permitted a single opportunity for individual profiles' relocation from one cluster to another in order to adjust any cluster membership misassignments in earlier analyses.

Following determination of profiles' cluster membership, logistic regression was applied to determine the odds ratios of individuals manifesting a particular cluster profile based on their age, sex, and ethnicity. The cluster membership criterion was indicated with a dichotomous variable (0 or 1), and predictor variables were represented by dichotomous (males = 0 or 1; teenager≥ 12 years = 0 or 1) or appropriately dummy coded categorical variables (e.g. for ethnicity

White = 1 or 0, African American = 1 or 0, Hispanic = 1 or 0, with Other ethnicities represented by 0 on all three variables).

2. Results

As expected, more than one cluster could be empirically resolved for the total sample. Based on fusion statistics, a five- or six-cluster solution was initially selected for each of the four independent blocks. Second stage clustering of the similarity matrix using Ward's minimum variance clustering resulted in a 5-cluster solution (see Table 2). Homogeneity statistics indicated the relative cohesion of variance within clusters, within profile variables, and overall ($\overline{H}$ = 0.79). Third stage clustering with relocation improved within cluster homogeneity ($\underline{h}$ = 0.63–0.90), within profile variable homogeneity (h = 0.73–0.84), and overall homogeneity ($\overline{H}$ = 0.76). Relocation of mis-assigned cases in the final cluster solution substantially improved the selected solution. Adequate to good replication rates were evident for each cluster, with Clusters 1, 3, and 4 replicating 100%, and Clusters 2 and 5 replicating 50% and 75%, respectively. While perfect cluster replication was not found, each cluster did occur in at least half of the blocks' cluster solutions.

To test an alternate cluster solution, reapplication of exploratory clustering techniques at the second and third stages was accomplished for an alternative 7-cluster solution. Replication rates of the 7 clusters were substantially reduced, which further supported the viability of the 5-cluster solution.

Table 2
Fear factor means (standard deviations) for male, female, and total sample across five empirical clusters formed from the Fear Survey Schedule for Children—II

		Factor				
Cluster	*N*	Death/Danger	Unknown	Animals	School/Medical	Failure/Criticism
1 Total	121	36.2 (5.1)	40.2 (2.9)	41.3 (3.4)	41.9 (5.2)	41.8 (4.8)
1 Male	89	36.0 (5.1)	39.5 (1.7)	40.7 (2.9)	41.7 (5.2)	41.7 (4.8)
1 Female	28	37.1 (5.1)	42.3 (4.4)	43.3 (4.2)	42.9 (5.3)	42.4 (4.9)
2 Total	60	61.1 (3.8)	66.4 (7.5)	58.7 (10.7)	66.3 (7.9)	63.2 (7.0)
2 Male	11	61.4 (2.7)	64.1 (8.6)	55.4 (11.7)	64.7 (8.8)	64.4 (4.9)
2 Female	47	61.1 (4.1)	67.1 (7.2)	59.4 (10.3)	66.8 (7.7)	62.7 (7.5)
3 Total	155	51.6 (5.6)	46.4 (4.9)	47.6 (6.5)	44.5 (4.9)	43.9 (4.3)
3 Male	65	51.6 (5.0)	45.9 (4.2)	44.7 (4.8)	44.7 (4.8)	43.9 (4.0)
3 Female	85	51.7 (6.2)	47.0 (5.3)	50.0 (6.7)	44.3 (5.1)	43.9 (4.5)
4 Total	107	56.7 (5.7)	56.6 (6.3)	61.3 (6.5)	53.0 (6.5)	50.9 (6.9)
4 Male	17	57.9 (4.0)	58.4 (7.4)	59.1 (7.6)	51.7 (5.9)	52.1 (5.6)
4 Female	87	56.6 (5.7)	56.3 (6.1)	61.6 (6.2)	53.1 (6.6)	50.8 (7.1)
5 Total	101	50.4 (6.9)	48.8 (5.6)	45.6 (5.0)	53.3 (7.4)	58.1 (6.2)
5 Male	46	50.4 (6.9)	47.8 (5.8)	44.2 (4.8)	52.8 (7.6)	56.2 (5.8)
5 Female	55	50.3 (6.8)	49.6 (5.3)	46.8 (4.9)	53.7 (7.3)	59.6 (6.2)

Note. N = 556; Sex was not identified for 2.7% of the sample (14 cases).

As evidenced in Fig. 1, Cluster 1 reveals minimal levels of reported fears across all five factors. In contrast, Cluster 2 has the highest level of fears for four of five factors, but particularly for Fear of the Unknown and School/Medical Fears. The Cluster 3 profile has a low level of fear with a relative peak on Fear of Death and Danger. Cluster 4 demonstrates average to above average fears with a relative elevation on Animal Fears. Finally, Cluster 5 demonstrates prominent Fear of Failure/Criticism and School/Medical Fears.

Application of logistic regression permitted the determination of the odds of particular demographic group members displaying specific cluster profiles (all reported results are significant at $p < 0.05$ or better). As expected, variability based on demographic characteristics was evident. Females were particularly likely to be members of Cluster 2 and 4 profiles, with odds ratios of 4.0:1 and 4.8:1, respectively. Conversely, males were substantially more likely to belong to Cluster 1 (6.3:1). Teenagers were twice as likely as younger children to be members of Cluster 1 (2.4:1) or Cluster 5 (2.3:1). In contrast, children under 13 were more likely to belong to Clusters 2 and 3 (2.4:1 and 1.8:1, respectively). Analyses based on ethnic group membership revealed only one significant finding: minority group members were 2.6 times more likely than whites to fit the Cluster 4 profile.

3. Discussion

The current study demonstrates the utility of the FSSC—II and cluster analytic methods to identify five unique fear profiles, as well as likely demographic characteristics of youth belonging to each profile. Approximately 22% of youth belonged to clusters where few or no fears of any type were reported. Another 29% of youth were distinguished by low levels of all types of fear. However, 11% reported high levels of fear across all fear themes. One cluster marked by elevated animal fears and another cluster distinguished by relative elevations on both fear of failure as well as school and medical fears contained the remaining 38% of the sample.

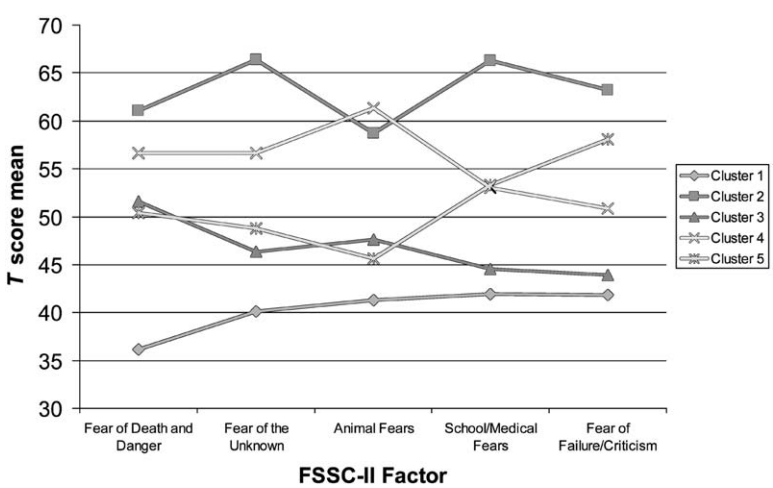

Fig. 1. Cluster mean *T* scores for youth on the five factors of the Fear Survey Schedule for Children—II ($N = 556$).

Based on these profiles, it was discovered that females were significantly more likely to exhibit two profiles: high levels of all types of fears, and relatively elevated animal fears. In contrast, males were significantly more likely to be members of a profile marked by minimal levels of all types of fears. Likewise, teenagers were more likely to report minimal levels of all types of fears. Teenagers were also more likely than younger children to demonstrate a profile marked by a relatively elevated fear of failure and criticism followed by a minor peak on school and medical fears. School-based educators and mental health practitioners might therefore find such fears an important area to assess given the propensity of some youth to disengage in the educational process during adolescence. In contrast, children were statistically more likely to exhibit profiles marked by (a) high levels of all types of fears and (b) low levels of fears but a minor peak on fears of death and danger. Finally, minority youth were more likely to belong to a profile with elevated animal fears.

Although applying different statistical methods, current results are generally consistent with previous research (Gullone, 1999). For example, the probability that girls would report more fears of all types than boys and be more likely to express a specific fear of animals validates the results of Bamber (1974), Moracco and Camilleri (1983), and Gullone and King (1993). Certainly it is possible that boys may underreport their fears as a result of male bravado and social conditioning; conversely, socialization and gender role expectations may influence girls' higher endorsement of numerous fears, as well. The likelihood that teenagers would report fewer overall fears than younger children, but would be vulnerable to specific fears about failure and criticism as well as fears about school and medical situations, supports the conclusions of Gullone (2000).

Results seem to align with the integrative theoretical perspective which encompasses developmental, cognitive, behavioral, and social learning components. With children's fears, there is a general acceptance that developmental issues coincide with these fears. Marks (1987) and Morris and Kratochwill (1985) echoed the position of many fear investigators by recognizing fears as typically transitory, age-related, normal, and an ordinary part of the maturation process. This position is supported by Campbell (1986) who reiterated the commonalities of fears and anxieties by explaining that fears "appear to be a permanent feature of the human condition and are relatively common in childhood" (p. 30).

Over the course of development, children possess various specific fears and worries. Our results comport with prior work that showed fears change qualitatively with age, which some researchers argue is due to cognitive and social development (Campbell, 1986). During maturation, the developmental structure of fear also changes, "from formless and imaginary to specific and realistic" (Bauer, 1976, p. 71). Bauer explained that the "older children have available a more elaborate system of verbal symbols with which to understand reality and to identify specific sources of fear than do younger ones" (p. 71). Thus, language sophistication and social expectations have an effect on fears reported (Bauer, 1976).

There were several unique results revealed by multivariate clustering methods. First, the majority of youth exhibited profiles marked by minimal to low levels of fear. Traditionally, research has focused on the number of fear items endorsed by youth and the normative aspect of fear endorsement has been overlooked. Second, minority youth were found to be more likely to exhibit a fear profile with relatively elevated animal fears. Unfortunately, it is not possible to disentangle the effects of socio-economic status (Bamber, 1974) or rural versus urban residence (King, Ollier, Iacuone, Schuster, Bays, Gullone & Ollendick, 1989) from ethnicity. Thus, this

outcome requires further investigation. Finally, previous investigations of fear survey schedules have consistently reported that fears of death and danger are the most commonly endorsed by youth. However, other methods of assessing fears among youth typically fail to find the death and danger theme to be most salient (Lane & Gullone, 1999; Muris et al., 1997). Considered within a multivariate profile, death and danger fears were not particularly distinctive. This offers a potential reconciliation of previously conflicting results. Nevertheless, this outcome should also receive additional research attention to validate its generalizability.

While not an experimental design, history may also affect the generalizability of these results since this survey research was completed prior to the events of September 11, 2001 in the United States. In New York City (NYC), the Board of Education hired evaluators to survey children and adolescents six months following the disaster (Applied Research et al., 2002), and results compared prevalence rates of mental disorders with those reported in the NIMH–MECA study (Shaffer, Fisher, Dulcan, Davies, Piacentini & Lahey et al., 1996). In addition to high rates of Posttraumatic Stress Disorder (PTSD; 10.5%) and Major Depression (8.4%), estimates of the rates for disorders with fear-related symptoms like Generalized Anxiety Disorder (10.3%), Separation Anxiety (12.3%), and Agoraphobia (15.0%) among NYC youth were 1.25–3 times higher than those reported in the MECA study (Applied Research et al., 2002). Exposure risk factors such as direct personal exposure, family exposure and loss, previous exposure to traumatic situations, and media exposure are relevant, as this survey reported higher rates of mental distress among Ground Zero youth, as well as those children and youth whose family or friends were directly impacted by the disaster. However, the PTSD rate among children at Ground Zero and the rest of NYC were quite similar.

Research by Pfefferbaum, Seale, McDonald, Brandt, Rainwater and Maynard et al. (2000) surveyed youths living 100 miles outside Oklahoma City two years after the bombing of the federal building there and discovered that nearly 20% of the sample reported current symptoms that impaired their school or home functioning. Media exposure and indirect interpersonal exposure were significant predictors of PTSD symptoms. Since post-9/11 media coverage continues to represent images of the disaster, it will be important to discern the extent to which youth both proximal and distal to the events of that day may continue to be affected. It would be worthwhile to note whether or not the youth are experiencing emotional distress, particularly their level of fear in areas related to death, danger, and the unknown. Inasmuchas as “all but the very youngest of children who have not yet acquired language are bound to be aware of the events of 9/11” (Pyszczynski, Solomon & Greenberg, 2003, p. 130) and because children’s responses to traumatic events vary, one might surmise that subsequent FSSC—II survey results might differ substantially. This is particularly true given the frequent reminders about security concerns, terrorism, and potential warfare that seem to permeate life in the United States since that time.

Overall, this study introduces a unique multivariate approach to the identification of replicable profiles of fear among school-aged American youth. Results generally comport with prior research, and permit the determination of the likelihood of demographic groups manifesting specific fear profiles.

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