Protective Factors and Risk Factors in Preschool Aged Children

Monica R. Geist
University of Northern Colorado

P. Antonio Olmos Gallo
Mental Health Corporation of Denver

Mary Grimmer
Mental Health Corporation of Denver

Daniel J. Mundfrom
University of Northern Colorado

Do resiliency or protective factors moderate risk factors in preschool aged children? This study looks at pre- and post-treatment data from 49 preschool children whose average age was 4 years old. The treatment included prevention and early intervention programs that promote emotional well-being and the development of healthy interpersonal relationships in children, ages birth to eight, and their caregivers. The Devereux Early Childhood Assessment Scale (DECA) was used to measure protective factors as well as behavior concerns by parents and teachers. There was no significant interaction effect between the number of risk factors and the post-treatment protective factors scores. This result does not support prior research on protective and risk factors. Cluster analysis was used to identify subgroups.

Children who are exposed to many risks growing up, are in danger of becoming a burden to society. In order to develop and improve preventions and interventions for children at risk, research in the resiliency of children is important. Resiliency can be defined as *good outcomes in spite of serious threats to adaptation or development* (Masten, 2001). Research in resiliency grew out of risk research (Masten, Best, & Garmezy, 1990). Risk factors include characteristics such as poverty, low maternal education, low socioeconomic status, low birth-weight, family instability, family violence, divorce, birth to a single parent, child abuse, homelessness, substance abuse, natural disasters and war, (Masten & Coatsworth, 1998, Masten, Best, Garmezy, 1990).

Resilient individuals seem to possess protective factors (Masters & Coatsworth, 1998). Protective factors moderate individual vulnerabilities or environmental hazards to increase the likelihood of success for a child (Baldo, 2000). Examples of protective factors include good intellectual functioning; an appealing, sociable, and easy going disposition; self-efficacy, self-confidence, initiative, and high self-esteem; talents; and faith. Some protective factors are external and include close relationships with caring parent figure(s), socioeconomic advantages, connections to extended supportive family networks, bonding with pro-social adults outside the family, connections to pro-social organizations, and attending effective schools (Baldo, 2000).

Researchers do not generally agree on how to measure resiliency. Many researchers study resilience in terms of *an observable track record of meeting the major expectations of a given society or culture in historical context for the behavior of children of that age and situation* (Masten, 2001). Other researchers focus on the absence of psychopathology. Still others look at both kinds of criteria (Masten, 2001). Three constructs that commonly occur in resiliency research are attachment, initiative, and self-control.

Attachment, as defined by LeBuffe and Naglieri (1999), is "a mutual, strong, and lasting relationship between a child and significant adult such as parents, family members, and teachers" (p. 4). Researchers have found empirical evidence that infants can be classified into one of three categories: (1) secure, (2) anxious-ambivalent, and (3) anxious-avoidant (Ainsworth & Bell, 1970). Recently Main and Solomon (1990) have found a fourth category called disorganized-disoriented. Current research suggests a strong relation between a child's early attachment classification and later social, emotional, behavioral, and academic outcomes (Jacobsen & Hofmann, 1997). Not forming secure attachments as infants has been linked with behavioral problems (Kennedy & Kennedy, 2004). Boys with insecure attachments have been shown to be more aggressive, disruptive, assertive, controlling, and attention-seeking than boys with secure attachments (Turner, 1991). Girls with insecure attachments show more dependent behavior than girls with secure attachments (Turner, 1991). Infants who were securely attached at 18 months were found to be more enthusiastic, persistent, and cooperative than insecurely attached infants (Matas, Arend, & Sroufe, 1978). Waters, Wippman, & Sroufe (1979) suggest that secure attachment is not merely the absence of negative behavior. In fact, they found that securely attached infants display positive affective sharing while their anxiously attached counterparts do not.

LeBuffe and Naglieri (1999) define *initiative* as "the child's ability to use independent thought and action to meet his or her needs" (p. 4). Hoehne (1990) found that motivation and initiative are related but are different concepts in that motivation's activating force is the achievement of a specific objective while initiative is rather a self-starting, self-activating, self-reliant urge or drive to act, question, search, probe

and persevere (Hoehne, 1990). Much research has been conducted on motivation. On the other hand, no empirical research on initiative was found.

LeBuffe and Naglieri (1999) define *self-control* as "the child's ability to experience a range of feelings and express them using the words and actions that society considers appropriate" (p. 4). Self-control and self-regulation are fundamental to successful functioning in society (Masten & Coatsworth, 1998). Failure to develop self-control in the early years has been shown to set the stage for aggressive and disruptive behavior (Patterson, 1986).

Need for the Study

Protective factors such as attachment, initiative, and self-control have been shown to moderate, or diminish, the effects of risk factors (Baldo, 2000). It is important to try to duplicate those results, as well as, attempt to understand the characteristics of preschoolers with similar protective and behavior scores. Understanding the relationship between risk factors and protective factors will enable mental health professionals to screen and identify young children at risk, as well as, raise awareness for prevention of risk factors.

Purpose of the Study

The purpose of this study was two-fold. One purpose was to determine the relationship between risk factors and protective factors on children's behavior as measured by the Devereux Early Childhood Assessment scale (DECA). A second purpose was to determine what subgroups of at-risk preschoolers who had similar protective and behavior scores had in common. The research questions that guide this study are:

1. Do protective factors moderate risk factors?
2. Are there identifiable subgroups of participants wherein the members within any group are similar and the subgroups are different from one another?

Methods

Procedures

Children enrolled in several preschools in an urban area of a large metropolitan Midwestern city were identified as having one or more risk factors. Once they were identified, their parents were invited to participate in the study. Participation in the research was voluntary. Researchers interviewed the parents and filled out an Early Intervention Child Data Sheet (see Appendix B) on each child in the study. Specific risk factors were identified in that interview. One parent of each child completed a Devereux Early Childhood Assessment (DECA) specifically regarding the child. Each child's preschool teacher also completed a DECA.

Each set of children and parents then received treatment. The treatment included prevention and early intervention programs that promote emotional well-being and the development of healthy interpersonal relationships in children, ages birth to eight, and their caregivers. There were two categories of treatment: center-based services and child-specific services. Center-based services involved consultation to center directors and staff regarding child development, strategies to handle behavioral problems, overall classroom environment and quality improvements. Center-based activities could also include educational programs to which all parents were invited or classroom instruction in which all children participated. All children enrolled in the contract-center programs benefited from these services. It is through these more general center-based services that children needing specific intervention were often identified.

Child-specific services included direct involvement with specific children and consultation with the parents and teachers of those children. The consultation and involvement focused on reducing problem behaviors and encouraging social and emotional competence in that particular child. Child-specific services also included direct involvement with the child individually or in a small group. Referral for evaluation and treatment of related problems often occurred. The child was in contact with some service category at least once a week. Treatment lasted one academic year (9 months). Parents and teachers then filled out a DECA for each child after the treatment.

Participants

The participants were 250 preschool age children enrolled in several preschools. There were only 49 useable participants due to missing data on the other 201. Of the 49 useable participants there were 27 males and 22 females. There were 14 African-Americans, 25 Hispanics, 2 mixed African-American and Hispanic, and 8 Whites. The average family annual income was $8,045. The average age was 4 years old.

Instrumentation

The Devereux Early Childhood Assessment scale (DECA; LeBuffe & Naglieri, 1999) is a nationally normed instrument designed to measure protective factors. It is the first instrument of its kind. The Devereux Early Childhood Assessment (DECA) will be used to study the relationship between risk factors, protective factors and behaviors. The DECA contains 37 items (see Appendix A). The items asked how often in the last four weeks did the child do a specific behavior. There were 5 choices for answering each item: never, rarely, occasionally, frequently or very frequently. The DECA has three subscales scores (attachment, initiative, and self-control) and a challenging behaviors score.
In order to get the initiative sub-score, items 2, 3, 7, 12, 16, 19, 20, 24, 28, 32, and 36 were added together and then made into a T-score. In order to get the self-control sub-score, items 4, 5, 13, 21, 25, 30, 33, and 34 were used to obtain a T-score. In order to get the attachment sub-score, items 1, 6, 10, 17, 29, 31, and 37 were used. The total protective factors added all the items from the three sub-scores together for another T-score. The behavior concerns score was a result of combining items 8, 9, 11, 14, 15, 18, 23, 26, 27, and 35. A high behavior score indicates the behavior is a problem. A low behavior score indicates the child does not have a behavior problem out of the ordinary average preschooler. A high protective score means the child has more protective factors than a child with a low protective score.
The risk factors were determined by interviewing the parents. The data was recorded on the Early Intervention Child Data Sheet (see Appendix B).

Data Analysis

In order to address the first research question, regression analysis was used. Two different models were created, one for teacher and one for parent responses. They were separated because the teacher and parent responses were not significantly correlated (Table 1).

Table 1. Pearson Correlations between Teacher and Parent Responses (N = 49)..

	R	Prob > $\lvert r \rvert$
Pre-treatment total protective score by Teacher & Pre-treatment total protective score by Parent	-0.33636	0.8257
Post-treatment total protective score by Teacher & Post-treatment total protective score by Parent	-0.09347	0.5229
Pre-treatment behavior concern score by Teacher & Pre-treatment behavior concern score by Parent	0.15714	0.2809
Post-treatment behavior concern score by Teacher & Post-treatment behavior concern score by Parent	0.16989	0.2432

Regression was used to determine if protective factors moderated risk factors. The first model included scores by the teachers.

Behavior_Teacher_Post = B_0
+ B_1 * Total Number of Risk Factors
+ B_2 * Protective_Teacher_Post
+ B_3 * Total Number of Risk Factors * Protect_Teacher_Post
+ B_4 * Behavior_Teacher_Pre

$$\hat{Y} = B_0 + B_1X_1 + B_2X_2 + B_3X_1X_2 + B_4X_4$$

This model included the total number of risk factors, the post-treatment total protective scores by the teacher, the interaction term between the total number of risk factors and the post-treatment protective

scores by the teacher, and the pre-treatment behavior concern scores by the teacher as independent variables. The post-treatment behavior concern scores by the teacher was the dependent variable. R-Square for the model was 0.680672. The post-treatment protective scores by the teacher were significant predictors in the model (F = 6.44, df = 1, p= 0.0148,). The pre-treatment behavior concern scores by the teachers were also significant predictors in the model (F=42.25, df = 1, p<0.0001). The total number of risk factors was not a significant predictor in the model (F = 0.01, df = 1, p = 0.9180). There was no significant interaction effect between total number of risk factors and the post-treatment protective scores by the teacher (F = 0.05, df = 1, p = 0.8265).The resulting model was: $\hat{Y} = 33.05 - 0.32X_1 - 0.35X_2 + 0.1X_1X_2 + 0.68X_4$.

The second model included scores by the parents.

Behavior_Parent_Post = B_0
+ B_1 * Total Number of Risk Factors
+ B_2 * Protective_Parent_Post
+ B_3 * Total Number of Risk Factors * Protect_Parent_Post
+ B_4 * Behavior_Parent_Pre

$$\hat{Y} = B_0 + B_1X_1 + B_2X_2 + B_3X_1X_2 + B_4X_4$$

This model included the total number of risk factors, the post-treatment total protective scores by the parent, the interaction term between the total number of risk factors and the post-treatment protective scores by the parent, and the pre-treatment behavior concern scores by the parent as independent variables. The post-treatment behavior concern scores by the parent was the dependent variable. *R*-Square for the model was 0.297152. The total number of risk factors was not a significant predictor in the model (F = 0.09, df = 1, p = 0.7639). The post-treatment protective scores by the parent were not significant predictors in the model (F = 4.05, df = 1, p = 0.0504). There was no significant interaction effect between total number of risk factors and the post-treatment protective scores by the parent (F = 0.00, df = 1, p = 0.9612,). The pre-treatment behavior concern scores by the parent were also not significant predictors in the model (F = 1.33, df = 1, p = 0.2553,). This "Parent's Model" is believed to have multicolinearity because none of the predictors were significant, however the overall model was significant (F = 4.65, df = 4, p = 0.0032). The resulting model was: $\hat{Y} = 74.24 - 1.2X_1 - 0.43X_2 + 0.004X_1X_2 + 0.15X_4$.

In order to deal with the multicollinearity in the Parent's Model, the interaction term between risk factors and the post-treatment protective score by the parent was removed to create a third model.

Behavior_Parent_Post = B_0
+ B_1 * Total Number of Risk Factors
+ B_2 * Protect_Parent_Post
+ B_4 * Behavior_Parent_Pre

$$\hat{Y} = B_0 + B_1X_1 + B_2X_2 + B_4X_4$$

This model was significant (F=6.34, df = 3, p = 0.0011). Neither the total number of risk factors nor the pre-treatment behavior concern scores by the parents were significant predictors in this model. The post-treatment protective scores by the parents, however, was significant (F = 16.71, df = 1, p = 0.0002). The resulting model was: $\hat{Y} = 73.80 - 1.01X_1 - 0.42X_2 + 0.15X_4$.

Cluster analysis was used to address the second research question. The cluster analysis identified four unique subgroups of children. The four identified clusters accounted for an R-square of 0.428. Increasing the number of clusters only increased R-square to 0.488. Also when five clusters were used the cluster sizes began to be too small since the sample size was small (N=49).

The variables considered were gender, ethnicity, income, single parent, parent health problem, parent unemployed, marital instability, substance abuse, domestic violence, and history of child abuse. Low income was not a defining feature of any of the clusters, as most participants had a low income family.

Cluster 1 *n*=13. Mostly male (85%); 85% African-American or Hispanic; 15% White; 92% had single parent home; 62% had an unemployed parent; 46% had some sort of substance abuse, domestic violence or child abuse in the home; highest post-treatment behavior concerns score as scored by the teacher (mean of 64.23); highest post-treatment behavior concerns score as scored by the parent (mean of 68.46); pre- and post-treatment protective factor cores as scored by the teacher were very close (pre 36.2 and post 37.4); pre- and post-treatment behavior concerns scores as scored by the teacher were also very close (pre 6.4 and post 64.2); pre- and post-treatment protective factor scores as scored by the parents decreased slightly (pre 42.5 and post 39.9); pre- and post-treatment behavior concerns scores as scored by the parent increased (pre 64.3 and post 68.5).

Cluster 2 *n*=18. 28% African-American; 55% Hispanic; 17% White; only one participant had a single parent home (5%); 17% had an unemployed parent; 39% had some sort of substance abuse, domestic violence or child abuse in the home; post-treatment behavior concerns score as scored by the teacher mean of 62.39; post-treatment behavior concerns score as scored by the parent mean of 60.28; pre- and post-treatment protective factor scores as scored by the teacher were very close (pre 42.5 and post 42.3); pre- and post-treatment behavior concerns scores as scored by the teacher were also very close (pre 62.1 and post 62.4); pre- and post-treatment protective factor scores as scored by the parents increased (pre 45.3 and post 53.8); pre- and post-treatment behavior concerns scores as scored by the parent decreased (pre 63.6 and post 60.3).

Cluster 3 *n*=10. Mostly Hispanic (90%); 10% White; mostly female (70%); 50% had single parent home; 30% had an unemployed parent; 20% had some sort of domestic violence or child abuse in the home; lowest post-treatment behavior concerns score as scored by the teacher (mean of 44.8); a high post-treatment behavior concerns score as scored by the parent (mean of 64.8); pre- and post-treatment protective factor scores as scored by the teacher increased (pre 48.5 and post 55.0); pre- and post-treatment behavior concerns scores as scored by the teacher decreased (pre 50.6 and post 44.8); pre- and post-treatment protective factor scores as scored by the parents were very close (pre 35.5 and post 35.8); pre- and post-treatment behavior concerns scores as scored by the parent decreased (pre 67.8 and post 64.8).

Cluster 4 *n*=8. 50% African-American; 25% Hispanic; 25% White; 75% had single parent home; 50% had an unemployed parent; 12.5% had some sort of domestic violence in the home; post-treatment behavior concerns score as scored by the teacher (mean of 56.75); post-treatment behavior concerns score as scored by the parent (mean of 55); pre- and post-treatment protective factor scores as scored by the teacher increased (pre 55.25 and post 57.25); pre- and post-treatment behavior concerns scores as scored by the teacher decreased (pre 58.875 and post 56.75); pre- and post-treatment protective factor scores as scored by the parents increased (pre 46.6 and post 50.5); pre- and post-treatment behavior concerns scores as scored by the parent decreased (pre 64.9 and post 5).

Discussion

Initially the answer to the first research question, "Do protective factors moderate risk factors?" appears to be no. In both of the models (teacher scores and parent scores), there was no significant interaction effect between the number of risk factors and the post-treatment protective factors score. Therefore, protective factors did not moderate risk factors. This does not support what previous research found (Baldo, 2000; Jacobsen & Hofmann, 1997; Patterson, 1986). In the third model, when the interaction term was removed from the parent model in order to deal with the multicolinearity, the risk factors were not significant predictors of behavior.

In the second research question, "Are there identifiable subgroups of participants wherein the members within any group are similar and the subgroups are different from one another?" was affirmative. Four clusters were identified (see Table 2).

Cluster 1 was made up of mostly African-American or Hispanic males and had the highest behavior scores as scored by the teacher. These higher scores mean the behavior was more challenging in this

Table 2. Cluster Demographics, Protective and Behavior Scores

	Cluster 1 (n=13)	Cluster 2 (n=18)	Cluster 3 (n=10)	Cluster 4 (n=8)
Gender	11 male (85%) 2 female (15%)	8 male (44%) 10 female (56%)	3 male (30%) 7 female (70%)	5 male (62.5%) 3 female (37.5%)
Ethnicity	5 African-Am (38%) 4 Hispanic (31%) 2 Af-Am/Hisp (15%) 2 White (15%)	5 African-Am (28%) 10 Hispanic (56%) 3 White (17%)	0 African-Am (0%) 9 Hispanic (90%) 1 White (10%)	4 African-Am (50%) 2 Hispanic (25%) 2 White (25%)
Single Parent Home	12 (92%)	1 (5%)	5 (50%)	6 (75%)
Unemployed Parent	8 (62%)	3 (17%)	3 (30%)	4 (50%)
Substance abuse, domestic violence, or history of child abuse	6 (46%)	7 (39%)	2 (20%)	1 (12.5%)
Protective Scores by Teacher	Pre = 36.15 Post = 37.38	Pre = 42.56 Post = 42.28	Pre = 48.50 Post = 55.00	Pre = 55.25 Post = 57.25
Behavior Scores by Teacher	Pre = 66.38 Post = 64.23	Pre = 62.06 Post = 62.39	Pre = 50.60 Post = 44.80	Pre = 58.86 Post = 56.75
Protective Scores by Parent	Pre = 42.54 Post = 39.92	Pre = 45.33 Post = 53.83	Pre = 35.50 Post = 35.80	Pre = 45.63 Post = 50.50
Behavior Scores by Parent	Pre = 64.31 Post = 68.46	Pre = 63.61 Post = 60.28	Pre = 67.80 Post = 64.80	Pre = 64.88 Post = 55.00

cluster according to the teachers. This cluster also had the lowest protective scores as scored by the teachers. This means that these children had fewer protective factors. The parents viewed these children with more protective factors than did the teachers. Cluster 1 had the largest percentage of single family homes and the largest percentage of unemployed parents.

Cluster 2 had a mix of ethnicities and genders. This group had the most number of instances of substance abuse, domestic violence or child abuse. Cluster 2 had the second to lowest number of protective factors with the second to highest score of behavior problems as reported by the teachers. This subgroup had the least number of single family homes.

Cluster 3 was made up of mostly Hispanic females and had the lowest behavior scores as scored by the teachers. In other words, these children had the least amount of behavior problems according to the teachers. This cluster had the second to highest protective scores as scored by the teacher, but the lowest protective scores as scored by the parents.

Cluster 4 had a mix of ethnicities and genders. They had the fewest number of substance abuse, domestic violence or child abuse incidences. Their protective scores by the teachers were the highest of the four subgroups. Only cluster 3 had better behavior than this subgroup as reported by the teachers.

Caution should be taken when considering the results of this study. The main limitation of this research was the small useable sample size of 49. Even though the original data included 250 participants, there was not enough data collected for each child to construct a complete picture. Further research needs to be conducted with larger useable sample sizes.

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Send correspondence to: Monica R. Geist
University of Northern Colorado
Email: jfraas@ashland.edu