

The Devereux Early Childhood Assessment Literature Review

Jennifer Chain, Alex Dopp, Gabriel Smith, Sean Woodland and Paul LeBuffe

The Devereux Center for Resilient Children

July 28, 2010

Abstract

The Devereux Early Childhood Assessment (DECA; LeBuffe & Naglieri, 1999a) is a widely used, standardized, norm-referenced behavior rating scale, grounded in resilience theory. It evaluates within-child protective factors in preschool children ages two through five. The DECA is a psychometrically sound tool that can be rated by both parents and teachers to promote collaboration. Research to replicate the original DECA psychometrics has been conducted and will be discussed in the current document along with DECA use in program evaluations and studies that look at the relationship of social-emotional competency to various early childhood mental health and development constructs. Reviews and critiques of the DECA will also be addressed. The DECA-C is an additional assessment that evaluates, in equal depth, protective factors and behavioral concerns through 3 protective factors scales and 4 behavioral concern scales. Research and reviews on the DECA-C shows that this tool has good psychometrics but is not as widely known or used as the DECA.

Table of Contents

The DECA Assessment	1
Purposes of the DECA	2
The DCRC Continuum of Strength-Based Assessments	2
DECA Use and the DECA Program	3
The DECA-C	4
Psychometrics	5
Standardization and Original Psychometric Studies	5
Independent Psychometric Studies	7
Parent-Teacher Agreement	13
DECA Programs and Interventions	14
DECA and Head Start	15
DECA and the Miami School Readiness Project	15
Reviews and Critiques of the DECA	18
Strengths	18
Concerns	21
Discussion	23
The Devereux Early Childhood Assessment Clinical Form	27
Standardization	28
The DECA-C in Research	28
Strengths of the DECA-C	30
Concerns with the DECA-C	30
Discussion of the DECA-C	31

Tables 33

References 42

List of Tables iii

List of Tables

Table 1: Independent psychometric studies compared to Standardization Sample	....	32
Table 2: Evidence for concurrent validity: Correlations (r)	.....	35
Table 3: Evidence for current validity: d-ratios	.....	37
Table 4: Evidence for predictive validity: Correlations (r)	.....	39
Table 5: Evidence for predictive validity: d-ratios	.....	40
Table 6: Effect sizes (Cohen's d) for parent-rated versus teacher-rated raw scores	....	41

The DECA Assessment

The Devereux Early Childhood Assessment (DECA; LeBuffe & Naglieri, 1999a) is a standardized, norm-referenced behavior rating scale that evaluates within-child protective factors in preschool children ages two through five (i.e. from their second to their sixth birthday). It was developed from 1996-1998 and published in 1999 by the Kaplan Early Learning Company. The DECA evaluates 27 positive behaviors and also contains a ten-item Behavioral Concerns Scale that measures a wide variety of challenging behaviors seen in some preschool children. The DECA is grounded in resilience theory and was created due to growing numbers of young children in center-based care, and growing numbers of children who encounter adversity and face stress in their daily lives. The DECA was the first strength-based assessment tool grounded in resilience theory. This document will discuss the psychometric properties of the DECA, use of the DECA in research, and reviews of the DECA. These topic areas will also be briefly discussed in relation to the DECA-Clinical Form (DECA-C; LeBuffe & Naglieri, 2003), a tool adapted from the DECA for clinical use.

The DECA can be completed by family members or early care and education professionals. It includes three scales and a composite scale called Total Protective Factors (TPF) which reflects the overall strength of a child's protective factors. The three protective factor scales reflect three important domains of social and emotional competence for young children. These include Initiative (IN), the child's ability to use independent thought and action to meet his or her needs; Self-Control (SC), the child's ability to experience a range of feelings and express them using the words and actions that society considers appropriate; and Attachment (AT), a mutual, strong, and long-lasting relationship between a child and significant adults such as parents, family members, and teachers. A separate ten-item Behavioral Concerns (BC) scale

serves as a screening tool for a variety of problematic behaviors in preschoolers (LeBuffe & Naglieri, 1999b).

Purposes of the DECA

The DECA was developed to serve five primary purposes as described by the *Devereux Early Childhood Assessment User's Guide* (LeBuffe & Naglieri, 1999b):

1. To generate a profile that identifies the strengths and comparative weaknesses of a child's protective factors so that targeted classroom and family-based strategies can be implemented to strengthen low protective factors.
2. To Generate DECA Classroom Profiles indicating the relative strengths and needs of all children in a class and to help with selection of classroom strategies to build and support social and emotional strengths.
3. To guide and support early intervention efforts by identifying children who may be exhibiting emotional/behavioral problems, leading to interventions to reduce these behaviors before they develop into behavioral disorders.
4. To assist Head Start programs in meeting the Program Performance Standards. (45 CFR 1301 et. seq.).
5. To assist early childhood programs in developing strength-based programs to foster healthy social and emotional growth in children.

The DECA is also intended to provide early childhood programs with a useful outcome measure related to children's social and emotional health, to aid in parent professional collaboration through comparing scores across the home and school environments, and to provide a well developed measure of protective factors in preschool children for research purposes.

The DCRC Continuum of Strength-Based Assessments

The DECA now exists in both electronic and paper form as part of a continuum of strength-based assessments developed by the staff of the Devereux Center for Resilient Children (DCRC). The DCRC is a division of the Devereux Foundation that encompasses the Devereux Early Childhood Initiative (DECI). The DCRC assessments include the DECA (LeBuffe and Naglieri, 1999a), DECA-Clinical Form (DECA-C; LeBuffe and Naglieri 2003), the DECA for Infants and Toddlers (for children 0 – 36 months; DECA – I/T; Mackrain, LeBuffe & Powell, 2006), and the Devereux Student Strengths Assessment (for children in kindergarten – eighth grade; DESSA; LeBuffe, Shapiro & Naglieri, 2008). A Devereux Adult Resilience Survey (DARS; Mackrain, 2008) also exists as a reflective checklist to help adult caregivers reflect on their own resilience as they work to foster resilience in children. The DCRC is dedicated to the mission of promoting social and emotional development, fostering resilience, and building skills for school and life success in all children and the adults who care for them.

DECA Use and the DECA Program

The DECA is now a widely used and recognized tool within early childhood. The DECA is recognized by numerous state (about 60) organizations and national organizations (about 12) and has a strong following of Head Start users and supporters (A Sampler of Where the DECA is Included in Federal, State and Head Start Programs and Initiatives, Research and Guidance Resources, 2010). The DECA was created to be used as part of the DECA program, an integrated approach with associated resources for both assessing and strengthening protective factors in children. The DECA Program kit includes a *Classroom Strategies Guide*, a booklet for parents on fostering resilience titled *For Now and Forever*, and a *Classroom Observation Guide*. The program emphasizes three components: 1. An environment that supports social and emotional development, 2. Building resilience within adult caregivers and 3. Building resilience

within the child. In addition to the three components, the DECA program follows a five-Step System which consists of: 1. Collecting information on the child and program, 2. Assessing the child using the DECA, 3. Summarizing DECA results, 4. Implementing strategies in the home and preschool environments, and 5. Evaluating progress. The DECA assessment is also used within some child welfare organizations for program evaluation and enhancement. An accompanying resource kit for child welfare service providers, adapted from the DECA Program kit is currently in development.

The DECA-C

The DECA-C is a standardized, norm-referenced behavior rating scale that evaluates behaviors related to both social-emotional resilience and concerns in preschool children ages two through five (i.e., up to the sixth birthday). The DECA-C was created to meet the needs of professionals using the DECA who requested a more thorough assessment of problem behaviors for children already exhibiting significant behavioral difficulties. The protective factors scales on the DECA-C are the same as those on the DECA (Initiative, Attachment, and Self-Control), but the DECA-C provides a balanced, in-depth look at behavior concerns in addition to protective factors.

The Behavioral Concern scales on the DECA-C measure Attention Problems (AP), difficulties the child may have in focusing on a task and ignoring competing environmental stimuli; Aggression (AG), hostile or destructive acts directed at other persons or things; Emotional Control Problems (ECP), difficulties the child has in modifying the overt expression of negative emotions; and Withdrawal/Depression (WD) which addresses behaviors related to emotional and social withdrawal in which the child is self-absorbed and often attends to his or her own thoughts or play rather than engaging in reciprocal interactions. The

Withdrawal/Depression scale also includes feelings of sadness and the inability to enjoy activities and social interactions. A Total Behavioral Concerns Scale also exists as a composite of the four behavioral concern scales and provides an overall index of the magnitude and severity of the child's behavioral problems. In addition to discussing the DECA, this document will briefly overview the psychometric properties, use in research, and overall reviews of the DECA-C.

Psychometrics

Standardization and Original Psychometric Studies

The development and standardization of the DECA, including all original psychometric studies, are described in detail in the DECA technical manual (LeBuffe & Naglieri, 1999a). The protective factor scales (i.e., IN, AT, and SC) and the TPF composite scale were standardized on a nationally representative sample of 2,000 children from 28 states. The BC scale was standardized on a nationally representative sample of 1,108 children from the same 28 states. This document refers to these two samples collectively as the standardization sample. The desired characteristics of the standardization sample were based on the *Statistical Abstract of the United States 1996: The national data book* (116th ed.) from the U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census (1996).

No meaningful age-related differences were identified in the standardization sample, and therefore age norms are not provided for the DECA. Although gender differences were identified in the sample, with girls scoring higher than boys on all protective factor scales and lower on the BC scale, the authors chose not to provide gender norms. This decision preserves observed differences between genders (because boys cannot earn the same T-score for different raw scores) and establishes a single set of social-emotional competency expectations for both

genders, based on the argument that girls should not be held to a higher standard than boys (LeBuffe, personal communication, April 26, 2010). The authors did construct separate norms by Rater (Parent or Teacher) based on identified differences in the sample.

The standardization sample was used to construct the scale structure and compute reliability estimates for the scales. Exploratory factor analysis was used to create the three protective factors scales. The median Cronbach's alpha (α) coefficients for internal consistency of the scales across raters were .93 for TPF, .87 for IN, .81 for AT, .88 for SC, and .76 for BC. With the exception of the BC scale, all scales exceed criteria for acceptable reliability estimates (Bracken, Keith & Walker, 1998). However, a somewhat lower internal consistency coefficient is expected for a scale used as a screener, such as the BC scale, due to the heterogeneity of the items. In addition, separate samples were collected to estimate the test-retest reliability and interrater reliability of the DECA. These samples are described in detail in the technical manual (LeBuffe & Naglieri, 1999a). Median test-retest coefficients were .64 for parents and .91 for teachers. Median interrater coefficients were .32 for parent-parent pairs, .62 for teacher-teacher pairs, and .23 for parent-teacher pairs. These findings do not all meet criteria for acceptable reliability (Bracken, Keith & Walker), but are similar to results obtained for similar behavior rating scales (Achenbach, McConaughy & Howell, 1987).

Finally, the authors collected data supporting the content, criterion, and construct validity of the DECA (LeBuffe & Naglieri, 1999a). Content validity is supported by a thorough review of the resilience literature and the results of focus groups conducted with parents and teachers. Items were selected for inclusion with three goals: to 1) identify the best factor solution in terms of psychometrics and interpretability, 2) minimize the length of the DECA without compromising its breadth, and 3) ensure reliability. Criterion validity is supported by mean

differences on all scales between a community sample and a sample with identified emotional and behavioral problems, with medium to large effect sizes (which are compared to independent findings later in this section), and by high overall classification accuracy. Potential differences in scores were also examined for children from minority racial and ethnic groups using a contrasted groups approach, and all were found to be negligible or to have a small effect size ($d \leq 0.38$). This indicates that the DECA does not discriminate against minority children, and is appropriate for use with such children. Construct validity is supported by evidence that protective factors moderate differences in behavioral concerns between high risk and low/average risk children.

Reviews of the standardization sample and psychometrics of the DECA have generally been positive (Buhs, 2003; Chittooron, 2003; Reddy, 2007), and these reviewers recommend the DECA as a reliable instrument that provides a valid assessment of social and emotional competencies in preschool children. Chittooron notes concerns that the number of children with special needs in the standardization sample is not reported, and that a larger number of items could improve the DECA's test-retest and interrater reliability. Buhs criticizes the validity of the protective factor scales, noting that the authors did not test *a priori* hypotheses about the factor structure and suggesting that the scales are data-driven rather than theory-driven. Bridges and colleagues (2004) echo these concerns, noting that the labels Attachment and Total Protective Factors do not reflect their use in developmental literature. Reddy cautions against the conclusion that the DECA does not demonstrate item bias for racial and ethnic minorities, and notes that more rigorous evaluations of item bias are available than the methods described in the manual.

Independent Psychometric Studies

Reddy (2007) and Nickerson (2007) also noted that independent psychometric research on the DECA was absent at the time of publication. In the years since those articles, this gap in the DECA's research base has been addressed through three studies, which have replicated findings from the DECA standardization sample. Lien and Carlson (2009) examined internal consistency, standard error of measurement, and factor structure in a sample of 1,208 children enrolled in Head Start programs in Michigan. Jaberg, Dixon and Weis (2009) examined internal consistency, interrater reliability (parent-teacher), and factor structure in a sample of 780 children from rural Missouri. Crane, Winsler and Mincic (2008) examined internal consistency and interrater reliability (parent-teacher) in a sample of 5,988 children from Miami-Dade county, Florida, primarily from urban, low-income, and racial and ethnic minority backgrounds. Both Lien and Carlson and Jaberg and colleagues replicated the original factor structure almost precisely. The internal consistency, standard error of measurement, and interrater reliability coefficients found in these studies also replicate the original findings; results are summarized and compared to the DECA standardization sample in Table 1. These results indicate that the DECA remains a reliable assessment 10 years after its publication, and supports its validity for use with children from low-income, rural, urban, and racially and ethnically diverse backgrounds. No independent study has examined the test-retest reliability of the DECA.

The relationship between DECA scores and other social-emotional competence measures was not examined when the DECA was in development, although this is a standard procedure for establishing construct validity, because no such measures existed at the time (LeBuffe & Naglieri, 1999a). Even today, although a number of behavior rating scales include "strength-based" or "competence" sections, the majority of these assessments are not grounded in resilience theory, and they therefore cannot be used as an appropriate comparison for construct

validity. However, a number of research studies in early childhood education and mental health lend additional evidence to the DECA's criterion validity by demonstrating both concurrent and predictive relationships between DECA scores and other variables of interest. These findings indicate the validity of predicted relationships between DECA scores and theoretically related constructs (e.g., parental engagement) and outcomes (e.g., academic achievement), including predicted inverse relationships (e.g., behavioral problems).

Effect sizes were calculated for these studies from available data, which evaluated the strength of effects using Cohen's (1988) criteria. For correlation coefficients (r), effect sizes of .10, .30, and .50 are considered small, medium, and large, respectively. For between-group comparisons (d -ratio), effect sizes of 0.20, 0.50, and 0.80 are considered small, medium, and large. For a regression equation (r^2), effect sizes of 0.02, 0.15, and 0.35 are considered small, medium, and large. Findings are described in the subsequent paragraphs and summarized in the following tables: Table 2 summarizes concurrent validity evidence from effect sizes for correlations; Table 3 summarizes concurrent validity evidence from effect sizes for between-group; Table 4 summarizes predictive validity evidence from effect sizes for correlations; and Table 5 summarizes predictive validity evidence from effect sizes for between-group comparisons.

Evidence for concurrent validity has been reported for math achievement, learning behaviors, and parental engagement, which all showed positive correlations with DECA scores. Dobbs, Doctoroff, Fisher & Arnold (2006) found medium to large correlations between DECA scores and math achievement (r from .33 to .57 for protective factor scales, $r = -.42$ for BC). Escalon & Greenfield (2009) found a medium negative correlation between learning behaviors and behavior concerns ($r = -.41$). Escalon and Greenfield did not replicate the concurrent

relationship with academic achievement, however, as correlations between BC scores were small and non-significant. Richard (2007) found that scores on the IN, SC, and BC scales predicted language proficiency, with a medium effect size ($f^2 = 0.28$). The Getting Ready intervention, which is designed to increase parental engagement with preschool children, has resulted in increased DECA scores on the IN and AT Scales with medium effect sizes ($d = 0.75$ and $d = 0.56$ respectively) (Sheridan, Knoche, Edwards, Bovaird & Kupzyk, 2010) and negligible effect sizes for SC and BC.

Negative correlations with DECA scores have been reported for parental stress, environmental risk factors, problem behaviors, child's referral for mental health services, and autism and special education classification. Dobbs and colleagues (2006) found consistent small and medium correlations between DECA scores and problem behaviors, (median r of $-.13$ to $-.40$ for protective factor scales, median r of $.42$ for BC), with a number of large correlations with scales of externalizing behaviors. Brinkman, Wigent, Tomac, Pham and Carlson (2007) also found a medium negative correlation between TPF and BC ($r = -.39$ and $-.34$). Fiore (2009) found a medium negative correlation between parent stress and TPF ($r = -.42$), although correlations with child stress and between AT and both types of stress were not significant. Bor (2007) found small correlations between neighborhood risk and TPF ($r = -.19$) and BC ($r = .21$) for public school preschool students, although these relationships were not replicated with students in community care settings. Crane (2009) found consistent medium and large effect sizes for a number of special education classifications on preschool children's DECA scores, with both parent and teacher ratings, compared to no diagnosis (d of -0.73 to -0.85 for protective factor scales, d of 0.75 for BC). Effect sizes for developmental delays, autism, and emotional disturbance all fell within this range, whereas effects were smaller for specific learning

disabilities and mostly negligible for speech impairment. This last finding indicates that the DECA is able to selectively identify children with social, emotional, and developmental disabilities.

DECA scores have also been found to positively predict literacy achievement, math achievement, language skills, school readiness (Fuccillo, 2008), and exiting special education (Crane, 2009). Although Escalon and Greenfield (2009) did not find a concurrent relationship between BC scores and academic achievement, the scores predicted later achievement in math and literacy with small negative correlations ($r = -.19$). Richardson, Thorburn-McCrory, Saunders and Graf (2008) found that DECA scores in preschool predicted kindergarten literacy achievement with a large effect size (f^2 from 0.37 to 0.52) when controlling for preschool literacy skills, age, gender, and income. Fuccillo (2008) found a medium correlation between AT scores and one aspect of school readiness, attention/persistence ($r = .35$), although AT did not significantly correlate with overall school readiness. Crane (2009) found large effects for children who exited special education in kindergarten (d of 0.73 to 1.02 for protective factor scales, d of -1.06 for BC) and small to negligible effects for changing special education category (d of -0.02 to 0.32 for protective factor scales, d of -0.45 for BC). In addition, LeBuffe, Hughes and Sperry (2009) found that low protective factors were correlated with later behavior concerns, even when behavioral concerns were not evident at pretest. In the same sample, protective factors predicted later behavioral concerns while controlling for initial behavioral concerns, with a large effect size ($f^2 = 1.28$).

The gender differences found in the DECA standardization sample, in which girls were rated higher on protective factor scales and lower on the BC scale, have been replicated in a number of independent studies (e.g., Bor, 2007, Richard, 2007; Richardson et al., 2008; Rosas,

Chaiken & Chase, 2006). These authors did not provide the necessary information to calculate effect sizes for gender. A data mining study from Devereux's online database of DECA data, using 297,897 ratings, replicated these gender differences and found small effect sizes (Smith, personal communication, April 26, 2010 – replace this citation with a report when written). Girls were rated higher than boys on protective factor scales (d from 0.20 to 0.31) and lower than boys on the BC scale ($d = -0.29$). One study did find no significant difference between boys and girls on the BC scale (Escalon & Greenfield, 2005). Overall, these results suggest that, 10 years later, girls are still rated as having higher social and emotional competence and lower behavioral concerns than boys. The differences found are small but reliable. As stated before, the authors' decision to not provide gender norms is based on an argument that is independent of these empirical data. Notably, studies have found that gender is not a significant predictor in regression analyses examining the relationship between DECA scores and outcome variables, such as math achievement (Dobbs et al., 2006) and language proficiency (Kim, 2004). These findings suggest that social and emotional competencies may function the same way in both genders and should not be treated separately (i.e., with separate norms) on the DECA.

Findings for age differences have been less conclusive. Richardson and colleagues (2008) partially replicated the lack of age differences from the standardization sample, finding no significant differences between four and five year olds. Rosas and colleagues (2006), however, found higher IN, lower AT, and lower BC scores for four- and five-year olds compared to two- and three-year-olds. The authors did not provide enough information to calculate an effect size for age. Crane and colleagues (2008) found significant but small to negligible correlations for every scale except AT (r from .03 to .12 for protective factor scales, r from -.07 to -.20 for BC scale).

Parent-teacher agreement

Studies have also examined agreements and discrepancies between parent and teacher DECA ratings, and the implications of these variations. Rosas and colleagues found that parents and teachers tend to agree more on ratings of protective factors than on ratings of behavioral concerns (Rosas et al., 2006), and that strengths identified by both teachers and parents are stronger negative predictors of behavior concerns than strengths identified by only one rater (Rosas et al., 2007). These results suggest that strength-based assessments may be more useful than assessments of behavioral concerns when teachers and parents collaborate, and that agreement between parents and teachers provides useful information about core competencies that are less likely to be situation specific (Rosas et al., 2007).

Furthermore, Crane and colleagues (2008) found that parents and teachers were most likely to agree about children at a typical level of cognitive functioning, while teachers rated children with low cognitive functioning more harshly (lower protective factors and higher behavioral concerns) and parents rated children with high cognitive functioning more harshly. A lack of consensus between teachers and parents may make it more difficult to intervene with children with low social and emotional competencies, putting them at higher risk for behavioral concerns. It should be noted, however, that these were findings for primarily Spanish-speaking parents and English-speaking teachers.

In a related issue, studies have reported interrater differences such that parent-rated T-scores are harsher than teacher-rated T-scores (Rosas, Chaiken & Chase, 2006; Stark Mental Health and Recovery Services Board, 2008; Winsler et al., 2008). However, raw scores from parent raters were found to be less harsh in the standardization sample, which resulted in the authors providing separate parent and teacher norms to correct this discrepancy (Naglieri &

LeBuffe, 1999a). More recently, the rater effect for raw scores from the standardization sample was replicated by Crane (2009) and Jaberg and colleagues (2009), who found medium to large effect sizes for all protective factor scales except SC (d from 0.22 to 1.12) for parents compared to teachers. The Devereux data mining study also replicated these raw scores differences. Rater effects for the BC scale were often negligible, but Crane found that parent ratings were harsher than teachers at one time point in their study ($d = 0.26$) and the Devereux data mining study also found parent ratings to be more harsh (d of .43 for BC and d of -0.12 to 0.73 for protective factor scales), however this sample consisted of primarily Head Start and publicly funded early care and education programs. These effect sizes are reported in Table 6. Based on these findings, it is possible that patterns in parent and teacher raw score ratings have changed over the past 10 years, particularly with regards to the SC and BC scales, such that updated rater norms are necessary. It is also possible that the relationship of parent and teacher raw scores is different based on demographics such as SES.

DECA in Programs and Interventions

In recent years, the Devereux Early Childhood Assessment (DECA) has received much attention in the realm of early childhood research. The majority of the research using the DECA has been in the form of program evaluations (Meyer, 2008; Olmos & Grimmer, 2005; Reardon, 2009; Richardson & Graf, 2006; Richardson, Thorburn-McCrory, Saunders, & Graf, 2008; Sheridan, Knoche, Edwards, Bovaird, & Kupzyk, 2010), as well as global comparisons to a wide variety of constructs related to early childhood mental health and development (for examples, see De Feyter & Winsler, 2009a and Escalon, Shearer, Greenfield, & Manrique, 2009). Programs were evaluated using the DECA as an outcome measure, with time or the program itself as the independent variable, making study results more a reflection of program or service delivery,

assuming systematic control of confounding variables. Foremost among programs using the DECA as an outcome measure is Head Start, and this population will be discussed at length here. The Miami School Readiness Project, which utilized the DECA in a number of comparisons, will also be discussed.

DECA and Head Start

With the Head Start population, the DECA has shown increases in Total Protective Factors (TPF) and decreases in Behavior Concerns (BC) over repeated administrations (Brinkman, Wigent, Tomac, Pham, & Carlson, 2007; Escalon & Greenfield, 2009). Investigators have deemed the DECA appropriate as a screener of behavior concerns, as well as a good measure of protective factors, mirroring results collected in the standardization sample (Lien & Carlson, 2009). Specifically, Lien and Carlson found that on their Head Start sample, TPF scores correlated negatively ($r = -.39$; $p = .00$) with BC, while the standardization sample showed similar results ($r = -.65$; $p > .05$). Studies have looked at the relationship of DECA scores to math skills (Dobbs, Doctoroff, Fisher, & Arnold, 2006), as well as general academic outcomes (Escalon & Greenfield, 2009; Escalon, Shearer, Greenfield, & Manrique, 2009).

DECA and the Miami School Readiness Project

The Miami School Readiness Project was a “large scale, 5-year university and community collaborative project” (De Feyter & Winsler, 2009b) which involved school readiness assessment for children described as “ethnically and linguistically diverse” by De Feyter and Winsler. The sample ($n = 5,988$) included low-income preschool children who were receiving funding to attend various early childhood programs, including public school and pre-K programs, family-based childcare, and center-based care. The main effort of the project was to gather data that would

inform better tailoring these programs to the population they served, mainly immigrant children of low socioeconomic status (SES).

Researchers were able to tease out different findings and comparisons by drawing on this large sample. The DECA was used as a measure of school readiness, with authors contending that social and emotional strengths are even more important for academic readiness than academic knowledge and skills, especially for first-generation immigrants (see De Feyter & Winsler, 2009b; Heaviside, Farris, & Carpenter, 1993). First-generation immigrants had significantly higher ($p = .001$) TPF scores than their second-generation and non-immigrant counterparts, and the effect size for the difference between first-generation immigrants and non-immigrants (reported by De Feyter and Winsler) was $d = .36$

The Miami School Readiness Project compared social and emotional protective factors and behavior concerns against cognitive and language skills with the Learning Accomplishment Profile-Diagnostic (LAP-D; Nehring, Nehring, Bruni, & Randolph, 1992), as well as a number of demographic factors, including generation (measured by which extended family members first immigrated to the United States), country of origin, region of origin (including South America, Central America, Cuba, and (non-Cuba) Caribbean Islands), and ethnicity (De Feyter & Winsler, 2009a). Other constructs measured included community deprivation/neighborhood disadvantage (Bor, 2007), special education status, cognitive outcomes (Crane, 2009), attention persistence, and competence motivation (Fuccillo, 2008).

A major iteration of the Miami School Readiness data set that has strong implications for the utilization of the DECA in early childhood program was published by Winsler and colleagues (2008). The study compared scores from the LAP-D to DECA teacher and parent ratings across samples of children attending center-based childcare ($n=1478$), children attending Title 1 public

school pre-k programs (n=1611), and children attending fee-supported public school pre-k programs (n=749). All three programs yielded significant gains in Total Protective Factors from Time 1 to Time 2 with *F*-ratios ranging from 16.65 to 88.25 ($p < .001$), and small to moderate effect sizes (*d of* .22 to .40) for both teachers and parents. Behavior concern scores remained largely the same for teachers and parents for all three programs, showing no significant changes and very small effect sizes (*d of* 0.00 to 0.09). LAP-D scores also increased significantly across all dimensions, which supports the utility of the DECA in the above-mentioned programs. These data suggest that social and emotional strengths are equally important in determining school readiness for economically disadvantaged, immigrant children to cognitive, language, and fine motor abilities.

Later findings from researchers using the same data set or subsets from the large Miami data set (most were in unpublished masters' theses or doctoral dissertations) included the following:

- Neighborhood risk correlates negatively with positive social and emotional outcomes on the DECA ($r = -.11$; $p = .01$) (Bor, 2007)
- Children entering special education programs before kindergarten achieve better social and emotional outcomes over time than children who enter after the first grade (Crane, 2009)
- Attachment (AT) marginally predicts school readiness as mediated by attention persistence ($p < .10$) (Fuccillo, 2008)
- Closeness with adults (as measured by AT) is significantly ($\beta = .10$; $p < .01$) related to English proficiency (Kim, 2008)

- Persistence predicts language and literacy outcomes more effectively than the DECA Initiative Scale (IN) ($B = .718$; $p < .05$ vs. $B = -.672$; NS) (Maier, 2008)
- Emergent bilingual girls have better social skills than their male counterparts ($F [2, 1254] = 8.86$, $p < .05$) (Richard, 2007)

The data reported from the Miami School Readiness Project hold weight with a culturally and linguistically diverse population, but replications are required to more definitively confirm the assertions made by the various investigators. The same is necessary to assert the various findings using the DECA with children in Head Start.

Reviews and Critiques of the DECA

The purpose of this section is to present a summary of the reviews and critiques of the purpose, development, constructs, and features of the DECA within the last decade. The review of psychometric properties of the DECA was covered in a previous section titled “Psychometrics” and therefore will not be discussed here. DECA users and critics have expressed both satisfaction and dissatisfaction with the DECA assessment and both viewpoints will be covered in the following “Strengths” and “Concerns” subsections. It is important to note that most of the reviews and studies were published before 2009. Two new Devereux assessments (the DECA-I/T and the DESSA) have been published since that time and have addressed some of the concerns and needs of DECA users. The DCRC strives to incorporate constructive feedback from users and experts in the field as part of a continuing process of quality improvement.

Strengths

Compared to other assessments that measure social-emotional competency in children, the DECA’s positive and strength-based approach sets the assessment apart from its peers (Plake

et al., 2003). LeBuffe and Shapiro (2008) identified “the continued reliance on deficit or pathology-oriented assessments” as a barrier to parent-professional collaboration and an impediment to children’s mental health. The DECA uniquely concentrates on the positive, adaptive characteristics of young children by eliciting parents and educators’ perspective on children’s strengths. The DECA is a tool to help parents and teachers engage in dialogue and develop a collaborative plan to support the child. As a result, this assessment has been praised for being “innovative” and “holistic” (Plake et al. 2003; Reddy, 2007). The DECA authors have been recognized for making “a significant contribution by developing the first standardized, norm-referenced, strength-based assessment approach for protective and risk factors for preschoolers” (Reddy, 2007).

The DECA has been lauded by researchers, users and reviewers for its level of user friendliness (Birkby, 2005; Denham & Burton, 2003; Plake et al., 2003; Reddy, 2007; Squires, 2000). Compared with other assessments of social-emotional competency, the DECA has fewer items, is easy to read and includes a well written user’s guide that clearly explains the purpose, administration, scoring and multi-level interpretation of the assessment (Hirsh-Pasek et al., 2005; Reddy, 2007). Reviewers have been impressed with the thoughtful details of the scoring forms. For example, the original items appear on the scoring sheet for easy reference (Reddy, 2007). *The Fifteenth Mental Measurements Year Book* concluded that “The DECA is quick and reliable for early childhood practitioners to use and requires minimal training to administer and score” (Plake et al. 2003).

The DECA has been evaluated positively for its representation of research in social-emotional competency of young children (Bridges et al, 2004; Campbell, 2002; Denham & Burton, 2003; Denham, 2005; Denham et al., 2009; Hirsh-Pasek et al., 2005; Kochanoff et al.,

2003; Plake et al., 2003; Rosas et al 2006). Each DECA subscale maps onto identified aspects and domains of social-emotional development. The AT subscale measures the domains of attachment, social competence (Denham, 2005; Denham et al., 2009), emotional expressiveness and prosocial behavior with peers and adults (Hirsh-Pasek et al., 2005). The SC subscale reflects the domains of emotional or behavioral control (Plake et al., 2003), emotional competence (Denham et al., 2009) and emotion regulation (Hirsh-Pasek et al., 2005). The IN subscale draws from the domains of self-directed behavior (Plake et al., 2003) and self perceived competence (Denham et al. 2009). Behavioral Concerns is also an essential domain of social-emotional assessment addressed through the DECA BC scale. The Temple University Forum on Preschool Assessment recognized that “any consideration of the social and emotional competence needs to also consider the assessment of early behavior problems” (Campbell, 2002 as quoted from Kochanoff et al., 2003).

The DECA can serve a number of assessment purposes. The DECA can inform the school readiness of children, support children’s learning by informing instructional planning, monitor trends to evaluate progress, provide outcome data for school accountability, identify at-risk children at an early age, and provide individual profiles and anecdotal records (Hirsh-Pasek et al., 2005; Kochanoff et al., 2003; Steward-Brown & Edmunds, 2007). The DECA allows for multiple informants to use the assessment in different contexts. Comparing different perspectives on the same child becomes a foundation for collaboration between parents/caregivers and teachers (Hirsh-Pasek et al., 2005; LeBuffe & Shapiro, 2008; Rosas et al., 2006) In addition, the DECA fits well with the three tiered Positive Behavioral Support model (McLaren et al., 2009). It has been recommended as the best tool for early care and education, early childhood research,

and assessing emotional intelligence in preschool settings in the U.S., Canada and England (Birkby, 2005; Reddy, 2007; Stainback-Tracy, 2004; Stewart-Brown & Edmunds, 2007).

Concerns

The Fifteenth Mental Measurements Yearbook has identified weaknesses in the development of the DECA. The DECA has been criticized for neglecting to provide an overall model of the causal relationship between protective factors, behavioral concerns and children's adjustment. (Plake et al., 2003).

The following suggestions for improvement in user friendliness have been voiced by users and reviewers. Reddy (2007) has indicated that it would be helpful for the DECA to have a computer software scoring program in addition to the eDECA online program (Reddy, 2007). It has been noted that teachers find some of the items difficult to rate (Reddy, 2007). Educators and researchers have identified the need for a continuum of measurements that span a wider age range beyond preschool (Denham et al., 2009; Stewart-Brown & Edmunds, 2007; Stainback-Tracy, 2004). It should be noted that the Devereux Center for Resilient Children has since then expanded its strength-based assessments to infants and toddlers and school-age children to address this concern.

The names and definitions of the subscales have been questioned and criticized. Bridges et al. (2004) asserted that "Total Protective Factors" does not match its use in the developmental literature. Current research suggests that total protective factors include within child, family and environmental protective factors. The DECA only measures the social-emotional competency of children. Bridges et al. also point out that the AT subscale does not capture the security of attachment as defined in the literature. Attachment is usually assessed through the observation of the interaction between children and parent or caregiver. The DECA scale may be better named

as a measure of social responsiveness and sociability. There are criticisms for the scope of the Behavioral Concern Screener. Researchers have pointed out that the Behavioral Concerns Screener is not designed to be used alone to diagnose specific emotional problems (Bridges et al., 2004; Carter et al., 2004).

The DECA does not assess some social-emotional domains that have been identified as important to the adjustment and outcome of children. Temperament, personality (Denham et al., 2009; Kochanoff et al., 2003), knowledge about emotions (Hirsh-Pasek et al., 2005), persistence (Maier, 2008), regulatory skills such as attention control, listening skills, following directions, learning rules, and planning (Kochanoff et al., 2003) as well as prosocial behavior such as perspective taking and dramatic play (Kochanoff et al., 2003) are shown to have predictive validity for academic achievement and well-being of children. These domains are not within the scope of the DECA.

As mentioned earlier in the section of this document on psychometrics, research has suggested that there are rating differences between different informants and that there are age and gender trends for children. It has been suggested that the lower scores from parents indicates that the DECA is better used as a school-based tool (Plake et al., 2005; Rosa et al., 2006). Rosas et al.'s 2006 study showed that compared to parents, more teachers rated children in the typical range. In addition, parents' ratings of behavioral concerns are higher than teachers'; Rosas et al. suggested that parent BC ratings should be interpreted with caution. In regards to age trends, Rosas et al.'s study showed that children who were 4 and 5 years of age, compared to younger children, were rated as having lower attachment, higher initiative and lower behavioral concerns by both parents and teachers. Maier's 2008 study showed that initiative was predictive of literacy and language only in older preschool students. The DECA has been criticized for lacking gender

norms because teachers have consistently rated girls as having more protective factors and lower behavioral concerns than boys (Reddy, 2007; Rosas et al., 2006).

The DECA can be used for the majority of preschool assessment needs. However, it does not identify learning difficulties (Hirsh-Pasek, 2005) or determine eligibility for special education (Kochanoff et al. 2003; Plake et al., 2005). It also does not provide specific diagnoses to aid interventions (Hirsh-Pasek, 2005).

It has been frequently posited that the DECA lacks evidence for cultural competency and application for specific populations. Reddy (2007) recommended the use of more rigorous method for assessing item bias. The assessment does not take into account language differences, English Language Learner status, and cultural and contextual differences (Hirsh-Pasek, 2005; Squires, 2000).

Discussion

Since the DECA was published in 1999, it has grown to be a widely used and well known tool in realm of early childhood. Research studies and reviews have both supported and critiqued the DECA as a tool to be used with young children ages two to five. As a strengths-based tool grounded in resilience literature, the DECA was not only the first tool of its kind, but it maintains a unique identity through its focus on giving children the skills to bounce back when faced with stress and adversity. As the importance of strengths-based approaches and resilience grows in the field of children's services, the DECA will need continued support for its use over other approaches for working with young children.

The DECA is a psychometrically strong tool and has been generally praised as such by reviewers. The DECA was developed through a thorough review of resilience literature as well as through focus groups with parents and teachers and has been praised for its representation of

research in social-emotional competency of young children. It was standardized and normed on a large, nationally representative sample. It has strong reliability and validity data and independent studies have confirmed its reliability and factor structure. Research studies using the DECA provide evidence of its concurrent and predictive validity. No studies have been done looking at the convergent or divergent validity of the DECA because during development it was the first assessment of its kind. While further research in this area is needed, researchers are cautioned when comparing the DECA to current measures with “strength-based” and “competence” sections due the DECA’s unique grounding in resilience literature. Further research replicating the test-retest reliability of the DECA is also needed.

The DECA has separate norms for teacher and parent raters, but does not provide separate norms based on age or gender. These aspects of the assessment have been questioned. No age norms exist for the DECA, because the authors found no age trends within the standardization sample. However, more recent studies have found mixed results regarding age trends. In addition, gender differences are consistently found in DECA scores (Richard, 2007; Richardson et al., 2008; Chaiken & Chase, 2006). While an argument is suggested to underlie the lack of gender norms for the DECA, repeated criticism of this aspect of the tool indicates a need for further explanation related to this decision on the part of the authors. In addition, gender differences were not found in the relationship between DECA and math achievement (Dobbs et al., 2006), but further research studying the role of gender as a moderator of the relationship between social and emotional competencies and specific outcomes would further inform the decision not to provide gender norms.

Regarding parent and teacher norms, some studies have shown parent scores that are harsher than teacher scores (Rosas, Chaiken & Chase, 2006; Stark Mental Health and Recovery

Services Board, 2008; Devereux Data Mining, 2010). These findings do not align with those of the standardization sample. Research also suggests that level of cognitive functioning moderates the relationship between parent and teacher ratings with greater differences shown for children with lower cognitive abilities (Crane et al., 2008). Parents and Teachers also tend to agree more on ratings of protective factors than on behavioral concerns (Rosas et al., 2006). Comparing scores between parents and teachers and eliciting ratings from multiple perspectives and settings is praised as an important asset of the DECA (Hirsh-Pasek et al., 2005; LeBuffe and Shapiro, 2008; Rosas et al., 2006). This practice promotes collaboration and comparative discussion between parents and teachers. In addition, similar parent and teacher ratings may indicate strengths that span different settings and indicate core competencies (Rosas et al. 2007). Identifying similar parent and teacher observations provides opportunities for unified intervention across settings and collaborative care-giving strategy development. However comparing discordant ratings may also put parents and teachers at risk for disagreement making collaboration more difficult. To best promote parent-teacher collaboration the *DECA Users Guide* (LeBuffe & Naglieri, 1999a) recommends discussing protective factors before behavioral concerns and avoiding using emotionally charged words such as “inadequate” and “poor” when describing results to parents. A further look at cultural sensitivity and implications for DECA scores may elucidate studies that showed parent and teacher differences. These studies will additionally provide evidence for the use of the DECA for application with specific populations.

The DECA is also praised for being extremely user-friendly and for serving many desired purposes for assessments within the domain of early childhood. However, the DECA does not identify learning difficulties (Hirsh-Pasek, 2005) or determine eligibility for special education (Kochanoff et al. 2003; Plake et al., 2005). Further studies looking at specific populations such

as children with special needs and children with learning disabilities will provide additional insight into how the DECA may best be used. Offering a computerized scoring assistant, adjusting a few criticized items and continuing to develop and enhance the DCRC continuum of social and emotional assessments for children of all ages might further boost the utility of the DECA. In addition, criticism of subscale names and construct definitions may suggest a need for a more recent evaluation of child development, social and emotional and resilience literature and refinement of the constructs and items in future revisions of the assessment. It may also suggest that use of the DECA with other assessment tools may provide the most comprehensive picture of the child.

The DECA is also a sound research tool. In research the DECA is most frequently used for program evaluation, but it is also used to measure the relationship of social and emotional competency to various other early childhood mental health and development constructs. Studies within Head Start reinforce the inverse relationship between TPF and BC and have also illustrated the relationship of social and emotional competencies to academic skills in young children. These findings reinforce the importance of social and emotional assessment and social emotional competencies in children.

The Miami School Readiness Project, a university and community collaboration provided data for a number of analyses that looked at a wide range of comparisons. Among numerous findings, studies from this data collection suggest differences in social and emotional competencies depending on immigrant generation status (De Feyter & Winsler 2009b). Further research looking at the DECA and immigrant status could provide insight into this population and its assessment with the DECA.

In addition, studies have shown that persistence predicts academic outcomes more effectively than the DECA IN scale (Maier, 2008). This reiterates that the constructs of the DECA may need to be refined if the DECA is intended to identify school readiness. The AT scale was shown to be significantly related to English proficiency (Kim, 2008). While this finding may show that better attachment with a teacher predicts better learning of English, it may also suggest that items on the attachment scale are more accurately measuring a child's ability to interact in English and with a teacher who speaks English than a child's attachment to the teacher.

Further research using the DECA as either an outcome measure or predictive measure may help the field of early childhood delve further into the concept of social emotional learning, risk and resilience. If we develop a greater understanding of the effects of social and emotional learning on young children, we can better learn how to build necessary skills for school and life success in all children and the adults who care for them.

The Devereux Early Childhood Assessment Clinical Form

The Devereux Early Childhood Assessment Clinical Form (DECA-C) is a standardized, norm-referenced behavior rating scale which measures protective factors and behavior concerns in preschool children ages 2 through 5 (LeBuffe & Naglieri, 2003). The DECA-C is intended for children in the "Expanded" range of intervention (versus "Universal" or "Targeted"), but like the DECA measures initiative (IN), attachment (AT), and self-control (SC), and also yields a Total Protective Factors (TPF) score. The assessment also includes four Behavior Concerns Scales: Attention Problems, Aggression, Emotional Control Problems, and Withdrawal/Depression. The composite of these four scales is called the Total Behavior Concerns Scale. The DECA-C also includes four Increased Concern Items, which assess unusual and "very troubling" behaviors

such as fire setting, self-harm, low self-esteem, and violence toward animals. The items for emotional and behavior concerns were taken from the Devereux Scales of Mental Disorders (DSMD; Naglieri, Lebuffe & Pfeiffer, 1994) a standardized, norm referenced rating scale that was developed to aid in the identification of individuals who evidence behaviors associated with psychopathology.

Like the DECA, the DECA-C produces a profile that displays a child's strengths and concerns. It also assesses severity of behavioral problems, by identifying children with severe social and emotional difficulties, and as such may be appropriate in recommending these children for special services. It is a useful tool in meeting Program Performance Standards (45 CFR 1301 et. seq.), as well as meeting IDEA standards (PL 105-17). The DECA-C may also be used as a tool for research in child outcomes and cross-rater (parents vs. teachers) analysis.

Standardization

Original strengths-based items on the DECA-C were developed after thorough research of relevant resilience literature, as well as focus groups with parents and teachers, in which participants were asked what children look like when they are "doing well." Items related to emotional and behavior disorders were taken from the Devereux Scales of Mental Disorders (DSMD; Naglieri, LeBuffe, & Pfeiffer, 1994). The national standardization consisted of two samples of children ages 2 years 0 months to 5 years 11 months 30 days. The norms on the Protective Factors Scales were based on 2,000 children, and the norms on the Behavior Concerns Scales were based on 1,108 children. The samples were collected during the fall of 1997 and the spring of 1998.

Psychometrics

Internal reliability (alpha) coefficients were good for both TPF and TBC across teachers and parents, median values ranging from .88 to .94. Individual subscales ranged from .66 to .93 for teachers and parents. Test-retest reliability (two DECA-C ratings by the same parent or teacher) scores ranged from .55 (AT for parents) to .94 (TPF for teachers). Median interrater reliability coefficients for different teachers ranged from .32 (Withdrawal/depression) to .77 (Self-control).

As the DECA and DECA-C are the first norm-referenced, standardized assessments that address within-child protective factors, it was impossible to draw conclusions related to content validity. To establish criterion validity, norms were contrasted against minority status, as well as predicted membership within “identified” and “community” sample groups (TPF > or < 40, TBC > or < 60).

For construct validity, the DECA-C was shown to measure diverse social and emotional functioning in children, which was related to commonly occurring disorders. In a study conducted by the authors (see LeBuffe & Naglieri, 1999a), the protective factor scales on the DECA-C were shown to have an inverse relationship with behavioral concerns, suggesting that the assessment is a valid measure of resilience as a construct. To assess the construct validity of the Withdrawal/Depression, Emotional Control Problems, Attention Problems, and Aggression scales, a small clinical sample was drawn to compare scores on these scales to children with diagnoses that might logically correspond. Results show that children diagnosed with psychiatric disorders (e.g. ADHD, ODD, and Depression) tend to also score in the Concern range for corresponding scales on the DECA-C, suggesting good construct validity overall for the Behavior Concerns Scales.

The DECA-C in Research

There has been little independent research on the DECA-C to this point. As there are not enough reviews, critiques, research articles, dissertations and theses that discuss different aspects of the DECA-C in depth, comments listed are merely divided into what the assessment does well, and areas of improvement that have been brought to light.

Strengths of the DECA-C

The greatest asset of the DECA-C is its commitment to strengths within clinical populations (see LeBuffe & Naglieri, 2003; Naglieri & LeBuffe, 2005; Sherwood, D., Bleecker, T., Durr, R., & Lipton, A. 2008). There exists a long line of behavioral rating scales that report behavior problems for children in the clinical range, but the DECA-C claims to be the first that addresses social and emotional strengths as well. It has been touted as the only clinical behavioral assessment that measures attachment in children, and provides an easy guide to intervention using the strengths model (Caselman & Self, 2008). It has been preferred over other assessments because of its shorter length, and more stringent standardization than other measures (Loew, 2005). In empirical studies, the DECA-C has been shown to reflect positive outcomes in early childhood pilot programs (see Munroe-Meyer Institute, 2008), and TPF scores have been shown to negatively correlate with TBC scores, which speaks to the validity of the DECA-C as both a measure of social and emotional strengths as well as a measure of behavioral concerns (Newton, 2007).

Concerns with the DECA-C

The DECA-C has not been utilized much in the research arena, which makes it difficult to highlight where it needs improvement. Research and reviews that have been produced provides some preliminary concerns with the DECA-C. For example, Ballard (2005) has argued that the DECA-C differs only from the DECA in that it has more pathology-based items and that

only half of the DECA standardization sample was administered the Clinical Form, and Birkby (2005) states frustration with no existing electronic scoring or administration. Critics reviewing DECA-C reliability say parent raters don't meet the standard of .80 on some subscales, which could be addressed in future standardization samples. In addition, DECA-C authors claim that the DECA-C can produce guidelines for detecting significant differences between pre- and post-intervention test scores, although test-retest reliability only supports an administration window of 72 hours, which would be an issue for any intervention lasting longer than this window (Caselman & Self, 2008; Ballard, 2005). Concerning validity, Loew (2005) has claimed the lack of validity studies to be a weakness. Research is also needed to assess the validity of TPF and TBC scales across different demographic groups (Newton, 2007).

Discussion of the DECA-C

While the DECA-C is generally a solid tool, psychometrically, its reliability and validity could be strengthened with a larger standardization sample and further research studies. The strength based items on the DECA-C are the same as the DECA items and therefore demonstrate the same content validity. The items for emotional and behavior disorders were taken from the Devereux Scales of Mental Disorders (DSMD; Naglieri, Lebuffe & Pfeiffer, 1994). The reliability and validity data of the assessment are generally sound, however, parent reliability does not meet acceptable standards on some subscales Caselman & Self, 2008, and it has been criticized that standardization was done for the DECA and DECA-C simultaneously by administering the DECA-C to half of the DECA standardization sample Ballard (2005). This was done to insure that the DECA norms did not change due to accompanying behavioral concern items on the DECA-C, but means that the DECA-C protective factor norms are based on 2,000 children, while the behavioral concern scale norms are based on only 1,108. Because this

number combines both parents and teachers these numbers do not meet the Bracken criteria for normative samples. It would be advised for future revisions for a larger sample to be acquired for the DECA-C standardization.

While the DECA-C is a strong assessment tool, and was created due to an indicated need in the early childhood field, it has not been given the same attention as the DECA and is therefore not as widely known or used. This may be because the DECA-C is a longer form than the DECA, requires more training to be used, is not available in languages other than English, and does not have any form of electronic or online scoring. In addition, the publisher of the DECA and DECA-C is not recognized as a publisher of clinical assessment tools, and therefore may have been more successful at marketing the non-clinical DECA. In general more research using the DECA-C is necessary to further assess its validity and to better support its use with diverse populations of young children.

Table 1

Independent psychometric studies compared to standardization sample

	LeBuffe and Naglieri (1999a)		Crane et al. (2008)		Jaberg et al. (2009)		Lien and Carlson (2009)
	Parent	Teacher	Parent	Teacher	Parent	Teacher	Parent
	Internal consistency (α)						
IN	.86	.90	.85	.90	.81	.92	.84
AT	.76	.85	.83	.90	.85	.92	.86
SC	.91	.94	.77	.82	.78	.83	.76
TPF	.84	.90	.92	.94	.91	.95	.91
BC	.71	.80	.72	.81	.71	.83	.71
	Standard Error of Measurement (SEM)						
IN	3.74	3.21	-	-	-	-	4.07
AT	4.91	3.87	-	-	-	-	3.87
SC	2.97	2.39	-	-	-	-	4.84
TPF	4.03	3.15	-	-	-	-	2.98
BC	5.40	4.46	-	-	-	-	5.43
	Parent-Teacher Interrater Reliability (r)						
IN	.34		.24		.31		-
AT	.23		.28		.37		-
SC	.19		.20		.20		-

TPF	.29	.27	.37	-
BC	.23	.26	.38	-

Note. Dashes indicate that the values were not calculated for the respective study.

Table 2

Evidence for concurrent validity: Correlations (r)

Study and measures	IN	AT	SC	TPF	BC
Bor (2007)					
Neighborhood Risk	-	-	-	-.11**	.12**
Public schools	-	-	-	-.19**	.21**
Community -based programs	-	-	-	.01	-.01
Brinkman et al. (2007) ^a					
DECA BC scale	-	-	-	-.39***, -.34***	-
Dobbs et al. (2006)					
Math Ability	.57***	.33*	.33*	-	-.42**
Total Problems	-.25**	-.23*	-.54***	-	.62***
Internalizing	-.13	-.08	-.20*	-	.34***
Externalizing	-.09	-.22*	-.60***	-	.60***
Withdrawal	-.33**	-.29**	-.17	-	.28**
Somatization	.07	.07	-.10	-	.18
Anxiety-Depression	-.06	-.01	-.21*	-	.33**
Social Problems	-.26**	-.15	-.40***	-	.50***
Thought Problems	-.27**	-.18	-.22*	-	.25**
Attention Problems	-.46***	-.28**	-.48***	-	.57***
Delinquency	-.06	-.20	-.41***	-	.42***

Aggression	-0.09	-.23*	-.61***	-	.61***
Escalon and Greenfield (2009)					
Learning Behaviors	-	-	-	-	-.41**
Language/literacy	-	-	-	-	-.13
Mathematics	-	-	-	-	-.09
Fiore (2009)					
Parent stress	-	-.30	-	-.42*	-
Child stress	-	-.30	-	-.31	-

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. Dashes indicate that the values were not calculated for the respective study.

^aStudy data were collected from two preschool classes, 2004-2005 and 2005-2006; the correlation from the 2004-2005 class is listed first.

Table 3

Evidence for concurrent validity: d-ratios

SE classification	LeBuffe & Naglieri (1999a)				
	IN	AT	SC	TPF	BC
Emotional or behavioral disorder	-0.78	-0.47	-1.01	-0.89	1.08
SE classification	Crane (2009) ^a				
	IN	AT	SC	TPF	BC
Developmental delay					
Teacher rating	-1.42, -1.96	-0.64, -0.84	-1.19, -0.87	-	1.23, 1.48
Parent rating	-1.31, 0.05	-0.69, -1.17	-0.79, -1.08	-	0.76, 0.61
Autism					
Teacher rating	-2.20, -2.75	-1.10, -1.27	-1.39, -1.08	-	2.73, 1.67
Parent rating	-2.17, -0.63	-1.04, -1.28	-1.55, -1.44	-	0.60, 1.13
Specific learning disability					
Teacher rating	-0.78, -0.91	-0.21, -0.38	-0.50, -0.45	-	0.73, 0.75
Parent rating	-0.85, 0.56	-0.14, -0.39	-0.20, -0.53	-	0.39, 0.35
Speech impaired					
Teacher rating	0.30, -0.02	0.24, -0.33	0.16, -0.08	-	0.13, 0.15
Parent rating	-0.27, 1.23	0.09, -0.03	0.08, -0.14	-	-0.23, -0.52
Emotionally disturbed					

Teacher rating	-1.22, -1.35	-2.01, -1.26	-1.06, -1.70	-	1.92, 2.03
Parent rating	-0.86, 0.64	-0.82, -1.22	-0.77, -1.26	-	0.89, 0.95
Sheridan et al. (2010) ^b					
	IN	AT	SC	TPF	BC
Getting Ready intervention	0.56	0.75	0.07	-	0.08

Note. Absolute value of $d \geq 0.20$ and < 0.50 is considered a small effect size; $|d| \geq 0.50$ and < 0.80 is considered medium; $|d| \geq 0.80$ is considered large (Cohen, 1988). Dashes indicate that the values were not calculated for the respective study.

^aEffect sizes indicate the effect of the given special education classification compared to no diagnosis. Study data were collected in the fall and spring of a school year; effect sizes from the fall are listed first.

^bEffect sizes indicate the effect of the Getting Ready intervention, calculated at post-test compared to pre-test.

Table 4

Evidence for predictive validity: Correlations (r)

Study and measures	IN	AT	SC	TPF	BC
Escalon and Greenfield (2009)					
Language/literacy	-	-	-	-	-.19**
Mathematics	-	-	-	-	-.19**
Fuccillo (2008)					
Competence Motivation	-	.13	-	-	-
Attention/ Persistence	-	.35***	-	-	-
Combined School Readiness score	-	.18	-	-	-
LeBuffe et al. (2009)					
Behavior concerns	-	-	-	-.64***	-

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. Dashes indicate that the values were not calculated for the respective study.

Table 5

Evidence for predictive validity: d-ratios

SE classification	IN	Crane (2009)			
		AT	SC	TPF	BC
Continued SE vs. Exited	1.03	0.73	0.82	-	-1.06
Change in disability category vs. No change	-0.03	-0.04	0.32	-	-0.45

Note. Dashes indicate that the values were not calculated for the respective study.

Table 6

Effect sizes (Cohen's d) for parent-rated versus teacher-rated raw scores

Study	IN	AT	SC	TPF	BC
Crane (2009) ^a	0.44, 0.22	0.58, 0.37	0.12, -0.09	-	0.09, 0.26
Jaberg et al. (2009)	0.81	1.12	0.11	0.75	0.13
Data mining (2010)	0.52	0.73	-0.12	0.43	0.58

Note. Effect sizes indicate the effect of parent ratings compared to teachers (i.e., calculated as parent ratings minus teacher ratings). Dashes indicate that the values were not calculated for the respective study.

^aStudy data were collected in the fall and spring of a school year; effect sizes from the fall are listed first.

References

- Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological bulletin*, *101*, 213-232.
- Amendments to the Individuals with Disabilities Education Act. (1997). PL 105-17.
- Ballard, J. C. (2005). Devereux Early Childhood Assessment – Clinical Form. In R.A. Spies & B.S. Plake (Eds.), *Mental Measurements Yearbook*, *16th ed.* (pp. 300-302). Nebraska: Buros Institute of Mental Measurements of the University of Nebraska-Lincoln.
- Birkby, B. W. (2005). *Early Childhood Mental Health Program (ECMH): Evaluation report FY 2005*. Retrieved March 8, 2010, from <http://mhmr.ky.gov/mhsas/files/ECMHY3%20Evaluation.pdf>
- Braken, B. A, Keith L. K., & Walker, K.C. (1998). Assessment of preschool behavior and social-emotional functioning: A review of thirteen third-party instruments. *Journal of Psychoeducational Assessment*, *16*, 153-169.
- Bridges, L. J., Berry, D. J., Johnson, R., Calkins, J., Margie, N. G. et al. (2004). Early childhood measures profiles. Washington, DC: Child Trends.
- Brinkman, T. M., Wigent, C. A., Tomac, R. A., Pham, A. V., & Carlson, J. S. (2007). Using the Devereux Early Childhood Assessment to identify behavioral risk and protective factors within a Head Start population. *Canadian Journal of School Psychology*, *22*(2), 136-151.
- Bor, E. (2007). Neighborhood quality, childcare quality, & children's early developmental outcomes. Unpublished thesis, George Mason University.

- Buhs, E. S. (2003). Devereux Early Childhood Assessment. In B. S. Plake, J. C. Impara, & R. A. Spies (Eds.), *The Fifteenth Mental Measurements Yearbook*. Lincoln, NE: Buros Institute of Mental Measurements.
- Caselman, T. D., & Self, P. A. (2008). Assessment instruments for measuring young children's social-emotional behavioral development. *Children and Schools*, 30(2), 103-115.
- Carter, A. S., Briggs-Gowan, M. J., & Davis, N. O. (2004). Assessment of young children's social-emotional development and psychopathology: recent advances and recommendations for practice. *Journal of Child Psychology and Psychiatry*, 45(1), 109-134.
- Chittooran, M. M. (2003). Devereux Early Childhood Assessment. In B. S. Plake, J. C. Impara, & R. A. Spies (Eds.), *The Fifteenth Mental Measurements Yearbook*. Lincoln, NE: Buros Institute of Mental Measurements.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). San Diego, CA: Academic Press.
- Crane, J. (2009). Preschool children with special educational needs: Achievement, retention, & classification through second grade. Unpublished doctoral dissertation, George Mason University.
- Crane, J., Winsler, A., & Mincic, M. (2008). *Assessing the social-emotional protective factors of ethnically diverse preschoolers in poverty: Parent-teacher agreement on the Devereux Early Childhood Assessment (DECA)*. Unpublished manuscript, George Mason University, Fairfax, VA.
- De Feyter, J. J., & Winsler, A. (2009a). Disentangling nativity status, race/ethnicity, & country

- of origin in predicting the school readiness of young immigrant children. In E. L. Grigorenko & R. Takanishi (Eds.), *Immigration, Diversity, & Education* (pp. 48-66). New York: Routledge.
- De Feyter, J. J. & Winsler, A. (2009b). The early developmental competencies and school readiness of low-income, immigrant children: Influences of generation, race/ethnicity, & national origins. *Early Childhood Research Quarterly*, 24, 411-431.
- Denham, S.A. (2005). Assessing social-emotional development in children from a longitudinal perspective for the National Children's Study: Social-emotional compendium of measures. Retrieved March 8, 2010, from <http://www.nationalchildrensstudy.gov/research/reviewsreports/Pages/Assessing-Social-Emotional-Development-in-Children-From-a-Longitudinal-Perspective-for-the-National-Children-s-Study.pdf>
- Denham, S. A., Wyatt, T. M., Bassett, H. H., Echeverria, D., & Knox, S. S. (2009). Assessing social-emotional development in children from a longitudinal perspective. *Journal of Epidemiology and Community Health*, 63(11), 137-152.
- Dobbs, J., Doctoroff, G. L., Fisher, P. H. & Arnold, D. H. (2006). The association between preschool children's socio-emotional functioning and their mathematical skills. *Applied Developmental Psychology*, 27, 97-108.
- Escalon, X. D., & Greenfield, D. (2009). Learning behaviors mediating the effects of behavior problems on academic outcomes. *NHSA Dialog: A Research-to-Practice Journal for the Early Intervention Field*, 12(1), 1-17.
- Escalon, X. D., Shearer, R. B., Greenfield, D., & Manrique, S. (2009). Promoting classroom

- learning for Head Start children: The importance of identifying early behavior problems and fostering adaptive learning behaviors. *NHSA Dialog: A Research-to-Practice Journal for the Early Intervention Field*, 12(1), 45-50.
- Fiore, Megan M. (2009). Multi-stressed parents with young children: The influence of crises, stress and protective factors on the parent-child relationship. Unpublished doctoral dissertation, James Madison University.
- Friesen, B. J., Ostrogorsky, T., Saifer, S. & Gordon, L. J. (2003) Project SUCCEED in Head Start: A training curriculum addressing the mental health needs of young children. 2003 *Building on Family Strengths Conference Proceedings*. Portland, OR, (pp. 109-114). Retrieved on February 18, 2010, from <http://www.rtc.pdx.edu/PDF/cp03.pdf>
- Fuccillo, J. (2008). Specific learning behaviors as mediators of the association between teacher-child attachment and school readiness. Unpublished thesis, University of Miami.
- Goelman, H. (2008). Three complementary community-based approaches to the early identification of young children at risk for developmental delays/disorders. *Infants & Young Children*, 21(4), 306-323.
- Heaviside, S., Farris, E., & Carpenter, J. (1993). *Public school kindergarten teachers' views on children's readiness for school*. Washington, DC: National Center for Education Studies.
- Hirsh-Pasek, K., Kochanoff, A., Newcombe, N. S., & de Villiers, J. (2005). Using scientific knowledge to inform preschool assessment: making the case for "empirical validity." *Social Policy Report*, 19(1).
- Horm, D. M., Goble, C. B., Boatright, M., Decker, C. G., Noble, N., & Norris, D. J. (2009).

- Oklahoma's pilot early childhood program birth through three years: Description, evaluation, & policy implications. *NHSA Dialog: A Research-to-Practice Journal for the Early Intervention Field*, 12(4), 360-373.
- Jaberg, P. E, Dixon, D. J., & Weis, G. M. (2009) Replication evidence in support of the psychometric properties of the Devereux Early Childhood Assessment. *Canadian Journal of School Psychology*, 24(2), 158-166.
- Kim, Y. (2008). Low-income Latino preschooler's learning of English as a function of child first language proficiency, closeness with adults, & teacher dominant language. Unpublished thesis, George Mason University.
- Kochanoff, A. T., Hirsh-Pasek, K., Newcombe, N. & Weinraub, M. (2003). Using science to inform preschool assessment: A summary report of the Temple University Forum on Preschool Assessment. Temple University's Department of Psychology.
- Lamb-Parker, F., LeBuffe, P. A., Powell, G., & Halpern, E. (2008). A strength-based, systemic mental health approach to support children's social and emotional development. *Infants and Young Children*, 21(1), 45-55.
- LeBuffe, P. A. (1998). The measurement of within-child protective factors in preschool children. *A System of Care for Children's Mental Health: Expanding the Research Base*. 197-200.
- LeBuffe, P. A. (2002). Can we foster resilience? An evaluation of a prevention program for preschoolers. *A System of Care for Children's Mental Health: Expanding the Research Base: Proceedings of the 15th Annual Conference*. Tampa, FL, (pp. 197-200) Retrieved January 4, 2008 from http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/1b/26/c8.pdf

- LeBuffe, P. A., Hughes, C., & Sperry, R. (2009). *The validity of protective factors for predicting behavioral concerns of preschoolers across the school year*. Unpublished manuscript, Devereux Center for Resilient Children, Villanova, PA.
- LeBuffe, P. A., & Naglieri, J. A. (1999a). *Devereux early childhood assessment technical manual*. Lewisville, NC: Kaplan Early Learning Company Publishing.
- LeBuffe, P. A., & Naglieri, J. A. (1999b). *Devereux early childhood assessment user's guide*. Lewisville, NC: Kaplan Early Learning Company Publishing.
- LeBuffe, P. A., & Naglieri, J. A. (2003). *The devereux early childhood assessment clinical form (DECA-C)*. Lewisville, NC: Kaplan Early Learning Company Publishing.
- Lien, M. T. (2007). *The validity of the Devereux Early Childhood Assessment within head start sample*. Unpublished doctoral dissertation, Michigan State University.
- Lien, M. T. & Carlson, J. S. (2009). Psychometric properties of the Devereux Early Childhood Assessment in a Head Start sample. *Journal of Psychoeducational Assessment*, 27(5), 386-396.
- Limpens, M. (2008). *Early childhood consultation and prevention*. Retrieved January 11, 2010 from <http://www.morrisonkids.org/>
- Loew, S. A. (2005). Devereux Early Childhood Assessment – Clinical Form. In R. A. Spies & B. S. Plake (Eds.), *Mental Measurements Yearbook, 16th ed.* (pp. 300-302). Nebraska: Buros Institute of Mental Measurements of the University of Nebraska-Lincoln.
- Mackrain, M. (2008) *Devereux Adult Resilience Survey*. Lewisville, NC: Kaplan Early Learning Company Publishing.
- McLaren, E. M., Hall, P. J., & Fox, P. (2009). *Kentucky's early childhood professional*

- development initiative to promote social-emotional competence. *NHSA Dialog: A Research-to-Practice Journal for the Early Intervention Field*, 12(2), 170-183.
- Maier, M. F. (2008). The differential role of initiative and persistence in early childhood. Unpublished thesis, University of Miami.
- Meyer, L. (2008). *Fremont school readiness: Devereux Early Childhood Assessment (DECA) outcomes 2007-08*. Retrieved March 8, 2010, from http://www.echofamilycenter.com/uploads/child_outcomes/07-08/DECA07-08_School_Readiness-Final.pdf
- Munroe-Meyer Institute (2008). *Nurturing healthy behavior in early childhood pilot projects: Evaluation executive summary*. Retrieved March 8, 2010, from <http://www.nde.state.ne.us/ECH/Finalreport.pdf>
- Naglieri, J. A., & LeBuffe, P. A. (2005). Measuring resilience in children: From theory to practice. In S. Goldstein & R. B. Brooks (Eds.), *Handbook of resilience in children* (pp. 107-121). New York: Springer.
- Naglieri, J.A., LeBuffe, P.A., & Pfeiffer, S.I. (1994). *Devereux scales of mental disorders*. San Antonio: The Psychological Corporation.
- Newton, L. V. (2007) Resiliency in early childhood: A survey of protective factors and behavioral concerns in a national sample. Unpublished doctoral dissertation, George Mason University.
- Nickerson, A. B. (2007). The use and importance of strength-based assessment. *School Psychology Forum: Research in Practice*, 2(1), 15-25.
- Olmos, P. A., & Grimmer, M. (2005). PEARL: Lessons learned from collaboratively delivering mental health services in early childhood settings. *A System of Care for Children's Mental Health: Expanding the Research Base: Proceedings of the 17th Annual*

- Conference*. Tampa, FL, (pp. 247-252). Retrieved March 5, 2010, from <http://www.outcomesmhd.com/presentations/Olmos2005.pdf>
- Reardon, A. (2009). *Snohomish County Early Childhood Education and Assistance Program: 2008-2009 outcomes*. Retrieved March 8, 2010, from http://www.co.snohomish.wa.us/documents/Departments/Human_Services/Community/ChildrenAffairs/08-09SnohomishCountyECEAPOutcomes.pdf
- Reddy, L. (2007). Test reviews. *Canadian Journal of School Psychology*. 22(1), 121-127.
- Richard, E. (2007). Individual differences and second language acquisition among low-income preschoolers. Unpublished thesis, George Mason University.
- Richardson, B. & Graf, N. M. (2006) Johnson county (IA) early learning initiative (JCELI) evaluation of services and outcomes. Retrieved on March 1, 2010, from <http://www.uiowa.edu/~nrcfcp/publications/documents/JCELIfinalevalreport.pdf>
- Richardson, B., Thorburn McCrory, K., Saunders, J., & Graf, N. (2008) Quality improvement for early care, health and education programs: Benton County kindergarten readiness. Retrieved March 5, 2010, from <http://www.uiowa.edu/~nrcfcp/publications/documents/FinalBCEReportMarch112009br316.pdf>
- Rosas, S., Chaiken, L., & Case, J. (2006). *Research brief: Devereux Early Childhood Assessment ratings from parents and teachers in Delaware*. Retrieved December 21, 2009, from <http://static.nemours.org/www-filebox/nhps/deca.pdf>
- Rosas, S., Chaiken, L., & Case, J. (2007). Cross-setting consistent and setting-specific strength behaviors in preschoolers: Influence on reported concerns. *A System of Care for Children's Mental Health: Expanding the Research Base: Proceedings of the 20th*

- Annual Conference*. Tampa, FL (pp. 201-204). Retrieved March 18, 2010, from <http://www.fmhi.usf.edu/institute/pubs/pdf/cfs/rtc/20thproceedings/20thChapter06.pdf>
- A sampler of where the DECA is included in federal, state and Head Start programs and initiatives, research and guidance resources [Devereux Record]. (2010). The Devereux Foundation.
- Sheridan, S. M., Knoche, L. L., Edwards, C. P., Bovaird, J. A., & Kupzyk, K. A. (2010). Parent engagement and school readiness: Effects of the Getting Ready intervention on preschool children's social-emotional competencies. *Early Education & Development, 21*(1), 125-156.
- Sherwood, D., Bleecker, T., Durr, R., & Lipton, A. (2008). *Building the evidence for early childhood mental health consultation*. Retrieved March 8, 2010, from <http://www.cimh.org/downloads/handouts/Building%20the%20Evidence%20for%20Early%20Childhood.ppt>
- Squires, J. K. (2000). Identifying social/emotional and behavioral problems in infants and toddlers. *The Transdisciplinary Journal, 10*(2), 107-119.
- Stainback-Tracy, K. (2004). *Screening for social and emotional development for infants, toddlers, & preschoolers in Colorado*. Retrieved December 21, 2009, from <http://www.projectbloom.org/ASP/DocumentationView.asp?NUMBER=54>.
- Stark Mental Health and Recovery Services Board (2008). *Stark Childhood Resiliency Project: July 2007-June 2008 narrative summary*. Retrieved March 9, 2010, via personal communication with Susan Lowery O'Connell, Ph.D.
- Stewart-Brown, S. & Edmunds, L. (2007). Assessing emotional intelligence in children: A review of existing measures of emotional and social competence. In R. Bar-On, J. G.

- Maree, & M. J. Elias (Eds.), *Educating people to be emotionally intelligent* (pp. 241-257). Connecticut: Praeger.
- U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census (1996). *Statistical Abstract of the United States 1996: The national data book* (116th ed.). Washington, DC: Author.
- U.S. Department of Health and Human Services, Head Start Bureau. (1998). *Head Start program performance standards and other regulations*.
- Volbrecht, L.A. (2003). An investigation of the protective factors present among low-income preschool children. Unpublished thesis, University of Wisconsin – Stout.
- Winsler, A., Tran, H., Hartmana, S. C., Madiganc, A. L., Manfrab, L., & Bleikerb, C. (2008). School readiness gains made by ethnically diverse children in poverty attending center-based childcare and public school pre-kindergarten programs. *Early Childhood Research Quarterly*, 23(3), 314-329.