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Testing the Validity of the KIDS COUNT State-Level Index of Child Well-Being

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Executive Summary

In this report we compare two state-level indices of child well-being. The first index is a composite of 10 key indicators of child well-being from the Annie E. Casey Foundation's *2006 KIDS COUNT Data Book*. The KIDS COUNT index has been published every year since 1990. The second quality-of-life index is based on 25 indicators, reflecting seven specific domains of children's well-being. Many of the indicators in the 25-item index are only available at the state-level for one year, and therefore cannot be included in the KIDS COUNT index, which is updated yearly.

There are two key questions we try to answer in the report:

1. How well does the 10-item KIDS COUNT composite index capture key state-level variations in children's quality of life reflected in the broader 25-item index?
2. Why do some state rankings show marked differences between the KIDS COUNT index and the broader quality-of-life index?

Our results show that the KIDS COUNT index provides a good approximation of children's overall quality of life across the 50 states. The correlation between the state rankings based on the two indices is +.93.

However, there were two dimensions of children's quality of life reflected in the 25-item index—emotional/spiritual well-being, and safety/behavioral factors—that were weakly or negatively correlated with the KIDS COUNT index. Here are some of the other key findings:

- In general, states in the West performed better on the KIDS COUNT index, while states in the eastern half of the United States performed better on the 25-item index.

- Several states in the eastern United States had relatively low rates of drug and alcohol abuse, which contributed to their higher 25-item index ranking. In the West, states tended to perform worse in the 25-item index because of poorer health and educational outcomes.

- There were two states (California and Nevada) where the ranking on the KIDS COUNT index was more than 10 ranks higher (better) than the rank on the 25-item index. There were three states (Maryland, South Carolina, and Tennessee) where the ranking on the KIDS COUNT index was more than 10 ranks lower (worse) than the rank on the 25-item index.

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Introduction

Over the past few decades, devolution of social policies and decision-making affecting children has led to increased demand for state-level measures of child well-being. Moreover, empirical analyses have shown striking differences among the states in measures that reflect key aspects of child well-being.[1] The dramatic inter-state differences in child well-being make national figures virtually useless for developing state policies to improve children's lives.

One of the most efficient ways to communicate state-level patterns and trends in child well-being is through the use of a composite index. A child well-being index can be used to combine multiple indicators of children's social, economic, and physical well-being into a single measure of overall well-being. An index helps popular audiences quickly determine whether trends for children are moving in the right direction and how children in one state compare to those in another state in broad terms.

In this report we compare two state-level indices of child well-being. The first index is a composite of 10 key indicators of child well-being from the Annie E. Casey Foundation's *2006 KIDS COUNT Data Book*. The second index is a broader quality-of-life measure based on 25 indicators of children's social, economic, emotional, and physical well-being.

The KIDS COUNT index has been reported every year since the first *KIDS COUNT Data Book* was published in 1990, and is based on indicators that are widely accepted as good benchmarks for describing the well-being of children. However, the dearth of consistent, state-level data on child well-being reported each year means that measures available for constructing state-level indices are limited.[2]

The 25-item index is adapted from a national index developed by Kenneth Land for the Foundation for Child Development.[3] This index contains 28 items[4] that track child well-being in the United States every year since 1975, but the data are only reported at the national level. In this report, we refer to Land's national index as the "FCD-Land index," and we refer to the state-level adaptation of that index as the "25-item index." By combining several different data sources, we found state-level data for 25 of the 28 measures used in the FCD-Land index for at least one recent year.

The primary purpose of comparing these two indices is to see how well the KIDS COUNT composite index captures key state-level variations in children's quality of life. If the KIDS COUNT index captures most of the differences across states, then the state rankings based on that index should be highly correlated with the state rankings based on the broader 25-item index. However, if the KIDS COUNT index is not capturing key dimensions of child well-being that are reflected in the 25-item measure, then the corresponding state rankings should differ markedly.

A secondary purpose of this analysis is to explain the reasons behind any large differences between the state rankings. For the purpose of this report, large differences are defined as differences of 10 or more in the state rankings.

Data and Methods

The *KIDS COUNT Data Book* includes 10 variables that measure the educational, social, economic, and health status of children state-by-state (see Table 1). Each year, the 10 indicators are combined to create a single, composite index that can be used to rank states in terms of overall child well-being.

Table 1:

KIDS COUNT Index Variables from the *2006 KIDS COUNT Data Book*	**Year**
1. LOW BIRTHWEIGHT BABIES	2003
2. INFANT MORTALITY RATE	2003
3. CHILD DEATH RATE	2003
4. TEEN DEATH RATE	2003
5. TEEN BIRTH RATE	2003
6. TEENS WHO ARE HIGH SCHOOL DROPOUTS	2004
7. TEENS NOT IN SCHOOL AND NOT WORKING	2004
8. CHILDREN WITHOUT SECURE PARENTAL EMPLOYMENT	2004
9. CHILDREN IN POVERTY	2004
10. CHILDREN IN SINGLE PARENT FAMILIES	2004

Note: For sources and definitions for each of these measures see www.aecf.org/kidscount/sld/databook.jsp.

These 10 measures were chosen for the *KIDS COUNT Data Book* because they possess three important attributes: 1) They reflect several important areas of a child's well-being including health, material well-being, educational attainment, behavioral concerns, and social relationships, 2) The indicators reflect experiences across a range of developmental stages—from birth through early adulthood, and 3) All of the indicators are measured consistently over time and across states.

Since 1999, the Foundation for Child Development has provided support to Kenneth Land and his colleagues at Duke University to construct a 28-measure composite index of child well-being. Annual changes in the FCD-Land index indicate how children in the United States are faring over time. The data set goes back to 1976, but data are only available at the national level. The FCD-Land index variables are grouped into seven different domains:

1. Family economic well-being;
2. Health;
3. Safety/behavioral concerns;
4. Educational attainments;
5. Community connectedness;
6. Social relationships with family and peers; and
7. Emotional/spiritual well-being.

Of the 28 measures included in the national FCD-Land index, 25 are included in this analysis (see Table 2). Three of the measures in the national index are not included here because they are either unavailable or unreliable at the state level: 1) 12th graders who report religion as being very important, 2) Violent crime victimization rates for teens, and 3) Rate of violent crime offenders for teens.

The 25-item index cannot be produced each year because some of the variables in the index are not available on an annual basis.

Table 2:

25-Item Index Variables	**Year**
Family Economic Well-Being Domain	
1. FAMILIES WITH CHILDREN IN POVERTY	2004
2. CHILDREN WITHOUT SECURE PARENTAL EMPLOYMENT	2004
3. MEDIAN INCOME-FOR FAMILIES WITH CHILDREN	2004
4. CHILDREN WITH HEALTH INSURANCE COVERAGE	2003
Health Domain	
5. INFANT MORTALITY RATE	2003
6. LOW BIRTHWEIGHT BABIES	2003
7. MORTALITY RATE, AGES 1-19	2003
8. CHILDREN WITH VERY GOOD OR EXCELLENT HEALTH	2003
9. CHILDREN WITH FUNCTIONAL LIMITATIONS	2003
10. CHILDREN AND TEENS WHO ARE OVERWEIGHT OR OBESE	2003
Safety/Behavioral Domain	
11. TEEN BIRTH RATE	2003
12. CIGARETTE USE IN THE PAST MONTH, AGES 12-17	2002-2003
13. BINGE ALCOHOL DRINKING AMONG YOUTHS, AGES 12-17	2002-2003
14. ILLICIT DRUG USE OTHER THAN MARIJUANA, AGES 12-17	2002-2003
Educational Attainment Domain	
15. AVERAGE READING SCORES FOR 4TH AND 8TH GRADERS	2005
16. AVERAGE MATH SCORES FOR 4TH AND 8TH GRADERS	2005
Community Connectedness	
17. YOUNG ADULTS WHO HAVE RECEIVED A HIGH SCHOOL DIPLOMA	2004
18. TEENS NOT IN SCHOOL AND NOT WORKING	2004
19. SCHOOL ENROLLMENT, AGES 3-4	2004
20. YOUNG ADULTS WHO HAVE RECEIVED A BACHELOR'S DEGREE	2004
21. YOUNG ADULTS WHO VOTED IN PRESIDENTIAL ELECTION	2004
Social Relationships Domain	
22. CHILDREN IN SINGLE PARENT FAMILIES	2004
23. CHILDREN WHO HAVE MOVED WITHIN THE LAST YEAR	2004
Emotional/Spiritual Well-Being Domain	
24. SUICIDE RATE, AGES 10-19	2003
25. WEEKLY RELIGIOUS ATTENDANCE, AGES 0-17	2003

Note: For sources and definitions for each of these measures see Appendix A.

Differences between the two indices

There are slight differences in the time period covered by the variables in the 10-item KIDS COUNT index and the 25-item index; however, most of the data in the two indices are centered on the same year. The state-level measures used in the 25-item index are based on data from 2002 to 2005, while the data in the KIDS COUNT index reflect 2003 to 2004 data.

The two indices also differ in terms of the reliability and stability of the estimates. The KIDS COUNT index is produced from reliable state-level data from the National Center for Health Statistics and the Census Bureau's American Community Survey. The 25-item index is also based on data from trusted sources, but some of the measures in the index are unstable at the state level. For example, the national FCD-Land index includes a measure of the suicide rate for youth ages 10 to 19. In 2003, there were 19 states with fewer than 20 deaths due to suicide, which could yield unstable rates, according to the National Center for Health Statistics.

Lastly, the two indices differ in the types of variables that they include. The KIDS COUNT index is essentially a subset of the broader 25-item index, focusing on measures related to health, family and economic well-being, and educational attainment. There are no variables in the KIDS COUNT index related to children's emotional or spiritual well-being, substance use, or educational achievement. Some of these measures are updated each year on the Casey Foundation's website, but are not included among the 10 key *Data Book* variables.

Index construction

The 10-measure KIDS COUNT index was constructed by first converting the 2004 (or 2003, depending on the indicator) state numerical values for each of the 10 key indicators into standard scores. Standardization was necessary because the distributions of the 10 measures were quite different from one another. By standardizing the variables, as described below, we make sure that each measure is given equal weight in the index.

For each variable, standard scores were derived by subtracting the mean state value from the state estimate and dividing the amount by the standard deviation for that distribution of state estimates, as shown in the following formula. In the formula *x* represents the state estimate, the Greek letter Mu represents the mean across the 50 state values, and the Greek letter Sigma represents the standard deviation:

$$z = \frac{x - \mu}{\sigma}$$

We then summed those standard scores to create a total standard score for each of the 50 states. Finally, we ranked the states on the basis of their total standard score in sequential order from highest/best (1) to lowest/worst (50). In the 2006 *Data Book*, New Hampshire ranked first and Mississippi ranked last on the composite measure.

We constructed the 25-item index in the same way that we constructed the KIDS COUNT index—by converting numerical state estimates into standard scores, and then summing across the standard scores to create a total score for each of the states. However, we had to first

calculate the inverse of the standard scores for certain measures (e.g., median income) so that for all the measures higher values consistently indicated worse child outcomes.

Weighting variables in the index

In our analysis, each of the measures was given the same weight in calculating the sum of standard scores. An equal-weighting strategy is the simplest and most transparent method, and is appropriate for this analysis because it is consistent with the method used to construct the annual KIDS COUNT index. While some researchers have questioned whether an equal-weighting strategy is appropriate in measuring child well-being, given that not all measures contribute equally to children's overall quality of life, there is no consensus at this point on a preferred alternative to equal weighting.[5]

The national FCD-Land index classifies variables into seven different domains and weights each *domain* equally in constructing the overall index. We tested this method at the state level by summing standard scores within each of the seven domains and then averaging the domain scores together to arrive at the total score for each state. This method produced results that were nearly identical to the equal-weighting strategy, so the results presented here are based on the simpler method (without the use of domains).

Results

Our analysis shows that state rankings based on the two indices are highly correlated (+.93) (see Table 3).[6] Overall, the KIDS COUNT index provides a good approximation of children's quality of life across the 50 states. However, when we looked at each of the seven domains separately, one of them—emotional/spiritual well-being—was negatively correlated with the KIDS COUNT index, and another—safety/behavioral concerns—was only weakly correlated with KIDS COUNT. These domains measure aspects of children's lives that are not captured in the KIDS COUNT index, including alcohol and drug use, spiritual well-being, and teen suicides. Nevertheless, these indicators have been identified by researchers as important indicators of children's quality of life.[7]

Each of the five other domains was highly correlated with the KIDS COUNT index (+.75 or more).

Table 3

Correlation of State Rankings in the Two Indices

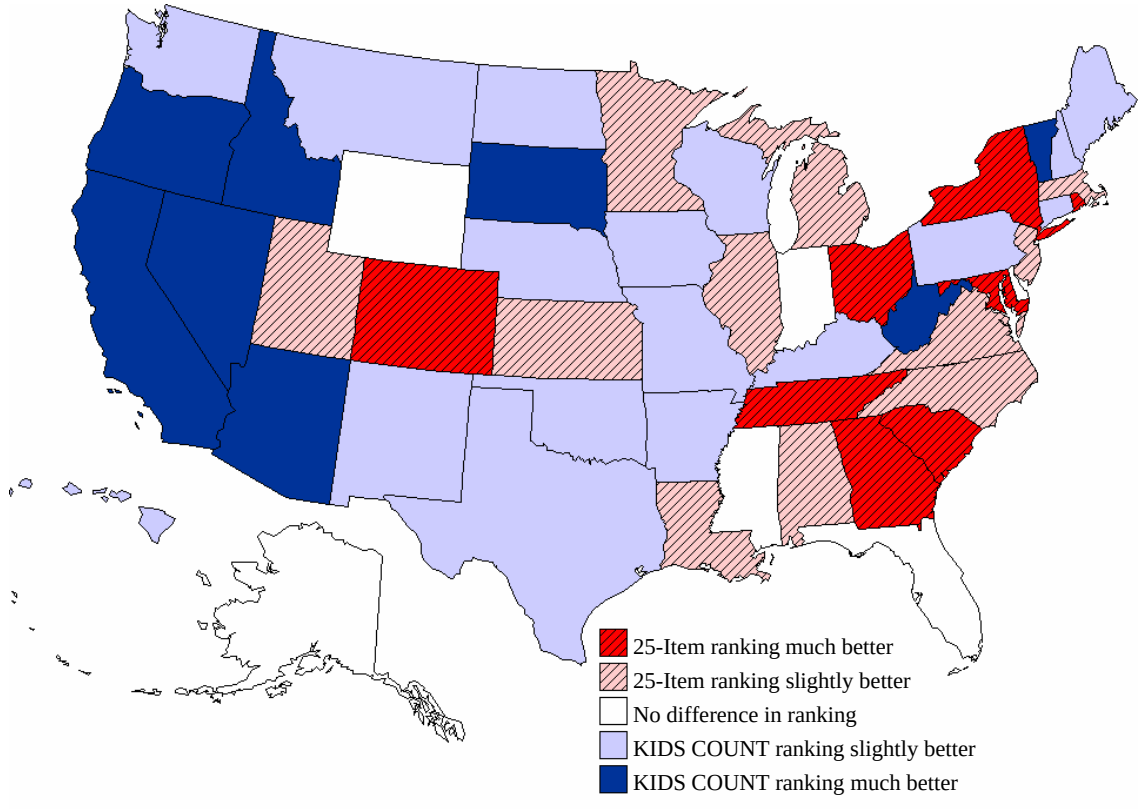
Domain	Correlation with KIDS COUNT rankings
25-item index	0.93
Family Economic Well-Being	0.86
Health	0.87
Safety/Behavioral	0.35
Educational Attainment	0.75
Community Connectedness	0.85
Social Relationships	0.86
Emotional/Spiritual Well-Being	-0.41

Source: Population Reference Bureau.

State patterns

The map below shows the states and regions where the differences between the two indices were most pronounced. In general, states in the West performed better on the KIDS COUNT index, while states in the eastern half of the United States performed better on the 25-item index. Colorado, West Virginia, and Vermont are exceptions to this pattern.

State Differences in Rankings: KIDS COUNT Index and 25-Item Index



Source: Population Reference Bureau.

A closer look at state patterns of individual indicators revealed that several states in the eastern part of the country had relatively low rates of drug and alcohol abuse which contributed to their higher (better) 25-item index ranking. West Virginia, however, was an exception, with relatively high rates of drug and alcohol use among teens. In the West, states tended to perform worse in the 25-item index because of poor health and educational outcomes. Colorado was an exception with relatively low dropout rates, high test scores, good physical health, and higher-than-average rates of health insurance coverage.

Table 4, below, compares individual state rankings based on the two indices. Lower standard scores indicate that children have better outcomes, relative to children in other states, while higher scores indicate that children are doing worse.

Table 4:

Rankings for States Based on the 25-Item Index and KIDS COUNT Index of Child Well-Being

	25-Item Index[1]		KIDS COUNT Index[2]		
	Sum of standard scores	State rank	Sum of standard scores	State rank	Difference in ranks
Alabama	13.8	41	8.5	43	2
Alaska	9.0	35	4.4	35	0
Arizona	16.6	45	4.9	37	-8
Arkansas	17.4	46	9.3	45	-1
California	0.3	30	-3.4	18	-12
Colorado	-3.8	20	-1.1	25	5
Connecticut	-20.8	4	-11.2	3	-1
Delaware	0.1	29	1.4	29	0
Florida	5.5	33	2.4	33	0
Georgia	9.6	38	8.6	44	6
Hawaii	-1.9	24	-2.2	21	-3
Idaho	-0.5	27	-2.3	20	-7
Illinois	-3.0	21	-1.4	24	3
Indiana	3.8	32	2.0	32	0
Iowa	-18.0	6	-11.1	5	-1
Kansas	-10.6	10	-5.2	12	2
Kentucky	15.5	43	7.1	42	-1
Louisiana	22.4	48	17.8	49	1
Maine	-10.1	12	-6.6	11	-1
Maryland	-11.6	9	-1.5	23	14
Massachusetts	-17.5	7	-7.1	10	3
Michigan	-0.8	26	-0.3	27	1
Minnesota	-23.0	1	-11.1	4	3
Mississippi	27.0	50	19.5	50	0
Missouri	0.5	31	1.4	30	-1
Montana	9.4	37	3.1	34	-3
Nebraska	-10.2	11	-8.4	8	-3
Nevada	17.9	47	4.8	36	-11
New Hampshire	-21.7	2	-14.0	1	-1
New Jersey	-20.5	5	-9.9	7	2
New Mexico	24.6	49	12.6	48	-1
New York	-7.4	16	-1.8	22	6
North Carolina	10.3	39	6.6	41	2
North Dakota	-9.5	13	-7.3	9	-4
Ohio	-5.0	18	-0.9	26	8
Oklahoma	14.9	42	5.5	40	-2
Oregon	-2.9	22	-4.0	15	-7
Pennsylvania	-5.8	17	-3.6	16	-1
Rhode Island	-1.0	25	2.0	31	6
South Carolina	8.3	34	10.1	47	13
South Dakota	-2.2	23	-4.5	14	-9
Tennessee	9.2	36	9.4	46	10
Texas	12.2	40	5.4	39	-1
Utah	-20.8	3	-10.9	6	3
Vermont	-14.3	8	-11.7	2	-6
Virginia	-8.3	15	-2.8	19	4
Washington	-4.3	19	-3.6	17	-2
West Virginia	16.2	44	5.1	38	-6
Wisconsin	-8.9	14	-5.0	13	-1
Wyoming	0.1	28	0.8	28	0

1. The 25-Item index is calculated by summing the standard deviations from the mean state value across 25 measures.

2. The KIDS COUNT index is calculated by summing the standard deviations from the mean state value across 10 measures.

Source: Population Reference Bureau.

The majority of states (45 out of 50) differed by less that 10 ranks in the two indices. There were two states however (California and Nevada), where the ranking on the KIDS COUNT index was more than 10 ranks higher (better) than the rank on the 25-item index. There were three states (Maryland, South Carolina, and Tennessee) where the ranking on the KIDS COUNT index was more than 10 ranks lower (worse) than the rank on the 25-item index.

On average, states in the two indices differed by less than 4 ranks. There were 32 states that differed by three ranks or less. Among these states, six (Alaska, Delaware, Florida, Indiana, Mississippi, and Wyoming) had equal rankings in the two indices.

Conclusions

Results indicate a high level of agreement between the KIDS COUNT and 25-item (quality-of-life) index. In general, the 10 items in the KIDS COUNT index capture most of the important dimensions of child well-being across the 50 states. However, the quality-of-life index paints a different picture of child well-being than the KIDS COUNT index in several states.

Our analysis suggests that if another measure were going to be added to the KIDS COUNT index, it should be one from the emotional/spiritual well-being domain or from the safety/behavioral domain. Both domains reflect important dimensions of children's lives and are not currently represented among the 10 key *Data Book* measures.

Appendix A
Sources for the 25-Item Index

Measure	Source
Families with children under age 18 in poverty, 2004	Population Reference Bureau, analysis of 2004 ACS data.
Secure parental employment rate, 2004	Population Reference Bureau, analysis of 2004 ACS data.
Median annual income all families with children, 2004	Population Reference Bureau, analysis of 2004 ACS data.
Rate of children in families headed by a single parent, 2004	Population Reference Bureau, analysis of 2004 ACS data.
Rate of children with health insurance coverage, 2003	PRB and the University of Louisville, analysis of the 2004 CPS data, March Supplement.
Rate of children who have moved within the last year, 2004	Population Reference Bureau, analysis of 2004 ACS data.
Infant mortality rate, 2003	Centers for Disease Control and Prevention, National Center for Health Statistics.
Low birth weight rate, 2003	Child Trends analysis of National Center for Health Statistics data.
Mortality rate, ages 1-19, 2003	Population Reference Bureau, analysis of National Center for Health Statistics data.
Rate of children with very good or excellent health (as reported by their parents), 2003	National Survey of Childrens Health, http://nschdata.org
Rate of children with functional limitations (as reported by their parents), 2003	National Survey of Childrens Health, http://nschdata.org
Children and teens who are overweight or obese, 2003	National Survey of Childrens Health, http://nschdata.org
Teenage birth rate, ages 15-19, 2003	Population Reference Bureau and Child Trends analysis of NCHS data.
Rate of cigarette use in the past month, ages 12-17, 2002-2003	Department of Health and Human Services, www.oas.samhsa.gov/.
Rate of binge alcohol use, ages 12-17, 2002-2003	Department of Health and Human Services, www.oas.samhsa.gov/.
Rate of illicit drug use other than marijuana, ages 12-17, 2002-2003	Department of Health and Human Services, www.oas.samhsa.gov/.
4th and 8th grade math scores, 2005	U.S. Department of Education, , http://nces.ed.gov/nationsreportcard/
4th and 8th grade reading scores, 2005	U.S. Department of Education, , http://nces.ed.gov/nationsreportcard/
Rate of school enrollment, ages 3-4, 2004	Population Reference Bureau, analysis of 2004 ACS data.
Rate of persons who have received a high school diploma, ages 18-24, 2004	Population Reference Bureau, analysis of 2004 ACS data.
Rate of youths not working and not in school, ages 16-19, 2004	Population Reference Bureau, analysis of 2004 ACS data.
Rate of persons who have received a bachelor's degree, ages 25-29, 2004	Population Reference Bureau, analysis of 2004 ACS data.
Rate of voting in predential election, ages 18-24, 2004	Population Reference Bureau, analysis of 2004 CPS, November Supplement
Suicide rate, ages 10-19, 2003	CDC, National Center for Injury Prevention and Control, http://webappa.cdc.gov/
Rate of weekly religious attendance, ages 0-17, 2003	National Survey of Childrens Health, http://nschdata.org
Percent who report religion as being very important, grade 12	Not available at the state level
Rate of violent crime victimization, ages 12-17	Not available at the state level
Rate of violent crime offenders, ages 12-17	Not available at the state level

Endnotes

[1] These state-level differences are shown in the Annie E. Casey Foundation's *2006 KIDS COUNT Data Book*, available online at www.aecf.org/kidscount/sld/databook.jsp.

[2] Brett Brown and Kristin Moore, "An Overview of State-Level Data on Child Well-Being Available through the Federal Statistical System," accessed online at http://65.242.47.55/Files//Child_TRends-2006_10_01_ES_StateLevelData.pdf, on Jan. 19, 2007.

[3] Kenneth C. Land, "The Foundation for Child Development Child and Youth Well-Being Index (CWI), 1975-2004, with Projections for 2005," accessed online at http://www.fcd-us.org/PDFs/03-21-06FINAL2006CWIReport.pdf, on Jan. 10, 2007.

[4] An expanded version of the national index, including 44 measures of child well-being, is discussed in Kenneth C. Land, Vicki I. Lamb, Sarah O. Meadows, and Ashley Taylor (2007), "Measuring Trends in Child Well-Being: An Evidence-Based Approach," *Social Indicators Research* 80: 105–132.

[5] Michael R. Hagerty and Kenneth C. Land, (2007) "Constructing Summary Indices of Quality of Life: A Model for the Effect of Heterogeneous Importance Weights," forthcoming in *Sociological Methods & Research*; and Nicholas Zill, "Are All Indicators Created Equal? Alternatives to an Equal Weighting Strategy in the Construction of a Composite Index of Child Well-Being," accessed online at www.fcd-us.org/PDFs/ZillPaper.pdf, on Nov. 21, 2006.

[6] Correlations between the state rankings were calculated using the formula for Spearman's rank-order correlation coefficient. Calculations using Pearson Product-Moment Correlation Coefficient produced nearly identical results.

[7] See Kenneth C. Land, Vicki I. Lamb, and Sarah Kahler Mustillo (2001), "Child and Youth Well-Being in the United States, 1975-1998: Some Findings from a New Index," *Social Indicators Research* 56: 241-320; and Kenneth C. Land, Vicki I. Lamb, Sarah O. Meadows, and Ashley Taylor (2007), "Measuring Trends in Child Well-Being: An Evidence-Based Approach," *Social Indicators Research* 80: 105–132.

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