
The Pitfalls of Using a Child Support Schedule Based on Outdated Data

Yana van der Meulen Rodgers, PhD
Rutgers University

William M. Rodgers III, PhD
Rutgers University

A strong rationale for updating child support guidelines arises from changes over time in the measurement of expenditures on children, as well as from changes in the empirical relationship between expenditures on children and the income of parents. Such changes affect the accuracy of the numerics upon which States' child support guidelines are based. This study evaluated an alternative child support guideline that was proposed for Virginia and drew lessons for other States that similarly base their guidelines on older survey data. Regression results showed that, over time, the child expenditure and household income relationship has changed considerably. Furthermore, the largest increases in expenditures attributable to children have occurred for lower and middle-income households.

While the Family Support Act of 1988 requires all States to assess their child support guidelines at least once every 4 years, States are not mandated to change their guidelines following the assessment. A number of economic changes could warrant the updating of a State's child support guidelines. One such change: Today, most obligors are fathers who are more involved in child-rearing than they were 20 years ago. In addition to paying child support, many obligors spend money on their children during visitation hours. This increase in father involvement and spending provides a rationale for implementing adjustments to child support schedules. Another change: A worsening in labor-market opportunities for less-skilled men has led to sharp increases in arrearages (Katz & Krueger, 1999; Welch, 2001). Including a downward adjustment for low-income obligors in child support schedules can help to reduce arrears caused by child support awards that surpass the ability of low-income obligors to pay (Holzer, Offner, & Sorenson, 2003; Sorenson & Zibman, 2001).

Another rationale for updating child support guidelines arises from changes that have occurred in the measurement

of expenditures on children, as well as from changes in the empirical relationship between expenditures on children and the income of parents. These changes affect the accuracy of the numerics upon which States' child support guidelines are based. To understand better the implications of these changes, we examined the costs involved when States use schedules based on statistical relationships derived from outdated survey data. We evaluated an alternative child support guideline that was proposed for the Commonwealth of Virginia and then drew lessons for other States that similarly base their guidelines on older estimates of child-rearing expenditures. The alternative schedule for Virginia proposed that total child support awards as a share of monthly income be raised at all income levels except for the lowest end of the income distribution.

Virginia's child support schedule has not been updated since the mid-1980s. The schedule is based on a study of child-rearing expenditures published in 1984 that used the 1972-73 Consumer Expenditure Survey (CES), the best household expenditure data available at the time. Because the Bureau of Labor Statistics has made significant

improvements in the quality and comprehensiveness of its data collection and because the data are collected annually, Virginia's current schedule is no longer tied to the best quality data from the CES. As was the case for Lino (2001), we found that average total expenditures on children have risen in past decades and have changed in composition. However, the child expenditure and income relationship upon which Virginia's schedule is based may also have changed since the 1970s, a hypothesis that was tested in this study. Such a change would imply that Virginia and 10 other States with older guidelines are no longer generating child support orders that are linked to accurate estimates of the child expenditure and income relationship. Statistical evidence in this study provides a strong economic rationale for developing a new child support schedule in Virginia and in other States with similar guideline structures.

Underlying Models and Measurement Issues

Federal legislation requires all States to have formal guidelines for calculating the dollar value of child support awards. These child support guidelines must take into account the earnings of the nonresidential parent, they must base support obligations on numerical criteria, and they must include the child's health care costs into the calculations. No particular method to determine State guidelines is mandated, so States must make decisions about the underlying model and measurement issues surrounding the definition of income and child-rearing costs (Beller & Graham, 1993; Venohr & Williams, 1999). States have chosen versions of three underlying models: the "Percentage of Obligor Income" model, the "Income Shares" model, and the "Melson Formula" model.

The Percentage of Obligor Income model entails the most basic calculations of the three models, in which the noncustodial parent pays a certain share of his or her income to the custodial parent. The share rises with the number of children; for some States, however, the share also changes as the income level of the obligor changes.

In contrast, the Income Shares model is more detailed. The underlying premise of this model is that the child should obtain the same percentage of total income that he or she would have obtained if the parents were together. In calculating the child support amount, the income of both the mother and father is combined to proxy for the total income of an intact family. This income calculation is then linked to estimates of child-rearing expenditures by intact families with the same income level and number of children. In the final basic step for converting estimates of child expenditures into a schedule of child support payments for noncustodial parents, the estimated child support amount is divided between the two parents according to their respective income shares.

Finally, the Melson Formula model is similar to the Income Shares model except that both parents are allowed a reserve amount to cover their own subsistence needs and to sustain employment.

No matter which model is chosen, however, States must make decisions regarding the measurement of income and expenditures on child-rearing. According to Beller and Graham (1993), to measure income, most States use either adjusted gross income (income adjusted for prior support orders and health insurance) or net income (income with these same adjustments plus deductions for taxes, mandated retirement contributions, and union dues). A few remaining States

use gross income. A number of States also build into their schedules a self-support reserve that protects the ability of the obligor to meet his or her basic subsistence needs and to facilitate employment. With a self-support reserve, if the combined gross monthly income is less than a certain threshold, then the guideline is not used to compute the child support order. Instead, a fixed minimum award is applied to the noncustodial parent. At the other end of the income distribution, very high income levels are sometimes treated with an income cap, declining percentages, or noncash transfers in the application of child support guidelines.

There is less agreement among policymakers and academics about the best estimates of child-rearing costs. These estimates come from a number of studies that vary in the underlying methodology as well as the survey year used to determine the estimations. In a survey of this literature, Beller and Graham (1993) point to two indirect approaches—the Engel method and the Rothbarth method—and the direct approach for estimating child-rearing costs.

The Engel method is based on the premise that families who spend the same share of their total consumption expenditures on food are equally well off. When the Engel method is used to compute child-rearing costs, two families, one with no children and one with one child, are assigned equal proportions for food spending in the total budget. Then the cost of raising the first child is the increase in spending required to keep the one-child family spending the same budget share on food. The approach is similar for families with more children. The most important assumption this approach must satisfy is separability in consumption; that is, families will not change the way they allocate their spending across food and other

consumption items as they have children.

The Rothbarth method is similar in notion and underlying assumptions, except that the equalizing factor across families is the budget share devoted to adult goods. Deaton and Muellbauer (1986) argue that the separability assumption causes the Engel estimator to overestimate child-rearing costs (families with children are overcompensated in computations to keep the food share equal), while the Rothbarth estimator underestimates child-rearing costs (families with children are undercompensated in computations to keep the adult-goods share equal). Finally, the direct approach for estimating child-rearing costs involves directly totaling different categories of spending on children. A few categories, such as child care or children's clothing, can be measured by actual spending on children, while most other categories, such as health care or housing, are measured by estimates of spending attributable to children.

By 1990, over 30 States, including Virginia, had based their guidelines on the Income Shares model. For most of these States, the estimates of child-rearing expenditures were initially calculated from Espenshade's work (1984), which was based on the Engel method and data from the 1972-73 CES. Subsequently, a number of States have updated their child support guidelines to reflect more recent estimates of child-rearing costs. These recent estimates, drawn mostly from work in Betson (1990), use a range of methods applied to CES data from 1980 to 1986. Some States have also drawn from annual reports by the U.S. Department of Agriculture, which uses the direct approach to total categories of spending attributable to children.

In 2003, there were still 11 States, including Virginia, that based their guidelines on Espenshade's earlier estimates (Venohr & Griffith, 2003). The other 10 States were Alabama, Florida, Indiana, Louisiana, Kansas, Kentucky, Maryland, Michigan, Rhode Island, and Washington. However, these older guidelines may no longer generate realistic child support orders. In recent decades, the CES's sample size has grown and the level of detail has improved, providing better expenditure and income data. Concepts and definitions have changed so much that officials of the Bureau of Labor Statistics warn users to exercise caution when comparing current survey data with data from earlier surveys, especially with data from surveys conducted prior to 1984.

Estimating Expenditures on Children

This section describes a schedule of child support that was developed for the Quadrennial Child Support Review Panel of the Commonwealth of Virginia.¹ The schedule has been grounded in current economic research on child-rearing expenditures. New estimates of child-rearing expenditures were developed by using micro data on husband-wife households from the 2000 CES. The sample criteria included having some positive amount of household income for the past year and reporting one to three children under age 18 living in the home.² These criteria yielded 1,987 households with one child, 2,557 households with two children, and 990 households with

¹The full report by Rodgers (2002) can be found at www.dss.state.va.us/pub/pdf/dcsepanel_final.pdf.

²Sample sizes for husband-wife households with more than three children were too small to generate reliable results.

three children. Data were used for households with gross monthly incomes that ranged from \$1,200 to \$8,500. Computed from the 2000 decennial census micro-data file for Virginia, this range of the income distribution represented 76 percent of all Virginia married-couple households with one to three children below age 18. Of the remainder, 2 percent were below the specified income range and 22 percent were above the range. Because of the CES's focus on lower and middle-income families, the Bureau of Labor Statistics cautions researchers about making statistical inferences on the expenditures of households with gross incomes above \$8,500.

Identifying Total Expenditures

This study estimated a household's expenditures on children by using the direct approach of totaling different categories of actual expenditures. A three-step procedure was used. The first step involved identifying the total expenditures on food, housing, clothing, transportation, education, miscellaneous expenditures, and nonextraordinary health expenditures. In Virginia, support for extraordinary health expenditures, child care costs, and health insurance premiums for the child are treated as add-ons after the initial level of support has been calculated.

Sample means from the 2000 CES showed that housing, variable transportation, and food expenditures comprised 70 percent of total household expenditures. Of note, expenditures on housing in the CES are underestimated because the Bureau of Labor Statistics treats mortgage principal payments as savings rather than as expenditures. Because a large

portion of an obligor’s direct expenditures on children is likely to be in housing, the CES’s treatment of mortgage payments generates lower expenditures on children. This downward bias can be thought of as a discount that all homeowners receive. Obligor with high incomes tend to own more expensive homes, so this treatment of the housing data generates a larger discount for these obligors.

Determining Proportion of Expenditures Attributable to Children

The second step to estimating a household’s expenditures on children was to determine in each expense category the proportion of expenditures attributable to children. For some categories, such as clothing, the CES data are reported separately for children; thus, 100 percent of these expenditures can be attributed to children. But for other categories, such as housing, transportation, and food, assumptions must be made regarding the proportion attributable to children. The most common approaches are (1) the “representative” approach, in which allocations are based on averages calculated for children and adults based on Federal studies; (2) the “per capita” approach, in which household expenditures are divided by the number of family members; and (3) the “average use” approach, in which allocations are based on the amount of a certain commodity that households with different numbers of children are observed to use on average, compared with households without children.

As discussed in a Virginia State government technical report on the costs of raising children (JLARC 2001), the choice of which assumption to use in estimating expenditures on children could lead to large differences

Table 1. Housing and transportation expenditures attributable to children based on per capita and average use allocation methods

	Housing		Transportation	
	Per capita	Average use	Per capita	Average use
Number of children				
1	33.3	1.0	33.3	24.0
2	50.0	9.5	50.0	44.0
3	60.0	12.4	60.0	38.0

Source: JLARC (2001).

for two major categories: housing and transportation. These differences, in turn, have an effect on estimated income shares that are used to compute child support guidelines, especially for middle- and higher income households. For those expenditure categories requiring a choice in allocation method, we compared alternative expenditure results and explored the reasons for choosing a particular method.

For housing, we estimated expenditures for four subcategories of costs: shelter, utilities, household operations and household equipment, and furnishings. Housing is an excellent example of the difficulty in assigning an expenditure amount attributable to children. If the per capita proportions were used, then 33 percent of expenditures in a one-child household were attributable to that child, compared with only 1 percent for the average use proportion (table 1). The 1-percent figure was computed by JLARC (2001), from American Housing Survey data, as the percentage difference between the estimated house size (1,776 square feet) of a two-adult household with one child and the estimated house size (1,758 square feet) of a two-adult household with no children. The other figures for average use in housing were constructed by using the same method.

Across household sizes, the per capita approach generated larger expenditures on children than did the average use approach. In effect, the per capita approach provided an upper bound on the share of housing expenditures attributable to children while the average use approach provided a lower bound. One explanation for why the average use figures were so small is that they were based on observed data on housing size that give no indication of housing and family planning decisions. Households may take longer term views of family size when they select their homes. When children are eventually added to the household, the total housing size may not increase if the children are living in extra space that had already been intended for their use. To estimate housing expenditures on children, our preferred approach was to apply the per capita proportions shown in table 1, mainly because the approach is more equitable in its assumption that each household member shares equally in the use of the home.

Following the method in JLARC (2001), we defined two types of transportation costs: fixed vehicle and variable costs. Fixed vehicle costs capture spending on new and used cars and trucks, vehicle financing, and vehicle insurance. This expense component captures the start-up cost of

obtaining a vehicle and does not vary much with mileage. When the average use approach is used, the estimated share of fixed vehicle costs that can be attributed to having children is 8.0 percent (JLARC, 2001). Variable transportation costs capture spending on gas and oil, licenses, other vehicles, maintenance and repairs, public transportation, and incremental expenses of operating a vehicle. Thus, this component captures the incremental expenses of operating a vehicle.

The fraction of transportation costs that can be attributed to children is 33 percent in a one-child household, based on the per capita approach, compared with 24 percent, based on the average use approach. Again, the average use proportions are well below the per capita proportions across household size. To estimate the transportation costs attributable to children, we alternatively applied the per capita proportions to all transportation expenditures (the per capita approach) and we applied the average use proportions to the fixed transportation subcategory (the “average use in vehicles” approach). Because neither approach offered a clear *a priori* advantage, the empirical analysis used both approaches.

The proportion of food expenditures attributable to children was based on four official U.S. Department of Agriculture food plans for May 2002. This approach is similar to the treatment of food expenditures in JLARC (2001). To compute this figure for each food plan, we averaged across gender and ages the estimated monthly food costs for children. This computation resulted in the monthly food cost for an average child under each plan.

Each plan also contains the average monthly food costs for an adult. Hence, for each plan, we could compute total household spending on food for dual-

parent households of different sizes; from there, we could construct the proportion of average household expenditures on food that are attributable to children. These proportions were fairly consistent across plans. For example, the proportion of food expenditures attributable to children ranged from 28.4 to 29.5 percent for dual-parent households with one child (data not shown). The average of the four plans for each dual-parent household size was multiplied by household expenditures on food. The resulting product was the estimate of food expenditures on children.

Clothing expenditures were divided into clothes and footwear and other apparel products and services (e.g., dry cleaning, repairs, and alterations). In the CES, clothes expenditures are reported for infants, children, and teens up to age 16. Thus, 100 percent of these expenditures are attributed to children. However, expenditures for 16- and 17-year-olds are not separately reported from expenditures for adults in the household. To address this issue, we identified households with children 16 and 17 years old and pro-rated, on a per capita basis, the clothing expenditures for men and women aged 16 and older.³ Footwear and other apparel products and services are not reported separately for children. Proportions based on the per capita approach were used for this expense category.

³ An alternative method was to compare households with 16- and 17-year-olds with households with no children in this age group and then attribute the difference to clothing expenditures for 16- and 17-year-olds. Applying this method to data from the 2000 CES yielded quarterly clothing costs for children that were slightly higher than those reported in the test. In particular, child clothing costs using the reported method versus the alternative method were, respectively, \$140 and \$143 for one-child households, \$187 and \$194 for two-child households, and \$205 and \$219 for three-child households.

To estimate housing expenditures on children, our preferred approach was to apply the per capita proportions shown in table 1, mainly because the approach is more equitable in its assumption that each household member shares equally in the use of the home.

Table 2: Average quarterly household expenditures on food, clothing, care, and other items in 2000, by number of children

	Total household expenditures			Child-related expenditures		
	1 Child	2 Children	3 Children	1 Child	2 Children	3 Children
Food and beverage						
Food	\$1,599	\$1,810	\$1,836	\$466	\$816	\$1,013
Alcohol and tobacco	161	175	169	—	—	—
Clothing						
Child clothing	140	187	205	140	187	205
Adult clothing	231	219	162	—	—	—
Other apparel	153	168	158	51	42	32
Care						
Child care	224	335	190	224	335	190
Health care	523	531	567	95	163	226
Personal care	100	104	92	33	26	18
Other						
Education	276	180	227	276	180	227
Personal insurance	1,700	1,859	1,544	—	—	—
Entertainment	644	859	795	215	215	159
Books	46	53	46	15	13	9
Pets and toys	126	156	157	126	156	157
Miscellaneous	115	128	144	39	32	29

— Not applicable.

Source: Calculations are based on the 2000 Consumer Expenditure Survey.

Because of its simplicity in generating per person expenditure estimates, the per capita approach was applied to all remaining expense categories, which include such items as entertainment, personal care items, and reading materials. Entertainment expenses comprise entrance fees and admission costs for various events, clubs, and memberships, as well as spending on equipment, including video games. Exceptions to this per capita approach occur for CES's education expenditures, which are fully identifiable for children, and for expenditures on a sub-category that includes pets, toys, and playground equipment. For these exceptions, we assumed that 100 percent of expenditures are attributable to children.

Results for average quarterly expenditures on food, clothing, health care, child care, and miscellaneous items are reported in table 2 as absolute numbers and in figure 1 as relative

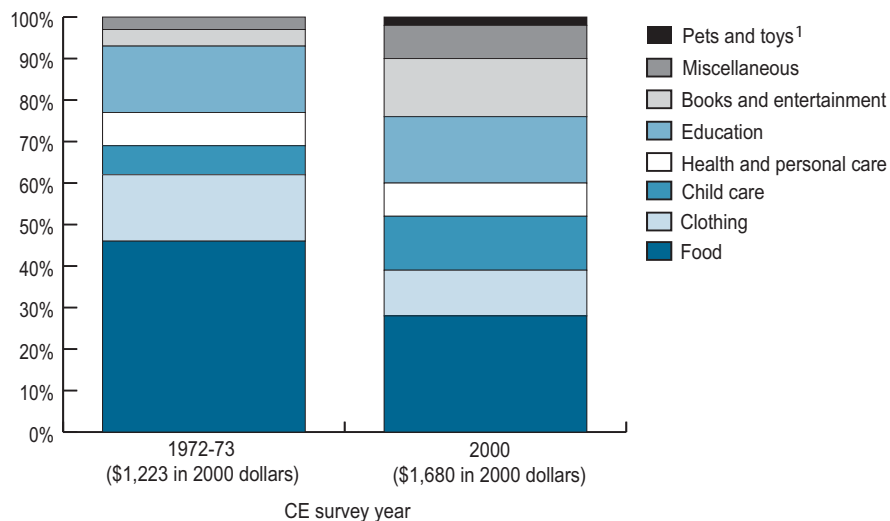
shares. Food expenditures comprised by far the largest single category, followed by child care and education expenditures. Actual quarterly child care expenditures are considerably higher than the reported results for those households that have preschool children and both parents working traditional shifts, and similarly for households that must pay for after-school care (Bernstein, Brocht, & Spade-Aguilar, 2000).

The reported child care results averaged these households together with all other households with children over the age of 5 and make little use of paid child-care services or after-school care. This averaging issue helps to explain why Virginia and numerous other States treat child care costs as an add-on in their guidelines. These States remove child care expenses from the underlying calculations when determining the structure of their child support guidelines. Later, they add on

child care expenses on a case-by-case basis. We followed the same approach in developing the alternative guideline for Virginia.

To help demonstrate that the 2000 CES better portrays family expenditure patterns than does the 1972-73 CES, we performed the same procedure for estimating expenditures on children by using the 1972-73 CES. In particular, the 1972-73 calculations for total household expenditures were converted into real 2000 dollars. Then, to estimate child-related expenditures, we used the 2000 weights and shares. The resulting expenditures on children were then compared with the 2000 expenditures reported in figure 1, which shows results for a one-child household. The figure has a similar format to that of Lino's study (2001), which found a significant increase in real expenditures on children between 1960 and 2000. Our findings show that in real dollar terms, average quarterly

Figure 1. Changes over time in average quarterly expenditures on children for a one-child household



In contrast to these expenditure jumps, spending on food for children has dropped noticeably in relative terms. . . . More puzzling is the absolute spending decline for children’s food.

¹Pets and toys are included in the miscellaneous category for 1972-73.

expenditures attributable to children have risen considerably over time: from \$1,223 in 1972-73 to \$1,680 in 2000 (fig. 1). Consistent with Lino’s comparison for 1960 and 2000, one of the key factors behind this increase was the jump in child care expenses, both in absolute and relative terms. Greater use of child care services, in turn, was driven by the surge in women’s labor force participation during the period.

Spending on entertainment has also risen in both absolute and relative terms as structured activities for children have become more widespread over time and as technological change has produced a wider variety of audio and visual equipment. Results also show a sizeable jump in spending on pets and toys, an expenditure item that was small enough in the 1970s data to be classified within the miscellaneous category. These increases in items relating to recreation are consistent with results by Jacobs and Shipp (1990) and Costa (1999), who argued that such spending has grown

historically as innovations have occurred in consumer goods industries, as new electronic toys and gadgets have become more available, and as participatory and spectator sports have become increasingly popular.

Spending on education has also risen in absolute terms as school tuition increases have outpaced inflation. In contrast to these expenditure jumps, spending on food for children has dropped noticeably in relative terms. The relative decline is consistent with Engel’s law: as income increases, the share of expenditures for food declines. More puzzling is the absolute spending decline for children’s food. In Lino’s (2001) study, a similar finding that the absolute amount of food expenditures for children has declined in real terms since 1960 was explained by differences over time in CES measures of spending for food at home. Before 1988, the CES estimated food-at-home spending on a child by using a scientific standard based on USDA food plans; after 1988, the CES used actual

food-at-home spending on children rather than on the food plans. Hence, the absolute decline we observed for spending on children's food may mostly reflect the comparison of two different concepts.⁴ Comparisons over time in quarterly expenditures on children for two-child and three-child households, not reported, yielded similar conclusions.

Household Expenditures on Children and Gross Income

The third step to estimating a household's expenditures on children was to evaluate the statistical relationship between household expenditures on children and combined gross income. To do so, for each household size, we regressed the logarithm of average monthly child-rearing expenditures on the logarithm of average monthly gross income:

$$\ln(\text{Expenditures}_i) = \alpha_0 + \alpha_1 \ln(\text{Income}_i)$$

These estimates will vary in magnitude when the per capita and average use approaches are alternatively used to calculate housing and transportation expenditures attributable to children. Because the per capita approach generates higher estimated expenditures on children, schedules based on the per capita relationships will be uniformly higher than schedules based on the average use relationships. We estimated a variety of specifications by using the different per capita and average use assumptions in table 1 and reported results for two alternatives: (1) per capita approach applied to all housing and transportation expenditures and (2) per capita approach applied to housing and variable

⁴Actual spending on away-from-home food has been included in the food estimates throughout the period.

Table 3. Coefficient estimates on the child-expenditure and household¹-income relationship (standard errors in parentheses)

Panel A: Estimated elasticities derived from the 2000 Consumer Expenditure Survey

	Per capita approach		Average use approach	
	Constant	Log(Income)	Constant	Log(Income)
Number of children				
1	4.902 (0.107)	0.237 (0.013)	4.839 (0.113)	0.235 (0.014)
2	5.786 (0.080)	0.179 (0.010)	5.679 (0.085)	0.180 (0.010)
3	5.921 (0.122)	0.180 (0.015)	5.852 (0.127)	0.176 (0.015)

Panel B: Estimated elasticities derived from the 1972-73 Consumer Expenditure Survey (in 2000 dollars)

	Per capita approach		Average use approach	
	Constant	Log(Income)	Constant	Log(Income)
Number of children				
1	2.624 (0.104)	0.492 (0.012)	2.475 (0.113)	0.498 (0.013)
2	3.233 (0.109)	0.460 (0.013)	3.112 (0.118)	0.461 (0.014)
3	3.789 (0.135)	0.419 (0.016)	3.626 (0.145)	0.425 (0.017)

¹Husband-wife households with children.

Note: The per capita approach and the average use approach are alternatively used to estimate vehicle costs attributable to children.

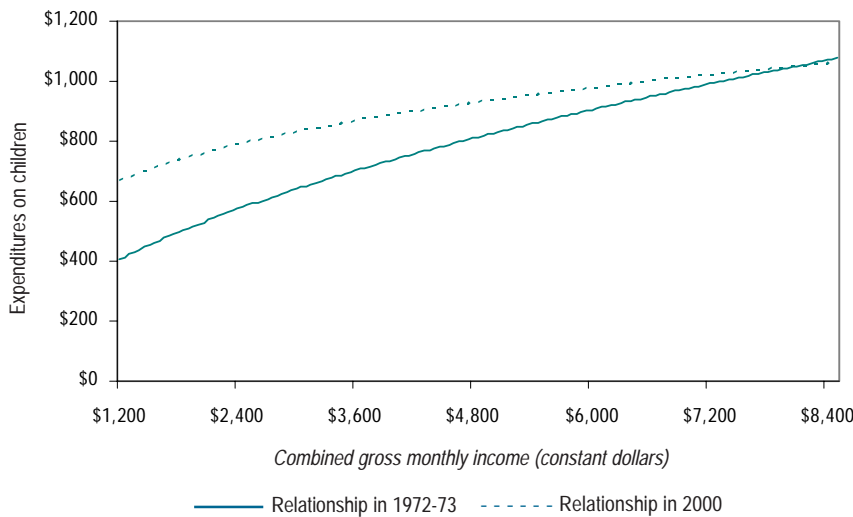
transportation expenditures and the average use approach applied to fixed transportation expenditures.

Panel A of table 3 presents the regression estimates, based on 2000 CES data, for husband-wife households with children (one to three). The coefficient estimates are interpreted as elasticities. For example, the estimated coefficient $\alpha_1 = 0.235$ (with the average use in vehicles approach) for a one-child household implies that a 10-percent increase in gross income is associated with an approximate 2.35-percent increase in expenditures on the child. Results were similar in magnitude and

precision across the two approaches, with a higher expenditure-income elasticity for one-child households, compared with households consisting of more children. We found differences between the constants in the per capita and average use models, implying that the per capita expenditure-income profiles would be 6 to 10 percent higher at all income levels, compared with the average use relationships.

To test the hypothesis that the underlying relationship between child-related expenditures and household income has changed over time, we used the 1972-73 CES to re-estimate the

Figure 2. Change over time in the child-expenditure and household-income relationship



Note: The relationship represents one-child households. Patterns for two-child and three-child households are similar.

expenditure-income regression for intact households of one, two, and three children. Results showed that over time, the regression line has changed considerably. The constant (intercept) has increased, indicating an upward shift in the child-expenditure and household-income relationship. In addition, the elasticities have fallen from a range of 0.42 to 0.49 to a range of 0.18 to 0.24.

To convert the statistical relationship between child-rearing expenditures and gross income into a schedule of total child support awards, one needs to predict expenditures on children at a succession of income levels. To do so, we evaluated the regression model for a large range of steadily increasing income levels and then took the exponential of each value. The average use in vehicles approach was used for one child and two children, and the per capita approach was used for three children. For example, for a one-child household ($\alpha_0 = 4.839$ and $\alpha_1 = 0.235$) with a monthly gross income of

\$5,000, the predicted monthly expenditure on that child would be \$934. To predict child-rearing expenditures, we applied this data transformation to all monthly gross income levels ranging from \$1,200 to \$8,500 in increments of \$50.

As predicted, for the 1972-73 and 2000 survey years, child expenditures rose with household income (constant dollars). As an indicator of plausibility, the relationship for 2000 fell within the range of the upper bound and lower bound relationships estimated in JLARC (2001) for Virginia when the 1997-98 expenditure data were used. The effect of the behavioral change in the child-expenditure and income relationship was striking (data not shown). The updated schedule showed a strong increase over time in estimated child-related expenditures at the lower and middle levels of the income scale. Hence, since the early 1970s, the largest increases in expenditures attributable to children have occurred for lower income and middle-income

households. The main explanation for this result is that in the past three decades, real expenditures on children have risen at all levels of the income distribution because of changes in technology and preferences. Yet, during this period, real incomes have been falling at the lower and middle portions of the income scale. Together, these changes have produced a shift in the child-expenditure and income relationship as observed in figure 2.

How plausible is this finding? First, one could argue that our estimates of α_1 could be biased because of sample selection. In particular, since the 1970s, single-parent households have increased. Our use of data on intact lower and middle-income families may then have misrepresented expenditure patterns for all lower and middle-income families. Under this scenario, our method would effectively impose the expenditure patterns of more privileged families on less privileged families, causing an increasing upward bias in expenditure estimates over time as the number of single-parent households grew.

Evidence in JLARC (2001) did not support this argument for smaller households but did provide some support for larger households. The JLARC study found that, when income is controlled, dual-parent households actually spent less on children than did single-parent households if there were one or two children, while dual-parent households spent slightly more, on average, than did single-parent households if there were three children. These results helped to explain JLARC's recommendation that the methodological underpinnings of Virginia's guideline be based on the child-expenditure and income relationship for dual-parent households. Small CES sample sizes for single-parent households were another reason to focus on intact households when

estimating the expenditure and income relationship. Finally, there was little conclusive evidence to suggest that the dissolution of dual-parent households has been nonrandom across the income distribution (Bedard & Deschenes, 2003; Bramlett & Mosher, 2002).

We also conducted a number of robust tests to confirm that the child-expenditure and income relationship has changed over time because of behavioral changes rather than empirical irregularities. First, we re-estimated the child-expenditure and income equations for each major expenditure category and found that the main conclusion (rising intercepts and falling slope coefficients over time) held for each category of spending on children. Second, we addressed the argument that problems with missing income in the CES leads to differential sample selectivity across the 2 years in the analysis. In the 1972-73 CES, close to 6 percent of dual-parent households with one to three children reported zero income but had positive expenditures on children; this proportion rose to 21 percent in the 2000 CES. Although reported income was zero, the CES did report income brackets for these households. We compared total expenditures, child expenditures, and income brackets for households with positive and zero reported income and found similar distributions in each year, suggesting that selection was random.

Furthermore, we re-estimated the statistical relationship between child expenditures and income by using median regression analysis applied to the full sample, including observations with zero reported incomes. Means, and thus ordinary linear regressions, are sensitive to outliers such as zero and top-coded values, while median regressions yield estimates that are robust to the inclusion of outliers in the sample. The median regressions

yielded results that were qualitatively similar: the intercepts rose and the elasticities fell over time. In particular, by using the per capita approach, we found that the child-expenditure elasticities for one-child, two-child, and three-child households were, respectively, 0.518, 0.473, and 0.437 in 1972-73 and 0.289, 0.290, and 0.226 in 2000. With the average use approach, the elasticities were, respectively, 0.518, 0.475, and 0.423 in 1972-73 and 0.276, 0.354, and 0.230 in 2000.⁵ The similarity in median and mean regression results also helped to bolster the case that top-coding was not driving the results. For example, in the 2000 CES, about 3 percent of dual-parent households with one to three children were top-coded.

Comparing Child Support Schedules

To facilitate a more realistic comparison between the revised schedule and the existing legislated schedule for Virginia, we included in the revised schedule a self-support reserve that is also built into the existing legislated schedule. In Virginia's legislation, if the combined gross monthly income is less than \$600 (the 1987 poverty line for a single individual), then the economic data are not used to compute the total child support order. Instead, a fixed minimum award of \$65 is applied to the noncustodial parent. This \$65 figure in Virginia's legislation is consistent with the range suggested in Williams's work (1987) for the obligor self-support reserve, allowing for cost-of-living increases. Williams's review of the economics literature supports the premise that low-income obligors be allowed a self-support reserve.

⁵All estimates were statistically significant at the 1-percent level. Complete estimation results and computations are available upon request.

Low-income obligors are more likely than are higher income obligors to have arrears, thus making it harder for them to have a stable record of support payments. The self-support threshold makes it easier for such low-income obligors to support their children financially without creating a disincentive to pay support. Hence, the guideline model and calculations will, in principle, not take the obligor below subsistence-level existence.

Virginia does not apply the self-support reserve to the custodial parent. The custodial parent, on the receiving end of the guideline calculations, cannot be taken to a below-subsistence level of existence simply because of the guideline model (even though she or he may already be at that level). To make the revised schedule politically more tractable, we increased the self-support reserve from \$600 to \$1,108 per month or \$13,025 annually, which was equivalent to 150 percent of the February 2002 poverty level for one person. This increase in the self-support reserve ensured that while all parents contribute financially to their children, the order would not cause the obligor to fall below the poverty level.

To minimize work disincentives that might occur at the self-support reserve's threshold, we slowly phased in the level of total child support just above the cutoff. This process prevented a large discrete jump in the order from \$65. (While the \$65 minimum payment at the self-support threshold was applied only to the noncustodial parent, all subsequent levels of total child support were divided between the custodial and noncustodial parents according to their respective shares in total income.) At gross incomes just above the self-support reserve, the estimates from the economic data were compared with a series of phased-in costs. For low levels of gross income, we computed

the difference between gross income and the self-support reserve and then multiplied this difference by 0.90 for one-child households, 0.91 for two-child households, and 0.92 for three-child households. We compared this obligation with the obligation predicted by the estimated coefficients, and the smaller of the two was included in the updated income shares.

The adjustment affected one-child households with gross incomes below \$1,450 per month, two-child households with gross incomes below \$2,450 per month, and three-child households with gross incomes below \$2,850 per month (data not shown). The 0.90, 0.91, and 0.92 adjustment factors have their origins in State-level child support panel discussions. By including a range in which the high shares are phased in, we included an adjustment that helped to address the problem of very high estimated income shares at the lowest tail of the income distribution.

The final step in developing an updated schedule for Virginia was to generate estimates of child-rearing expenditures for households with monthly incomes between \$8,500 and \$15,000, the latter point being the endpoint in Virginia's current schedule. Because the Bureau of Labor Statistics cautions CES users against making statistical inferences on expenditures for households with monthly gross incomes in excess of \$8,500, we applied the income share at \$8,500 per month to all higher income households.

Results, reported as child expenditure shares in combined gross monthly income, are illustrated in figure 3. The current income shares as specified in Virginia's child support guidelines are labeled "Legislated," and the new estimated shares based on the 2000 CES are labeled "Updated." The figure indicates that Virginia's legislated

shares were well below the updated shares at all income levels except for very low income levels close to \$1,200 per month. For example, for a two-child household earning \$3,550 in gross income per month, the current schedule sets the order at 22 percent per month, compared with a CES estimate of 36 percent.

This difference between the legislated income shares and the CES-estimated income share devoted to children was greatest for low-income households and smallest for higher income households. The difference also rose as the number of children per household increased. For a household with three children and earning \$3,550 per month, the order was set at 28 percent, compared with a CES estimate of 46 percent. These results point to a considerable gap between mandated support levels based on outdated CES data and updated support levels based on recent CES data. Therefore, the evidence suggests a need to increase total child support awards as a share of monthly income at all income levels except for the very lowest end of the income distribution.

These results help to explain why Virginia is one of numerous States that have child support orders that do not sufficiently reflect typical expenditures on children. According to calculations reported in Pirog, Klotz, and Byers (1998), Virginia's child support orders for most income levels ranked slightly above the mean and median child support orders for all 50 States during the 1988-97 period. However, at most income levels, Virginia joined the majority of States that failed to meet even the lower bound estimates of adequate child support orders that reflected the actual costs of raising children. For example, for a two-child divorced family scenario with a combined monthly income of \$4,400, Pirog et al. reported that Virginia's

The figure indicates that Virginia's legislated shares were well below the updated shares at all income levels except for very low income levels close to \$1,200 per month.

child support order in 1997 for the noncustodial parent would have been \$641, slightly above the mean of \$624 for all 50 States.⁶ Yet, this order fell well below \$827, Pirog et al.'s minimum estimate of what a non-custodial parent should have paid to meet the cost of raising children. The benchmarks used in Pirog, Klotz, and Byers also assumed that data in the CE from intact families should be used to generate the estimated costs of raising children.

Similar conclusions that child support awards across States fell short of the actual cost of raising children in earlier years were found by Lino (1998) and Beller and Graham (1993). The fact that Virginia's guidelines are based on data from the 1970s is an important source of this shortfall. Our own updated estimate for this particular level of household income in constant dollars would suggest that the non-custodial parent be awarded an obligation of \$742, roughly halfway between the Pirog et al. minimum benchmark and the legislated child support order for Virginia.⁷

Thus far, the discussion has focused on revisions based on updates to the underlying economic relationship between income and child-rearing expenditures. However, policy discourse is also focusing on the need to revise schedules to adjust for expenses incurred during "shared parenting time." States are trying to develop means for compensating noncustodial parents for their direct expenditures on

children during visitation hours and for the resources they need to operate and maintain a household. However, the method by which support schedules should be adjusted for parenting time is far from clear-cut for several reasons. First, child-related expenses by the noncustodial parent during visitation hours show considerable variance and unpredictability (Venohr & Williams 1999). Hence States that do have adjustments for parenting time mostly require a high share of legal custody, such as 30 percent, with the rationale that these parents are likely to incur higher direct expenditures on their children (Venohr & Williams 1999).

Second, some fixed costs incurred by the noncustodial parent are simply duplicated and do little, if anything, to reduce fixed child expenditures for the custodial parent. Because the custodial parent is also incurring expenses to maintain a separate household, some States have resisted pressures to reduce child support orders based on the noncustodial parent's direct expenses while other States have introduced adjustments based on whether the costs are "variable," "duplicated fixed," or "unduplicated fixed" (Venohr & Williams 1999). Finally, there is very little evidence on the effect of the obligor's child expenditures during visitation hours on the custodial parent's child expenditures. More scholarly research in this area is needed to inform States of the justification for whether and how much to adjust support awards for shared parenting time.

Virginia is among the States to have experienced considerable pressures to adjust the child support schedule for shared parenting time. To address this concern, we built an easily adjustable "separate household discount" into the revised schedule. Our precedent for this label came from a report developed for Minnesota's child support

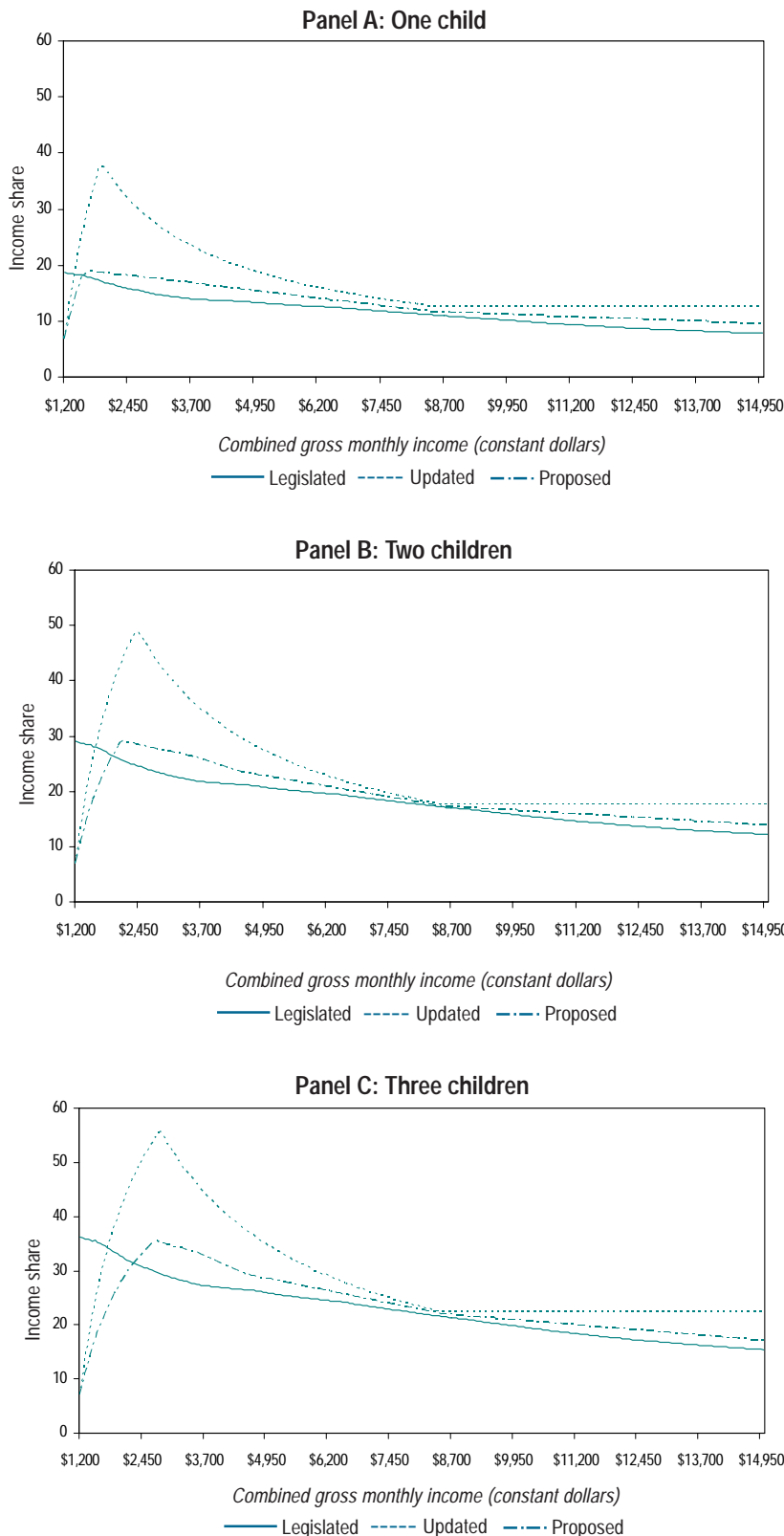
guidelines (Beld, 2001). The discount reserved income for expenditures that may have occurred during the non-custodial parent's visitation time and for the fixed costs of operating a second household. Adding the discount helped to smooth the updated income shares shown in figure 3 by lessening the size of jumps in support that could induce reductions in hours worked or the shielding of income. However, for the reasons just described, this discount presented some awkward problems. Because the discount was applied to the total child support order, it effectively compensated noncustodial parents for costs associated with shared parenting time while reducing the support amount received by the custodial parent. The final proposed schedule was developed by using the discount procedure described in the box (p. 36), with the strong caveat that the shared-parenting-time rationale remains a complex issue that requires more supporting evidence.

A major problem with the "phase-in" approach illustrated for the updated series in figure 3 was that large increases in the child support order occurred in the lower tail of the income range. To address the potential work disincentive that this guideline structure generated, we constructed a revised phase-in. Starting at the \$1,200 income level, we moved up the schedule in \$50 increments and increased the support levels by no more than \$30 until they equaled the levels of support predicted by the regression model. More specifically, for one child, we began with a support level of \$83 and increased support by \$28 for the first 7 increments and \$14 for the next 8 increments. For two children, we began with a support level of \$84 and increased support by \$29 for the first 19 increments and \$14 for the next 7 increments. For three children, we began with a support level of \$85 and increased support by \$29

⁶ The scenario assumed that the father contributed 60 percent of the income and the mother, 40 percent.

⁷ This \$742 figure was computed by taking our updated total child support estimate of \$1,327 for the \$4,400 income level and multiplying it by Pirog et al.'s assumed noncustodial contribution of 60 percent. The calculated amount, \$796, was converted into 1997 dollars by using a discount factor of 1.073.

Figure 3. Comparison of child support guidelines, by number of children



for the first 30 increments and \$20 for the next 5 increments.

The intuition behind this approach was to provide larger discounts for lower income obligors and for obligors with more children. However, the approach maintained the inverse relationship between the size of household income and the proportion of household income spent on children. It reflected the statistical reality that families with less money spend a larger percentage of their income on their children, but it acknowledged that separated families cannot afford to spend as much on their children as would be spent if they lived together.

Results from incorporating a separate household discount and revising the phase-in are reported in figure 3 as the series labeled “Proposed.” Overall, the adjustments generated proposed income shares that generally fell between the lower bounds of the current Virginia guidelines and the upper bounds of the 2000 CES updated guidelines. For one child at incomes below \$1,550, the support order in the proposed schedule was less than the order in the legislated schedule. From \$1,550 to \$3,600, the proposed schedule’s order exceeded the actual order by up to 3 percentage points; thereafter, the difference fell to about 2 percentage points. The proposed and legislated schedules for two children exhibited a similar pattern. At combined gross income below \$1,950, the legislated order exceeded the proposed order. From \$1,950 to \$3,450, the proposed schedule’s order exceeded the legislated order by up to 4.5 percentage points, and at combined gross incomes in excess of \$3,450, the proposed schedule’s orders were higher than the legislated orders by about 2 percentage points. A similar conclusion could be made for households with three children.

Creating the Separate Household Discount

To include a separate household discount in the proposed guidelines, we took the legislated and updated income shares at the \$3,550, \$4,550, and \$8,500 income levels; calculated proposed shares that were seven-tenths of the distance between the legislated and the updated shares; and then connected these proportions across the entire income scale to create a final proposed schedule. (To derive the seven-tenths figure as a proxy for expenditures during shared parenting time, we started with three-tenths base points for visitation days and added the child expenditure shares for shelter, household equipment, and fixed transportation. This discount was applied uniformly across the income distribution.) Starting at \$3,550 and moving down to \$1,200 in \$50 increments, we adjusted the proportions upward for each income level and additional child by small increments. The discounted percentage for a one-child family was increased by .05-percentage points for each \$50 decrease in income, the discounted percentage for a two-child family was increased by .10-percentage points for each \$50 decrease in income, and the discounted percentage for a three-child family was increased by .12-percentage points for each \$50 decrease in income.

The proportions from the median household income (approximately \$4,550 to \$8,500) were reduced as follows. For one child, the proposed proportion fell by 4.2-percentage points, from 15.8 percent at \$4,550 to 11.6 percent at \$8,500. For two children, the proposed proportion fell by 6.1-percentage points, from 23.4 percent at \$4,550 to 17.3 percent at \$8,500. For three children, the proposed proportion fell by 7.3-percentage points, from 29.3 percent at \$4,550 to 22.0 percent at \$8,500. Over this income range, there were 79 increments of \$50. To generate a smooth transition across this range, we divided the specified percentage points for each household size equally across these 79 increments.

The discount proportions at \$8,500 to \$15,000 were reduced as follows. For one child, the proposed proportion fell by 2.1-percentage points, from 11.6 percent to 9.5 percent. For two children, the proposed proportion fell by 3.5-percentage points, from 17.3 percent to 13.8 percent. For three children, the proposed proportion fell by 4.9-percentage points, from 22.0 percent to 17.1 percent. Over this income range, there were 130 increments of \$50. To generate a smooth transition across this range, we divided the specified percentage points for each household size equally across these 130 increments. Finally, the discount proportions for different-sized families with gross monthly incomes of \$4,050 (the mid-point between \$3,550 and \$4,550) were calculated by averaging the discounted percentages for similar-sized families. Following this procedure provided a smooth transition for incomes between the two endpoints.

These changes may appear minor, but in absolute terms, the proposed increases were substantial. For example, at the \$3,600 monthly income level, the legislated child support award for a one-child household was \$507 per month. Our proposed monthly award was \$610, a 20-percent increase. And without the separate household discount and revised phase-in, the updated monthly award would have been \$860, a 70-percent increase. This calculation and the alternative guidelines depicted in figure 3 help to illustrate the tradeoffs involved when revisions to guidelines are based on economic criteria alone—as represented by the “Updated” series—versus revisions based on economic and political criteria—as represented by the “Proposed” series. The legislated schedules for Virginia and the 10 other States with similar guideline structures are clearly out of line with the economic reality of how much parents are spending on children.

Conclusion

About one-fifth of the Nation’s State governments still use child support guidelines that are based on estimates of child-rearing expenditures that were derived from data that are three decades old. Yet during this period, the number of households covered by the CES and the level of detail have grown, providing better expenditure and income data. In addition, the fundamental relationship between child-related expenditures and parental income has changed, a result that our article has demonstrated with regression analysis. This finding expands upon Lino’s (2001) earlier work showing the increase over time in average total expenditures on children.

Our article has also described a new schedule for child support payments that was proposed for Virginia, 1 of 11 States still using the 1970s data. The schedule, which was based on CES data for the year 2000, was compared with the actual schedule in place. Results showed a large gap in Virginia's legislated income shares and the revised income shares based on the 2000 CES. This gap grew as household income fell and the number of children rose. These findings provide economic and statistical rationales for updating child support schedules that have weaker relationships to statistical estimates of what families actually spend on their children today. The alternative schedule proposed in this study for Virginia raised child support awards as a share of monthly income for parents at all income levels except for those at the lowest end of the income distribution.

Any schedule created in the future must be embraced by all child support constituencies, including noncustodial and custodial parents (particularly those in the lower and middle-income brackets), social workers, attorneys, and judges. Gaining this support is quite a challenge given the wide variety of preferences among stakeholders. During the Virginia legislature's consideration of the proposed schedule, the politics of child support trumped the economics. Virginia's lack of progress in making substantial revisions to the guideline structure is consistent with a finding by Venohr and Williams (1999): since the mid-1990s, there has been a marked decline across States in major guideline updates and revisions. More common across States in recent years, and considerably less controversial and politically charged, has been the tendency for States to refine definitions and calculations related to special factors such as shared parenting time,

child care services, and low-income obligors.

The experiences of other States over time show that changes in child support policy have happened, particularly with the emergence of new policy ideas and entrepreneurial individuals and groups (Crowley, 2003). Further research in this area, particularly on the political dynamics of the reform process across States, will yield valuable ideas for overcoming political factors in the determination of realistic and appropriate child support guidelines.

References

- Bedard, K., & Deschenes, O. (2003). *Sex Preferences, Marital Dissolution and the Economic Status of Women*. Working Paper, University of California at Santa Barbara Economics Department.
- Beld, J.M. (2001). *The Shared Responsibility Child Support Guidelines: Rationale and Research Support*. Report to the Minnesota Department of Human Services, Child Support Enforcement Division.
- Beller, A., & Graham, J. (1993). *Small Change: The Economics of Child Support*. New Haven: Yale University Press.
- Bernstein, J., Brocht C., & Spade-Aguilar, M. (2000). *How Much is Enough? Basic Family Budgets for Working Families*. Washington, DC: Economic Policy Institute.
- Betson, D. (1990). *Alternative Estimates of the Cost of Children from the 1980-1986 Consumer Expenditure Survey*. U.S. Department of Health and Human Services.
- Bramlett, M., & Mosher, W. (2002). Cohabitation, marriage, divorce, and remarriage in the United States. *Vital and Health Statistics*, 23(22), 1-103. Washington, DC: National Center for Health Statistics.
- Costa, D. (1999). *American Living Standards: Evidence from Recreational Expenditures*. National Bureau of Economic Research Working Paper No. 7148.
- Crowley, J. (2003). *The Politics of Child Support in America*. Cambridge, UK: Cambridge University Press.
- Deaton, A., & Muellbauer, J. (1986). On measuring child costs: With applications to poor countries. *Journal of Political Economy*, 94, 720-744.
- Espenshade, T. (1984). *Investing in Children: New Estimates of Parental Expenditures*. Washington, DC: Urban Institute Press.
- Holzer, H., Offner, P., & Sorenson, E. (2003). *Declining Employment Among Young Black Men: The Role of Incarceration and Child Support Policies*. Mimeo: Urban Institute.
- Jacobs, E., & Shipp, S. (1990). How family spending has changed in the U.S. *Monthly Labor Review*, 113(3), 20-27.
- Joint Legislative Audit and Review Commission (JLARC). (2001). *Technical Report: The Cost of Raising Children*. Richmond, VA: Commonwealth of Virginia.
- Katz, L., & Krueger, A. (1999). The high-pressure U.S. labor market of the 1990s. *Brookings Papers on Economic Activity*, 1, 1-65.
- Lino, M. (1998). Do child support awards cover the cost of raising children? *Family Economics and Nutrition Review*, 1(1&2), 29-40.

Lino, M. (2001). USDA's expenditures on children by families project: Uses and changes over time, *Family Economics and Nutrition Review*, 13(1), 81-86.

Pirog, M., Klotz, M., & Byers, B. (1998). Interstate comparisons of child support orders using State guidelines. *Family Relations*, 47(3), 289-295.

Rodgers, W.M. III. (2002). *Determining the Level of Child Support*. Report to the Secretary of Health and Human Resources, The Honorable Jane Woods, and the General Assembly of Virginia: Review of Child Support Guidelines.

Sorenson, E., & Zibman, C. (2001). Getting to know poor fathers who do not pay child support. *Social Service Review*, 75(3), 420-434.

Venohr, J., & Griffith, T. (2003). *Economic Basis for Updated Child Support Schedule: State of Arizona*. Denver, CO: Policy Studies, Inc.

Venohr, J., & Williams, R. (1999). The implementation and periodic review of State child support guidelines. *Family Law Quarterly*, 33(1), 7-39.

Welch, F. (Ed.). (2001). *The Causes and Consequences of Increasing Inequality*. Bush School Series in the Economics of Public Policy, Vol. 2. Chicago: University of Chicago Press.

Williams, R. (1987). *Development of Guidelines for Child Support Orders: Advisory Panel Recommendations and Final Report*. U.S. Department of Health and Human Services.