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**Another Factor to Consider in Choosing a Child Support Guideline:
Errors in Child Support Calculations**

Maureen A. Pirog-Good
Associate Professor
School of Public and Environmental Affairs
Indiana University

Patricia R. Brown
Associate Researcher
Institute for Research on Poverty
University of Wisconsin–Madison

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Abstract

In an effort to standardize the calculation of monthly child support awards, the federal government requires states to use preestablished formulas to determine the amount of awards. However, because of human error, differences in the experience and training of the officials making the calculations, and the extent to which computers are used to calculate the awards, the formulas do not always yield the same result. In fact, the discrepancy between the amount calculated by an individual child support official and the approved amount as calculated by the state in which that official works can be quite large, on the order of several hundred dollars. Adopting simpler formulas will reduce errors; this should be a priority even if child support officials use computers to calculate award amounts (computers can reduce errors but will not eliminate them, particularly in the case of complex formulas). Efforts to further the training and education of personnel who calculate awards would also help, and child support offices should revise their formulas to cover high-income cases.

Another Factor to Consider in Choosing a Child Support Guideline: Errors in Child Support Calculations

INTRODUCTION

The Child Support Enforcement amendments of 1984 (PL 98-378) required states to develop specific numeric formulas for determining the amount of child support that should be paid to children by absent parents. This legislation was enacted because child support awards were typically too low (Williams, 1987; Ollerich et al., 1991; Beller and Graham, 1986, 1993), there was substantial variation in the amount owed by individuals in similar economic circumstances (Yee, 1979; White and Stone, 1976), and case-by-case award setting had resulted in administrative inefficiencies and had aggravated problems for interstate cases (Thompson and Paikin, 1985; Williams, 1987). The 1984 legislation, however, provided states minimal direction in how to frame the content of the guidelines. Sensing this problem, Congress postponed the original implementation deadline from October 1985 to October 1987 (Brackney, 1988).

The original 1987 state guidelines were based on three models which are known as the Percentage of Income, Income Shares, and Melson models. Including the District of Columbia, Puerto Rico, Guam, and the U.S. Virgin Islands, there continues to be fifty-four unique variations of the three basic child support models. When introduced in 1987, the state guidelines were advisory, meaning that individuals calculating child support awards could have used, but were not required to use, their state's guideline. The National Advisory Panel on Child Support Guidelines first recommended that state guidelines become presumptive rather than advisory in 1987. That is, the amount of a child support award calculated using each state's guidelines would be considered the correct amount of child support unless good cause for deviating from the guidelines could be established. The advisory panel urged the use of presumptive guidelines citing the same reasons used to adopt guidelines in the first place: to further improve the adequacy of awards; ensure greater equity for litigants; and facilitate the

adjudication of cases (Advisory Panel on Child Support Guidelines, 1987). The statewide application of child support guidelines became presumptive with the passage of the 1988 Family Support Act (PL 100-485).

More recently, the U.S. Commission on Interstate Child Support (1992) recommended that Congress appoint a National Child Support Guidelines Commission no later than January 1995 to determine if the United States should move to a single, national child support guideline. This commission asserted that very different amounts of child support are required of obligors depending on which of the fifty-four state guidelines is used and that this variation results in an inequitable interstate system. A federal child support guideline also is viewed as an essential component of a reformed child support system by Ayuda, Clinica Legal Latina, the Center for Law and Social Policy, the Children's Defense Fund, the National Women's Law Center, the United States Catholic Conference, and the Women's Legal Defense Fund (1994). The possibility of a national child support guideline raises the question of which, if any, of the fifty-four guidelines should be adopted and what criteria should the new guideline's architects employ to arrive at a single standard.

A number of criteria for selecting a federal guideline have been discussed previously (Bassi and Barnow, 1993; Betson et al., 1992; Schaeffer, 1990; Takas, 1992), but the issue of whether court and Child Support Enforcement (CSE) workers can accurately implement a guideline has not been taken into consideration. Even the most equitable guideline is of limited usefulness if court and CSE workers cannot uniformly apply that guideline. In this study, we capitalize on the period of natural experimentation with state guidelines which has occurred since 1987 to determine if certain types of guidelines are more likely to be accurate and uniform in their application to a particular case. Specifically, the type of guideline adopted in a given state (Percentage, Income Shares, or Melson), the complexity of the guideline, and whether or not taxes must be deducted from income are examined. However, it is likely that other factors will affect the accuracy of child support calculations including

the training and experience of the individual making the calculations as well as the availability of computer software to assist in computing awards. The effect of each of these factors on the accuracy of child support calculations is also taken into consideration.

BACKGROUND

The National Center for State Courts used the following four family-income scenarios to determine the amount of child support owed to two children in each state in 1988 (Munsterman, 1990):

Mother and father are divorced. Father lives alone. Mother and the party's two children, ages 7 and 13, live together. Father pays union dues of \$30 per month and the health insurance for the two children at \$25 per month. Mother incurs monthly employment-related child care expenses of \$150. There are no extenuating circumstances for this unit. The gross combined monthly income for this family is as follows:

Case A: Combined \$ 1,200—Father \$ 720, Mother \$ 480
Case B: Combined \$ 2,500—Father \$1,500, Mother \$1,000
Case C: Combined \$ 4,400—Father \$2,640, Mother \$1,760
Case D: Combined \$10,500—Father \$6,300, Mother \$4,200

Finally, the father files taxes as a single person with one deduction, while the mother files taxes as the head of a household with three deductions. The father spends less than 10 percent of his time with his children. Union dues are a mandatory condition of employment.

These same scenarios were used by Pirog-Good (1993) and Pirog-Good and Mullins (1995) to compare the 1988 award levels with 1991 and 1993, respectively. These two studies used the data to discuss the adequacy of child support awards, assess the extent of cross-state variation in child support awards, and explain the reasons for the extreme variation in low-income awards. The studies focused on the amounts of awards and trends in awards during the period of natural experimentation with state guidelines that had been occurring since 1987.

In the most recent of these studies, Pirog-Good and Mullins received responses concerning the amount of child support owed in the four family-income scenarios from either the director of the state Child Support Enforcement division and/or the administrative director of each state court in every state. Responses were received from both agencies in twenty-seven states. An unexpected outcome was that responses differed across agencies using the same guideline in the same state. When this occurred the respondents in these agencies were contacted to determine the cause of the discrepancy and to come to a mutually acceptable figure for a particular family-income scenario.

Of the twenty-seven states where both agencies calculated the amounts of child support owed, twenty states (74 percent) had one or more discrepancies in their responses. To clarify, using the same four simple family-income scenarios described above and the same state child support guidelines, the monthly amount of child support owed initially differed depending on whether the calculations were done by CSE or state court personnel. While Pirog-Good and Mullins were interested in the amounts of child support owed that these agencies eventually agreed upon, the current study focuses on the discrepancies in the calculated child support award. The relatively common occurrence of variation in child support calculations suggests that there may be considerable within-state variation in child support awards, even when the findings of fact in a given case are identical and a well-established state child support guideline is used. This variation is strictly a function of *who* is calculating the child support awards. Such variation must be viewed as undesirable since one of the primary goals of guidelines is to eliminate unjustified variation in child support awards within a given state.

Discrepancies between child support awards calculated by the state court and CSE offices in the 1994 study were reported by Pirog-Good at *Securing Our Children's Future: Welfare Reform and Child Support*, a conference sponsored by the Department of Social Services, State of New York, in May 1993. The discrepancies were substantial. For example, the average differences in the monthly awards calculated by the state court and CSE personnel were \$36.12 for Case A, \$65.44 for Case B,

\$90.83 for Case C, and \$202.22 for Case D. Relative to average monthly child support obligations, these discrepancies were 18 percent of the average monthly Case A award; 17 percent of the average Case B award; 15 percent of the average monthly Case C award; and 18 percent of the average monthly Case D award. In some states, the amounts of child support owed differed dramatically across agencies. The largest discrepancies in monthly child support awards were \$133 for Case A, \$344 for Case B, \$481 for Case C, and \$804 for Case D.

In the process of reconciling these differences, Pirog-Good asked both agencies to inform her why these differences occurred in the first place. The most common reasons for discrepancies were the miscalculation of taxes, math errors, omission of union dues and/or child care from the calculations, or that both figures were different but equally correct under the state guideline due to ambiguities in the guidelines. States using the flat Percentage of Income model had the smallest discrepancies, suggesting that the simplicity of this type of guideline may facilitate its uniform usage. However, given the small number of observations, twenty discrepant responses, it was not possible to make reliable judgments about how discrepancies varied across guideline models.

The fact that these discrepancies were common when two agencies responded to the initial survey raised a series of empirically testable hypotheses which the current study was designed to address. In particular, do the amounts of child support owed in the four family-income scenarios vary substantially within a state when the amount of child support owed is determined by individuals who regularly calculate child support awards? Are within-state variations in support awards a function of the type of guideline used (Percentage, Income Shares, Melson), the complexity of the guideline, the experience of the individual calculating the awards, and/or whether or not a computer package was used to arrive at the amounts of support due? Answers to these questions should provide some useful insights into the reformulation of state guidelines and the formation of a single federal guideline, if one is legislated.

METHODS

In the Fall of 1993, we initially selected twenty states to participate in this study. The states were selected to provide roughly equal representation of the three guideline models, although only four states had adopted the Melson model or a variant of the Melson model at that time.¹ A second criteria used to select states was to obtain a balance of states which do and do not deduct taxes from gross income to arrive at a child support award. Some state CSE and court office personnel had indicated that calculations using tax deductions were difficult.

The names and addresses of individuals who regularly calculate child support awards or offices where these calculations regularly occur within each state were solicited from the state CSE director as well as the administrative director of each state court. The lists of office locations and/or names from these agencies were pooled and twenty individuals or offices were selected in each state for inclusion in our study. The selection of participants was not strictly random as we wanted to ensure that individuals from both lists gave a broad representation of CSE employees, lawyers, judges, court commissioners, etc. Also, it was not always possible to obtain the names and addresses of twenty individuals in each state. For example, support calculations are centralized in five offices in Delaware and since we asked for a single response from each office, only five responses were obtained from Delaware. In total, there were 250 responses to 382 requests for information from individuals or offices where child support awards were regularly calculated. This generated a response rate of 65.4 percent.²

In November of 1993, all respondents were asked to determine the amount of child support owed using the current child support guidelines for the four family-income scenarios described in the previous section. We compared each respondent's support calculations to the support awards that were mutually agreed upon by the director of the state CSE agency and the administrative director of the

state court using the same guidelines in each state.³ (The term "state-approved" is used throughout the remainder of this article to refer to the support awards mutually agreed upon by the director of the state CSE agency and the state court administrator.)

RESULTS

Calculation Errors and Differences Stemming from Ambiguities in State Guidelines—The Overall Picture: Table 1 provides an overall picture of the extent to which the application of a state's guideline results in the calculation of similar child support awards for all four family-income scenarios. The results indicate that there is considerable variation in the amount of child support owed even when a state's guideline is strictly applied in a very simple scenario. Serial families, extraordinary health expenses, extension of child support past the age of majority, joint custody, and unusual visitation arrangements are complications which some state guidelines deal with very specifically whereas others are either silent or vague. As a consequence, we might expect considerable variation in support awards using state guidelines if our scenario was complex and incorporated these factors. However, our scenarios or findings of fact are simple.

Depending on the scenario examined, the percentage of respondents whose support calculations fell within \pm \$1.00 of the state-approved award ranged from 18.7 percent to 28.2 percent, depending on the case scenario. Any differences less than \$1.00 were most likely due to rounding errors. A substantial percentage of the respondents, however, had responses which differed from state-approved support awards by \pm \$1.01 to \pm \$25.00: between 32.2 percent and 58.0 percent of respondents fell into this category, depending on the case scenario. For Cases A, B, and C, 20.4 to 26.1 percent of respondents calculated support awards which had a discrepancy of more

TABLE 1**Number (and Percentage) of Respondents Whose Child Support Calculations Differed from State Figures**

	Case A	Case B	Case C	Case D	All Cases
Discrepancies:					
Within \$1	69 (28.2%)	71 (27.7%)	48 (18.7%)	49 (24.3%)	237 (24.7%)
\$1.01–\$25.00	126 (51.4%)	118 (46.1%)	149 (58.0%)	65 (32.2%)	458 (47.7%)
\$25.01–\$50.00	23 (9.4%)	38 (14.8%)	25 (9.7%)	36 (17.8%)	122 (12.7%)
\$50.00 +	27 (11.0%)	29 (11.3%)	35 (13.6%)	52 (25.7%)	143 (14.9%)
Mean discrepancy	\$23.48	\$20.93	\$24.20	\$60.41	\$30.76
Median discrepancy	\$6.00	\$6.50	\$12.00	\$12.33	\$9.00
Discrepancy as a percentage of state-approved award (mean)	12.6%	6.0%	4.4%	5.7%	7.2%
Range of discrepancies	-\$237.00 to \$462.00	-\$138.00 to \$290.67	-\$282.00 to \$340.00	-\$720.00 to \$1,240.00	-\$720.00 to \$1,240.00
Direction of discrepancies:					
Negative discrepancy	104 (42.4%)	91 (35.6%)	107 (41.6%)	68 (33.7%)	370 (38.5%)
Discrepancy within \pm \$1.00	69 (28.2%)	71 (27.7%)	48 (18.7%)	49 (23.3%)	237 (24.7%)
Positive discrepancy	72 (29.4%)	94 (36.7%)	102 (39.7%)	85 (42.1%)	353 (36.8%)
Total responses	245	256	257	202	960

than \$25.00. In Case D larger errors were more common. Discrepancies in excess of \$25.00 were found in 43.5 percent of Case D responses.

There are many more small departures from the state-approved support awards than there are large departures. This is highlighted by the fact that the median discrepancies are always substantially smaller than the mean discrepancies. For example, the mean discrepancy for Case D using the state-approved figures is \$60.41; however, half of the Case D calculations fell within \$12.33 of the state-approved award. This is somewhat heartening given that state guidelines were intended to insure greater uniformity in child support awards. However, between 11.0 and 25.7 percent of child support calculations deviated from the state-approved child support figures by more than \$50.00 per month. Across all scenarios, an average of 14.9 percent of responses had discrepancies exceeding \$50.00. Moreover, the maximum differences between the respondents' and state-approved support award calculations were startling, reaching \$462.00 per month in the lowest income scenario and \$1240.00 per month in the highest income scenario.

Relative to the amount of the state-approved child support award, discrepancies averaged 12.6, 6.0, 4.4, and 5.7 percent of the child support awards for Cases A through D, respectively. This figure is highest for the low-income scenario, Case A, because even modest errors can represent a large percentage of small awards. When discrepancies are viewed as a percentage of state-approved awards, then 73.5, 86.7, 92.2, and 87.6 percent of the errors were within 10 percent of the correct child support awards (results not shown in Table 1). At the other extreme, 5 percent of the Case A calculations departed from state-approved awards by at least 50 percent of the approved award; the figures were 21, 17, and 23 percent of the award for Cases B, C, and D, respectively (results not shown in Table 1). This indicates that although small errors are more common, there are large calculation errors.

Finally, Table 1 provides information on the direction of the calculation errors. In the low-income scenario, Case A, the computed awards were lower than the state-approved figures in 42.4

percent of the cases and higher in 29.4 percent of the cases. For Cases B and C, discrepancies above and below the state-approved awards occurred with roughly the same frequency. In the high-income scenario, Case D, discrepancies in excess of the state-approved award were more common than in the low-income scenario.

Does the Guideline Model Adopted by a State Affect Calculation Errors? The existence of within-state differences in child support calculations when that state's guideline is being strictly applied raises the issue of whether calculation errors depend on the type of guideline adopted within a state. Recall that there are three basic guideline models. The Melson formula requires a computation using both parents' incomes and a self-support deduction for each parent. The Income Shares model also uses both parents' income. Both the Melson formula and the Income Shares model also allow a child care deduction for employed custodial parents. The Percentage of Income model requires a computation based solely upon the income of the noncustodial parent. There is no self-support deduction in the Percentage of Income model and generally no provision for child care expenses of the custodial parent.

The difference in the mean errors for the three guideline models are given in Table 2, along with a separate comparison of the flat and varying Percentage of Income models. T-tests of the differences in the reported means reflect differences across the guideline models, not differences of means from zero.

On average, the smallest discrepancies occur in Percentage of Income states. Further, the discrepancies in the Income Shares states usually are smaller than those found in states using the Melson formula. The magnitude of these differences are quite large and statistically significant for Cases A and B. For example, the Case A child support calculations of respondents in states using a

TABLE 2

Average Discrepancies from State Child Support Calculations

	Case A	Case B	Case C	Case D
Discrepancies:				
Income Shares	31.68** (N=119)	22.82*** (N=118)	24.61 (N=119)	75.46 (N=77)
Melson formula	33.90** (N=31)	44.52*** (N=31)	32.39 (N=31)	72.81 (N=31)
Percentage of Income	9.80** (N=95)	12.00*** (N=107)	21.39 (N=107)	43.99 (N=94)
Flat Percentage of Income	9.66 (N=80)	11.09 (N=80)	17.45* (N=80)	39.11 (N=79)
Varying Percentage of Income	10.56 (N=15)	14.70 (N=27)	33.04* (N=27)	69.67 (N=15)

Note: The t-tests refer to statistical differences between the groups, for example, differences in discrepancies between respondents using Flat versus Varying Percentage of Income guidelines.

*** = $p \leq .001$.

** = $p \leq .01$.

* = $p \leq .1$.

Percentage of Income guideline differed, on average, by \$9.80 from the support awards agreed upon by the state CSE and court offices. This contrasts to a \$31.68 difference in states using an Income Shares guideline and \$33.90 in Melson formula states. However, while these patterns generally hold at all income levels, the differences are not statistically significant for Case scenarios C and D.

The accuracy of child support calculations in states using a "flat" versus a "varying" percentage of income guideline were also compared. Some states like Wisconsin require obligors to pay 25 percent of their adjusted gross income for two children irrespective of their income level ("flat" guideline), whereas other states reduce ("vary") the child support percentages as the obligor's income increases. In all comparisons, discrepancies were smaller in states using flat rather than varying percentages. These differences were, however, statistically significant only for Case C.

Does the Complexity of the Guideline Affect Calculation Errors? The complexity of a child support guideline is difficult to quantify. We examined each state's guideline to determine if certain types of computations were required to calculate a child support award. For example, we were interested in whether or not taxes were deducted from gross income in order to arrive at a child support award. We also examined the worksheets returned by our survey respondents. While our scenario was specifically chosen to be simple, we found that some worksheets required specific calculations for health insurance, union dues, child care expenses, and an adjustment for the ages of the children, whereas others did not. Mean discrepancies, and t-tests comparing discrepancies, for responses where these factors were present or absent from the worksheets were also calculated. The results of these comparisons are shown in Table 3.

The evidence concerning the role of taxes on errors in calculation is mixed. In most cases, child support guidelines that required tax calculations lent themselves to greater calculation errors. However, the differences in the discrepancies were significant only for Cases A and B. Regarding the presence or absence of health insurance, union dues, child care, and age adjustments for children

TABLE 3

**Average Discrepancies from State Child Support
Calculations—Guideline Complexity**

	Case A	Case B	Case C	Case D
Discrepancies:				
Taxes deducted	29.88**	25.31*	25.46	58.75
Taxes not deducted	14.35**	15.38*	22.61	63.50
Health insurance	26.88***	23.12**	25.53	67.83
No health insurance	11.74***	12.90**	19.33	40.05
Union dues	36.40***	29.14**	25.41	51.52
No union dues	13.13***	14.93**	23.32	68.78
Child care	32.14***	26.51***	27.26*	74.70
No child care	9.80***	11.46***	18.99*	43.99
Ages of children	22.48	38.12*	35.14*	36.00*
No ages of children	23.58	18.20*	22.48*	61.68*

Note: The t-tests refer to statistical differences between the groups, for example, difference in discrepancies between respondents who made child care calculations and those who did not.

*** = $p \leq .001$.

** = $p \leq .01$.

* = $p \leq .1$.

on child support worksheets, our overall pattern of results suggests that the more factors present on a worksheet, the less accurately or uniformly are child support awards calculated. This pattern is most pronounced for Cases A, B, and C. However, there was one anomalous result which we could not explain. In Case D, there were significantly smaller discrepancies on worksheets which explicitly took into consideration the ages of children.

Case D presented unusual difficulties to survey respondents. Table 1 shows that the number of responses for Case D were fewer than for the other case scenarios. This was due not only to individual response rates, but also to the failure of some state-approved guidelines to cover high-income households. Child support awards for high-income families are decided in the "court's discretion" in a number of states, and a state-approved figure could not be provided. In addition to worksheets, most states provide income tables which indicate the appropriate award level at various income intervals. The high income given in Case D was not included in the income charts available in a number of states, and therefore required a different method of award calculation.

Does Employee Training, Experience, or Computerization Increase the Accuracy with Which Awards Are Calculated? The qualifications of individuals calculating child support awards also were taken into consideration. Respondents were asked if they had any training in the calculation of child support awards. Overall, 34.2 percent of the respondents indicated that they had not been trained to calculate child support awards. Comparisons of the accuracy or consistency of the support calculations of those who had not been trained with individuals who were trained are given in Table 4. With the exception of support calculations for Case D, the high-income scenario, we found that the calculations made by individuals who had received training were not significantly more accurate or consistent than those made by the untrained respondents. For Case D, however, the differences between the two groups were quite large. The average discrepancy was \$38.14 for the individuals who were trained and \$97.04 for untrained individuals. Thus, with respect to high-income cases,

TABLE 4**Average Discrepancies from State Child Support Calculations—Training and Computerization**

	Case A	Case B	Case C	Case D
Discrepancies:				
Training	24.41	20.97	23.14	38.14*
No training	21.74	21.06	26.20	97.04*
Juris Doctor	23.94	18.49	21.52	55.08
No Juris Doctor	23.11	22.88	26.35	68.36
Handwritten worksheet	29.14	25.56	34.82**	102.72*
Computerized worksheet	35.24	26.04	15.85**	33.91*

Note: The t-tests refer to statistical differences between the groups, for example, differences in discrepancies between respondents who used a computer to generate support awards and respondents who calculated by hand.

*** = $p \leq .001$.

** = $p \leq .01$.

* = $p \leq .1$.

individuals who had received training were far more accurate or uniform in calculating award amounts than those who had no training. Training may be particularly important when there are ambiguities in guidelines, such as when income tables do not extend to very high income cases. Without training, individuals might use the highest award in the charts or extrapolate the chart to cover a higher income or use some other inaccurate method for calculating a child support award.

The educational background of some respondents may have better prepared them to calculate child support awards. For example, individuals possessing a law degree might calculate child support awards more accurately because they possess an advantage in reading the child support guidelines. A total of 126 respondents had a Juris Doctor; however, a significant accuracy advantage was not found to accompany the law degree.

We also examined each response to our survey to determine if the worksheets returned to us with the support calculations for our four family-income scenarios were generated by computer or were handwritten. Also some respondents simply indicated the amounts of the child support awards on a cover sheet which we sent and failed to return their worksheets, as requested. The results for the 103 individuals who failed to return worksheets are not included in Table 4 because it was unclear whether or not they used a computer for their child support calculations. In comparing the 95 handwritten responses to the 68 computer-generated responses, however, we found significant differences for Cases C and D. In these scenarios, computer-assisted responses had substantially smaller discrepancies than handwritten responses. Thus, as more states adopt computer systems which facilitate child support calculations, we would expect that calculation errors would diminish, although they will not be eliminated.

We also examined the correlations between child support discrepancies and the years of experience the respondent had in calculating child support awards. We expected that the longer an employee had calculated awards, the more experience he or she would have with guidelines, and the

more consistent or accurate the calculations would be. Our results were not compelling. For Case C, the results followed the anticipated pattern and were statistically significant, although the correlation was low, $-.117$. For Case D the results were similar but statistically insignificant. However, in Cases A and B, individuals with more years of experience had larger discrepancies; the correlation was small ($.141$) but statistically significant for Case A. (Results not shown in tables.) Hence, we cannot unambiguously discuss the impact of employee tenure on the quality of performance in calculating child support awards.

Multivariate Results. The univariate relationships described above were also examined in the context of a multivariate model to determine the impact of each independent variable, net of the influence of the other variables which are likely to affect child support discrepancies. The dependent variable is the absolute value of the discrepancy for Cases A through D. That is, a zero discrepancy indicates that a respondent's support calculation was the same as the state-approved calculation; a non-zero discrepancy measures the amount that the respondent's calculation deviated from the state-approved award. Because we focus on the amount of error (i.e., we treat positive and negative deviations equally), the dependent variable is censored at zero and a tobit estimator was used. The underlying latent dependent variable should be viewed as the proclivity for error in the calculation of child support awards.

Regressors include a dummy variable equal to one if respondents were using a guideline which allowed any one of three deductions from income: taxes, health insurance costs, or union dues. A dummy variable was created which indicates whether the child support award varied by the child's age. The different types of calculations included in the different guidelines were measured with dummy variables indicating whether or not a self-support reserve calculation was done, and whether both parents' incomes were used rather than one parent's income. The inclusion of a child care

dummy was omitted since the use of both parents' incomes and child care deductions were highly correlated.⁴

Two dummy variables were included which indicate whether the response was returned with a handwritten worksheet or with a computer-generated worksheet. The omitted category includes respondents who failed to return a worksheet. A dummy variable equal to one if the respondent was trained to calculate child support awards is included as well as the number of years which the respondent had calculated child support awards. Another dummy variable equals one if the respondent had a Juris Doctor. The results of these regression models are given in Table 5.

Our results clearly indicate that the proclivity for error is higher in guidelines which are more complex. The variables measuring guideline complexity are shown to be positively and significantly related to error in one or two of Case scenarios B, C, and D.

For Cases B, C, and D, respondents who returned computer-generated worksheets showed fewer errors in their calculations than individuals who did not return a worksheet, or returned a handwritten worksheet. These differences are substantial given that the complexity of the guideline has been controlled. Hence, additional computerization has the potential to further reduce errors in the application of state guidelines, although computerization alone will not eliminate errors. The proclivity to err is a function of the complexity of guidelines as well as the use of new computer technologies.

Finally, training appears to be important only for Case D calculations. We suspect that training is more important for Case D calculations because many guidelines do not provide tables which extrapolate to this high-income case. Hence, instruction in how to apply a state's guideline in the absence of clear-cut instruction in the guidelines is important. This suggests that simply extending income charts to high-income scenarios will likely reduce the ambiguity and help reduce error rates in the case of upper-income households.

TABLE 5**Tobit Analysis of Child Support Discrepancies**

	Case A	Case B	Case C	Case D
Three deductions	7.94	11.60	30.88***	72.21*
Child age	-15.72	24.82***	13.71	-22.94
Self-support	-16.35	25.20***	11.75	29.05
Both parents' income	18.75	21.52**	7.62	83.63*
Handwritten worksheet	10.81	-10.04	-.93	-14.41
Computer-generated worksheet	16.61	-21.74*	-28.84**	-115.13**
Training	-4.49	-2.60	-6.00	-72.45***
Juris Doctor	2.11	-12.39**	-16.48**	-15.22
Years of experience	2.15*	.23	-1.75*	-3.43
Constant	-16.36	.69	13.01	30.25
Number of observations	245	256	257	202

*** = $p \leq .01$.

** = $p \leq .05$.

* = $p \leq .10$.

Finally, having a Juris Doctor also reduces the magnitude of error. Having more years of experience in calculating child support awards reduces errors for Case C but, oddly, seems to increase errors for Case A.

SUMMARY

The guideline models adopted by states have been the subject of considerable controversy which has focused on issues of fairness and equity (Bassi and Barnow, 1993; Betson et al., 1992; Pirog-Good, 1993; Schaeffer, 1990; Takas, 1992). By their very nature child support guidelines make important equity tradeoffs between children, obligors, and taxpayers. We believe that equity issues should be the principal concerns of guideline developers. It is important to understand, however, that even with well-conceived guidelines, awards are calculated inconsistently. Our survey has found that errors in award calculations were numerous. Most of these errors were small. Some errors, however, were quite large.

Our findings indicate that expanding the use of computers in the calculation of awards will reduce the magnitude of errors. Instituting the use of computers, however, is not a solution for correcting all implementation inequities. Individuals returning computerized worksheets still made errors averaging 9 percent of the awards across all four scenarios. Computerized output is only as good as the data entered into the support calculation algorithms. Moreover, the complexity variables were still important even after we controlled for computerization. This finding undermines the view that the complexity of guidelines will not matter as states increasingly computerize child support calculations. Furthermore, guidelines are used by others than child support enforcement workers, judges, and family court commissioners. Guidelines are also used in the true meaning of the word "guideline" by lawyers and by parents who often stipulate to agreed-upon child support awards, and

who have no access to computer software to arrive at an "error-free" calculation of an appropriate award.

Our findings also indicate that other efforts can be made in local offices to reduce error in child support awards. Extending income schedules to cover high-income situations will reduce errors for this category of cases. And continued training or higher education of personnel who calculate awards should also reduce error.

Finally, while complexities in some of the guidelines were designed to improve the fairness of awards, our study shows that simpler guidelines with fewer computations result in smaller calculation errors. Deductions from income, adjustments for children's ages, computation of a self-support deduction for the parents, and the inclusion of both parents' incomes in the child support formula increase the likelihood of simple mathematical or clerical errors. The more factors considered in the award formula, the greater the opportunity for error, producing an inadequate child support award for the child, or an inordinately high award charged to the obligor.

Notes

¹The Melson states sampled were Delaware, Hawaii, West Virginia, and Montana. The Income Shares states were Indiana, Kansas, Colorado, Maryland, Michigan, New Jersey, Washington, and Florida. The Percentage of Income states were Wisconsin, Georgia, Nevada, Massachusetts, Texas, Illinois, Tennessee, and Arkansas.

²This rate does not take into consideration one data anomaly. Sixteen additional responses were obtained because a single request for information from six offices generated multiple responses. The multiple responses are not used in our computation of responses rates but are used throughout the remainder of this article. We ultimately decided to incorporate these responses because there was substantial variation in the support calculations within these offices, and thus it seemed doubtful that co-workers had collaborated on their calculations. The inclusion or exclusion of these 16 cases does not substantially alter any of the results that we report. Hence, a total of 266 responses are used in our analyses.

³We also compared the 266 individual responses to the median response for that state and family-income scenario. For example, if the median response for Case A in a particular state was \$112 and a respondent from that same state indicated that the Case A award should be \$135, we would have identified a discrepancy of \$23. This latter approach would have eliminated the need to use the state-approved figures altogether. However, because the results using the state median responses were not substantially different from those comparing individual responses to the state-approved child support calculations, the results using the medians are not reported.

⁴We include as regressors the component factors rather than different guideline models because we feel it is more important to identify the specific factors which lead to calculation errors rather than to discuss general guideline models. Because the guideline models are highly correlated with some of the component factors it was impossible to include both sets of variables in the same multivariate model.

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