ESTIMATES OF FAMILY EXPENDITURES FOR CHILDREN: A REVIEW OF THE LITERATURE

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April 2001

This report has been prepared under a contractual agreement between the Wisconsin Department of Workforce Development and the Institute for Research on Poverty. The authors thank Dan Meyer and Maria Cancian for their helpful comments, and Elizabeth Evanson and Dawn Duren for their expert assistance. Any views expressed in this paper are those of the authors and not necessarily those of the sponsoring institutions.

I. Introduction

Child support orders are based on the philosophy that once an individual has given birth to, fathered, or adopted a child, he or she has an obligation to provide care for the child, including necessities, goods, and services that are required for the child's survival. Eighteenth- and nineteenth-century English and American laws, drawing from antecedents in centuries of English law, tried to enforce this obligation by creating incentives and penalties that would increase the likelihood that parents of children would either get or stay married to each other; if that failed, child support orders were designed to reduce the drain on the public treasury, rather than provide adequately for the child (Carbone, 2000). By the 1970s in the United States, the pressures for parents to remain together "for the sake of the child" had declined, although belief in the general obligation of parents to provide support for their children was so widespread as to be almost axiomatic. The problem was how to establish and enforce this obligation.

In the United States, the question of public intervention in the financial arrangements of divorcing or never-married parents has historically fallen within the purview of the states. In many states, the assemblage of such laws, designed to address post-divorce financial arrangements, frequently ignored the matter of providing support for the child. Unlike many states, however, Wisconsin had earlier in the twentieth century taken steps to address the question of how parents should provide support for their children following the dissolution of marriage. For instance, the Wisconsin requirement that child support payments be received, tracked, and distributed by a local governmental agency was established in the 1920s. Similarly, Wisconsin began to study and experiment with methods for improving the private support of children before the enactment of federal requirements that were designed to improve order setting and enforcement (the 1984 Child Support Enforcement Amendments to the Social Security Act and the Family Support Act of 1988). The state had established a guideline specifying a percentage of the nonresident parent's income prior to the federal requirement for numeric guidelines, and its early

experimentation with automatic wage withholding was an important influence in the congressional deliberations that determined to make wage withholding a universal method for collecting child support.

Wisconsin's child support guideline, the percentage-of-income standard, was first promulgated in 1983, after an extended collaboration between the then Wisconsin Department of Health and Social Services and researchers[1] affiliated with the Institute for Research on Poverty at the University of Wisconsin-Madison. In the context of examining new ways to ensure that children would be supported, the state looked particularly at ways of determining reasonable amounts of payments for children, as well as at methods designed to improve the ease and efficiency of transferring such amounts from the nonresident household to the child's household.

Now, seventeen years after its initial adoption, concerns about the fairness of Wisconsin's percentage-of-income standard continue to be raised. In addition, federal regulations require that each state, in its mandatory periodic review of its guideline, take into account evidence concerning the cost of children. This paper is designed to relate solely to the issue of the cost of raising children; we accomplish that by a review of the existing literature regarding estimates of expenditures for children. We attempt to set the context for reliance on estimates of expenditures for children in Section II, in which we outline possible public policy goals that might be considered in selecting a child support guideline. Section III reviews the initial selection of the standard. Conceptual approaches to determining the cost of children are reviewed in Section IV. The purpose of this paper is *not* to develop new estimates, but to review existing estimates, which we do in Section V. In Section VI, we discuss implications of our research for Wisconsin's standard and identify areas where future research may be required. Appendix I contains a more detailed description of the alternative methodologies reviewed for this report.

[1]Including, in particular, Irwin Garfinkel, a professor in the School of Social Work, Marygold Melli, a professor in the Law School, and Judith Cassetty, a visiting professor at the Institute for Research on Poverty.

II. Potential Public Policy Goals Associated With Child Support Guidelines

Although child support has been the object of public policy considerations for centuries, its role has changed dramatically. The traditions of eighteenth- and nineteenth-century England dictated that children be cared for within the context of marriage. Attempts to resolve problems associated with nonmarital children were focused on devising penalties and incentives that would induce the parents-to-be or unmarried parents to wed. Even when actual child support was awarded, the intent was to give women more leverage in securing marriage to the fathers of their children (Carbone, 2000). No particular attention was paid to determining the amount of support that a single parent required to support a child because adequacy (which might permit the mother to live alone with the child) was not the desired outcome.

As the incidence of divorce in the United States increased in the nineteenth and early twentieth centuries, the claim for support by one former partner against the other continued to be derived from the preference for reinforcing marital stability. This preference remained until the passage of the Uniform Marriage and Divorce Act (UMDA) in the early 1970s. In the course of this change, child support came to be recognized as the primary ongoing financial obligation that remained from marriage. Inevitably, as the number of divorces and the number of nonmarital births increased, the question of how much parents ought to pay for the support of their children moved to the forefront of policy considerations.

Local court systems across the country developed a variety of strategies for setting child support orders. By the late 1970s and early 1980s, policy makers and advocates had begun to conclude that so much variability resulted in inequities and inefficiencies in providing support for children.

In 1984, when Congress required states to establish numeric child support guidelines, it sought to improve four outcomes related to child support, each corresponding to perceived problems entailed in the common law method of establishing child support. These outcomes were: (1) adequacy of child support orders; (2) consistency and predictability of child support orders; (3) compliance with child support

orders (through enhancing the fairness of child support orders); and (4) ease of administration of child support cases. Robert G. Williams, chair of the Advisory Panel of the federal Office of Child Support Enforcement, characterized the federal government's objectives as follows: to enhance the adequacy of orders for child support by making them more consistent with economic evidence on the costs of child rearing; to improve the equity of orders by assuring more comparable treatment for cases with similar circumstances; and to improve the efficiency of adjudicating child support orders by encouraging voluntary settlements and reducing the hearing time required to resolve contested cases (Morgan and Lino, 1999). These stated objectives address desired outcomes, although they provide no structural parameters for achieving them.

In pursuit of the above objectives, the design of states guidelines will entail choices among a number of strategies, all of which meet the letter of the federal requirements, if not the intent. For instance, there are a number of alternative economic standards for children's well-being that have implications for the way that the guidelines are structured and the way that estimates of what children cost are used to structure them. For instance, child support may be viewed as a means to promote a child's subsistence, or "minimally acceptable," standard of living, with reference to the poverty threshold. Alternatively, child support may be seen as a means to promote equalization of economic well-being between the two parents' households, which would require substantial transfers if the child lives with the parent who has the lower income. Child support could also be seen as a method for maintaining the standard of living to which a child had become accustomed, which would require even larger transfers because expenses rise when two households are substituted for one. Most states, including Wisconsin, appear to view child support as a means to continue the expenditures for the child that would have prevailed when the adults lived together. These states have chosen guidelines based on the

"continuity-of-expenditures"[2] concept, even when they may appear to have adopted other goals. Wisconsin, for instance, states in the preamble of its administrative guidelines rule: "The standard is based on the principle that a child's standard of living should, to the degree possible, not be adversely affected because his or her parents are not living together" (DWD 40.01).

Each of these standards or goals has its limitations. One might argue, for instance, that promoting a subsistence-level standard of living for a child whose nonresident parent can afford better is not in the best interests of the child. Similarly, if the income of the nonresident parent is below the poverty level, it may be unreasonable to expect him or her to provide sufficient funds so that the child will reside in a nonpoor household.

Even before the passage of federal laws that mandated adoption of numeric guidelines to be chosen and implemented by each state, several approaches to developing guidelines that would achieve the stated public policy goals had emerged in public and professional debate. Early attempts to classify the guidelines may have obscured the nature of the fundamental goals of the various guidelines over time, which are far more similar than the public and published debates on their relative merits might suggest. The most important unifying characteristic of all of the state guidelines, regardless of the popular name by which they are known, is that they are designed to achieve continuity of expenditures. This means that they are all based, directly or indirectly, upon estimates of what parents spend on their children.[3] All of the state guidelines that are currently in effect are expenditure-based, and differ from one another primarily on the basis of the means of allocating these estimated or actual expenditures for a child

[2]We are indebted to Marsha Garrison ("The Goals and Limits of Child Support Policy," in Oldham and Melli, 2000) for the descriptive term "continuity-of-expenditures."

[3]The early typology for several guidelines widely discussed in the literature and public debate was derived from the strategy for allocating shares of the estimated or actual costs of a child between the two parents. Of the four principle "types" of guidelines—"Melson," "Cassetty Formula," "income-shares," and "percentage-of-income"—all but the Cassetty formula are based upon estimates or measures of parents' expenditures for their children.

between her/his parents.[4] In Section V of this report we will return to a review of the existing literature on parental expenditures for children.

III. Historical Note on Wisconsin's Percentage-of-Income Standard

Early discussions of guidelines for Wisconsin focused on two principal features of the prevailing system for establishing a child support order amount: adequacy and equity. Child support orders were low and rarely updated to reflect changes in a child's needs or the parents' circumstances. Further, child support awards were inequitable across individual cases, treating people differently who were in substantially similar circumstances and similarly when circumstances were substantially different. These fundamental problems with child support order outcomes were attributed by researchers and advocates to the inherent nature of a system that relied on adversarial legal processes and ultimate judicial discretion in setting order amounts, in the absence of precise, uniform standards and guidelines. Many of the proposals for reform of the system called for the development of standardized rules that would be designed and implemented by state and federal agencies rather than by local judiciaries (Cassetty, 1978; Chambers, 1979; Garfinkel and Melli, 1982).

In Wisconsin, discussion about the need for and the attributes of standardized guidelines took place in the context of burgeoning interest in large-scale reform of the provision of support to children. In addition to the debate over what eventually emerged as the percentage-of-income guidelines, state government, as well as researchers at the University of Wisconsin-Madison, and child welfare advocates were interested in improving collections (automatic wage withholding was first tested in Wisconsin) and removing the uncertainties associated with child support payment by the nonresidential parent (by guaranteeing child support payments to the residential parent). These components were all seen as

[4]The "Cassetty formula" is not expenditure-based, but is designed instead to equalize economic well-being across the (now divided) household.

consistent with a goal of standardizing the child support system and operating it on a bureaucratic basis similar to other successful transfers of income, such as the collection of income taxes and the distribution of funds by the Social Security Administration. In this framework the often conflicting claims of the parties (child, resident and nonresident parent) can be cast in terms of the amount of support a child "needs," in tandem with the amount of support that the parents "should" or "are able to" provide and what form that support should take, e.g., personal care, economic, etc. There was general agreement that any child needs an adequate level of support; that the residential parent should not be called upon to provide a disproportionate share of support for a child; and that the nonresident parent should not be impoverished as the result of supporting the child.

Operationalizing these concepts presented a much more difficult challenge than articulating them. Prior to the federal requirement for the development of normative standards, individual courts frequently relied conceptually on the notion of budget allocation. In these schemes, courts examined and approved budgets for all the parties; once the child's budget was adopted, the courts decided how to allocate (or share) these allowed expenditures.

Once it became necessary for states to adopt normative standards that could be applied to all cases before the courts, however, the notion of allocating parental shares based on individualized budgets was readily seen to be deficient: expenditures for children vary as the household income varies. Children cost what parents have available and choose to spend on them. Hence, it would be quite difficult to develop a standardized child's budget that could be applied across a wide range of household circumstance and preferences. Similarly, the ages of the children, as well as the number and gender distribution in a household, are also factors that would tend to affect the amount expended on any given child or set of children. Mindful of these and myriad other limitations entailed in a "budgeting" approach to guidelines, policy makers, including those in Wisconsin, turned to the concept of income-sharing as a potential foundation for developing a normative standard. The questions then became what share of the

household income would, under most circumstances, be expended on a child, and how this information would be applied to the choice of a guideline for child support payments.

To operationalize an income-sharing model requires information on the rate at which parents (in different household configurations) make expenditures for their children. When Wisconsin and other states were initially considering the adoption of guidelines, they found little empirically derived evidence on household expenditures for children. Among the few was a study by Thomas J. Espenshade (1973), initiated while he was at the University of Wisconsin.

In Wisconsin, policy makers contracted with the Institute for Research on Poverty for a study by an IRP affiliate, Jacques van der Gaag, 1982. An economist, van der Gaag included a review of the methodologies and findings of twelve major studies of parental expenditures for children, including the Espenshade study. Focusing his analysis only on those studies that he judged to be the most theoretically and methodologically sound, van der Gaag found that the range of estimates of the proportion of income that parents expend on their first child varied from 20 to 30 percent, and he concluded that 25 percent was the best point estimate. He also found that these estimates suggest that when age of the child is considered, expenditures for the second child are roughly half of those on the first child (although a few studies found the second child to be about equally expensive as the first). The third child is about as expensive as the second child, and expenditures fall by half again for subsequent children. Finally, van der Gaag found that expenditures for children are approximately a constant proportion of household income throughout the income ranges used in the studies he reviewed. That is, there was little or no evidence to suggest that high-income households spent a smaller or larger proportion of their income on children than did middle-income or low-income households.

But a number of questions remained unanswered, in large measure because so little of the extant research had addressed them. In particular, the scholars and state child support enforcement administrators who were engaged in early efforts to develop a guideline for Wisconsin believed it to be

of increasing importance to take account of mothers' opportunity costs, that is, the costs of two alternatives: to work for pay or to stay home to care for children. Two previous studies (Turchi, 1972; Reed and McIntosh, 1972) seemed to indicate that the costs (in terms of lost wages) of children that were attributable to a mother's decision to stay in the home with the children ranged from 59 to 152 percent of the total costs that Espenshade had estimated for a first child to age eighteen. This meant that the foregone earnings of a parent who remains in the home to care for the child might easily be as large as the total out-of-pocket expenditures for the child. If she were employed, on the other hand, her expenditures (aside from child caring duties) for the child were incorporated in Espenshade's (and others') estimates. Therefore, the resident parent would be making significant contributions for the care of the child whether or not she was employed.

Thus it remained for the developers of Wisconsin's child support guideline to propose an income share representing nonresident parents economic obligations to their children. Armed with this extensive review of the complex economics literature Wisconsin policy makers and researchers considered recommendations for Wisconsin's child support standard, examining how these findings should be used as a starting point from which to develop child support guidelines that could be used in a wide range of child support cases. One of the first questions has to do with expenditures that a child should expect to receive in a single-parent family. The team of researchers and policy makers recognized that while they had estimates of the proportion of parental income that is expended for children in two-parent households, it did not necessarily follow that children should be expected to receive the same proportion of parental income if the parents lived apart (Garfinkel and Melli. 1989).

For several reasons a nonresident parent might be expected to contribute less to the support of a child than what she or he would pay if living with the child. First, the nonresident parent may not derive the same satisfaction (also referred to in the economics literature as "utility") from the child and from being a parent to a child when the child resides elsewhere. This assumes that parents elect to give birth to

or adopt a child because they anticipate that doing so will increase their sense of (nonfinancial) well-being.

Also, nonresident parents incur some costs in the course of maintaining contact with the child, including the costs of normal visitation. These costs may duplicate those that are borne by the resident parent, or they may be those that would not have been necessary had the family been intact. (One could also make the opposite argument, however. That is, these lost economies of scale should result in requirements to pay *more* than the proportion of income that was spent when both parents lived with the child in order to maintain the child's accustomed standard of living.)

Additionally, a nonresident parent might respond to orders that are perceived to be "too high" by becoming a less-than-willing payor and parent, challenging the enforcement system and becoming alienated from the child. Finally, the architects were concerned about the costs of providing health insurance for the child. Taken all together, these arguments suggested to the authors of Wisconsin's standard that fairness to the nonresidential parent required that the Wisconsin percentage standard be adjusted downward from Van der Gaag's findings to take into consideration the additional cost of running two households, the cost of visitation and the cost of maintaining health insurance for the children (Zink and Chesnik, 1987).

An additional issue faced by the authors of the standard concerned how the expenditures made by the residential parent should be evaluated. Estimates of expenditures for children were based on household expenditures made by all members of the household and were compared to the combined incomes of household members. The authors assumed that expenditures by the resident parent, in the form of either time or financial support if the resident parent were employed, would be shared directly with the child in the same proportion as expenditures were to be shared by the nonresidential parent.[5] At

[5]The authors considered a guideline that would require calculation of support from both the residential and nonresidential parents (an "income shares" model). Since Van der Gaag's findings about expenditures across a broad range of incomes dictated that the percentage paid by each parent be constant as incomes rose, adoption of an

the time, the authors did not have available more recent estimates showing that single parents tend to spend a much higher proportion of their income on children than do parents in two-parent families.

Ultimately, the decision to establish a particular percentage level corresponding to the number of children in a household for which support was owed was made by balancing the conflicting needs and wishes of all principal parties. The authors attempted to reconcile the following demands: (1) the economic needs of the child to be supported when the household was deprived of the benefits arising from the presence of both parents; (2) the right of the child to share in the economic resources controlled by his or her parents; (3) the need for each parent to maintain an "acceptable" lifestyle, neither being forced into poverty; (4) fear of establishing a "tax" at a level that would adversely affect the work incentives of either parent; and (5) interest in maintaining a reasonable balance between the public and private purses in providing for the child.

It was clear that the best interests of the child, the parents, and the taxpaying public could easily come into conflict with each other. These deliberations were also made more difficult by concern that the parent owing child support might object to paying support because the residential parent would, of necessity, share in the benefits of the payments received.

The authors of the final proposal recommended a percentage of income for the first child (17 percent) to whom a parent was required to contribute support, an amount that was substantially lower than most of the better estimates for a single child at that time. The percentage recommended for a second child in the same household represented an increment of only 8 percentage points, well below that which most economists found to be the average amount that parents expended for a second child. Increments for additional children were similarly conservative, leaning toward the lower end of the

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"income shares" model would result in identical payments to the residential household as those calculated using a "percentage of income" model, but require the increased burdens associated with discovering, verifying and monitoring the income of another individual. This seemed an unwise use of public resources, given the identical outcomes.

distribution of estimates of actual expenditures. These recommendations were later adopted by what is now the Wisconsin Department of Workforce Development for eventual promulgation statewide, and are presently used presumptively in all child support cases in Wisconsin.

IV. Expenditures for Children: Review of the Technical Literature

"Costs" versus "Expenditures"

The Family Support Act of 1988 requires states to review their guidelines at least once every four years. Among other things, states are required to consider economic data on the cost of raising children, although no further procedural or substantive guidance is provided in the regulations. While social scientists have been interested for many years in understanding how much parents spend to raise their children, estimation of the *cost* of children involves different technical and theoretical constructs.

Estimation of the cost of raising children in any given environment can entail several components, the most fundamental of which involves the differentiation between private and publicly borne costs. (Publicly borne costs include those expenditures, such as welfare, which are paid or provided directly to an individual family, as well as community goods such as schools.) For the most part, policy makers concerned with child support guidelines are interested in costs that are privately borne, usually by parents, stepparents, and other members of a child's immediate family. A second important delineation involves identification and estimation of direct and indirect costs of children. In addition to the obvious out-of-pocket expenditures for consumption goods and services such as food, health care, and clothing, privately borne *direct* costs may include savings by parents that are designed for the future benefit of their children. An obvious example is savings for a child's future educational needs, and may be in various forms, including trusts, equity in a home, or a simple passbook savings account. *Indirect* private costs borne by parents may include forgone wages, often attributable to mothers' withdrawal from the labor force to care for children. Some indirect private costs are far more

difficult to identify and are therefore frequently overlooked in calculations by scholars. Included are returns on investments or savings that are forgone in order to spend for the child's needs. These and other indirect costs may be substantial components of the cost of raising a child and are no less real than the out-of-pocket expenditures that make up a calculation of direct costs.

Variations in how families decide to generate and allocate their incomes and personal resources and provide for the needs of their children can lead to an anomalous understanding of what constitutes the actual private costs of a child. For instance, by including out-of-pocket expenditures for child care and babysitters but not the forgone wages of parents who themselves provide child care, we underestimate the total "costs" of children for those families that do not use formal, paid child care. In addition, for children who are eligible for various publicly subsidized services, such as child care or medical insurance, there are also public costs associated with the child that are not included in calculations of how much the parents spend on the child. To the extent that these indirect private and public costs are not accounted for in estimates of the costs of children, total costs may be seriously underestimated.

The issue of defining "cost" versus "expenditure" is, however, not just an esoteric academic exercise; it has real implications for how one should interpret the findings of various bodies of research and those researchers who have attempted to estimate the real cost of children.

From the foregoing discussion, one sees that expenditures are but one component of the total, real cost of a child. As most of the research which we review and discuss in the balance of this report examines only parental expenditures for children, most of our remaining discussion will focus on this cost component. However, it is important to recognize instances in which the researchers' fail to include commonly occurring direct and indirect costs and how such omissions tend to bias the estimates.

Conceptual Challenges in Measuring Parental Expenditures for Children

There is no doubt that the addition of a child to a family requires adjustments in the way the family allocates both its income and its time. Families may alter their savings practices, saving more or less in response to the addition of the child or spending existing savings to meet a child's needs. Parents may withdraw from the labor force, in part or wholly, and alter both the level and the type of expenditure they make on a full range of goods and services. Some expenditures may remain fixed in given categories, though the array of items within the category may change substantially. Expenditures for food items are a good example: an individual or couple may divert a substantial portion of a fixed level of expenditure for food from soft drinks and more expensive prepared foods to infant formula and baby foods when a child is born or adopted, eliminating soft drinks from their market basket of purchases and substituting less expensive vegetables and cuts of meat for prepared foods. In general, substituting inexpensive goods for more expensive ones within the same category of purchase may lead to underestimates of the indirect cost of adding a child to the family. Other goods that a family purchases may be shared, such as a house or apartment, from which all members benefit, although perhaps not equally.

Clearly, determining the proportion of a shared good that should be allocated to a child is not a straightforward task. Perhaps not so obviously, determining the proportion of private goods that should be attributed to the presence of a child is also challenging, except in some more readily observable cases: commercial baby food, for instance, is almost certainly not consumed by the adults in the family. However, how does one attribute the portion of a bunch of bananas to each individual member of a household, in the absence of detailed recordkeeping, or determine how much of a meatloaf was consumed by one member of a household, or how much air-conditioning was enjoyed?

These brief examples represent the two major pitfalls in trying to fully account for out-of-pocket parental expenditures attributable to the presence of children: barriers to data access, and conceptual

problems in allocating expenditures to the appropriate members of households. Researchers have developed a variety of methodologies, each with its own limitations, to overcome or compensate for these obstacles. Appendix I describes some of these strategies in more detail. In the next section we highlight three that we consider the most useful to provide some context for the literature review which follows.

Alternative Methodologies for Estimating Parental Expenditures for Children

Consider the hypothetical example in Table 1.

TABLE 1
Hypothetical Example of
Annual Expenditures Made by a Family

	Before the first child	After the first child
Shared goods (e.g., housing)	$15,000	$15,500
Adult goods (liquor)	2,000	1,500
Children's goods (baby food)	0	1,000
All other privately consumed goods (milk)	13,000	12,000
Total Expenditures	$30,000	$30,000

Source: Lewin/ICF,1990

In this case the household, consisting of two adults, neither gains nor loses income after the first child arrives. Clearly the adults have expended $1,000 on the child for goods that are not shared but are consumed by the child alone. These figures may also be hiding other expenditures made on the child, however. The $500 increase in shared goods may reflect an expenditure, such as expanded housing, that is made for the benefit of the child and could be attributed to the child. Also, the child is certainly consuming some of the privately consumed goods (such as food). Even with this kind of detailed accounting, we are unable to determine how much the parents have expended on the child. What is needed is a way to allocate a proportion of both the shared goods and all the other privately consumed goods to the child.

One way would be simply to divide the total expenditures by the number of people in the household, which, in our hypothetical example, would yield a per child cost of $10,000 per year. This is referred to as the *per capita* or *average expenditure* estimator. It is simple and accomplishes the task of allocating total expenditures among the household members. Unfortunately, it is rather flawed. It

assumes that the pattern of household allocation of expenditures among the various kinds of goods remains unchanged after the arrival of the child. And it is likely that the marginal (or incremental) expenditure on an additional child is less than the average expenditure. For instance, it may not be necessary to move into a larger house with the addition of each child, so that the shared expenditures for housing would not actually rise as much as this technique would imply. Taking these two problems together, *it is likely that an average or per capita expenditure model overestimates the true expenditures that should be attributed to the presence of a child.*

There are a series of so-called *marginal expenditure* estimators that attempt to ameliorate some of the flaws of the *per capita* estimator. In order to use these estimators, it must be determined when one household, with a given demographic configuration, is "as well off" as a second household, whose demographics differ from the first. While there are a series of demographic dimensions along which we vary the households (such as age of the children and the characteristics of the parents), an initial step entails increasing the number of children in the household. This gives us a way to estimate the amount of money that would be required to make one household with one child as well off as another household with no children. The total costs of these additional expenditures are attributed to the presence of the child and are assumed to represent the amount of the household's expenditures for the child. We could then ask how much additional money is required to make a household with two children as well off as another household with one child, and so forth.

An early approach, developed by Ernst Engel in the nineteenth century (Engel, 1857) and still employed today, uses the proportion of household income that is spent on food as the vehicle for identifying households that are equally well off. Engel had observed that as the size of households increased, all else unchanged, the proportion of the household budget that was spent on food also increased. He also noted that as the income of the household increased, all else held constant, the proportion of the budget spent on food declined (although the *total* amount spent on food increased).

Based on these observations, he suggested that households with different demographic configurations that spend the same proportion of their budgets on food can be assumed to be equally well off.

A second approach, developed by Erwin Rothbarth (1943), posited that two families of different compositions could be assumed to be equally well off if the amount of money spent by the two adults in the family on adult goods was the same in each family. Over time, different researchers have used different definitions of "adult goods" to estimate the expenditures for children using the Rothbarth equivalency method.

Table 2 provides hypothetical examples of how the Engel and Rothbarth methods might work.

TABLE 2
HYPOTHETICAL COMPARISON OF ANNUAL EXPENDITURES

	Family A (No children)	Family B (One child)	Family C (One child)
Food	$6,000	$8,000	$9,000
Adult goods	2,000	2,000	3,000
All other goods	12,000	14,000	18,000
Total expenditures	$20,000	$24,000	$30,000

Source: Lewin/ICF, 1990

Family A, the childless couple, spends 30 percent of its budget on food. Similarly, Family C, with one child, spends 30 percent of its budget on food. By the Engel method, Family A and Family C are equally well off. Therefore, by this method the amount of money that must be given to a household, after a child is added, so that the adults will be equally well off, is $10,000, the difference between the total expenditures of Family A and Family C.[6] This is the estimated expenditure on the child.

[6]A number of researchers (e.g., Lazear and Michael, 1988) have commented on the conceptual problems created by the assumption that a utility function can be associated with a family or a household rather than an individual. They note that this requires highly restrictive assumptions about how resources are distributed within the family. Many researchers acknowledge that this is a problem, but available data on household expenditures are not sufficiently detailed to permit the use of assumptions that are less onerous.

According to the Rothbarth method, Family A and Family B are equally well off because each spends $2,000 on adult goods. Therefore, to compensate Family A for the addition of a child requires an increase in the family budget of $4,000, which is the estimated expenditure on the child. These basic approaches can be used to estimate the expenditures for additional children by comparing expenditures for either food or adult goods for families with one child to those same expenditures by families with two children, and so on, for additional children.

The Engel and Rothbarth estimators are the most commonly used methodologies, in part because they are simpler to implement than some of the others. However, their other advantage is that there is fairly wide agreement about the direction of the bias (the tendency to under- or over-estimate the true values) of both estimators (Deaton, and Muellbauer, 1986; Barnow, 1994). The Engel estimator implicitly assumes that the proportions of the family expenditures for food and nonfood items that are attributed to the child should be the same as the proportions attributed to the adults. This assumption is probably false, since children are relatively more intensive consumers of food than of nonfood items. This failing probably means that the Engel estimator *overestimates* actual parental expenditures for children.

The Rothbarth estimator, on the other hand, probably *underestimates* these expenditures, principally due to its failure to account for the possibility that, once a child has joined a family, the adults will try to maintain their expenditures for "adult" goods by consuming fewer goods that can be shared with their child and instead substituting goods that are less likely to be those that can be shared with their child.[7] In other words, it will take less money to restore the adults to their former level of well-being because they have increased their relative spending on adult goods at the expense of shared goods. For example, if parents spend somewhat less on transportation (a shared good) than they did before the child

[7]The Engel and other related estimators also do not allow for this type of substitution, but because the Engel estimator relies on consumption of food as its measure of well-being, this shortcoming does not lead to the kind of systematic underestimation as does the Rothbarth estimator.

arrived so that they can spend nearly the same amount on entertainment (an "adult" good), the increment to income needed so that the family can spend an identical amount on adult goods will be too small to accurately reflect the expenditures for children.

As a result of these systematic biases, some authors (Betson,1990; Lewin/ICF,1990) argue that these two most commonly used estimators can be used to provide upper and lower limits on estimates of expenditures for children. They suggest that estimators that produce findings lower than Rothbarth or higher than Engel are suspect, particularly when considered in conjunction with the other conceptual and measurement shortcomings from which most estimators suffer. By comparing the Rothbarth and Engel estimation strategies with those of others, we have a basis for comparing these more recent approaches to estimation with "classic" estimators whose directional biases are well-known.

V. Findings in the Literature on Expenditures for Children

Estimates of Expenditures for Children in Two-Parent Families

Table 3 presents estimates of the percentage of expenditures attributable to children in two-parent families. In addition to the previously discussed Engel and Rothbarth estimators, we add a third, that produced by the Center for Nutrition Policy and Promotion (U.S. Department of Agriculture, 2000). The results presented for the Engel and Rothbarth estimators were calculated by David Betson, 1990 as part of a congressionally required study by the U.S. Department of Health and Human Services of the costs of raising children, using data from the Consumer Expenditure Survey (CEX) for 1980 through 1987.[8] The USDA values were calculated by Mark Lino, using his 1995 estimates.[9]

[8]Betson also produced estimates using some alternative methodologies, which are presented in Appendix I.

[9]The USDA methodology, which is produced annually, is primarily a *per capita* estimator, although for some types of expenditures it uses a *marginal* estimator approach.

As we would expect, Betson found both of the Engel estimates to be higher than the two Rothbarth estimates. The USDA estimates fall between Engel and Rothbarth.[10] In Table 3 we notice first that the range across the estimates is fairly wide. In the first panel, for one child, the difference between Rothbarth 2 and Engel 1 is 10 percentage points. In the same panel, the difference between Rothbarth 2 and Engel 1 for three children is 22 percentage points. In the third panel we also see a fairly wide range of estimates, diverging from each other by as much as 18 percentage points (for high levels of family expenditures, comparing Rothbarth 2 with Engel 1). As we have already discussed, we expect Engel estimates to be higher than Rothbarth estimates. The variability we observe probably also reflects the difficulties in operationalizing these estimators, in part because the available data lack sufficient detail to obtain more precise estimates.

These three estimates taken together, suggest the following:

1. The proportion of household expenditures for children tends to rise as the number of children increases. Again, this is what we would expect. Rothbarth increased 14 percentage points from one to three children. Engel increases about 25 percentage points, and the USDA increases 22 percentage points. For all three estimators, as the number of children rises from one to two, the proportion of expenditures made for children rises by about half, exactly as van der Gaag (1982) had suggested in his study done for the Wisconsin Department of Health and Social Services. All three estimators show a smaller increase for the third child than for the second one, although the Engel estimate is still quite sizable (about 10 percentage points).

2. Expenditures for older children tend to be higher than expenditures for younger children, although the data are more mixed for this conclusion. It is clear that the Engel estimator finds that older children result in a higher proportion of expenditures.

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[10]In his comparison of estimates for the USDA, Lino (Lino, 2000) used Rothbarth 1 and Engel 1 to compare the Betson marginal estimator approach with his own per capita approach.

Table 3
Percentage of Expenditures Attributable to Children in Two-Parent Families

	Rothbarth[a]		USDA[b]	Engel[c]	
	1	2		1	2
Number of children [d]					
One	25	23	26	33	30
Two	35	33	42	49	45
Three	39	37	48	59	55
Age of children (2 children)[e]					
4 and 8	36	33	n/a	46	37
8 and 10	35	33	n/a	49	45
10 and 16	n/a	n/a	n/a	53	50
Family expenditures (2 children) [f]					
Low	36	36	45	49	46
Medium	35	33	42	49	45
High	35	31	39	49	45

Sources: Lewin/ICF (1990); Judicial Council of California (1998); Lino (2000).

[a] Lewin/ICF (1990). See also Betson (1990). The measures of well-being used by each of the estimators are as follows: Rothbarth 1 is the expenditures for adult clothing, alcohol, and tobacco; Rothbarth 2 is expenditures for adult clothing.

[b] Percentages for these estimators taken from the 1995 USDA study. Average expenditures of families in each income level were used to make comparisons. Percentages by number of children are based on average expenditures of middle-income families.

[c] Lewin/ICF (1990). See also Betson (1990). The measure of well-being used by this estimator are as follows: Engel 1 is percentage of expenditures devoted to food at home; Engel 2 is percentage of total expenditures devoted to food (at home and away).

[d] Based on annual expenditures of $30,000 (1990 dollars, or $38,250 in 1999 dollars). In families with one child, the child is assumed to be 8 years old; with two children, the children are assumed to be 8 and 10 years old; with three children, the children are assumed to be 4, 8, and 13 years old.

[e] The Rothbarth figures for older children are unreliable due to data problems in the Consumer Expenditure Survey.

[f] Based on two children 8 and 10 years old. The Betson study reported expenditure patterns for families with expenditures between $5,000 and $50,000 (in $5,000 increments) in 1990 dollars ($6,375 and $63750 in 1999 dollars). Low-expenditure families are defined to be those with annual expenditures of $5,000, $10,000, or $15,000 ($6,375, $12,750 or $19,125 in 1999 dollars). Medium-expenditure families are defined to be those with expenditures in $20,000 to $40,000 ($25,500 to $51,000 in 1999 dollars) range. High-expenditure families are those with annual expenditures of $45,000 to $50,000 ($57,375 to $63,750 in 1999 dollars). The figures reported in the table represent the average over this range. (Note that although we have converted these figures to 1999 dollars for greater ease of comparison to present day values , it is not necessary to do so because these models generate an estimate of expenditures for children that is a proportion of all expenditures, not a fixed dollar amount.)

3. As total expenditures rise, the proportion devoted to children remains roughly constant. Both Engel and Rothbarth 1 estimates show essentially no difference, or else a constant rate of expenditures, between low and high family expenditures. Rothbarth 2 and the USDA estimators exhibit some decline in proportion of expenditures for children as total expenditures increase. Unfortunately, the range of total expenditures among households across the reported observations (which are pooled observations from the 1980-1986 CEX) is quite small: $5,000 to $60,000 ($6,375 to $76,500 in 1999 dollars). The sample sizes in the 1980-86 Consumer Expenditures Survey for families with expenditures above $60,000 are generally too small to permit any inferences about expenditures for children for this segment of the population.[11]

Table 4 presents information on translating proportions of household expenditures for children into proportions of *income* spent for children[12]. The difference between household income and total household expenditures is, generally speaking, attributable to taxes and savings. Actual tax rates in the United States are thought to be proportional (Pechman, 1987). Savings rates are likely to be slightly higher for higher-income families. As we have noted earlier, none of the extant studies[13] address how household savings should be allocated to children, so it is difficult to know how much of household savings is for the future benefit of children. If parents save, intending to benefit their children in the future, then total expenditure estimates understate the magnitude and proportion of total household expenditures that are attributable to the presence of children. Given this caveat, calculating expenditures for children as a proportion of gross income appears to show a slight decline in the proportion as total

[11]Using the average rates of taxation and savings assumed by Barnow (Haynes, 1994), $60,000 in expenditures would convert to $89,552 in annual income in 1988 dollars ($126,090 in 1999 dollars).

[12]We have excluded the USDA method from Table 4 because income data from the CEX (source of the data used in its construction) do not readily permit an accurate estimate of income, as opposed to expenditures.

[13]Some "life-cycle" models attempt to estimate expenditures, including savings, on children over extended periods of time. However, the data sources available for longitudinal studies do not contain expenditure detail comparable to that in the CEX; it is consequently difficult to compare their findings with studies using the CEX.

expenditures for current consumption rise. However, this difference appears to be almost entirely due to increased savings by families whose total expenditures are higher.

TABLE 4
Upper- and Lower-Bound Estimates of Expenditures for Children
Comparison of Engel and Rothbarth Estimators

	As a Percentage of Expenditures		As a Percentage of Income	
Estimator	Rothbarth 1	Engel	Rothbarth 1	Engel
Number of Children[a]				
One	25	33	18	23
Two	35	49	25	34
Three	39	59	27	41
Ages of Children (2 children)				
0-8	n/a	46	n/a	32
8-10	35	49	25	34
10-17	n/a	53	n/a	37
Family expenditures (2 children)[b]				
Low	36	49	28	39
Medium	35	49	25	34
High	35	49	23	33

Sources: Betson (1990), using 1980-86 CEX estimates, for percentage of expenditures figures. Those figures were converted to percentage-of-income figures using a methodology developed by Burt Barnow, reported in Haynes (1994), that defines income as a multiple of expenditures, based on expenditure and tax estimates.

[a]Based on two-parent, average-expenditure families.
[b]In 1990 dollars, low income is defined as an annual income of less than $25,000; medium income is between $25,000 and $60,000; and high income is $60,000 or more. Allowing for inflation, these annual incomes would translate to 1999 dollars as follows: low income is defined as an annual income of less than $30,400; medium income is between $30,400 and $73,100; and high income is $73,100 or more.

Estimates of Expenditures for Children in One-Parent Families

Most estimates of the level and share of total household expenditures attributable to the presence of children have entailed analyses of spending in two-parent households. Since a prominent objective in most state child support standards and guidelines is related to assessing child support that is comparable to what the nonresident parent would have paid for the support of the child while the family remained

together, it is reasonable to examine the expenditures for children in two-parent families. When states have other objectives, such as those related to maintaining standards of living or distributing the losses in both households standards of living from that enjoyed when the family was intact, then it may be appropriate to estimate expenditures for children in one-parent families.

Among the few analyses of one-parent households, the proportion of total expenditures that are attributable to children are found to be substantially higher than the estimates for two-parent households. To some extent, this is to be expected: there are fewer members of the family over whom to spread expenditures, and a share of what would have been expended for a second parent may now be expended for the child; second, one-parent families may substitute expenditures for children for parenting time, substituting child care by others when time in the workforce increases, which will increase absolute and proportional expenditure levels for children. In the absence of a second income in a household (usually the higher income of the father) a one-parent household will need to spend more and a greater proportion of its income for its children.

A review of Table 5, comparing the Rothbarth and Engel estimators, shows that the general pattern is much the same for one-parent as for two-parent households:

1. The range of expenditures is again very broad, the difference between the two estimators hovering around twenty-five percentage points in all three panels. However, the level of expenditures is much higher than in the estimates for two-parent families. Expenditures in one-parent families tend to be about 15 to 30 percentage points higher than expenditures in two-parent families.

2. The greater the number of children, the higher the proportion of expenditures for children. The increase for the second child is about half that expended for the first child, and the increase in the expenditures for the third child is somewhat lower yet.

3. The patterns with respect to expenditures for older children are similar to those observed in expenditures for two-parent families. The Engel 2 estimator shows a clear increase for older children, while the Rothbarth is roughly constant.

4. Three of the four estimates show constant proportion of expenditures in high expenditure families. The fourth (Engel 1) reflects a very modest decline.

TABLE 5
Percentage of Expenditures Attributable to Children in One-Parent Families

	Rothbarth		Engel	
	1	**2**	**1**	**2**
Number of children[a]				
One	38	38	61	49
Two	53	55	78	66
Three	60	65	85	73
Ages of Children (2 children)[b]				
4 and 8	51	56	76	61
8 and 10	53	55	78	66
10 and 16	n/a	n/a	78	68
Family expenditures (2 children)[c]				
Low	55	54	81	66
Medium	53	55	78	66
High	53	56	77	65

Source: Lewin/ICF(1990); Judicial Council of California (1998); Betson (1990).

Note: See Lewin/ICF, October 1990. Also see Betson,D.M. September 1990. The measures of well-being used by each of the estimators are as follows: Rothbarth 1 includes the expenditures for adult clothing, alcohol, and tobacco; Rothbarth 2 are expenditures for adult clothing. Engel 1 is percentage of expenditures devoted to food at home; Engel 2 is percentage of total expenditures devoted to food (at home and away)

[a] Based on annual expenditures of $30,000 (in 1990 dollars, or $38,250 in 1999 dollars). In families with one child, the child is assumed to be 8 years old; with two children, the children are assumed to be 8 and 10 years old; with three children, the children are assumed to be 4, 8, and 13 years old.

[b]The Rothbarth figures for older children are unreliable due to data problems in the Consumer Expenditure Survey.

[c]Based on two children (8 and 10 years old). the Betson study reported expenditure patterns for families with expenditures between $5,000 and $50,000 (in $5,000 increments) in 1990 dollars ($6,375 and $63,750 in 1999 dollars). Low-expenditure families are defined to be those with annual expenditures of $5,000, $10,000, or $15,000 ($6,375, $12,750 or $19,125 in 1999 dollars). Medium expenditure families are defined to be those with expenditures in $20,000 to $40,000 range ($25,500 to $51,000 in 1999 dollars). High -expenditure families are those with annual expenditures of $45,000 to $50,000 ($57,375 to $63,750 in 1999 dollars). The figures reported in the table represent the average over this range. (Note that although we have converted these figures to 1999 dollars for greater ease of comparison to present day values, it is not necessary to do so because these models generate an estimate of expenditures for children that is a proportion of all expenditures, not a fixed dollar amount.)

Mark Lino of the USDA also examined expenditure patterns on behalf of children in one-parent households and found that the dollar amount of expenditures do not differ greatly from those for children in two-parent households. However, Lino found that the difference in income available to each type of household was responsible for the larger *share* of the household's expenditures for its children in one-parent households. Using the USDA estimator, the absolute value of the difference in expenditures is, on average, about 5 percent lower in one-parent households than in two-parent households. Since incomes for single-parent families are so much lower, expenditures for one child in a single-parent family represent about 45 percent of total income, as compared to about 20 percent of total income for two-parent families.

V. Potential Implications for a Review of the Wisconsin Standard

Since researchers began to estimate the proportion of expenditures made for children in the late 1970s, their findings have remained remarkably stable over time.[14] In every instance, however, data on the cost of children is based on national data sets and most states rely on these estimates when they consider the economic costs of raising children. Evidence from data collected by the U.S. Bureau of the Census identifies differences in regional costs of living, suggesting that expenditures for children also vary by region. Unfortunately, no data set that can be used for estimating expenditures for children relies on Wisconsin data. This is largely the consequence of sample sizes that are too small to permit analysis at other than the national level. Even in instances of data collection that include significant Wisconsin samples (e.g., the New Survey of America's Families, conducted by the Urban Institute in 1997 and 1999), there is insufficient detail on expenditures to permit estimates of expenditures for children.

[14]Mark Lino notes that expenditures in real dollar amounts for child care have risen significantly between 1969 and 1999, although the real dollar values of some other categories have fallen slightly (personal communication with the author).

In response, several states have attempted to "benchmark" the national data in ways that could shed light on their own particular circumstances (e.g., Commonwealth of Massachusetts, 1993). One way to do this for Wisconsin is to compare the median income for four-person families in Wisconsin and the United States. In Table 6 we see that, with the exception of 1989, the median four-person family income in Wisconsin is slightly higher (in the range of 3 or 4 percent) than that of the United States as a whole, over the period from 1974 to 1998, the most recent years for which data are available. Wisconsin's income distribution, divided into fifths, suggests that Wisconsin's families are slightly more likely to be in the middle (second, third and fourth) quintiles than is true nationally. (Dresser and Rogers, 2001). This suggests that estimates of expenditures for children using national data sets are likely to provide reasonable estimates for Wisconsin's children as well.

TABLE 6
Median Income of Four-Person Families, Wisconsin & United States: 1974-1998
(1999 dollars)

Year	Wisconsin	United States
1974	$ 49,348	$ 47,241
1979	52,839	50,317
1989	54,379	54,619
1998	59,048	57,182

Source: Dresser L. and J. Rogers (2001), inflated to 1999 dollars using CPI-U.

The Case of High-Income Payers

Almost from its inception, the Wisconsin percentage-of-income standard, which does not vary by income of either parent, was criticized for requiring disproportionately high payments from high-income payers. As we noted earlier, van der Gaag, in his 1982 study that served as a basis for deliberations leading to Wisconsin's standard, concluded that "the share of income devoted to children is roughly proportional up to very high income levels."

Subsequently, however, Williams (1987), relying on a study by Espenshade (1984), argued that the proportion of expenditures that parents make on their children decreases as their income increases. Williams also argued that Wisconsin's standard was inequitable on the basis of its failure to accommodate tax rates, requiring high-income nonresident parents to pay a greater proportion of their *net* incomes in child support than their low-income counterparts.

These assertions led the Wisconsin Department of Health and Social Services to seek advice from the Institute for Research on Poverty regarding the vertical equity of Wisconsin's standard, resulting in two reports by Robin Douthitt (1988; 1990) examining the question of vertical equity. Douthitt found the basis of Williams' assertions[15] to rest on an assumption drawn from Espenshade (1984), who found that expenditures for children both increase with income and represent a constant proportion of current consumption of families. However, he did not provide direct evidence regarding the relationship between current consumption and income. Williams extrapolated from Espenshade's findings and concluded that "As income increases, *total* family current consumption declines as a proportion of net (after-tax) income because non-current consumption increases with the level of household income." Moreover, he noted, as quoted in Douthitt (1988), that family current consumption declines as proportion of gross (before-tax) income because of the progressive federal and state income tax structure.

Williams' reasoning is problematic on at least two grounds. The first is that prior to Douthitt's work, we lacked information on the relationship between current household consumption for children and household income. The second is that Williams and some other researchers assume that no part of non-current (e.g., savings) consumption should be considered as an expenditure for the children. That assumption implies that expenditures to purchase family homes, expenditures for consumer durable goods (such as refrigerators, washers and dryers, and personal computers) and traditional savings do not influence the well-being of the children.

[15]And the assertion of others. See, for instance, Rogers (1999).

Using both Canadian data and data from the 1982-84 Consumer Expenditure Survey, Douthitt (1990) noted that there were only very small differences in the average tax rates faced by lower-middle-income households compared to upper-middle-income households. Further, prior to the expansion of the Earned Income Tax Credit (EITC), if the two most regressive of Wisconsin and federal taxes (the sales tax and social security payroll taxes) had been included in estimates, one would likely have found that average tax rates were actually lower for upper-middle-income households.

Furthermore, using data on Canadian households (from a data base that contains more information on capital expenditures than does the CEX), Douthitt found that the share of expenditures allocated to current consumption is quite sensitive to the definitions used to define current consumption. If the durable goods that contribute to a child's well-being are purchased by the households that are more likely to be able to afford them, and then included in the estimates for these higher income households, the observed differences between lower- and upper-income families' allocation of expenditures to current consumption become much smaller. Because the CEX does not include the kind of information that would permit inclusion of payments for durable goods and mortgage principal in estimates of current consumption, the differences between lower- and upper- income household estimates are somewhat larger in the Douthitt study which relies on a sample of the CEX data.

More to the point, however, even in the absence of data which that would lead to more comprehensive and accurate estimates of expenditures for Wisconsin children, the balance of evidence suggests that the proportion of gross income that households spend for children significantly exceeds the percentages established by the Wisconsin standard at all measurable levels of household income.[16]

One shortcoming of all the studies we have reviewed is that the CEX, the only data source that has sufficient expenditure information to undertake these kinds of studies, does not include enough very high-income households to draw conclusions about whether their decisions concerning expenditures for

[16]In a lower-middle income family whose mother is employed full time, expenditures as a percentage of gross income were 34 percent for one child, 46 percent for two, and 51percent for three children. For an upper-middle income family whose mother is employed full time, expenditures as a percentage of gross income were 20 percent for one child, 29 percent for two, and 34 percent for three children.

children would differ fundamentally from other households with children. In particular, it is important to recall that expenditures for children are apparently sensitive to definitions of current consumption, and it is reasonable to assume that very high-income households engage in non-current consumption strategies that benefit the children, and which should be included in efforts to estimate expenditures for children. Unfortunately, existing data do not permit a full exploration of these strategies.

The Case of Low Income Payers

In establishing their child support guidelines, many states have struggled to determine the best way to treat low-income nonresident parents. The potential conflict between the economic needs of the child and the economic needs of the nonresident parent are seen in sharper opposition to each other than is the case when the nonresident parent has moderate income or is wealthy. In the latter instances, the payment of child support is not likely to reduce the living standard of the payer below the poverty level, as might happen with low income payers. Some states have responded to this problem by providing first for the needs of the nonresident parent before determining what child support is owed, or by building into their guidelines formula "special" reduced rates for low-income nonresident parents whose income falls below some threshhold. Still other states allow the courts to deviate from their guidelines because of the economic circumstances of the parties.[17] Others argue that the well-being of the child should have precedence; the children of low-income resident parents may themselves be especially vulnerable to economic hardship. The difficulties presented when the nonresident parent is low income are exacerbated by the simultaneous likelihood that income of the nonresident parent will rise over time and the likelihood that the problems associated with attempting to adjust child support orders to accommodate changing economic circumstances will result in infrequent changes to an order to reflect the true economic capacity of the parents to provide for the child. This problem may lead courts to engage in "speculative" order

[17]Wisconsin legislation regarding divorce (767.25lm) and paternity (767.51.5c and 5d) permit the court to deviate after considering factors that include the "needs of each party in order to support himself or herself," and the "earning capacity of each parent. . .")

setting, in an effort to establish an order that will accurately reflect the income of the nonresident parent in future years.

It is perhaps not surprising to learn that even less attention has been paid to the question of estimating expenditures by low-income parents for their children than is the case for high income parents. The findings of researchers who attempted to estimate expenditures on children have been presented in Tables 3, 4 and 5. As a percentage of expenditures, low- income one-parent and two-parent families spend virtually the same proportion as do their wealthier counterparts. As a proportion of income, low-income families are estimated to spend slightly higher proportions than do higher income families. As was was noted in the case of high-income families, these estimated expenditures on children are well above the percentages provided for in Wisconsin's guideline.

In contrast to efforts to estimate expenditures, some analysis has been done of the impact of the child support program on low-income fathers (Meyer, Cancian, and Melli, 1997; Brown, 2000). Meyer, Cancian and Melli examined information from the Wisconsin Court Records Database, which contains information about divorce and paternity records in 21 Wisconsin counties. In this study, they defined low income fathers as those with income below $20,000 (1995 dollars).[18] Among divorced parents for whom income information was available, fully 36 percent of fathers were low income using that definition. Among fathers for whom paternity had been established (and for whom income was known), 88 percent were low income.[19] For those fathers with extremely low income (between $1000 and $5000), courts were somewhat more likely to establish orders that were above the guidelines than they were for other fathers. Across all divorced low income fathers, however, courts displayed considerable variety in their treatment of low income fathers. A higher share of low-income than other fathers are not ordered to pay

[18]$21,900 in 1999 dollars.

[19]It is interesting to compare these figures with the proportion of federal tax returns filed by Wisconsin residents for tax year 1997 (EconData, 2001). Just over 40 percent of all tax returns filed showed an adjusted gross income of less than $20,000 (1997 dollars). At the opposite extreme, only 4.5 percent of all filers reported an adjusted gross income of $100,000 or more. These figures of course include many filers for whom child support is not an issue, (and the measure of income is different than reported in the Meyer, Cancian, Melli study) but it does tend to reinforce the idea that a significant group of Wisconsin residents (fathers, mothers and their children) have relatively low incomes.

child support; at the same time, a higher proportion of low income fathers are given above-guideline orders. When the income of these fathers is examined over time, considerable variation is also evident. Among all low-income fathers, 46 percent showed increases of at least $5000 over the a three year period; however, 15 percent had lost more than $5000.

Another route to understanding the potential impact of child support on low-income payers and their children is to examine post-divorce economic well-being among mothers and fathers in Wisconsin. The differential economic losses experienced by women and men after divorce are well documented, although estimates vary depending on the sample and methodology used (Bartfeld, 1998; Bianchi et. al., 1999; Hoffman and Duncan, 1988; Smock 1993; Smock, 1994). Using Wisconsin data, Bartfeld (1997) finds that in the first year after divorce, the mean annual incomes of mothers and fathers are not that dissimilar ($25,620 and $28,425, respectively, 1994 dollars). However when the amounts are adjusted for family size, reflecting the greater likelihood that children live with their mothers, the mean income-to-poverty ratio is substantially lower for mothers than fathers (2.24 and 3.31 respectively)[20]. The relative disadvantage of mothers occurs across all income levels: mothers are about twice as likely as fathers to have an income that places them below twice the poverty level while fathers are more than twice as likely as mothers to have incomes that place them above the poverty-times-three level. Bartfeld shows that child support can ameliorate some of this inequality without placing low income fathers at substantially increased risk of poverty.

VI. Conclusions

Estimating family expenditures for children is difficult and inexact. There are no ideal data sources. There is not unanimous agreement about the theoretical and conceptual underpinnings of such measurement and it is not a topic that attracts either great academic fervor or philanthropic devotion. Even

[20]These numbers may be read as follows: the mean annual income for mothers and the children who live with them is 2.24 times the poverty level; for fathers and the children who live with them, it is 3.31 times the poverty level.)

if it were, however, it is unlikely that shortcomings in the data can ever be fully eliminated because of the intrusive data collection that would be required to remedy the data problems and because of the difficulty in allocating expenditures made for children rather than adults.

It is probable that the methodologies thus far employed in the various studies do not work well for families with significant noncurrent consumption spending because the methods cannot identify savings that are intended for the benefit of the child. Since it is likely that these families have higher incomes (and greater capacity to advocate for their own self-interest) it seems particularly important to keep this point in mind when using estimates of expenditures for children to develop child support policy.

Although the data and estimates are inexact, relying strictly on estimates of expenditures for children does not suggest that Wisconsin's standard should be amended. The percentages still seem reasonable, though perhaps erring on the low side: for all income levels, the percentage of income specified in Wisconsin's standard is lower than estimates of expenditures for children in two-parent families. Although a continuity-of-expenditure paradigm is not consistent with reliance on estimates of expenditures in one-parent families, the estimates for one-parent families are strikingly higher than the current Wisconsin percentages (across all income levels) and tend to confirm the finding that current Wisconsin percentages are not too high.

Wisconsin's reliance on a continuity-of-expenditures paradigm for selecting its child support guideline implies that it is unnecessary to calculate the income of the resident parent when determining the amount of the child support owed by the nonresident parent. This is also consistent with reliance upon estimates of expenditures in two-parent (rather than single parent) families.

Nor does the fact that the Wisconsin standard is based upon gross (or adjusted gross) income rather than that net of taxes appear to be problematic, given the body of work reviewed here. There may be other reasons for amending the standard, but it would be difficult to sustain an argument that estimates on expenditures for children require such an amendment.

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APPENDIX I

Expenditures for Children in One-Parent and Two-Parent Families

Equivalence Scales

Measuring the costs of children is difficult. A straightforward method might be to add up all of the expenditures a family makes for children, including direct and indirect costs. Direct costs are those that can be identified specifically by a particular individual with a relatively high degree of accuracy; indirect costs are those that are incurred for joint or shared objectives and therefore cannot be identified as easily. This is complicated however, because it is difficult to place a value on shared or public goods, such as heat for the house or who ate the cereal. These problems have led economists to develop the idea of equivalent variation. (Betson, Reilly, Evenhouse, and Smolensky, 1992). It is based on the assumption that the households (not the individuals within them) can be ascribed a certain level of economic well-being. Subsequently, the well-being of each family member is equated with the well-being of that household. The equivalence approach is based on the idea of adjusting the income for the nature of the household in order to make comparisons across households regarding economic well-being.

If two households are alike in several characteristics, but one has a substantially higher level of income, it is generally thought to be better off than the other. If the two households are not alike in terms of characteristics, problems occur. A one-person household with $12,000 in income is not necessarily worse off than a two-person household with $20,000 in income.

One way of measuring equivalence is the per capita method. The standard of living is measured by dividing total household expenditures by the number of its members. The rationale is that all of the individuals share equally in the consumption and that there are no economies of scale in consumption. However, this likely overstates the amount spent for children

Other methods are based on techniques that account for family size. Following is a brief history of several techniques that have been developed to estimate the costs of raising children in one- and two-parent households and establish the well-being of these families.

The Engel Estimator

Ernst Engel (Engel, 1857) developed a methodology to measure the cost of children that was based upon the concept that the standard of living of a household could be estimated by the share of total expenditures devoted to the consumption of food. Engel found two important empirical regularities in expenditure patterns. First, as a family's size increases (holding family income constant) the percentage of the family's expenditures devoted to food increased. This has become known as Engel's Law. Second, he found that as family income increased (holding family size constant) the percentage of the family's expenditures devoted to food decreased, even though total expenditures on food increased. These regularities led Engel to conclude that the percentage of a family's income spent on food was a good criterion for evaluating family well-being (Bassi and Barnow, 1993). Families with the same food share are assumed to be equally well off. It follows that if one family allocated a greater percentage of expenditures to food than did another family, the first was assumed to be less well off than the second. This assumption also assumes "separability," the idea that the relationship between food consumption and all other consumption is the same for adults as it is for children.

The Engel estimation requires that the expenditure patterns of families without children be examined to determine how spending on food (as a percentage of total expenditures) varies with a family's sociodemographic characteristics. Then food expenditure patterns in families with one child are examined to determine how they compare with similar families without children. Expenditures for one child are then computed as the difference between total consumption expenditures of a one-child family and total consumption expenditures of a childless couple with the same utility level or level of economic well-being (i.e., families with expenditures that represent the same proportion of the total budget on food).

(Note: The Engel estimator, and others, does not provide an estimate of how much is spent for children: rather, they indicate how much the family with a child must be compensated to bring the adults to the same utility level or level of economic well-being that they would have enjoyed without a child.) This estimator also makes the assumption, that by examining how expenditure patterns vary among families with different numbers of children, it is possible to estimate the expenditures for additional children, (Bassi and Barnow, 1993; Haynes,1994; Betson,1990; van der Gaag, 1982).

One of the weaknesses of the Engel estimator is that children tend to be "food intensive." If this is the case, and the estimator is based on the notion of separability, then estimates of expenditures for children using the Engel methodology will tend to be too high (Bassi and Barnow, 1993; Deaton and Muellbauer, 1986).

Rothbarth Estimator

An alternative estimator of family expenditures for children was developed by Erwin Rothbarth,1943. Rothbarth proposed that the best way to measure the expenditures of families for children is to assess the children's impact on their parents' consumption. The well-being (utility) of parents can be established by the level of "excess income" available to them once necessary expenditures for all family members have been made. Excess income was defined by Rothbarth to include such items as alcohol, tobacco, entertainment, sweets, and savings. This definition has been narrowed to include only "observable adult goods," those adult goods that can be assumed to be consumed only by adults. This method assumes that two families spending the same amount on adult goods would be considered equally well off. (Haynes,1994; Bassie and Barnow, 1993).

The underlying assumption of this estimator is that the level of expenditures devoted to observable adult goods is a reliable criterion for evaluating adults well-being, and that the level of spending on adult goods is a proxy for the level of all goods consumed by adults. The method calculates the sum of money that would restore the level of expenditures on adult goods after the presence of

children. The procedure for computing expenditures for children using this estimator is similar to that used for the Engel estimator.

The primary weakness of the Rothbarth estimator is that it is likely to underestimate expenditures for children. The estimator does not take into account the possibility that the presence of children in a household may lead to substitution away from goods that must shared with children toward goods consumed primarily by adults. If this substitution does happen, the Rothbarth estimator will show low levels of additional income needed to restore the level of adult expenditures to that which the adults would have had if children were not present. (Deaton and Muellbauer,1986; Haynes, 1994; Betson, 1990).

Barten-Gorman Method

This method was first developed by Barten (1964) and later modified by Gorman (1976). The Barten-Gorman method, a utility maximization measure, is regarded as generalizing both the Rothbarth and Engel estimators. It proposes a family equivalence scale that does not require all of the assumptions made in the Engel and Rothbarth estimators. Barten assumed in his model that the standard of living of the household is a function of all goods consumed by the household. Consumption decisions are based upon a common preference according to which the consumption of each good is individually scaled. Households of different composition or size will differ in their ability to consume given amounts of goods and achieve a given standard of living. As the household increases in size it will require more food and clothing to achieve the same standard of living, and consumption patterns will change to reflect varying economies of scale across goods. For example, adults with teenage children may be less inclined to buy a new car (because the children might use it so much that the adults never be able to) and be more inclined to spend the money on themselves (perhaps to improve their wardrobe).

A primary focus of the Barten-Gorman model is that the presence of children is assumed to raise the consumption needs of a household above those if children were not present. The premise is that the presence of children results in changes in the cost of a unit price of adult consumption as children are

added to a family. Once these changes are accounted for, it is possible to estimate the amount of money needed to restore a family's economic well-being to the level that prevailed when the family was childless.

The major drawback to this method is the strong empirical assumptions that are required to implement the estimator, making it likely to yield unstable estimates and therefore limiting its practical applications. see Table A.3

Prais-Houthakker Estimator

The Prais-Houthakker 1955 estimator assumes that the percentage of expenditures attributable to a particular family member is not constant across broad categories of goods. This estimator uses a per capita measure of family spending on each major commodity group (health, food, etc.) which is then adjusted using a relative expenditure scale. The relative expenditure scale recognizes that family members do not consume the same proportion of each kind of good. For example, expenditures for a male teenager may be food intensive, and expenditures for a female teenager may be clothing intensive.

The addition of a child to the household reduces the adjusted per capita expenditures made by other family members. Expenditures for the new child are then determined by adding up all reductions in the per capita expenditures of the other family members.

The major disadvantage of this technique is that the system of equations for estimating adjusted per capita expenditures by commodity group is not established. There is not enough information to reliably identify the expenditure scale that is used to adjust per capita expenditures. The level of expenditures for children is essentially assumed and therefore unreliable.

Iso-prop

The Iso-prop estimator (Watts, 1967) operates in the same manner as the Engel estimator but expands the expenditures to include not just food, but also clothing, housing, transportation and medical expenses. Iso-prop denotes isoproportional, meaning characterized by equal proportions. see Table A.3.

Per Capita Method

This method measures the standard of living of a household by dividing the total expenditures of the household by the number of its members. The rationale is that all family members share equally in the consumption of goods by the household. The underlying assumption is that there are no economies of scale in the consumption of goods, that is, two family members whose total expenditures are the same and living apart will not be better off if they live together. see Table A.3. Per capita estimators are likely to overestimate expenditures for children because the marginal expenditures for an additional child are likely to be less than the per capita (or average) expenditures. For instance, families may not purchase a new house with an additional bedroom for each new child; instead two children share a bedroom. In this example, per capita estimators would overestimate the housing expenditures attributable to the second child.

USDA Method

The United States Department of Agriculture provides estimates of expenditures for children from birth to age 17, by husband-wife and single-parent families and by region. Data are from the 1990-92 Consumer Expenditure Survey - Interview portion. This survey is the most comprehensive source of household expenditure data available at the national level. Multivariate analysis was used to estimate household and child-specific expenditures, controlling for income level, family size, and age of younger child. Regional estimates were also made. The USDA utilizes the per capita approach rather than the marginal cost approach in allocating housing, transportation, and miscellaneous expenditures to children in a household. Comparisons are also made between husband-wife families and single-parent families most often headed by a women. see Table A.1.

Table A.1. USDA Method Comparing Expenditures by Family Structure		
Age of child	**Expenditures by Single-Parent Households**	**Expenditures by Husband-Wife Households**
0-2	$ 5,090	$ 6,080
3-5	5,770	6,210
6-8	6,480	6,310
9-11	6,070	6,330
12-14	8,540	7,150
15-17	7,240	7,050
Total	$111,570	$ 117,390
Source: Lino, 2000, in 1999 dollars.		

Comparisons with the Engel, Barten-Gorman, and Rothbarth methods continue to show that the Engel and Barten-Gorman methods produce lower estimations and the Rothbarth method produces higher estimations of expenditures. see Table A.2.

TABLE A.2. Comparison of Percent of Expenditures Attributable to Children in Two-Parent Families				
	Estimator (percent)			
Child Expenditures	**Engel[a]**	**Rothbarth [a]**	**Per-capita**	**USDA[b]**
Number of Children				
One	33	25	33	26
Two	49	35	50	42
Three	59	39	60	48
Household expenditure level				
Low	49	36	50	45
Average	49	36	50	42
High	49	35	50	39

[a] Engel and Rothbarth percentages are from Lewin/ICF (1990).
[b] USDA percentages are from Lino (1996).

Among families with one child and families with high expenditure levels, USDA child-rearing expenses are closer to the Rothbarth estimates. Among families with low expenditure levels, USDA child rearing expenses are closer to the Engel estimates. Among families with two or more children and families with an average household expenditure pattern, USDA child-rearing expenses are about in the middle of the Rothbarth and Engel estimates.

The following table is included only for comparative purposes. These alternative methods of estimating expenditures have not been widely used and for reasons explained here and have been discounted by many researchers.

TABLE A.3
Percentage of Expenditures Attributable to Children in 2-Parent Families

	Iso-prop[a]			Barten-Gorman	Per-capita
	1	**2**	**3**		
Number of children					
One	16	13	9	11	33
Two	29	27	21	16	50
Three	41	41	34	21	60
Ages of children (2 children)					
4 and 8	27	25	22	13	50
8 and 10	29	27	21	16	50
10 and 16	34	32	24	19	60
Family expenditures (2 children)					
Low	34	33	28	13	50
Medium	29	27	21	16	50
High	27	23	17	17	50

Sources: Lewin/ICF, (1990*;* Judicial Council of California, *Review of Statewide Uniform Child Support Guidelines, 1998.*

[a] Iso-prop 1 is the percentage of total expenditures devoted to food at home and to shelter, clothing, and health care; Iso-prop 2 is the percentage of total expenditures devoted to food at home and to shelter and clothing; Iso-prop 3 is the percentage of total expenditures devoted to food at home and to shelter.