Review of the Arizona Child Support Guidelines: Findings from the Analysis of Case File Data and Updating the Child Support Schedule

Submitted to:
Arizona Supreme Court
Administrative Office of the Courts

Submitted by:
Jane Venohr, Ph.D.
Savahanna Matyasic, MSW

CPR
center for policy research
1570 Emerson St., Denver, CO 80218 | Tel: (303) 837-1555 |centerforpolicyresearch.org

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Points of view expressed in this document are those of the authors and do not necessarily represent the official position of the Court or Subcommittee. The authors are responsible for any errors and omissions.

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SECTION 1: INTRODUCTION

Arizona is reviewing its child support guidelines as required by federal regulation and state statute. Federal regulations (C.F.R. § 302.56(a)) require states to review their guidelines at least once every four years and, as part of that review, consider economic data on the cost of raising children, labor market data, and the impact of the guidelines on low-income families. States are also required to analyze deviation from the guidelines using case file data such that guidelines deviations are kept at a minimum.

This report documents Arizona's fulfillment of these requirements. Appendix A includes updated measurements of child-rearing expenditures developed by Professor David Betson, University of Notre Dame, based on the current expenditures data available. This report uses the new Betson measurements to develop an updated schedule and documents the steps and data used for the update.

Arizona child support guidelines are set by Supreme Court rule. The guidelines are to be used by all judges for establishing and modifying child support orders. State statute charges the Supreme Court with establishing the guidelines and periodically reviewing them.[1] The review was conducted by the Child Support Guidelines Review Subcommittee of the Court's Family Court Improvement Committee.

Exhibit 1: Child Support Guidelines Review Subcommittee

Chair of Subcommittee Honorable David B. Gass Arizona Court of Appeals, Division	
Ms. Carol Park Aden Community Legal Services, Inc	Ms. Mary K. Boyte Henderson, J.D. Mary Katherine Boyte, PC
Honorable John J. Assini Superior Court in Pima County	Ms. Jennifer A. Mihalovich Stewart Law Group
Ms. Laura C. Belleau Karp & Weiss, P.C.	Ms. Janet W. Sell Office of the Arizona Attorney General
Honorable Bruce R. Cohen Presiding Family Court Judge Superior Court in Maricopa County	Mr. Vance D. Simms Public Member, Custodial Parent
Ms. Kellie E. DiCarlo Arizona Legal Document Services, LLC	Honorable Jeff Fine Superior Court in Maricopa County (replaced Honorable Amanda Stanford on 7/15/2020)
Honorable Joseph Goldstein Superior Court in Yavapai County	Ms. Rosa Torrez Department of Economic Security
Ms. Tiffany Harvey Public Member, Non-Custodial Parent (replaced Cherie Wasiel on 7/15/2020)	Mr. Steve Wolfson, J.D. Dickinson Wright PLLC
Ex Officio Members	
Don Bays Horne+Horne	Chris Gorman Gorman Consulting Group, LLC

[1] Arizona Revised Statute Section 25-320 (D).

Membership of the Subcommittee includes representatives of the government child support agency and individuals representing or serving low-income parents in the course of their normal job duties.[2] The Subcommittee's recommended changes to the guidelines have been published on the Court website for public comment and are being reviewed by the Court. If approved, they will become effective January 1, 2022. In turn, the next guidelines review will be in 2026. More information about the Arizona child support guidelines review can be found on the Court's website.[3]

Arizona Children and Their Parents

Child support is an important source of income to many Arizona children. Based on the U.S. Census American Community Survey, there were 1,639,648 children living in Arizona in 2019.[4] The 2020 Kids Count reports several statistics, mostly from 2018 or 2019, that are relevant to child support:[5]

- Twenty percent of Arizona children lived at or below poverty.
- Thirty-seven percent of Arizona children lived in single-parent families.
- Twenty-four percent of Arizona female-headed families received child support.
- Twenty-seven percent of Arizona children had parents who lacked secure employment.
- Eight percent of Arizona children had a parent who was ever incarcerated in Arizona.
- Eight percent of Arizona children lacked health insurance.

In 2019, the Arizona Department of Economic Security (DES) Division of Child Support Services (DCSS) reported serving 157,828 cases to the federal Office of Child Support Enforcement (OCSE).[6] DCSS collected and distributed over $300 million in child support in 2019. There are also child support cases that are not part of DCSS. Collections on non-DCSS cases generally are not reported to OCSE. Although the amount is unknown, it likely to exceed DCSS collections.[7]

Current Arizona Guidelines

Exhibit 2: Excerpt of Current Child Support Schedule

Combined Adjusted Gross Income	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
4500	817	1180	1388	1550	1705	1853

[2] Federal regulation (45 C.F.R. § 302.56(h)(3)) requires opportunities for input from low-income parents and their representatives as well as input from the child support agency.
[3] Arizona Judicial Branch. (n.d.) FCIC – Child Support Guidelines Review Subcommittee. https://www.azcourts.gov/cscommittees/Family-Court-Improvement-Committee/FCIC-Child-Support-Guidelines-Review-Subcommittee.
[4] U.S. Census American Community Survey 2020. Retrieved from https://data.census.gov.
[5] The source is the Annie E. Casey Foundation. (2020). *2020 Kids Count Data Book: State Trends in Child Well-Being*. Retrieved from https://www.aecf.org/interactive/databook/. The percentages receiving child support and those with ever incarcerated parents are from 2017–2019.
[6] Federal Office of Child Support Enforcement. (2020). *Office of Child Support Preliminary Report 2019*. Retrieved from https://www.acf.hhs.gov/css/resource/fy-2019-preliminary-data-report.
[7] The authors suggest this based on data from various sources that non-government child support cases tend to have higher orders and higher payments data.

4550	822	1188	1396	1559	1715	1864
4600	827	1195	1404	1568	1725	1875
4650	833	1202	1412	1577	1735	1886
4700	838	1209	1420	1586	1745	1897
4750	843	1216	1428	1596	1755	1908
4800	848	1224	1437	1605	1765	1919
4850	853	1231	1445	1614	1775	1930
4900	858	1238	1453	1623	1785	1940
4950	863	1245	1461	1632	1795	1951
5000	869	1252	1469	1641	1805	1962

The core of the Arizona guidelines calculation is a lookup schedule of monthly basic obligations for a range of incomes and number of children. (Exhibit 2 shows an excerpt of the current schedule.) The basic obligations in the schedule reflect economic data on the costs of raising children. They relate to the combined income of the parents—that is, the amount of income the parents would have if they lived together and combined financial resources. The support award is determined by prorating the obligated parent's share of the basic obligation. For example, if each parent's gross income is $2,500 per month, the combined gross income would be $5,000 per month and, using the schedule in Exhibit 2, the basic obligation for two children is $1,252 per month. The obligated parent's prorated amount in this example would be $626 per month (*i.e.*, 50% of $1,252). This is the basis of the support award amount, although there is usually an additional adjustment for the number of days the child spends with the obligated parent, and there also may be additional adjustments for other considerations such as work-related childcare expenses the self-support reserve test.

The existing Arizona guidelines schedule is based on economic data available in 2016. This is when the Arizona guidelines were last reviewed.

Fulfillment of Expanded Federal Requirement of State Guidelines

Exhibit 3 shows the current federal requirements. Federal requirements for state guidelines were initially imposed in 1987 and 1989 and essentially have had no major changes until recently; specifically, in December 2016 when the Flexibility, Efficiency, and Modernization Rule (FEM) was published.[8] The 1984 Child Support Amendments to the Social Security Act required each state with a government child support program through Title IV-D of the Social Security Act to have one set of child support guidelines to be used by all judicial or administrative tribunals that have authority to determine child support orders within state by 1987.[9] The Family Support Act of 1988 expanded the requirement by requiring that the application of a state's guidelines be a rebuttable presumption and that states review their guidelines at least once every four years and, if appropriate, revise their guidelines.[10] States could determine their own criteria for rebutting the guidelines; however, the federal requirements made it

[8] U.S. Department of Health and Human Services. (Nov. 17, 2014). "Flexibility, Efficiency, and Modernization in Child Support Enforcement Programs." *Federal Register*, Vol. 79, No. 221. Retrieved from https://www.gpo.gov/fdsys/pkg/FR-2014-11-17/pdf/2014-26822.pdf.

[9] See the 1984 Amendments of the Social Security Act (Public Law 98-378).

[10] See 1988 Family Support Act (Public Law 100-485).

clear that states should aim to keep guidelines deviations at a minimum. For several decades, the federal requirements for state guidelines essentially:

- Have one set of guidelines to be used by judges (and all persons within a state with the authority) to issue a child support order;
- Provide that the guidelines are rebuttal and develop state criteria for rebutting them;
- Consider all earnings and income of the noncustodial parent in the calculation of support;
- Produce a numeric, sum-certain amount;
- Provide for the child's healthcare coverage; and
- Review their guidelines at least once every four years and as part of that review analyze guidelines deviations.

Arizona has always met these requirements.

Exhibit 3: Federal Requirements of State Guidelines

45 C.F.R 302.56
§302.56 Guidelines for setting child support orders
(a) Within 1 year after completion of the State's next quadrennial review of its child support guidelines, that commences more than 1 year after publication of the final rule, in accordance with § 302.56(e), as a condition of approval of its State plan, the State must establish one set of child support guidelines by law or by judicial or administrative action for setting and modifying child support order amounts within the State that meet the requirements in this section.
(b) The State must have procedures for making the guidelines available to all persons in the State.
(c) The child support guidelines established under paragraph (a) of this section must at a minimum:
(1) Provide that the child support order is based on the noncustodial parent's earnings, income, and other evidence of ability to pay that:
(i) Takes into consideration all earnings and income of the noncustodial parent (and at the State's discretion, the custodial parent);
(ii) Takes into consideration the basic subsistence needs of the noncustodial parent (and at the State's discretion, the custodial parent and children) who has a limited ability to pay by incorporating a low-income adjustment, such as a self-support reserve or some other method determined by the State; and
(iii) If imputation of income is authorized, takes into consideration the specific circumstances of the noncustodial parent (and at the State's discretion, the custodial parent) to the extent known, including such factors as the noncustodial parent's assets, residence, employment and earnings history, job skills, educational attainment, literacy, age, health, criminal record and other employment barriers, and record of seeking work, as well as the local job market, the availability of employers willing to hire the noncustodial parent, prevailing earnings level in the local community, and other relevant background factors in the case.
(2) Address how the parents will provide for the child's health care needs through private or public health care coverage and/or through cash medical support;
(3) Provide that incarceration may not be treated as voluntary unemployment in establishing or modifying support orders; and
(4) Be based on specific descriptive and numeric criteria and result in a computation of the child support obligation.
(d) The State must include a copy of the child support guidelines in its State plan.
(e) The State must review, and revise, if appropriate, the child support guidelines established under paragraph (a) of this section at least once every four years to ensure that their application results in the determination of appropriate child support order amounts. The State shall publish on the internet and make accessible to the public all reports of the guidelines reviewing body, the membership of the reviewing body, the effective date of the guidelines, and the date of the next quadrennial review.
(f) The State must provide that there will be a rebuttable presumption, in any judicial or administrative proceeding for the establishment and modification of a child support order, that the amount of the order which would result from the application of the child support guidelines established under paragraph (a) of this section is the correct amount of child support to be ordered.

(g) A written finding or specific finding on the record of a judicial or administrative proceeding for the establishment or modification of a child support order that the application of the child support guidelines established under paragraph (a) of this section would be unjust or inappropriate in a particular case will be sufficient to rebut the presumption in that case, as determined under criteria established by the State. Such criteria must take into consideration the best interests of the child. Findings that rebut the child support guidelines shall state the amount of support that would have been required under the guidelines and include a justification of why the order varies from the guidelines.
(h) As part of the review of a State's child support guidelines required under paragraph (e) of this section, a State must:
(1) Consider economic data on the cost of raising children, labor market data (such as unemployment rates, employment rates, hours worked, and earnings) by occupation and skill-level for the State and local job markets, the impact of guidelines policies and amounts on custodial and noncustodial parents who have family incomes below 200 percent of the Federal poverty level, and factors that influence employment rates among noncustodial parents and compliance with child support orders;
(2) Analyze case data, gathered through sampling or other methods, on the application of and deviations from the child support guidelines, as well as the rates of default and imputed child support orders and orders determined using the low-income adjustment required under paragraph (c)(1)(ii) of this section. The analysis must also include a comparison of payments on child support orders by case characteristics, including whether the order was entered by default, based on imputed income, or determined using the low-income adjustment required under paragraph (c)(1)(ii). The analysis of the data must be used in the State's review of the child support guidelines to ensure that deviations from the guidelines are limited and guideline amounts are appropriate based on criteria established by the State under paragraph (g); and
(3) Provide a meaningful opportunity for public input, including input from low-income custodial and noncustodial parents and their representatives. The State must also obtain the views and advice of the State child support agency funded under title IV–D of the Act.

The FEM Rule imposed additional requirements of state guidelines reviews, namely, it required more analysis of specific guidelines factors and the analysis of labor market data (see 45 C.F.R § 3025.56(h) in Exhibit 3) to be considered as part of the review process. This report documents the analysis for this review.

The FEM also imposed additional requirements of the guidelines themselves. Although Arizona had until one year after this review to meet these new requirements, the Arizona Supreme Court developed an interim review committee to address the new requirements in 2017.[11] The interim committee's recommendations were adopted as part of the child support guidelines in 2018. Exhibit 4 shows the new requirements and how Arizona addressed them. Before the 2018 changes, Arizona actually had a self-support reserve, but the interim review gave them an opportunity to review it and make changes more appropriate to Arizona. Exhibit 3 also shows the provisions Arizona adopted to consider the individual circumstances of the parent when income imputation is authorized and to not consider incarceration to be voluntary unemployment.

Exhibit 4: Arizona Provisions Meeting New Federal Requirements of State Guidelines

45 C.F.R § 302.56 (c) The child support guidelines established under paragraph (a) of this section must at a minimum:	Arizona Child Support Guidelines

[11] Arizona Supreme Court Committee for an Interim Review of the Child Support Guidelines. (Dec. 2017). *Final Report and Recommendations.* Retrieved from https://www.azcourts.gov/Portals/31/FinalReportDec2017.pdf?ver=2019-04-10-163620-39.

(1) Provide that the child support order is based on the noncustodial parent's earnings, income, and other evidence of ability to pay that: (ii) Takes into consideration the basic subsistence needs of the noncustodial parent (and at the State's discretion, the custodial parent and children) who has a limited ability to pay by incorporating a low-income adjustment, such as a self-support reserve or some other method determined by the State; and	15. SELF-SUPPORT RESERVE TEST In each case, after determining the child support order, the court shall perform a self support reserve test to verify that the paying parent is financially able to pay the child support order and to maintain at least a minimum standard of living, as follows: The self-support reserve shall be an amount equal to 80% of the monthly full-time earnings at the current state minimum wage at the time of the order (the self-support reserve amount). Deduct the self-support reserve amount from the paying parent's Adjusted Gross Income, except that the court may deduct from such parent's Adjusted Gross Income for purposes of the self-support reserve test only, court-ordered arrears on child support for children of other relationships or spousal maintenance, if actually paid. If the resulting amount is less than the child support order, the court may reduce the current child support order to the resulting amount after first considering the financial impact the reduction would have on the receiving parent's household. The test applies only to the current child support obligation, but does not prohibit an additional amount to be ordered to reduce an obligor's arrears.
iii) If imputation of income is authorized, takes into consideration the specific circumstances of the noncustodial parent (and at the State's discretion, the custodial parent) to the extent known, including such factors as the noncustodial parent's assets, residence, employment and earnings history, job skills, educational attainment, literacy, age, health, criminal record and other employment barriers, and record of seeking work, as well as the local job market, the availability of employers willing to hire the noncustodial parent, prevailing earnings level in the local community, and other relevant background factors in the case.	5.E. If a parent is unemployed or working below full earning capacity, the court may consider the reasons. If earnings are reduced as a matter of choice and not for reasonable cause, the court may attribute income to a parent up to his or her earning capacity. If the reduction in income is voluntary but reasonable, the court shall balance that parent's decision and benefits therefrom against the impact the reduction in that parent's share of child support has on the children's best interest. The court may not attribute income to a person who is incarcerated, but may establish or modify support based on actual ability to pay. In accordance with Arizona Revised Statutes Section 25-320, income of at least minimum wage should generally be attributed to a parent after considering the specific circumstances of the parents to the extent known. This includes such factors as the parents' assets, residence, employment and earnings history, job skills, educational attainment, literacy, age, health, criminal record and other employment barriers, and record of seeking work, as well as the local job market, the availability of employers willing to hire the parents, prevailing earnings level in the local community, and other relevant background factors in the case. If income is attributed to the parent receiving child support, appropriate childcare expenses may also be attributed.
(3) Provide that incarceration may not be treated as voluntary unemployment in establishing or modifying support orders; and…	

Organization of Report

Section 2 reviews case file data and labor market data.

Section 3 reviews the current economic data on the cost of child rearing.

Section 4 develops an updated schedule using more current economic data.

Section 5 analyzes the impact of the guidelines and proposed, updated schedule.

Section 6 provides conclusions.

Appendix A includes new measurements of child-rearing expenditures developed by Professor David Betson, University of Notre Dame.

Appendix B provides technical documentation of the data and steps used to develop the updated schedule.

Appendix C provides the proposed updated schedule.

SECTION 2: FINDINGS FROM THE ANALYSES OF CASE FILE DATA AND LABOR MARKET DATA

This section documents the findings from the analysis of case file data and labor market data considered in the 2020 review of the Arizona child support guidelines. The analyses fulfill the federal requirements relating to case file and labor market data shown in Exhibit 5. (The analysis of economic data and the impact of guidelines amounts, which are other federal requirements shown in Exhibit 5, are discussed in later sections.)

Exhibit 5: Federal Requirement to Analyze Case File Data and Labor Market Data

45 C.F.R § 302.56

(h) As part of the review of a State's child support guidelines required under paragraph (e) of this section, a State must:

(1) Consider economic data on the cost of raising children, **labor market data (such as unemployment rates, employment rates, hours worked, and earnings) by occupation and skill-level for the State and local job markets,** the impact of guidelines policies and amounts on custodial and noncustodial parents who have family incomes below 200 percent of the Federal poverty level, and factors that influence employment rates among noncustodial parents and compliance with child support orders;

(2) **Analyze case data, gathered through sampling or other methods, on the application of and deviations from the child support guidelines, as well as the rates of default and imputed child support orders and orders determined using the low-income adjustment required under paragraph (c)(1)(ii) of this section. The analysis must also include a comparison of payments on child support orders by case characteristics, including whether the order was entered by default, based on imputed income, or determined using the low-income adjustment** required under paragraph (c)(1)(ii). The analysis of the data must be used in the State's review of the child support guidelines to ensure that deviations from the guidelines are limited and guideline amounts are appropriate based on criteria established by the State under paragraph (g); …

Prior to 2016, federal regulation required analysis of case file data to examine the application of and deviations from the guidelines. Arizona met this requirement through the analysis of a random sample of court files obtained from county court clerk offices. Due to the expanded requirements, this review also considers data from two other sources.

In all, the data sources can be broken down into three major categories.

- A random sample of child support orders (and the companion worksheet used to calculate the order) from county clerk offices.
- Recently established or modified child support orders tracked on ATLAS, which stands for the Arizona's Tracking and Location Automated System and is administered by the Arizona Department of Economic Security (DES) Division of Child Support Services (DCSS). ATLAS has two purposes: it serves as the information management system for DCSS cases, and it tracks payments for all child support orders regardless of whether they are a DCSS case. Unless otherwise ordered by the court, all Arizona child support orders are required to be sent to the Support Payment Clearinghouse that is a part of ATLAS.
- Labor market data reported by the U.S. Department of Labor, the Arizona Labor Department, and the Arizona Commerce Authority.

Since many states rely on their equivalent to ATLAS to fulfill most of the data analyses requirements, the analyses from the court case files and ATLAS are discussed together to explore whether future guidelines reviews can rely solely on ATLAS data.

This section ends with the analysis of the labor market data.

Analysis of Case File Data

Data Sources and Limitations

Historically, Arizona has met the requirement to analyze case file data on guidelines applications and deviations from a random sample of child support orders filed at county court offices. In addition to analyzing guidelines deviations, federal regulations now require the analyses of income imputation, orders set by default, and the application of the low-income adjustment, and payment patterns. These requirements complement the new requirements to consider the subsistence needs of a low-income, obligated parent in the guidelines calculation and to consider the individual circumstances of the obligated parent when income imputation is authorized (45 C.F.R. § 302.56(c)(1)). These new requirements are based on research that finds income is sometimes imputed beyond what a low-income parent actually earns, as well as a negative correlation between income imputation and payments.[12] The findings from the analysis of case file data may inform how to better consider a parent's subsistence needs and impute income more appropriately. Guidelines deviations are analyzed because of the federal objective to keep guidelines deviations at a minimum.[13]

Due to the new requirement to analyze payments, ATLAS data is also extracted. To avoid any potential data confidentiality issues, the ATLAS data are not matched to the information collected from the county court offices. Instead, all personal identifiers are removed from ATLAS data for purposes of the analysis. Personal identifiers are also removed from the county clerk data.

Data Limitations

The major limitation to both data sets is that neither contains all data necessary to fulfill federal requirements for data analysis. In general, court records are a better source of how the guidelines are applied and guidelines deviations, whereas ATLAS is the only source of payment information. Still, some of the federally required fields (*e.g.*, income imputation and default) are not readily available from either source. (As discussed later, they are still analyzed by using proxies based on other data fields such as the guidelines-calculated amount for parties with minimum-wage income since minimum wage is a common amount imputed as income to a party when that party is voluntarily unemployed and there is little work history.) The lack of data fields capturing the federally required information (*i.e.*, income imputation, default, and application of the low-income adjustment) on automated child support systems is a common issue to most states. States are addressing these limitations in two ways: adding checkboxes to court forms and adding data fields to automated systems.

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[12] See page 68555 of U.S. Department of Health and Human Services. (Nov. 17, 2014). "Flexibility, Efficiency, and Modernization in Child Support Enforcement Programs." *Federal Register*, Vol. 79, No. 221. Retrieved from https://www.gpo.gov/fdsys/pkg/FR-2014-11-17/pdf/2014-26822.pdf.

[13] 45 C.F.R. § 302.56(c)(1).

Exhibit 6 compares the data availability between the two sources. Court records are further broken down into whether the information came from the order or the worksheet. ATLAS data is broken down between whether the information is available for IV-D cases and non-IV-D cases. IV-D stands for Section IV-D of the Social Security Act that authorizes government child support agencies. ATLAS tracks more information about IV-D cases than non-IV-D cases. In contrast, court files cover both IV-D and non-IV-D orders, but the IV-D status is not always available or obvious in the court file.

Exhibit 6: Comparison of Data Fields Available from Court Files and ATLAS

	Court Files		ATLAS Data	
	Orders	**Worksheets**	**IV-D Orders**	**Non-IV-D Orders**
Core Data Elements for Federally Required Analyses				
Guidelines deviation	✓		Data field exists but not populated	
Income imputation	Sometimes	Inferred from guidelines income		
Default	Sometimes			
Application of the self-support reserve (SSR)	Can be inferred by comparing worksheet lines for SSR test and order amount			
Payments			✓	✓
Other Data Elements				
Monthly child support order	✓	✓	✓	✓
Number of children on order	✓	✓	✓	✓
Age of the child	✓	✓	✓	✓
Gender of the party receiving/due support		Some worksheets[14]	✓	✓
Relationship of party to child	✓	✓[15]	✓	
Monthly spousal support	✓		✓	
Age of the party receiving/due support	Available but not collected		✓	✓
Income used for guidelines calculation		✓		
Quarterly wage data			✓	
	Orders	**Worksheets**	**IV-D Orders**	**Non-IV-D Orders**

[14] There are multiple worksheets used in Arizona. The differences are very subtle. Most of the line items are the same. The major difference is typically the columns of the worksheet. Some use petitioner/respondent or the columns, whereas others use Parent A/Parent B or mother/father.

[15] *Ibid.*

Deductions from Income	Not usually	✓		
Additional children	Not usually	for whom there is an income deduction	Other ATLAS cases	Other ATLAS cases
Childcare expenses	Sometimes	✓		
Cost of child's health insurance	Sometimes	✓		
Medical support ordered	Available but not collected		✓	
Parent ordered to pay medical support/health insurance	Available but not collected	✓	✓	
Each parent's share of uninsured/unreimbursed medical expenses	✓		✓	
Each parent's share of transportation expense due to timesharing	✓			
Provisions for which parent claims child as tax deduction	✓			
IV-D status	Sometimes		✓	✓
Court action type (*e.g.*, divorce or modification)	Sometimes		✓	✓
County of the order	✓	✓	✓	✓
Closed case			✓	✓
Incarceration	Sometimes		✓	
Whether the obligated parent had income from the Social Security Administration or Veteran's Affairs	Sometimes		✓	

Pros and Cons of Data from Court Records

There are several pros to obtaining the data from the court records. Because Arizona's sampling of orders from county court files dates back to the 1990s, comparisons can be made over time to examine trends. For the vast majority of orders, the guidelines worksheet is also obtainable from the court records, albeit there may be more than one worksheet. (When this occurs, the worksheet that matches the order amount is used.) The guidelines worksheet provides all of the detailed information used for the guidelines calculation of support (*e.g.*, the number of children, each party's income, adjustments to income, the parenting days considered, and any additional expenses such as childcare expenses).

The same level of detail about how the guidelines were applied and the factors considered are not available on ATLAS. The court order on file with the county clerk also accurately notes whether there was a deviation from the guidelines and the reason for the guidelines deviation, and provisions in the order for medical support, transportation expenses associated with the timesharing arrangement, and which parent will claim each child and in what year for tax purposes. Whether the self-support reserve was applied can be determined by comparing the order amount (as noted in the order) with the lines of the worksheet that address the self-support reserve. The court records also capture all orders within the state.

One con of obtaining data from the court records is that it does not include payment data or readily notes whether the order was established through default or using income imputation. Some of these limitations could be alleviated by adding checkboxes to the guidelines worksheet to note income imputation or default or requiring child support orders to note defaults and income imputation. Although not required for federal analysis, the court records do not always note the relationship of the party to the child, particularly in non-parent caretaker cases, and do not always note whether the case is an IV-D order. Another con to obtaining data from court records is that it requires more time, staffing, and coordination than a data extract since the information must be converted manually from individual records to a database suitable for analysis. This may change in time, however, as code is developed that can be used to extract data for periodic reviews and as electronic files become more predominant and tools to extract from the electronic files are developed or enhanced.

Pros and Cons of ATLAS Data

There are also several pros to using data extracted from a state's automated system. The major pro is it contains payment data, which must now be analyzed to fulfill a new federal requirement. Once the initial code is developed, it requires less time and staff resources to extract. Many states use their automated system to analyze guidelines deviations because federally certified systems are required to have a field tracking whether the guidelines were applied or not applied (which is called a "deviation" when the guidelines are not applied.) ATLAS contains a field to note whether the guidelines are applied, but it rarely is population. This is a common issue among states because government child support staff do not always have the guidelines deviation information readily available or it is not identifiable (*e.g.*, even if child support staff have the court order, it may be pages of narrative where a guidelines deviation is not obviously noted.) The data field is also not available for IV-D cases. This means that even if the guidelines deviation field were populated and used to determine the guidelines deviation rate, it would not be representative of the state because it does not include non-IV-D cases. This limitation is common in most states using data from their automated system to measure the deviation rate. Nonetheless, it is still reported and useful information even though it typically understates a state's guidelines deviation rate.

Federal certification does not require data fields noting whether income was imputed to a party, whether the order was entered by default, or whether the low-income adjustment was applied. Only a few states currently include all or some of these data fields on their automated system, although most states are considering adding them as they enhance their automated systems. In all, a common limitation of state automated systems is that they do not contain the detailed information used to calculate support (*e.g.*, each party's income amount that was used for the guidelines calculation*)* as the guidelines worksheet does or only capture it for those orders using an automated guidelines calculator that is attached to the state system. In Arizona, there is an automated calculator available through the court, but it is not part of ATLAS.

Sampling

For both data sources, child support orders were limited to intrastate actions with an order established or modified sometime between July 1 and December 31, 2018. Payment information was obtained for

the following 12 months of 2019. Orders were limited to intrastate actions because the Arizona guidelines would more likely apply in intrastate cases, whereas the guidelines of another state could apply in interstate case depending on which state had controlling jurisdiction. The time period was limited to six months because there were substantial guidelines changes made earlier in the year. As discussed in the previous section, there was a change to the self-support reserve test and other changes to conform to new federal requirements of state guidelines.[16]

Sampling from Court Records

Like previous case files, samples were randomly drawn from four counties: Apache, Maricopa, Pima, and Yavapai. Sampling from some counties and not all counties is known as cluster sampling. It can be a more efficient way to collect data and can be representative of a state. As shown in Exhibit 7, Maricopa and Pima are the two most populous counties in Arizona and account for almost 6.5 million of Arizona's total population, which is just over 7 million. Yavapai is a middle-sized county and Apache is a small county.

The ideal information for determining sampling would be the number of child support orders established in each county, but that information was not readily available when developing the sampling plan. Later, it was obtained from the sampled counties only and for the six-month sample period only. A random sample was generated from these lists.

Exhibit 7 shows other county statistics related to the number of child support orders: court filings for marriage dissolution or divorce, divorces, and court filings for child support without dissolution or divorce action. The counts of court filings for divorce and actual divorces include those with and without children, so they overstate the number that are likely to have child support orders. Counting "filings" likely overstates the number of child support orders because an action may be filed, but the parents may not complete the divorce or court action, or it may take several years. Still, regardless of what count is used, the sampled counties comprise about 70 to over 80 percent of the state total. Due to this, the sampled counties are a suitable representation of the state.

As shown in Exhibit 8, there were 712 child support orders available for analysis, whereas there were 684 child support orders last review. Historically, the sample size was determined based on testing whether there was a statistically significant change in the guidelines deviation rate, and increasing the sample size to account for the likelihood that some orders and worksheets could not be readily located in the court files. Based on 95 percent confidence and an error of estimation of 0.05, the proposed sample size is 463. Since this is smaller than the last sample of 684 cases,[17] CPR set the previous sample size as the ideal. This would also make the statistical comparisons over time more robust. The smaller count is a minimum. There was also a slight change in methodology of allocating the sample among

[16] These changes are detailed in the Arizona Supreme Court Committee for an Interim Review of the Child Support Guidelines. (Dec. 2017). *Final Report and Recommendations.* Retrieved from Final Report and Recommendations (azcourts.gov).
[17] The larger sample size for last review was partially due to an overestimation of the number of child support orders established and modified in Pima County, as well as sampling was determined from the number of orders reported from each county (except Pima County, where an estimation was used since Pima County did not have a count.)

counties. The total sample size was first determined then apportioned to counties based on the sizes of Maricopa and Pima counties and the proportions of Arizona populations living in small[18] and medium-sized[19] counties, respectively, for Apache and Yavapai counties. The 712 count includes orders where both the order and worksheet could be found. More orders and worksheets were actually reviewed. The vast majority of orders had matching worksheets. Those that did not were excluded from the analysis. A few other orders were excluded for various reasons such as the order was from another state, the order was terminated, or child support was not addressed. In other words, the initial limitation of intrastate cases and child support actions was not always possible.

Exhibit 7: Population, Divorces, Dissolutions, and Support Filings of Arizona Counties

County	Sampled County	Population 2018	2018 Court Filings for Marriage Dissolution/ Divorce (with and without children)[20]	2018 Divorces Reported for Vital Statistics (with and without children)[21]	2018 Court Filings for Support without Dissolution/Divorce Actions[22]	Number of Child Support Orders Entered During 6-Month Sample Period (7/1–12/31/2018)
Apache	☑	71,818	99	80	6	48
Cochise		126,770	619	409	72	N/A
Coconino		142,854	396	338	43	N/A
Gila		53,889	185	127	49	N/A
Graham		38,072	177	125	36	N/A
Greenlee		9,483	61	30	1	N/A
La Paz		21,098	69	50	3	N/A
Maricopa	☑	4,410,824	17,799	13,429	2,568	2,958
Mohave		209,550	862	409	295	N/A
Navajo		110,445	282	219	71	N/A
Pima	☑	1,039,073	3,881	3,380	106	1,573
Pinal		447,138	1,263	923	231	N/A
Santa Cruz		46,511	169	123	80	N/A
Yavapai	☑	231,993	994	796	104	302
Yuma		212,128	844	750	241	N/A

[18] Small counties are Apache, Gila, Graham, Greelee, La Paz, and Santa Cruz.
[19] Medium counties are Cochise, Coconino, Mohave, Navajo, Pinal, Yavapai, and Yuma.
[20] Arizona Superior Court. (n.d.) *Narrative Summary,* Appendix C. Retrieved from https://www.azcourts.gov/Portals/39/2018DR/SuperiorCourt.pdf?ver=2019-06-25-133011-100.
[21] Arizona Department of Health Services (n.d.) *Population Health and Vital Statistics.* Retrieved from https://pub.azdhs.gov/health-stats/mu/index.php.
[22] Arizona Superior Court (n.d.) Narrative Summary, *supra* note 6. The count includes the court categories labeled: "IV-D Intrastate," "IV-D Other," "Private (non-IV-D)," and "Other Support (non-divorce)." It does not include "IV-D UIFSA" since counties are instructed to not include interstate cases.

Exhibit 8: Targeted Sample Size and Actual Sample Size

County	Minimum Sample Needed from 2018 Orders	Number of Orders Sampled and Analyzed from 2013	Number of Orders Sampled and Analyzed from 2nd Half of 2018
Apache	16	27	21
Maricopa	284	413	415
Pima	67	197	190
Yavapai	47	96	86
Total	463	684	712

Sampling from ATLAS

DES selected and extracted information from 7,867 ATLAS orders meeting the above criteria: the case was an intrastate order, and an order was established or modified between July 1, 2018, and December 31, 2018. This included both IV-D and non-IV-D orders. The orders used for analysis were limited to those that were part of a divorce decree, an initial action for child support that was not part of a divorce, or a modification; and excluded order types that were medical support only, a change in registration, and orders in which a guidelines calculation would not be necessary. The analysis was further limited to exclude closed cases, which would not have payments (federal regulation requires the analysis of payments). Small shares of IV-D and non-IV-D cases in initial extract (*i.e.*, 13% and 15%, respectively) were closed. The three common reasons for closure were that the IV-D status was changed or transferred (35% of closed cases); there was no longer a current support order, arrears order, or obligation (25% of closed cases); and the court dismissed the case (21% of closed cases). Another criterion imposed for the purposes of analyzing payments was that a current, non-zero support order existed. Due to the way the data were coded, it was not always clear whether there was actually a zero order or whether the order amount was just missing. Cross-referencing it across another data field, it appeared that about 2 percent of the orders may have actually been set at zero. Those that became non-zero amounts in the year that payments were analyzed (which appeared to be the situation for 39 orders) were left in the analysis of wage and payment patterns but were excluded from the analyses relating to monthly order amounts.

Application of the above criteria limited the analysis to 6,396 orders. Among those, 2,413 were IV-D orders, and 3,983 were non-IV-D orders. Exhibit 9 shows the breakdown of these orders by action. It also shows that most IV-D orders (64%) were non-divorce, new establishments, and few (5%) were divorce actions. Non-divorce, new establishments are more likely to encompass never-married parents. In contrast, more (42%) of non-IV-D orders were divorce actions, and a smaller share (20%) were non-divorce, new establishments. A national report on the characteristics of IV-D and non-IV-D recipients also finds a lower proportion of divorcing or divorced parents in the IV-D caseload than the non-IV-D caseload and a higher percentage of never-married parents in the IV-D caseload than the percentage in

the non-IV-D caseload.[23] Exhibit 9 also shows that about a third of the analyzed ATLAS orders (31% of ATLAS IV-D orders and 37% of ATLAS non-IV-D orders) were modifications.

Exhibit 9: Number of Analyzed ATLAS Orders by IV-D Status and Court Action Type

	All Orders (N=6,396)		IV-D Orders (N=2,413)		Non-IV-D Orders N=3,983)	
	Count	Percentage of Total	Count	Percentage of Total	Count	Percentage of Total
Total						
Divorce Actions	1,804	28%	119	5%	1,685	42%
Non-Divorce, New Establishment	2,360	37%	1,545	64%	815	20%
Modifications	2,232	35%	749	31%	1,483	37%

Analyses of Core Requirements

This subsection considers data fields that federal regulation requires to be analyzed: deviations, income imputation, defaults, use of the low-income adjustment, and payments.

Guidelines Deviations

As noted earlier, guidelines deviation data is only available from the court files; although there is a data field on ATLAS to record guidelines deviations, it is rarely populated.[24] Based on the analysis of the 2018 case file data, the guidelines deviation rate is 27 percent. As shown in Exhibit 10, this differs little from the deviation rate from the last guidelines review, which was 26 percent. When calculating the guidelines deviation rates from both the 2018 and 2013 samples, they were adjusted for small round-offs; that is, if the order amount was rounded to the nearest $10 increment, it was not considered a deviation (*e.g.*, if the worksheet amount was $427 and the court order amount was rounded down to $420, this would not be considered a deviation).

Deviation rates varied among subgroups. Two of the most notable variations were by the obligated parent's number of parenting days and income. Exhibit 11 shows that the guidelines deviation rate was higher among orders when the obligated parent's number of parenting days was in the range of 173 to 182.5 days per year. The deviation rate among these orders was 40 percent. Several of these orders were deviated to zero. In contrast, the deviation rate was 23 percent among those with no adjustment for parenting days and 15 percent for orders in which the number of parenting days was 4 to 20 days per year.

[23] Sorensen, E., Pashi, A., Morales, M. 2018. *Characteristics of Families Served by the Child Support (IV-D) Program: 2016 Census Survey Results.* Office of Child Support Enforcement. https://www.hhs.gov/guidance/sites/default/files/hhs-guidance-documents//iv_d_characteristics_2016_census_results.pdf.

[24] As previously discussed in detail, this is a problem common to many states.

Exhibit 10: Guidelines Deviation Rate over Time

Exhibit 11: Deviation Rate by Parenting Time Adjustment (n=712)

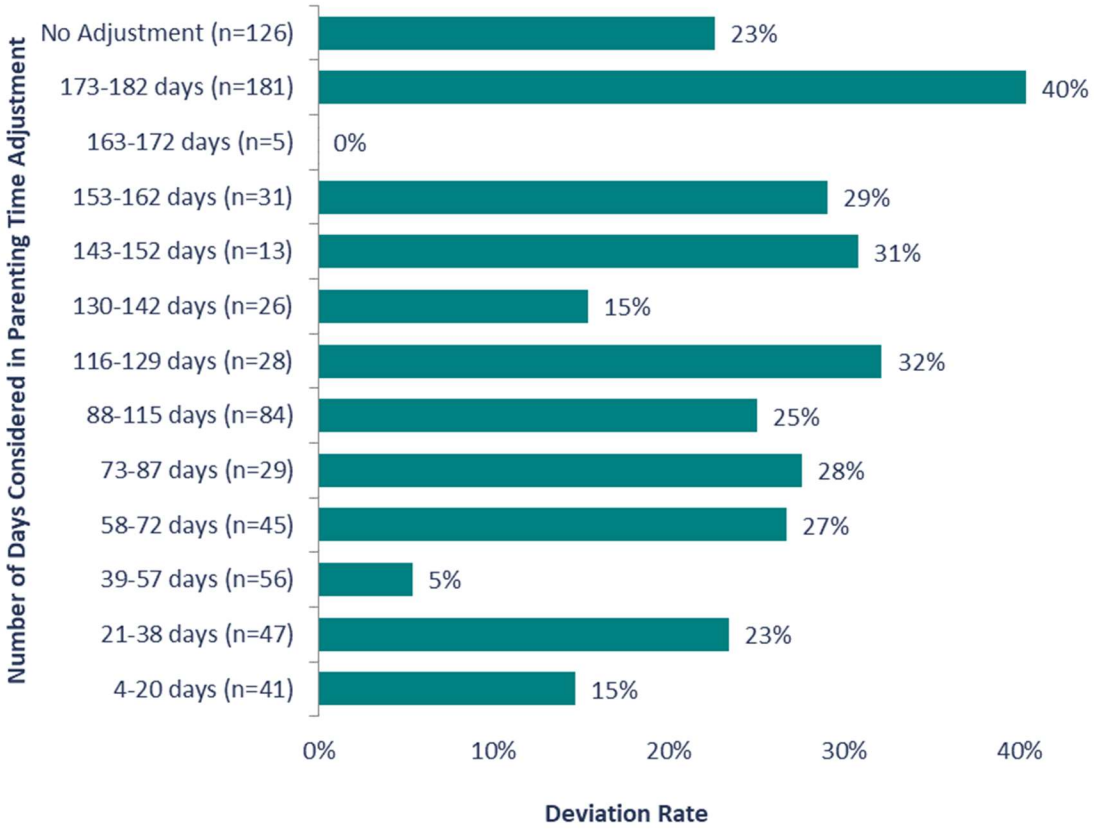
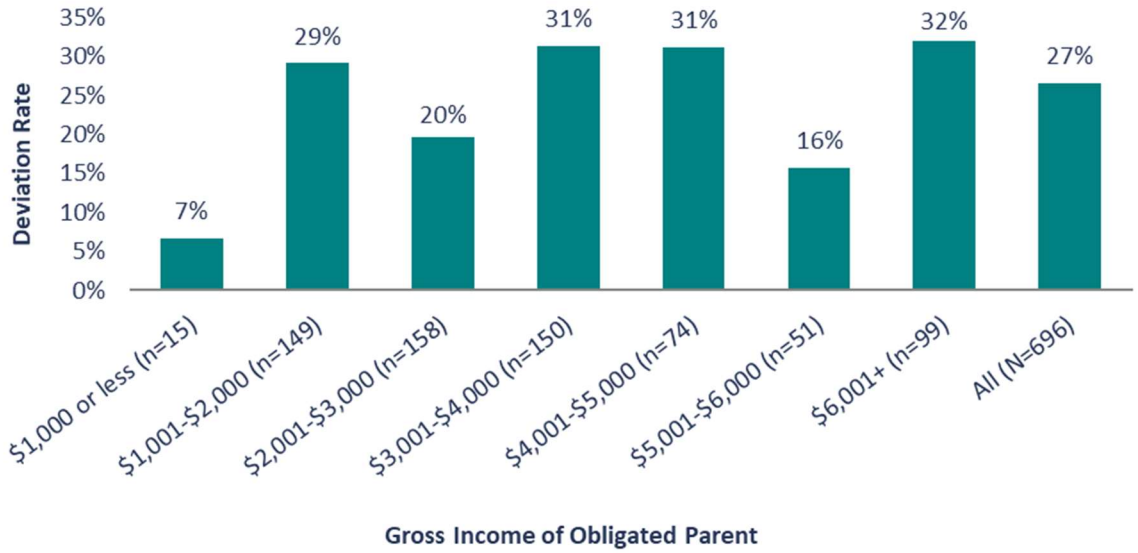


Exhibit 12 shows that deviation rates were also higher for high-income cases. For example, the guidelines deviation rate for orders where the obligated parent's income was over $6,000 gross per month was 32 percent. In contrast, the deviation rate was 7 percent among those where the obligated parent's income was $1,000 gross per month or less.

Exhibit 12: Deviation Rate by Gross Income of Obligated Parent
(n= 696, income information was missing for 16 obligated parents)



Direction and Amount of Deviations

Exhibit 13 compares the direction of deviations and the average amounts of the deviations over time. For the 2018 sample, the average guidelines-calculated amount before a downward deviation was $368 per month, and the average order after deviation was $115. On average, the final order amount was 39 percent less than the guidelines-calculated amount among downward deviations. Two-thirds (66%) of downward deviations were deviated to an order amount of zero. In all, 13 percent of the total sample was deviated downward to a zero order. Those with deviations downward to zero were disproportionately cases where essentially equal custody where the mother would have been the obligated parent under strict adherence to the guidelines calculation. The mother would have been the obligated parent in almost half (44%) of these downward deviations to zero. Over half (53%) of the downward deviations to zero were essentially equal parenting-time cases. The average guidelines-calculated amount before an upward deviation was $535 per month and the average amount after deviation was $839, which was an average increase of 65 percent.

Exhibit 13: Deviation Rate, Direction, and Percent Amount of Deviation by Sampling Year

	2018 (n=712)	2013 (n=684)	2007 (n=568)	2002 (n=427)	1999 (n=267)
Percent of orders with deviation	27%	26%	26%	22%	15%
Direction of Deviation (% of deviated orders)					
Upward	25%	28%	30%	49%	58%
Downward	75%	72%	70%	51%	42%
Average Amount of Deviation (% of Guidelines-calculated amount)					
Upward	65%	13%	42%	74%	22%
Downward	-39%	-67%	-67%	-48%	-24%

Income Imputation and Defaults

The data do not specifically note income imputation and whether the order was entered through default, but proxies are used to measure them. The proxy for income imputation is income equivalent to full-time, minimum-wage earnings. This may understate the rate of income imputation if another income amount is used. It may overstate income imputation if the parent actually earns full-time, minimum-wage earnings. There is less concern about the former than the latter because analysis of labor market data suggests that many occupations requiring little skills or experience (*e.g.*, food preparation workers) pay slightly more than minimum wage.

Courts must essentially presume, at a minimum, income at full-time, minimum-wage earnings if other income evidence is not provided.[25] In Arizona and throughout the nation, full-time, minimum wage is often imputed to a parent with little or inconsistent work history, few skills, and no evidence of a disability that precludes employment. Analysis of the court file data found that 15 percent of obligated parents and 22 percent of parents due support had incomes equivalent to full-time minimum wage earnings.[26] Both parents had incomes equivalent to full-time, minimum-wage earnings in 6 percent of the analyzed orders obtained from court files. In other words, the policy of income imputation is not limited to obligated parents: income may be imputed to parents receiving support also. However, the incidence of imputing to both parents is not the overwhelming situation (*i.e.*, it is imputed to both parents in 27% of the cases where it is imputed to the obligated parent). This is

Based on the court file data, income was likely imputed at minimum wage to:

- 15 percent of the obligated parents
- 22 percent of the parents due support.

[25] Arizona Revised Statutes § 25-320 (N). The presumption is actually, "… that a parent is capable at least at the applicable state or federal adult minimum wage, whichever is higher." It also provides an exception for noncustodial parents under 18 years of age and who are attending high school. To be clear, the presumption can be rebutted by "contrary evidence."

[26] Both 2018 and 2019 minimum wage were considered in this calculation. This is to accommodate counties that could not select the order based on its effective date rather they used the data that the complaint for child support was filed. A complaint could have been filed in 2018 and the order effective date was not till 2019.

important because it suggests that the circumstances of parties in cases with income imputation do not always mirror each other.

The comparable percentages from the 2013 court case sample were 13 percent for each party. In other words, the income imputation rate (at minimum wage) among obligated parents has had a small increase (*i.e.*, from 13% to 15%), while the income imputation rate (at minimum wage) among receiving parties has increased significantly (*i.e.*, from 13% to 22%). The reasons behind these changes are not known.

Default Orders

Income imputation can be used as a proxy for an order entered by default. A national study found that income was imputed to 37 percent of the obligated parents in low-income cases because the parent was unemployed or underemployed.[27] The same study found that 46 percent of those with income imputation also had orders entered by default. One possible explanation for their high correlation is that the same parents who do not supply income information for the purposes of calculating the guidelines amount are not likely to show up for their child support hearing. Still, other evidence of income could be used, such as quarterly wage data, documentation of the parent's incarceration, or the other parent's verbal testimony, including testimony of occupation (*e.g.*, the other parent identifies the occupation of the parent who did not supply income information as a roofer and state labor market information on the median income of roofers is used as that parent's imputed income). However, an order entered by default does not always mean non-cooperation. It could also mean the parent agreed with whatever the default order would be.

Whether Arizona's income imputation rate is a good proxy of Arizona's default rate is unknown. Other proxies may be whether a timesharing adjustment was made or the obligated parent attended the parenting education program.[28] If the order is set by default, it may be likely that no parenting plan was established and the obligated parent had no parenting days and did not attend parenting education. Over one-third (36%) of the 15 percent of obligated parents whose income was equivalent to full-time minimum wage earnings had no parenting days, 78 percent of them did not attend parenting education, and 29 percent had neither. Without more information, it is unknown whether these are good proxies. Instead of no parenting days, the order may be entered using the parenting days reported by the receiving party even though the order was entered by default. Since the parenting education program targets divorcing and separating parents and unmarried parent with custody access disputes, an obligated parent may not attend for the sole reason that he or she was never married to the other parent and there is no custody access dispute, rather than because the order was entered through default. Still, the high percentage (78%) of obligated parents with minimum-wage income who did not

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[27] U.S. Department of Health and Human Services Office of Inspector General. (July 2000.) *The Establishment of Child Support Orders for Low income Non-custodial Parents.* p. 16. Retrieved from The Establishment of Child Support Orders for Low Income Non-Custodial Parents (OEI- 05-99-00390; 7/00) (hhs.gov).

[28] Attendance is required among divorcing parents or never-married parents with custody disputes. For more information see the Arizona Judicial Branch (n.d.) *Parent Education.* Retrieved from https://www.azcourts.gov/familylaw/parent-education.

attend parenting education suggests a level of non-involvement of these obligated parents in the child support order establishment process.

Using ATLAS Data to Inform Income Imputation and Default Rates

ATLAS does not record default, imputed income, or the incomes used for the guidelines calculation, but it does contain quarterly wage data and other information that can be used to estimate the percentage of obligated parents with imputed income and the percentage of default orders. In general, parties must supply documentation of their income when an order is being established or modified. In IV-D cases, if a child support action has been filed against a parent and that parent does not supply his or her income information, quarterly wage data may be used as the income amount for the guidelines calculation or to locate the parent's employer to obtain income information directly from the employer that is, in turn, used in the guidelines calculation. Quarterly wage data is not collected for non-IV-D cases.

Quarterly wage data was not available for 62 percent of the IV-D obligated parents in the year that the order was established or modified. This is an indirect indicator that the obligated parent would have had to supply his or her income information, the child support agency would have had to obtain it from another source, or it would have been imputed to these obligated parents. Income also may have been imputed to those with quarterly wage data if the obligated parent recently voluntarily quit his or her job. Generally, if quarterly wage data is available, an employer is identified, and the child support agency can obtain that parent's income information directly from the employer. If income information could not be obtained from another source for the 62 percent of IV-D obligated parents without quarterly wage data, it is likely to be imputed at the statutory minimum, which is full-time, minimum-wage earnings. Income may have also been imputed to IV-D obligated parents with quarterly wage data whose approximate monthly income according to the quarterly wage data was less than full-time minimum wage earnings.[29] This constituted 14 percent of all IV-D cases.[30]

Using the guidelines amount for the number of children for whom the obligated parent owes support and imputing minimum-wage earning to the obligated parent should be a way to estimate how many of the 76 percent of IV-D obligated parents with no quarterly wage data or quarterly wage income less than full-time, minimum-wage earnings had income imputed to them. However, this approximation only works if assumptions about the number of parenting days and the income of the receiving party, which are key to the Arizona guidelines calculation, are correct. Assuming the obligated parent has no parenting days and the receiving party's income is also equivalent to full-time, minimum-wage earnings, the order amount would be $354 for one child and $364 for two or more children assuming application of the self-support reserve.

Application of the proxy suggests a low rate of income imputation: it is lower than the rate from the analysis of court files. The proxy found 8 percent of all IV-D orders were at the minimum-wage

[29] Monthly income is estimated by totaling the income from available quarters and then divided it by the number of quarters with available data multiplied by three months.

[30] This is based on the 2018 Arizona minimum wage since all of the quarters are in calendar year 2018.

amounts, while the court data found 14 percent of obligated parents had income imputed at minimum wage. The proxy also found that 10 percent of IV-D orders where there was no quarterly wage data or the quarterly wage data indicated less than minimum wage earnings had orders equivalent to the guidelines-determined amounts for minimum-wage earners. The fact that there is only small gap in the percentages with order amounts based on minimum wage earnings between all IV-D orders and IV-D orders limited to those where the obligated parent's quarterly wage data was not available or less than minimum-wage earnings, suggests the proxy is not a good indicator of income imputation.

In summary, the income imputation rates appear slightly lower using ATLAS data than court case file data. Further, based on the findings from the national data and the court case file data, it is estimated that the default rate is lower than the rate of income imputation to the obligated parent. In all, the Arizona income and default rates appear lower than or near those of many other states.[31]

Analysis of Application of the Self-Support Reserve

The guidelines provide that the court perform a self-support reserve (SSR) test in each case to assess whether the obligated parent's remaining income after consideration of the guidelines amount is above the SSR, which is set at 80 percent of the state minimum wage. Adjustments resulting from the SSR test could be determined clearly from the 2018 court case sample. SSR application was inferred from the ATLAS data.

Based on the court file data, 8 percent of orders were adjusted for the self-support reserve.

The adjustment was applied to 8 percent of the obligated parents in the 2018 court case sample. Based on the comparison of the guidelines worksheet and child support order, it was applied in most situations where the obligated parent was eligible. In contrast, the SSR was applied to 4 percent of the 2013 court case sample. The self-support reserve was changed in 2018 to relate to the state minimum wage rather than the federal poverty guidelines for one person. This increased the amount of the SSR. In turn, this would make more obligated parents eligible. This may explain the increased application.

Income Less than the SSR

Unlike many states, the Arizona guidelines do not provide a minimum order for incomes below the SSR *(e.g.*, Colorado provides a minimum order of $10 per month and many states provide a minimum order of $50 per month). Few orders (3%) in the 2018 court case sample involved an obligated parent whose income was below the SSR. The low rate undoubtedly reflects that unless other evidence was presented such as a disability that impeded work, income would often be imputed at minimum-wage income in

[31] For example, New Mexico's estimated income imputation rate based on its automated system data for IV-D obligated parents is 13 percent, but New Mexico believes this is underestimated. In contrast, Arizona's comparable rate would be 8 percent. See New Mexico Human Services Department. (December 2018.) *State of New Mexico 2018 Child Support Guidelines Review Commission: Final Report.* P. 8. Retrieved from https://www.hsd.state.nm.us/wp-content/uploads/FileLinks/22ddd455f2de49089689e333736004e7/2018_Child_Support_Guidelines_Review_Commission_Report_1.pdf.

this situation. Among obligated parents whose income used for the guidelines calculation was less than the SSR, the average income was $668 per month and the median was $806 per month. The average order amount for these cases was $45 per month and the median order amount was zero. Few (21%) had guidelines deviations.

Using ATLAS Data to Inform Adjustments Due to the Results of the Self-Support Reserve Test

ATLAS does not have a data field that explicitly notes whether the order was adjusted for the self-support reserve (SSR). Instead, an approximation is used. Since Arizona sets its SSR at 80 percent of full-time earnings at minimum wage and the Arizona minimum wage was $10.50 per hour in the sample year (2018), this would mean a SSR of $1,456 per month. In turn, the order should never be more than $364 for those with minimum-wage income or less if the SSR adjustment is applied. In all, 60 percent of all ATLAS orders were $364 or less per month (58% among IV-D orders and 61% among non-IV-D orders). When this is limited to IV-D cases where the obligated parent had no quarterly wage income or quarterly wage income less than full-time, minimum-wage earnings, 56 percent had orders of $364 or less. For these orders, the SSR may have been applied, or consideration of other circumstances of the case resulted in the order being $364 or less (*e.g.*, essentially equal timesharing or the obligated parent paid a large health insurance order.). For those with orders greater than $364 per month and who had no quarterly wage data or quarterly wage data less than minimum wage earnings, their actual income may have been more than the quarterly wage data because they were self-employed or worked for an employer who did not have to report quarterly wages. In summary, it does not appear that quarterly wage data is that useful toward identifying the frequency that orders are adjusted for the SSR test.

Analysis of Payment Patterns

All of the payment analysis comes from ATLAS data. Payment data is analyzed by the ATLAS proxies for income imputation/default and the proxy for application of the self-support reserve. In addition, payments are analyzed by the availability and amount of quarterly wage data, IV-D status, the court action in which child support was an issue (*i.e.* whether there was a divorce action with children, an order establishment without a divorce, or an order modification), incarceration, income from Social Security Administration (SSA) benefits or Veteran's benefits, and by wage assignment.

Prior to analysis of payments for these subgroups, payment patterns Exhibit 14: Characteristics of Payments in Calendar Year 2019 by IV-D and Non-IV-D for IV-D orders and non-IV-D orders are compared in Exhibit 14. It shows that most (81%) of orders had payments, with the percentage being slightly less for non-IV-D orders. However, among those with payments, the average amount paid, the percentage due that was paid, and average number of months with payment are more among non-IV-D orders than IV-D orders.

Exhibit 14: Characteristics of Payments in Calendar Year 2019 by IV-D and Non-IV-D Status

	All ATLAS Cases (N=6,396)	All IV-D Orders (N=2,413)	All Non-IV-D Orders (N=3,983)
Payment (% of orders)			
Made Payments	81%	85%	79%
Made No Payments	19%	15%	21%
Of Those Who Made Payments	**(N=5,204)**	**(N=2,046)**	**(N=3,158)**
Total Paid in Year			
Average	$6,924	$5,006	$8,167
Median	$4,833	$4,057	$5,292
Percentage Due that Was Paid			
Average	78%	75%	79%
Median	97%	96%	97%
Months with Payment			
Average	9.7	8.8	10.3
Median	12.0	11.0	12.0

Payment by Availability of and Amount of Quarterly Wage Data among IV-D Obligated Parents

Since the proxies for income imputation, defaults, and application of the self-support reserve (SSR) hinge on the quarterly wage data, Exhibit 15 compares payment patterns by whether quarterly wage data was available, and when available, the amount of income. Exhibit 15 is limited to IV-D orders since quarterly wage data is only available for IV-D orders. Exhibit 15 shows that payment patterns are generally better when quarterly wage data is available and the more income that that an obligated parent has.

Exhibit 15: Payment Patterns for IV-D Orders by Availability and Amount of 2018 Quarterly Wage Data

	Obligated Parent's Income Based on Quarterly Wage Data[32]				
	All IV-D Orders (N=2,413)	No Wage Data Available (N=1,485)	Less than $1,820 per month (2018 Minimum Wage) (N=339)	$1,820-$2,600 per month (N=127)	More than $2,600 per month (N=462)
Payment					
Made Payments	85%	80%	88%	96%	96%
Made No Payments	15%	20%	12%	4%	4%
Of Those Who Made Payments	**(N=2,046)**	**(N=1,183)**	**(N=299)**	**(N=122)**	**(N=442)**
Total Paid					
Average	$5,006	$4,532	$4,523	$4,916	$6,625
Median	$4,057	$3,563	$3,717	$4,159	$5,753
Percent Due Paid					
Average	75%	68%	77%	88%	89%
Median	96%	84%	94%	100%	100%
Months with Payment					
Average	8.81	7.9	8.8	10.2	10.8
Median	11.0	9.0	10.0	12.0	12.0

[32] Quarterly wage income is converted to monthly amounts by totally the quarterly wage income over the calendar year of 2018 and divided it by the number of quarters available multiplied by three months.

Exhibit 16 compares payment patterns of orders where it appears that the obligated parent had income imputed at minimum wage to payment patterns for all IV-D orders, those with quarterly wage data, and those with quarterly wage data less than full-time, minimum wage earnings. As discussed earlier, these two subgroups would reasonably be candidates for possible income imputation at minimum wage. The payment patterns for those appearing to be set using minimum wage income are generally worse than the payment patterns for all IV-D orders or the subgroups. This indirectly corroborates other research that payment patterns are worse when income is imputed.

Exhibit 16: Payment Patterns of IV-D Orders that Appear to Be Set Using Minimum-Wage Income

	All IV-D Orders (N=2,413)	No Wage Data Available (N=1,485)	Less than $1,820 per month (2018 Minimum Wage) (N=339)	IV-D Orders that Appear to Be Set Using Minimum Wage Income (N=182)
Payment Made Payments				
Made No Payments	85%	80%	88%	69%
Made Payments	15%	20%	12%	31%
Of Those Who Made Payments	**(N=2,046)**	**(N=1,183)**	**(N=299)**	**(N=125)**
Total Paid				
Average	$5,006	$4,532	$4,523	$2,727
Median	$4,057	$3,563	$3,717	$2,535
Percent Due Paid				
Average	75%	68%	77%	57%
Median	96%	84%	94%	61%
Months with Payment				
Average	8.81	7.9	8.8	6.5
Median	11.0	9.0	10.0	6.0

Analysis of Payment by Other Characteristics

This subsection analyzes payments by several other characteristics.

Payments of Court Action. Exhibit 17 compares payment patterns by initiated court action. It shows that the payment patterns are generally better among modification actions than new establishments. This is consistent with findings from many other studies. The explanation essentially rests in self-selection bias: parties of paying orders are more likely to seek a modification than parties of non-paying orders. If there are no payment to begin with, there is no reason to seek a modification. Exhibit 17 also shows that with the exception of the percentage making payments, payment patterns are better in divorce cases than non-divorce cases.

Exhibit 17: Payment Patterns by Initiated Court Action

	All ATLAS Cases (N=6,396)	All Divorce Actions (N=1,804)	All Non-Divorce, New Establishment (N=1,843)	Modifications (N=2,020)
Payment (% of orders)				
Made Payments	81%	74%	78%	91%
Made No Payments	19%	26%	22%	95
Of Those Who Made Payments	**(N=5,204)**	**(N=1,341)**	**(N=1,843)**	**(N=2,020)**
Total Paid				
Average	$6,924	$9,163	$4,860	$7,321
Median	$4,833	$5,596	$3,840	$5,286
Percent Due Paid				
Average	78%	84%	75%	75%
Median	97%	99%	95%	94%
Months with Payment				
Average	9.7	10.2	8.9	10.0
Median	12.0	12.0	11.0	12.0

Payments of Incarcerated Parents. A recent federal rule change limits income imputation to obligated parent, specifically, it prohibits presumption of voluntary unemployment to incarcerated parents. In turn, without presumption of employment, earnings cannot be imputed (although income could be imputed from an asset). Only a small proportion (4%) of IV-D obligated parents were known to be incarcerated. Information about incarceration was not available among non-IV-D orders. The average order amount among incarcerated parents was $408 per month. Note, however, that zero orders were not selected for analysis. There also may be incarcerated parents with zero orders. Overall payment patterns tended to be worse for incarcerated parents than for parents who were not incarcerated. Just over a third (36%) of incarcerated parents made payments, while the comparative percentage for all IV-D obligated parents was 85 percent. When paid, the average total amount paid over the 12-month period examined was $1,206 and the median amount paid was $411, and the average percentage of due that was paid was 36 percent and the median was 18 percent.

Payments of Parents Receiving Veterans or Social Security Benefits. ATLAS records whether an IV-D obligated parent receives benefits managed by the Social Security Administration (SSA) or Veterans Administration. Similar information is not recorded for obligated parents without IV-D orders. SSA benefits include Supplemental Security Income (SSI, which is a means-tested disability benefit), Social Security Disability Insurance (SSDI, which is a disability benefit based on earnings), and Old-Age, Survivors, and Disability Insurance. About 3 percent of obligated parents with IV-D cases receive a Social Security Administration (SSA) benefit or are pending an SSA benefit, about 2 percent receive a Veterans benefit or are pending a Veterans Administration benefit, and another 1 percent receive both a Veterans Administration benefits and receive or have a pending SSA benefit. For those receiving a SSA benefit, 85 percent made payments. Among those who were paying, the average percent of due that was paid was 75 percent and the median was 94 percent. The vast majority (96%) of those receiving VA benefits made payments. Among those with payments, the average total amount paid over a 12-month period was $6,845 and the median was $5,904, and the average percentage of support due that was paid was 83 percent and the median was 100 percent.

Payment by Income Withholding. National data shows that over 70 percent of child support is collected through wage withholding. Since information about the percentage of support collected through wage withholding was not readily available for analyzed orders, a proxy for the percentage of orders with wage withholding was developed. It was whether the last payment was made by wage withholding. This is likely to understate the percentage with income withholding or percentage paid through withholding because it is just a snapshot from one month rather than an annual period. Just under half (46%) of all orders noted this proxy code for wage withholding (41% for IV-D orders and 49% for non-IV-D orders). Those with wage withholding had better payment patterns than those without wage withholding. The average and median number of months with payments for those with wage withholding were 11.2 and 12.0 respectively, compared to 7.7 and 9.0 for those without wage withholding. Similarly, the average and median percentages of support due that was paid was also higher for those with wage withholding (87% and 100%, respectively, compared to 65% and 75% for those without withholding).

Payment on Other Judgments. In addition to being obligated to pay child support, some parents may have other judgments for past-due support, medical support, or another expense. Judgments are only known in IV-D cases. More than half (56%) of obligated parents with IV-D orders have judgments for past-due support. Among those, 96 percent made some payment toward their judgment in 2019. The mean and median judgment amounts were $5,437 and $2,925. The average and median amounts paid, however, were just $62 and $38, respectively. In general, those with judgments do not have payment patterns that differ much from those without judgment: that is, they pay about the same percentage of current support due and the same number of months on average.

Comparison of Findings of Data Available from Both Court Files and ATLASExhibit **18** compares the findings from the analysis of data that were both in court files and ATLAS. One purpose of the comparison is to determine whether common fields from the court files and ATLAS yield similar statistics or differ.

Exhibit 18: Comparison of Findings from Common Data Elements

	Court Files (n=712)	ATLAS Data (N=6,396)	
		IV-D Orders (N=2,413)	Non-IV-D Orders (N= 3,983)
Monthly Child Support Order			
Average	$398	$452	$547
Median	$350	$380	$439
Number of Children on Order			
Average	1.6	1.5	1.7
Median	1.0	1.0	2.0
Age of Oldest			
Average	9.2	8.9	11.7
Median	9.0	8.0	12.0
Age of Youngest			
Average	7.5	7.5	9.3
Median	7.0	6.0	9.0
Percentage of Orders with Child at Least 12 Years Old	24%	23%	33%

• Youngest at least 12 years old • Oldest at least 12 years old	37%	33%	51%
Spousal Support Ordered			
No	97%	98%	88%
Yes	3%	2%	12%
Average amount when ordered	$1,518	$719	$1,530
Median amount when ordered	$800	$500	$1,000
Obligated parent has other children (% of orders)[33]			
No	95%	88%	97%
Yes	5%	12%	3%
Receiving parent has other children (% of orders) [34]			
No	92%	86%	96%
Yes	8%	15%	4%
Monthly Gross Income of Obligated Parent from Worksheet/Quarterly Wage Data[35]			
Average	$5,128	$3,058	
Median	$3,131	$2,589	N/A
Monthly Gross Income of Receiving Party from Worksheet/Quarterly Wage Data[36]			
Average	$3,306	$2,259	
Median	$2,543	$1,936	N/A
Parent Providing Child's Health Insurance (when specified)			
Obligated parent	42%	17%	
Receiving parent	26%	73%	
Both parents	32%	10%	N/A
Provision of Unreimbursed Medical Expenses			
Has provision	81%	93%	
No provision	19%	7%	N/A
Parent Providing Unreimbursed Medical (when specified)			
Obligated parent	42%	44%	
Receiving party	26%	22%	
Both parents	32%	34%	N/A

Monthly Child Support Order and Zero Orders

The analysis of court case file data found that the average child support order was $398 per month and the median was $350 per month; when analyzing for non-zero orders only, the average was $527 per month and the median was $428 per month. The average and median amounts from the ATLAS data were higher, but the ATLAS data extract criteria generally excluded zero orders.[37]

[33] For the court files, this is noted by any sort of income deduction for other children. For ATLAS data, this is noted by whether the party had another ATLAS case.

[34] *Supra,* n. 21.

[35] For the court files, this is the gross income of the party as determined from the worksheet. For the ATLAS data, this is the estimated monthly income of those with quarterly wage data where the total quarterly wage data from 2018 is divided by the number of quarters available multiplied by three months. Income was not available for all parties within the ATLAS data. It was available for 928 obligated parents and 947of the receiving parties.

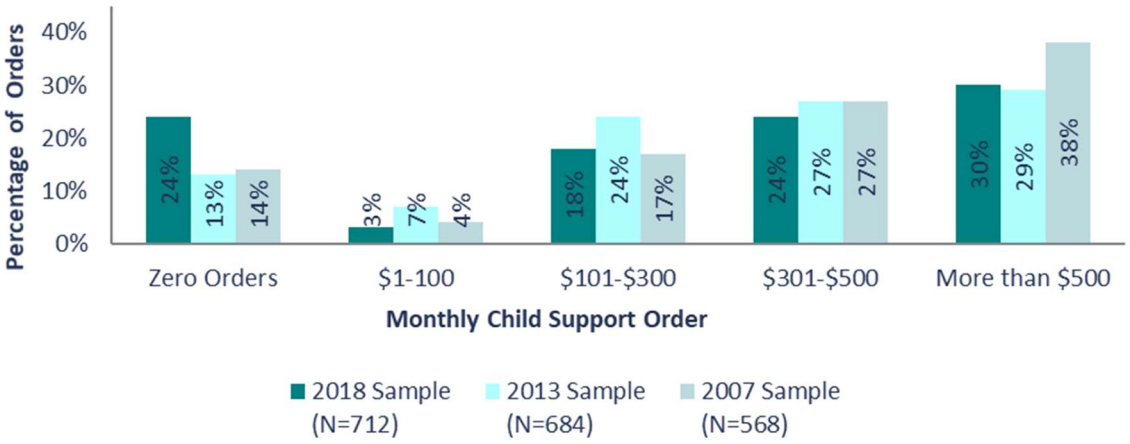
[36] *Supra,* n. 23.

[37] This was not discovered until the analysis. It appeared to be imposed so the payment data would only focus on orders with current support due.

Changes in Monthly Order Amount over Time Based on Court Case Sample

As shown in Exhibit 19, almost a quarter (24%) of the orders from the 2018 court files were zero, which was a significant increase from the percentage of court files from the 2013 sample set at zero, which was 13 percent. About half (43%) of the zero orders from the 2018 court files were essentially equal parenting time.

Exhibit 19: Changes in Distribution of Amount of Child Support Ordered over Time
(Source: Court Case Samples)



Despite the increase in the percentage of zero orders from the last case file review, the average amount of child support ordered as determined from the court case file data was more than the average from the previous court case file samples. The average amounts from the previous court case file samples were $412 per month from the 2013 sample, $460 per month from the 2007 sample, and $455 per month from the 2002 sample.

As shown in Exhibit 19, there were small changes in the frequency of order amounts above $500 (*i.e.*, 30% of the 2018 court sample were set at more than $500 and 29% of the 2013 court sample were set at more than $500 per month.) In contrast, 38 percent of the child support orders from the 2007 court sample were above $500 per month. As suggested in the previous review, though, in 2013, the economy was still experiencing some repercussions and lingering wage losses from the 2007–2009 economic recession that not begin until the last month of 2007.

Number and Ages of Children

According to the case file data, about a half (54%) of orders covered only one child, about a third (32%) covered two children, 10 percent covered three children, and only 4 percent of orders cover four or more children. The average number of children on an order was 1.6. The number of children, as analyzed from ATLAS data, were generally the same and did not vary by IV-D status. The average ages of the youngest and oldest children in the 2018 court case sample were 7.5 and 9.2 years, respectively. The average ages among IV-D orders from the ATLAS extract were very similar and slightly older among non-IV-D orders from the ATLAS extract.

Adjustment for Age of the Child

The age of the child is important to the guidelines calculation because the Arizona guidelines provides that the court may increase child support for a child who has reached the age of 12 years by an amount up to 10 percent of the child support schedule. Based on the ATLAS data, 23 percent of the youngest child in IV-D cases were at least 12 years old, and 33 percent of the youngest child in non-IV-D cases were at least 12 years old. The comparable percentage based on the 2018 court file sample was 24 AND 37 percent, respectively. Whether the adjustment is applied can be determined from the court case sample, but not the ATLAS extract. In all, a third (33%) of all orders from the 2018 court case sample were adjusted for expenses for older children. It was applied in 36 percent of the orders in the 2013 court case sample in which the youngest child was at least 12 years old.

Changes in the Number and Ages of Child over Time

Trend analysis is possible using the analyses of court case files over time. The average ages of children from the 2018 court case sample were slightly younger (7.1 and 9.0 years old, respectively, for the youngest and oldest child) than those from the 2013 court case sample (age 10.6 for the youngest child and age 11.7 for the oldest child). There is some economic evidence that the probability of divorce is affected by changes in household income, and economic downturns can escalate or slow the process. Other children can reflect a slowing of the process.

Spousal Support

According to ATLAS data, spousal support was also ordered among 8 percent of the child support orders (2% among IV-D orders and 12% among non-IV-D orders). The average amount of spousal support was $719 per month among IV-D cases with spousal support orders and $1,512 per month among non-IV-D cases with spousal support. By comparison, just 3 percent of the sampled court files had an adjustment to a parent's income for spousal support maintenance paid, and the average adjustment for spousal maintenance was $1,518 per month.

Relationship of Obligated Parent to Child

Exhibit 18 shows the child's relationship to a party was only available for IV-D orders from ATLAS. Among IV-D orders, the relationship to the obligated parent and party due support was missing or unknown in less than 1 percent of orders. According to ATLAS, the child's relationship to the obligated parent was son or daughter in all cases where the relationship was known. The relationship to the parent due support was also son or daughter in the vast majority (98%) of cases. The relationships among other receiving parties consisted of grandparents (1%), other relatives (1%), and unrelated parties or stepchildren (less than 1%).

Additional Dependents

Many parents have children with more than one partner. Most state guidelines provide an income deduction for additional children. Arizona guidelines provide for several types of income deductions for other children depending on whether there is an order for the child.

Sometimes, an additional child results in another child support case. Data from the ATLAS system noted if the obligated parent or receiving party had other child support cases, though it did not specify whether they were the obligated parent or the receiving party for these other ATLAS cases. The percentages with other ATLAS cases are 12 percent of IV-D obligated parents, 3 percent of non-IV-D obligated parents, 15 percent of IV-D receiving parties, and 4 percent of non-IV-D receiving parties. The majority (91% for receiving parties and 89% for obligated parents) of parents with additional orders were for only one other order. The 2018 court case file data indicated that 5 percent of obligated parents and 8 percent of parties due support had additional children using income deductions noted on the worksheet.

Addressing the Child's Health Insurance

ATLAS notes whether there was an order to provide health insurance, including temporary orders, and which parent was ordered to provide health insurance even if it was not currently available to the party. The information pulled from the court file sample only noted if there is an adjustment for the cost of the child's health insurance. Although the provision for health insurance is noted in the order, it was not pulled.

There was a provision specifying which party was to provide the child's medical insurance in 88 percent of the ATLAS IV-D orders. Of those, the obligated parent was primarily responsible for the child's insurance in 17 percent of orders; the receiving party was responsible in 73 percent of orders, and both were responsible in 10 percent of orders. The data collected from the court files only noted whether there was an adjustment in the worksheet for the cost of insurance. Among the 2018 court case sample with adjustments for the cost of the child's insurance (55%), the obligated parent was responsible for paying insurance in 44 percent of cases, while the receiving parent was responsible in 54 percent of cases. In a few cases (2%) both parents were responsible for insurance. The average and median adjustment for insurance were $197 and $166 per month, respectively.

Orders for Uninsured Medical Expenses

Among IV-D ATLAS orders, courts allocated responsibility for the child's uninsured medical costs in 81 percent of orders. The obligated parent was primarily responsible for the cost of the child's uninsured medical expenses in 44 percent of orders, with the party due support was responsible in 22 percent of orders and split equally in the remaining 34 percent. By comparison to the court file sample, courts allocated responsibility for uninsured medical expenses in 93 percent of orders, with the obligated parent being primarily responsible for expenses in 42 percent of those orders, the party due support in 26 percent of cases, and split equally in the remaining 32 percent.

Gross Income of the Parties

The source of income information from the court case file and ATLAS extract differs. The income information from the court case file is the amount of income used for the guidelines calculation. It may include income that was imputed to a party rather than the party's actual income. For example, income is often imputed if a party voluntarily quit his or her employment. ATLAS does not record the incomes used for the guidelines calculation. The major source of income information available from ATLAS is

quarterly wage data reported by the employer for the purposes of the State's unemployment insurance and worker's compensation programs. Employers report that information to the Arizona Department of Economic Security (DES) quarterly; in turn, DES creates a database commonly called quarterly wage data. Federal regulation authorizes child support agencies (*i.e.*, the IV-D agency) access to quarterly wage data to help establish and enforce child support orders. To this end, ATLAS contains quarterly wage data for IV-D cases only.

Quarterly wage data is not available for all workers. A small number of employers are exempted from the requirement mostly because they have their own program (*e.g.*, railroad workers). Self-employed individuals are not captured by quarterly wage reporting. Still, a significant share of employers and self-employed individuals do not comply with the reporting requirement.[38] Some do not report it to avoid taxes. This unreported income is also known as income from the underground economy or black market.

The average and median incomes of obligated parents from the 2018 court case sample was $5,128 and $3,131, respectively. As discussed earlier, quarterly wage data is not available for every ATLAS order and it is converted to a monthly amount for comparative purposes. The average and median incomes of IV-D obligated parents from the ATLAS extract was $3,058, and $2,589, respectively. The average and median incomes of receiving parties from the 2018 court case sample was $3,306 and $2,543, respectively. In contrast, the average and median incomes of IV-D receiving parties from the ATLAS extract was $2,259, and $1,936, respectively. In short, the guidelines incomes from the court case file are generally more than the incomes from quarterly wage data.

Changes in Income over Time Based on Court Case Sample

Historical data on incomes is available from the court case sample. When comparing the income data from the 2013 to 2018 court case sample, incomes have increased in general. This increase is likely an effect of the strong economy prior to the COVID-19 pandemic and an increase in the minimum wage over time. Exhibit 20 examines changes in the distribution of income of the parties over time. Generally, the only consistent trend is a decline in the percentage with gross incomes below $1,000 per month. This undoubtedly reflects increases to the state minimum wage.

Obligated Parent's Share of Parent's Combined Income

The obligated parent's share of the parents' combined income is an integral part of the guidelines calculation. The obligated parent is essentially responsible for his or her prorated share of the basic obligation and all other child-rearing expenses that may be considered in the guidelines calculation (*e.g.*, the cost of the child's medical insurance and childcare expenses). The obligated parent's prorated share of combined income was 55 percent on average in the 2018 sample.

[38] More information about the underground economy and its negative impact on families and state tax revenues is detailed in Michigan Supreme Court. (June 2010). *The Underground Economy: Report of the Underground Economic Task Force.* Retrieved from https://courts.michigan.gov/Administration/SCAO/Resources/Documents/Publications/Reports/UETF-2010.pdf.

Exhibit 20: Changes in Income Distribution Over Time (Source: Court Case Samples)

	2018 (N=712)	2013 (N=684)	2007 (N=568)
Obligated Parent's Gross Monthly Income			
$1,000 or less	2%	2%	4%
$1,001–$2,000	21%	31%	24%
$2,001–$3,000	23%	22%	24%
$3,001–$4,000	22%	15%	19%
$4,001–$5,000	11%	11%	12%
$5,001–$6,000	7%	6%	5%
$6,001 or more	14%	14%	13%
Receiving Party's Gross Monthly Income			
$1,000 or less	4%	9%	12%
$1,001–$2,000	31%	39%	36%
$2,001–$3,000	29%	24%	26%
$3,001–$4,000	15%	13%	12%
$4,001–$5,000	7%	7%	6%
$5,001–$6,000	5%	5%	4%
$6,001 or more	9%	3%	4%

Changes in the Obligated Parent's Share over Time

Exhibit 21 shows changes in the distribution of the obligated parent's prorated share over time using court case samples. It shows a slight decrease in the obligated parent's average share over time: the average share was 60 percent in 1999 and 55 percent in 2018. Yet, the only percentage range where this a significant rise from 2013 to 2018 is the 46 to 60 percent range: 36 percent of the obligated parents were in the 46 to 60 percent range in 2013, and 45 percent were in the 46 to 60 percent range in 2018. This may reflect income differences between obligated parents and receiving parties is narrowing, but slowly.

Exhibit 21: Obligated Parent's Prorated Share of Combined Income (% by Year)

	2018 (N=712)	2013 (N=684)	2007 (N=568)	2002 (N=427)	1999 (N=267)
Obligated Parent's Prorated Share of Combined Income					
0–15%	1%	<1%	1%	1%	0%
16–30%	5%	6%	6%	7%	5%
31–45%	16%	16%	17%	17%	19%
46–60%	45%	36%	29%	31%	30%
61–75%	23%	29%	30%	25%	29%
76–90%	7%	10%	13%	10%	10%
91–100%	2%	3%	5%	10%	6%
Obligated Parent's Prorated Share (average)	55%	57%	59%	59%	60%

Other Findings from the Analysis of the Court Case Sample

As stated earlier, the court case sample contains a wealth of detail about the guidelines calculation, including details on what was deducted from income, other expenses that were added to the basic obligation (schedule amount) such as the cost of the child's medical, dental and/or vision insurance, adjustments for the parenting days and the child's age, consideration of the cost of travel expenses

associating with the sharing of parenting time, the order for addressing which parent's claims the children for tax purposes, and attendance of parenting education.

Deductions from Income

The guidelines provide adjustments to income for what is actually paid for court-ordered spousal maintenance that is paid, court-ordered child support for children of other relationships, and the support of other natural or adopted children who are not the subject of the child support order that is being determined. Small percentages of parties had income adjustments: 12 percent of obligated parents and 15 percent of receiving parents had adjustments to income. These percentages mark a decline from the 2013 court case sample, in which 26 percent of obligated parents and 22 percent of receiving parents had adjustments to income.

The average income adjustment to obligated parents with an adjustment was $842 per month. The adjustments for spousal maintenance ($1,518 per month on average) were generally larger than adjustments for supporting other children, including other child support orders. When spousal maintenance was excluded, the average income adjustment to obligated parents with an adjustment was $651 per month. For receiving parents with an adjustment for spousal maintenance, the average adjustment was $764 per month. For obligated parents receiving an adjustment for supporting other children, the average adjustment was $606 per month. The average gross income of obligated parents with a downward adjustment for spousal maintenance was $10,179 per month.

Changes in Income Adjustments over Time

Exhibit 22 shows the frequency of income adjustment by adjustment type. Adjustments for spousal maintenance and court-ordered child support are generally infrequent. They occur in less than 10 percent of the cases in any sample year. The adjustment for children from other relationships (additional dependents) that are not the subject of a child support order was 5 percent among obligated parents and 8 percent among receiving parties in the 2018 court case sample.

Other Expenses Added to the Basic Obligation (Schedule Amount)

The parent's adjusted gross income is used to find basic obligation from the guidelines schedule, which reflects average child-rearing expenditures for families of comparable income and family size but does not consider the cost of the child's medical insurance or childcare expenses. Instead, the guidelines provide that the actual amount of these expenses and other extraordinary expenses, if any, for the child's education or special needs, be added to the basic obligation and prorated between the parents. In addition, the guidelines provide an adjustment for older children. The guidelines also provide that parents shall be assigned responsibility for the payment of any medical costs of the child that are not covered by insurance.

Among the 2018 court case sample, 55 percent of orders were adjusted for the cost of the child's medical, dental, and/or vision insurance, and 23 percent of the orders were adjusted for childcare expenses. As shown in Exhibit 23, the comparable percentages were slightly higher among the 2013 sample (*i.e.*, 56% for insurance adjustments and 29% for childcare adjustments). There were few cases

in the 2013 sample that had adjustments for educational expenses or the extraordinary needs of children with special needs. These adjustments were applied in 3 percent and less than 1 percent, respectively, of the 2018 sample.

Exhibit 22: Frequency that Income Adjustments Are Applied

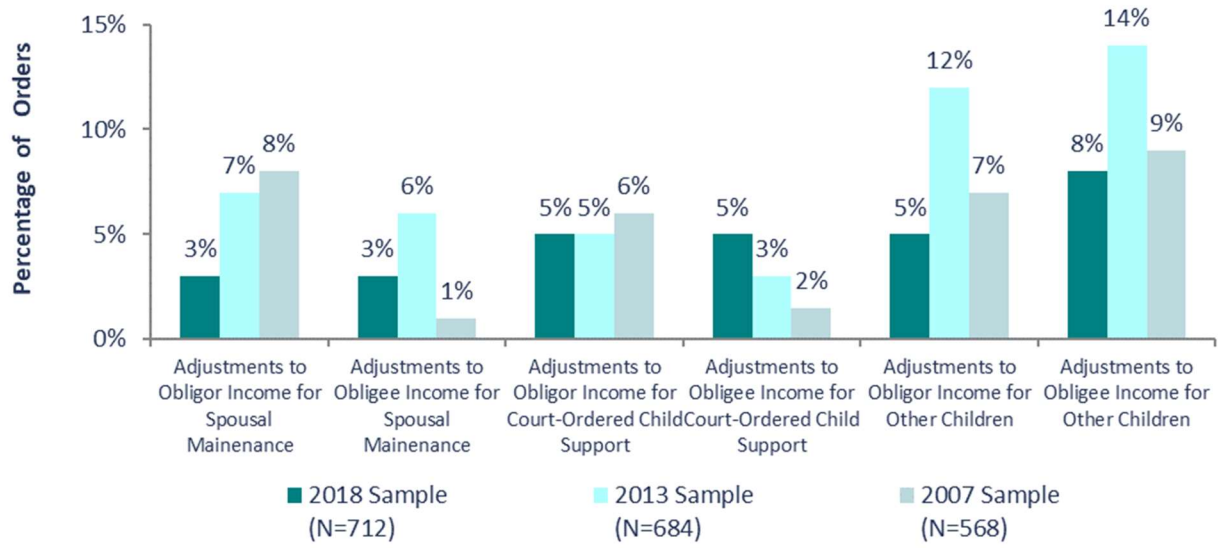
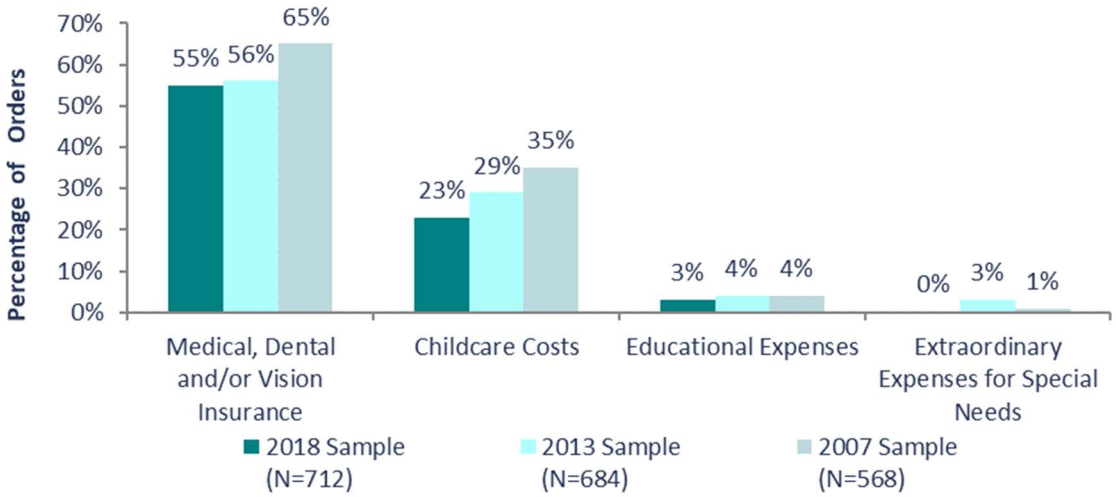


Exhibit 23: Frequency of Add-ons for Additional Expenses by Type of Expense



Child's Health Insurance

As noted earlier, among the 2018 court case sample with adjustments for the cost of the child's insurance, the obligated parent was responsible for paying insurance in 42 percent of cases, while the receiving party was responsible in 52 percent of cases. In a few cases (6%), both parents were

responsible for insurance. The average and median amounts paid for insurance were $197 and $166 per month, respectively. In contrast, the amounts from the 2013 court case sample were $149 and $124 per month.

Childcare Expenses

Under a quarter (23%) of the guidelines worksheets contained an additional expense for childcare costs. Among those with adjustments for childcare costs, the receiving party incurred expenses in the majority (70%) of cases, while adjustments were made for the obligated parent's childcare expenses in 10 percent of worksheets, and both parties incurred expenses in the remaining 20 percent of worksheets. The average and median monthly amounts for childcare were $400 and $320, respectively. In contrast, the amounts from the 2013 court case sample were $357 and $280 per month. The average adjustment of the tax credit in the 2018 court case file sample was $77 per month (the maximum adjustment for one child is $50 per month and the maximum adjustment for two or more children is $100 per month).

Education Expenses and Special Needs

Only 3 percent of worksheets in the 2018 court file sample noted an adjustment for education or special needs expenses. The receiving parent paid the expense according to 52 percent of worksheet calculations, while the obligated parent paid the expense in 31 percent of worksheets, and both parents incurred the expense in the remaining 17 percent of worksheets. Among worksheets that had adjustments for education expenses, the average and median expenses were $233 and $154 per month, respectively. In contrast, the amounts from the 2013 court case sample were $271 and $291 per month. The expense for those claiming special needs adjustments in the 2018 court case sample was $409 per month and the median was $416 per month. The amounts from the 2013 court case sample were $273 and $355 per month, respectively.

Adjustment for Older Children

As already stated, the guidelines also allow for adjustments for expenses related to children being 12 or older.[39] A third (33%) of all orders from the 2018 sample were adjusted for expenses for older children. This is lower than the percentage of 2013 orders with this adjustment (36%), which corresponds to the lower overall ages of children in the 2018 sample, relative to the 2013 sample. The average amount of adjustment was $112 per month and the median was $102 per month.

Adjustments for Costs Associated with Parenting Days

Parenting time adjustment applied in 82 percent of guidelines calculations in the 2018 court case sample, compared to 84 percent in the 2013 court case sample. This analysis is limited to worksheets

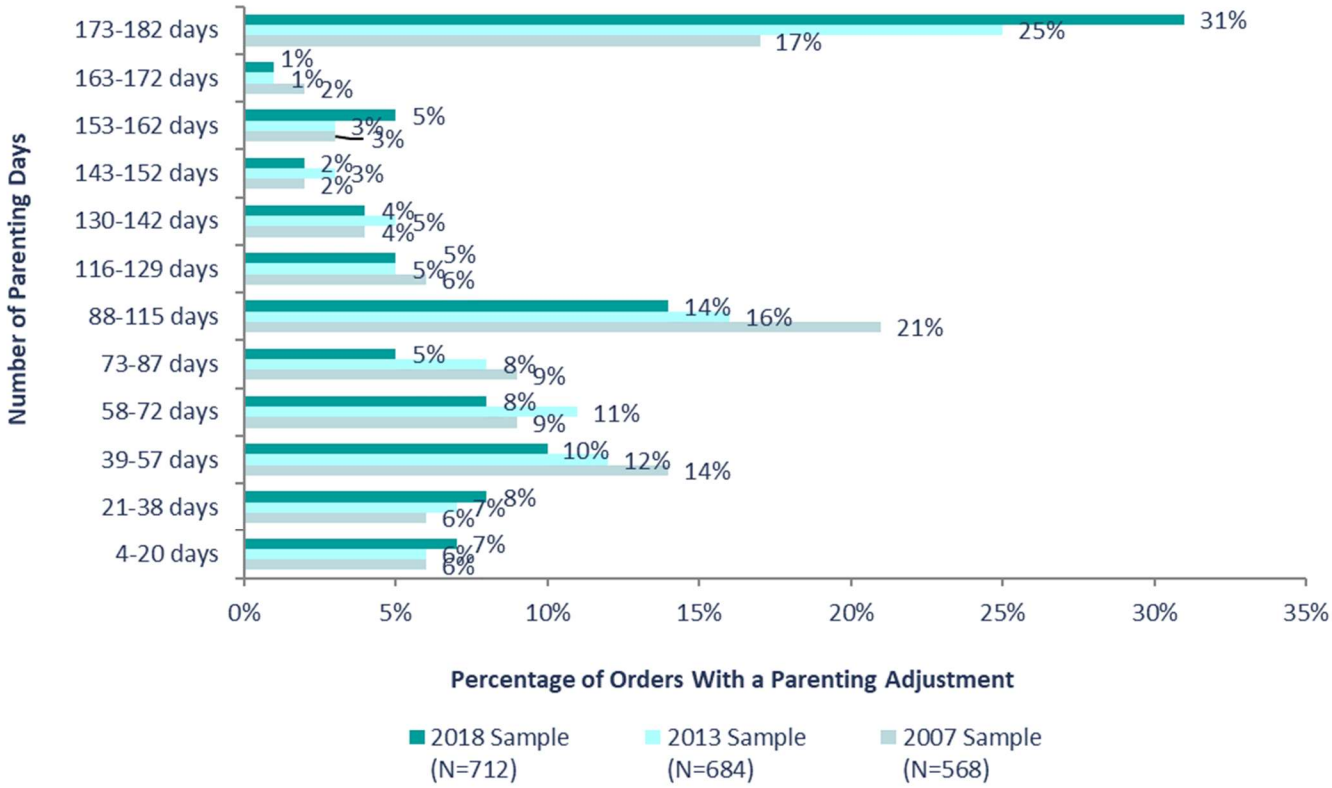
[39] Per guidelines, average expenditures for children 12 or older exceed average expenditures for all children by approximately 10%.

with parenting times adjustments using worksheet lines for Table A. (Table B was used for two orders.) The average and median adjustments in the 2018 sample were both 112 days per year.

Exhibit 24 shows the distribution of the number of days used in the adjustment for costs associated with parenting time. Overall trends and distributions have remained consistent over the past few reviews; however, there are some areas of difference between the 2018 and 2013 samples that show at least a 3 percentage point difference from 2013 and 2018:

- From 2013 to 2018, the percentage of those with 173–182.5 days increased statistically from 25 to 31 percent ($\rho < .02$).[40]
- From 2013 to 2018, the percentage of those with 73–87 days decreased statistically from 8 to 5 percent ($\rho = .04$).
- From 2013 to 2018, the percentage of those with 58–72 days decreased statistically from 11 to 8 percent ($\rho = .08$).

Exhibit 24: Number of Days Used in Adjustments for Costs Associated with Parenting Time



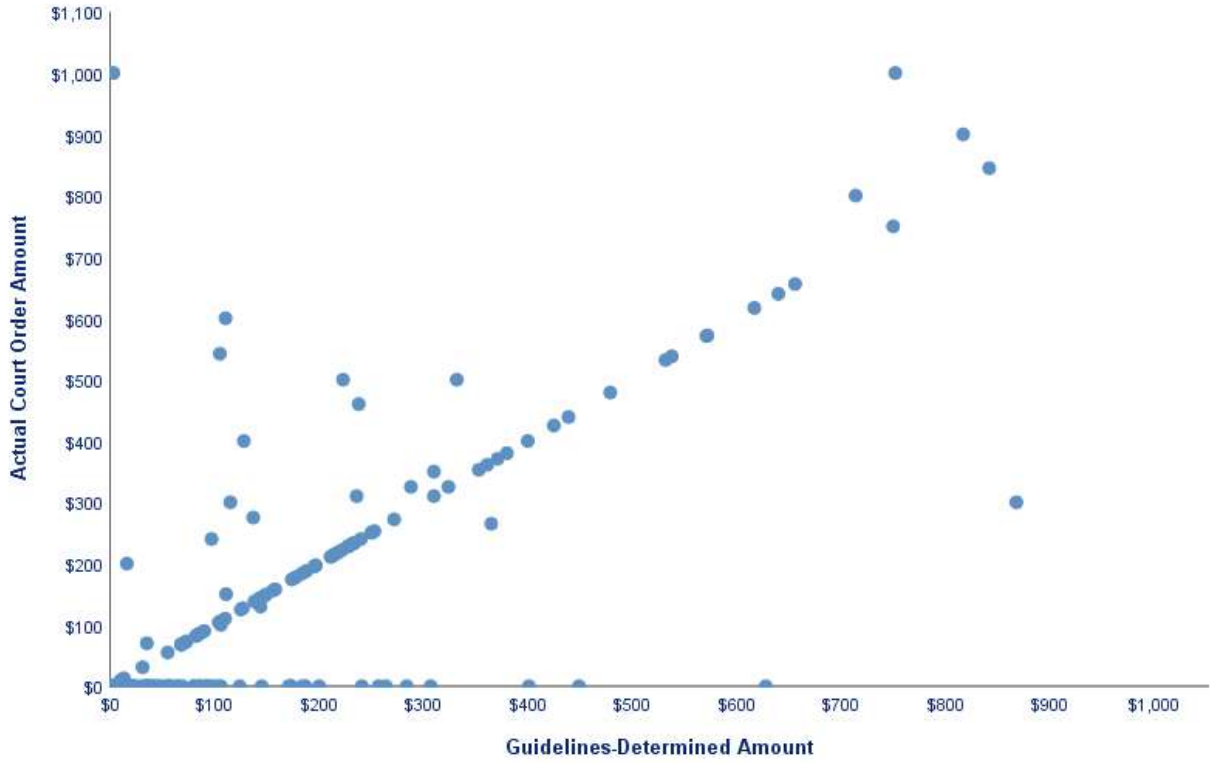
[40] A ρ of .02 indicates statistically significant at the 98% confidence interval assuming a two-tail test.

Adjustment for Essentially Equal Parenting Time

A quarter (25%) of cases within the 2018 court case sample were adjusted for essentially equal parenting time, compared to 21 percent of the 2013 sample. Essentially equal parenting time comprised 37 percent of deviations. Almost half (47%) of essentially equal parenting time orders were set at zero. Among essentially equal parenting time cases, non-zero orders generally had similar combined incomes as zero orders; however, the obligated parent's prorated share of combined income was generally more among non-zero orders than among non-zero orders. As stated earlier, the guidelines deviation rate was higher for cases with the essentially equal adjustment (*i.e.*, 40%) than it was for those without the essentially equal adjustment (*i.e.*, 20%).

Although the deviation rate is higher among essentially equal parenting time orders, Exhibit 25 suggests the existing formula is generally working. The almost perfect 45-degree line starting from zero indicates that the guidelines amount equals the actual court order amount among these orders. The solid line formed along the horizontal axis indicates many deviations to zero. The clustering of dots along the horizontal axis below $100 further suggests that the guidelines-amount is being rounded to zero when the guidelines amount is below $100 per month.

Exhibit 25: Guidelines Deviations by Court Order Amount



Orders Directing Which Party Claims the Child for Tax Purposes

The Tax Cuts and Jobs Act of 2017 (P.L 115-97) vastly changed the treatment of children as dependents in federal income tax code. There were four major changes. One was the elimination of the exemption for minor children. A second change was an increase to the standard deduction. It essentially doubled the amount for head of households. A third change was the increase of the child tax credit from $1,000 to $2,000 per year per child. The range of incomes eligible for the tax credit also expanded. It now phases out above adjusted gross incomes of $200,000 per year for single parents and $400,000 for married couples. It was also expanded to include lower incomes. If the credit exceeds taxes owed by a parent with an eligible child, that parent can receive up to $1,400 as a refundable amount. This refundable amount is known as the additional child tax credit. The fourth change expanded the earned income tax credit (EITC). Many states consider the EITC to be means-tested income and most states including Arizona do not consider means-tested income as income available for child support. Further, the EITC cannot be transferred from the parent with primary physical custody to the other parent like the child tax credit can through the custodial parent's release or revocation to claim the child as an exemption.[41]

Absent an agreement between the parents, the existing Arizona guidelines provide that the federal and state tax exemptions associated with the child shall be prorated between the parents. This can be accomplished by rotating the exemption or splitting the exemption among the number of children. For example, if there are three children and the obligated parent's prorated share of combined gross adjusted income is two-thirds, the obligated parent could claim the children as an exemption two out of every three years. Another example assuming the obligated parent's prorated share is two-thirds, and there are three children is that the obligated parent claims two of the children and the receiving party claims one of the children, and there is no rotation from year to year.

The tax exemption for the child was prorated between parents in 74 percent of the court case sample. This is further broken down as split between the parents (26% of orders), rotated between the parents (41% of the orders), or a combination of split and rotation (7% of orders). A split generally requires an even number of children (*e.g.*, there are two children and one parent claims the oldest and the other parent claims the youngest). A rotation refers to changing which parent claims a child in a particular year. In those where the tax exemption was not prorated, it was granted to one parent in 18 percent of the court case sample (*i.e.*, it was granted to the obligated parent in 4% of the orders and the receiving party in 14% of the orders). The tax allocation was not ordered among 7 percent of the orders and could not be categorized among 2 percent of the orders.

Rotating was more common when there was one child and splitting or a combination of splitting and rotating was more common when there were more children. There were no significant variations based on the income of the receiving parent, which was somewhat surprising since a lower income party may not be eligible for the full $2,000 child tax credit. The vast majority of essentially equal custody orders

[41] See IRS Publication 501, Publication 504, and Form 8332.

prorated the tax benefit through splitting or rotating the exemption. Since the majority of essentially equal custody cases involved two or more children, splitting the exemption was an option in most essentially equal custody cases. The deviation rate varied slightly with how the tax exemption was distributed. The rate was higher (39%) when the party due support received all or most of the exemption, compared to when the obligated parent received all or most of the exemption (20%) or it was prorated (25%).

Changes over Time

In general, proration between the parents has become more common. The proration rate was 53 percent among orders in the 2013 court case sample, while the tax benefit was ordered to just one parent in 39 percent of the orders in the 2013 court case sample. The 2013 court case sample also contained a fewer percentage of orders with not tax allocation ordered (5%) or the tax allocation could not be categorized (3%).

Attendance to Parenting Education Classes

Arizona law mandates that all divorcing and never-married parents with minor children and parenting time disputes attend a parenting education class. Over half (57%) of obligated parents attended and 73 percent of receiving parties attended. Both parents attended in 49 percent of the cases. Comparable percentages from the 2013 court case sample were 56 percent of obligated parents, 75 percent of receiving parties, and both attended among 49 percent of cases.

Other Findings from the Analysis of ATLAS Data

This subsection provides more detail from the analysis of ATLAS data, particularly those data extracted from ATLAS that have not been discussed earlier, such as payments, IV-D status, case closure and reason, court action producing a child support order, incarceration, income from Social Security Administration benefits or Veteran's benefits. It also provides more detail about quarterly wage data available from the IV-D parties. Other ATLAS fields that are available for IV-D and non-IV-D cases that have not been discussed yet are the gender of the parties, age of the parties, and county of the order. In addition, more detailed information about medical support orders was available for IV-D cases only and discussed in this subsection.

Gender and Age of the Parties

Most (90%) obligated parents were males, and most (91%) receiving parties were females. There was some variation by IV-D status. The obligated parent was more likely to be male among IV-D orders than non-IV-D orders, but there were no differences among new, modified, or divorce orders. According to ATLAS, the average age of obligated parents was 39 years old, while the average age of parties due support was 37 years old. Ages of obligated parents and receiving parties were higher among modified and divorce orders than for initial orders. In general, the ages of obligated parents tended to be older than receiving parties. Ages of obligated parents and receiving parties among modified orders were 42 and 40, respectively, compared to 40 and 38 among divorce orders and 35 and 34 among new orders.

County of the Order

The county of the order was known for both IV-D and non-IV-D orders. Exhibit 26 shows that Maricopa County, which encompasses Phoenix, has the majority (65%) of ATLAS orders. Pima and Pinal counties had the second and largest share, respectively. No other county has more than 3 percent of the orders.

Exhibit 26: County of the Order

	All Orders (N=6,396)	IV-D Orders (N=2,413)	Non-IV-D Orders (N=3,983)
Apache	1%	3%	<1%
DCSE-Cochise	2%	2%	1%
Coconino	2%	2%	1%
Gila	<1%	1%	-
Graham	1%	<1%	1%
Greenlee	<1%	<1%	<1%
La Paz	<1%	<1%	<1%
Maricopa	65%	58%	69%
Mohave	2%	3%	2%
Navajo	1%	2%	<1%
Pima	14%	12%	15%
Pinal	6%	7%	5%
Nogales	1%	1%	<1%
Prescott and Cottonwood	3%	3%	2%
Yuma	3%	5%	2%

Additional information about Quarterly Wage Data

As stated earlier, ATLAS does not record the income used for the guidelines calculation. The only source of income data comes from the State's quarterly wage data, and it is only available to IV-D cases. Wage data is limited to income reported by employers to the state for the state's unemployment and workers' compensation programs. Wage data is matched to IV-D orders periodically; it is not matched to non-IV-D orders. One limitation to analyzing income by wage data is that quarterly wage data is not always available for every order. As shown in Exhibit 27, wage data was only available for obligated parents in 38 percent of IV-D orders and was available for the receiving party in 39 percent IV-D orders. This limited availability is common in other states. Exhibit 27 also shows little variation in the availability of quarterly wage income by court action.

Exhibit 27: Availability of 2018 Quarterly Wage Data by Court Action for IV-D Orders

	Obligated Parents		Receiving Parties	
	With Wage Data	No Wage Data	With Wage Data	No Wage Data
Availability of Wage Data	38%	62%	39%	61%
Divorce Actions (N=119)	43%	57%	32%	68%
Non-Divorce, New Established (N=1,545)	39%	61%	39%	61%
Modifications (N=749)	37%	63%	42%	58%

Exhibit 28 shows the average and median monthly income for both parties, where quarterly wage data was converted to a monthly amount. Specifically, monthly income was calculated by taking the total wage data available and dividing the number of quarters available by three months. In general, obligated parents have higher incomes than receiving parties. The mean and median monthly incomes

for obligated parents was $3,058 and $2,589 per month, compared to $2,259 and $1,936 for receiving parties. The average incomes of parties tended to be higher among modification and divorce orders, compared to incomes of parties with new orders that were not part of a divorce action.

Exhibit 28: Approximate Monthly Income According To 2018 Quarterly Wage Data

	Obligated Parents (N=928)		Receiving Parties (N=947)	
	Average	Median	Average	Median
Approximate Monthly Income				
Divorce Actions with Child	$3,733	$3,429	$2,166	$1,934
New Establishment, Non-Divorce	$2,744	$2,300	$2,047	$1,841
Modifications	$3,610	$2,995	$2,673	$2,146

Although Exhibit 28 shows the approximate monthly income based on averaging available quarterly wage data over the number of months that quarterly wage data is reported, a limitation of quarterly wage data is that there is often a high variance in wages between quarters. The average difference in quarterly wages among those with at least two quarters of wage data is $3,895 between the lowest and the highest quarterly wage reports for obligated parents and $960 for receiving parties.

Based on the approximate monthly income for those that have quarterly wage data, 21 percent of IV-D obligated parents have quarterly wage income below the 2018 federal poverty guidelines for one person ($1,012 per month).[42] Among receiving parties and adjusted for family size—that is, the number of children on the child support order—39 percent have quarterly wage incomes below the 2018 federal poverty guidelines for their household size.

Another way to view poverty is to look at how many IV-D obligated parents with quarterly wage data would below poverty income after subtracting the full child support amount from their monthly income and how many IV-D receiving parties with quarterly wage data would have less than poverty income after adding the full child support order. In other words, full compliance is assumed. When subtracting the monthly order amount from the calculated monthly wage of obligated parents, the percentage that falls below poverty increases from 21 percent to 28 percent. In contrast, after adding the monthly child support amount to the receiving party's wage data and considering family size, poverty decreases from 39 percent to 28 percent.

Medical Support

Medical or temporary medical support was only recorded for IV-D cases. As noted earlier, the majority (93%) of ATLAS cases specified medical support. For cases in which support was ordered, the receiving party was the parent responsible for providing it among 70 percent of the orders. The obligated parent was responsible for providing it among 17 percent of orders, both parents were responsible in 9 percent of orders, and the provider was not noted or unknown in the remaining 4 percent.

[42] U.S Department of Health and Human Services. (2018). "2018 Poverty Guidelines." Office of the Assistant Secretary for Planning and Evaluation. Retrieved December 12, 2020, from https://aspe.hhs.gov/2018-poverty-guidelines.

Only 2 percent of IV-D orders noted an order for cash medical support. Cash medical support is typically ordered when neither parent has health insurance available or if there are known recurring medical expenses. The average and median amounts for medical support were $90 and $94 per month, respectively.

Analysis of Labor Market Information

Federal regulation (45 C.F.R § 302.56 (h)(1)) requires the consideration of labor market data such as the unemployment rate, hours worked, and earnings for various occupations. The intent of the federal regulation is to assist states with the development of income imputation provisions reflective of labor market conditions. Information about unemployment rates was presented at the September subcommittee meeting. As of August 2020, Arizona's unemployment rate was 5.9 percent, which is significantly less than the U.S. average of 8.4 percent.[43] Both rates are higher than before the COVID-19 pandemic. The unemployment rates in August 2019 were 4.6 percent for Arizona and 3.7 percent for the U.S. average. There is considerable variation in unemployment rates by region. Among metropolitan areas, Yuma MSA (Yuma County) has the highest unemployment rate (16.4%), and Sierra Vista-Douglas MSA has the lowest (5.2%). This suggests local consideration of employment opportunities when imputing income.

The unemployment rates that are reported above are based on the U-3 measurement methodology, which is the conventional rate tracked historically and typically reported in media streams. The official U-3 measurement only counts those who are participating in the labor force, either through employment or by active job-seeking within the last four weeks for those available for work. Even before the pandemic, the U.S. Bureau of Labor Statistics (BLS) developed alternative measures to better account for discouraged workers who stopped searching for employment, those working part-time who wanted full-time work, and other circumstances that generally yield higher rates. Other issues with measuring unemployment have surfaced since the pandemic. The U.S. BLS has responded by adding questions to the monthly survey measuring unemployment.[44] For example, they have added questions concerning whether people were unable to work because their employers closed or lost business and whether the pandemic prevented job-seeking activities. The intent is to supplement the U-3 measurement. With regards to how this measurement issues affect the guidelines review, it underscores the importance of considering local labor market circumstances when imputing income to a parent and that examining the official unemployment rate (*i.e.*, the U-3) likely understates the severity of employment issues.

Exhibit 29 focuses on employment, entry-level wages, and average hours worked by industry. In 2020, the Arizona state minimum wage was $12,00 per hour. The entry-level wages are from 2018, which was

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[43] Arizona Commerce Authority. (Sept. 17, 2020). *Monthly Employment Report for August 2020.* Retrieved from https://www.azcommerce.com/oeo.

[44] U.S. Bureau of Labor Statistics. (n.d.). *Labor Force Statistics from the Current Population Survey: Supplemental data measuring the effects of the coronavirus (COVID-19) pandemic on the labor market.* Effects of the coronavirus COVID-19 pandemic (CPS) (bls.gov).

the most current information available. As mentioned earlier, Arizona statute[45] provides for imputation of income at full-time employment at minimum wage absent contrary evidence. One possible piece of contrary evidence is labor market data on usual hours worked for specific occupations. Several states and courts are recognizing that many entry- and low-level positions (*e.g.*, service sector jobs) offer less than 40-hour workweeks and are imputing income at the usual hours worked for those occupations. Exhibit 29 shows the average weekly hours for selected industries in Arizona. When Arizona-specific data are not available for a specific industry, U.S. average data is provided. Exhibit 29 also shows the number of employees in these selected areas, the year-over-year increase or decrease in employment, entry wage for a specific occupation in that industry and the percentage of Arizona employees in that industry.

Exhibit 29: Labor Market Data from Selected Industries

	Arizona Employment (Aug. 2020)[46]	Arizona Year-over-Year Change[47]	Percent of Arizona's Total Nonfarm Employment	Arizona's 2018 Entry Wage of Selected Occupation[48]	Average Weekly Hours of all Arizona or U.S. employees (Aug. 2020)[49]
Total Nonfarm employment	2,864,200	- 3.2%	N/A	N/A	N/A
Total Private	2,436,000	-3.6%	85%	N/A	35.0 (AZ)
Select Industries					
Manufacturing	179,800	-4.3%	6%	Tool and die makers: $14.47	39.9 (AZ)
Construction	170,300	-1.1%	6%	Laborer: $12.12/hr	38.0 (U.S.)
Wholesale trade	104,400	+6.0%	4%	Driver: $10.94/hr	38.4 (U.S.)
Retail trade	328,000	+0.8%	11%	Cashiers: $10.80/hr	30.7 (U.S.)
Transportation and warehousing	121,400	+1.8%	4%	Order clerk: $11.87/hr	34.7 (AZ)
Professional and business services	420,000	-6.0%	15%	File clerk: $12.08/hr	36.2 (AZ)
Leisure and hospitality	268,000	-19.1%	9%	Maids: $10.96hr	25.8 (U.S.)

[45] Arizona Revised Statutes § 25-320 (N).
[46] Arizona Department of Commerce. (n.d.) *Industry Employment and Wages (August 2020)*. Retrieved from https://www.azcommerce.com/oeo/labor-market/industry-employment/.
[47] *Ibid*.
[48] Arizona Commerce Authority. (n.d.) *Occupation Employment and Wages.* Retrieved from https://www.azcommerce.com/oeo/labor-market/occupation-employment/.
[49] Arizona data is not available for all employment sectors. When Arizona data is not available, U.S. average is used. Arizona data is from Arizona Office of Economic Opportunity. (n.d.) *Average Hours and Earnings: All Employees.* Retrieved from https://www.azcommerce.com/media/1546019/ces-allemp-04st-2020.pdf. U.S. data is from U.S. Bureau of Labor Statistics. (n.d.) *Table B-2. Average weekly hours and overtime of all employees on private nonfarm payrolls by industry sector, seasonally adjusted.* Retrieved from https://www.bls.gov/news.release/empsit.t18.htm.

Exhibit 29 also shows that there is a dramatic decrease in the number of jobs in the leisure and hospitality sector in the last year due to the COVID-19 pandemic. Exhibit 29 also shows the average hours per week are significantly less than 40 hours per week in the leisure and hospitality sector. In all, the average hours in several of the industries are below 40 hours per week. This suggests that income imputation below 40 hours per week may be appropriate depending on the industry that the party could be employed.

There is some evidence that labor force participation rates have decreased due to the COVID-19 pandemic: that is, people have quit working and stopped looking for work. Because they are not in the labor force, they would not be counted in the U-3 unemployment rate. For example, a recent Pew Research Center publication reports that fewer mothers and fathers with children younger than 18 at home are working due to the COVID-19 pandemic.[50] The research did not note whether they were no longer participating in the labor force because they are sick, they are caring for a sick child, they fear contracting COVID-19 at work, or another reason. Regardless, the relevance to child support is whether these are valid reasons not to presume a non-employed parent can work and hence not impute income to that parent. Some state guidelines actually have provisions that address extreme circumstances that share some similarities to the pandemic. For example, the Louisiana guidelines specifically mention that a party temporarily unable to find work or temporarily forced to take a lower-paying job as a direct result of Hurricane Katrina or Rita shall not be deemed voluntarily unemployed or underemployed.[51] Similarly, the Indiana guidelines provide for the consideration of "a natural disaster" in its application of a low-income adjustment.[52]

Factors that Influence Employment Rates and Compliance

Federal regulation (45 C.F.R. § 302.56(h)(2)) also requires the consideration of "factors that influence employment rates among noncustodial parents and compliance with child support orders." The factors that influence labor force participation and employment are numerous, complex, and go beyond child support. For example, the COVID-19 pandemic is an illustration of another factor that affects labor force participation and employment. Understanding each of these factors and disentangling their unique impact from the impact of other factors requires sophisticated research methods, appropriate data, and substantial effort. Further, the labor market is constantly changing: the labor market may change before the research is completed. Again, the impact of the pandemic on the labor market illustrates this point: research examining the impact of the pandemic on labor force participation and employment is just starting to emerge, and there is concern about its scaring impact on the labor market. Still, the pandemic may cease and the economy may be back in a growth spell before definitive research studies

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[50] Kochhar, Rakesh. (Oct. 22, 2020). *Fewer mothers and fathers in U.S. are working due to COVID-19 downturn; those at work have cut hours*. Pew Research Center. Retrieved from Fewer U.S. mothers and fathers are working due to COVID-19, many are working less | Pew Research Center.

[51] Louisiana Revised Statute 9:315.11 C.(1).

[52] Indiana Rules of Court. (amended Jan. 1, 2020). *Guideline 2. Use of the Guidelines Commentary*. Retrieved from Indiana Child Support Rules and Guidelines.

on the impact of the pandemic on the labor market are completed. Moreover, the impact of these other factors (*e.g.*, the COVID-19 pandemic) may overshadow any impact child support has on labor force participation and earnings. Other recent studies echo that child support is not the only factor considered in labor force participation or earnings. For example, one study finds that prior labor force experience and attachment influences whether work effort increases or decreases when child support arrears accumulate.[53]

There is some older academic research which finds that child support can affect employment among obligated parents directly.[54] Another study finds some weak association of changes in father's earnings with changes in orders among fathers in couples that had their first child support ordered in 2000.[55] There are also many anecdotes of obligated parents who quit working or turn to unreported employment (also called the underground economy) once wages are garnished for child support. These studies are of limited value for this analysis because they are dated (hence do not consider today's labor market and child support enforcement practices) and not specific to Arizona. Besides pandemic-related employment changes, opportunities for income from unreported employment are rapidly changing. It is becoming more common to have multiple jobs, where one may be unreported employment, and the other may be reported employment. Still, more mechanisms are being developed to facilitate the reporting of gig economy jobs (*e.g.*, drivers for ridesharing). As is, the earnings from unreported employment are often sporadic and yield inconsistent earnings. Many guidelines or guidelines users average incomes among parties with sporadic and inconsistent earnings as long as it is above full-time, minimum-wage earnings.

[53] Miller, Daniel, P. and Mincy, Ronald B. (Dec. 2012). "Falling Further Behind? Child Support Arrears and Fathers' Labor Force Participation." *Social Service Review.* pp. 605–633.
[54] Holzer, Harry J. Offner, Paul, and Sorensen, Elaine. (Mar. 2005). "Declining employment among young black less-educated men: The role of incarceration and child support." *Journal of Policy Analysis and Management*.
[55] Ha, Yoonsook, Cancian, Maria, and Meyer, Daniel, R. (Fall 2010). "Unchanging Child Support Orders in the Face of Unstable Earnings." *Journal of Policy Analysis and Management.* Vol. 29, No. 4, pp. 799–820.

SECTION 2: COST OF RAISING CHILDREN

Child support schedules are part policy and part economic data. Most state guidelines rely on studies of child-rearing expenditures as the underlying basis of their child support schedule or formula. There are ten different studies that form the basis of state child support guidelines. In other words, states have a choice in which study or studies to consider when developing their guidelines schedules or formulas. The studies vary in their age and methodology used to separate the child's share of expenditures from total household expenditures. Obviously, the older the study, the less appropriate it is as the basis of guidelines schedules and formulas used today. As discussed in more detail later, economists do not agree which methodology best measures actual child-rearing expenditures. Nonetheless, all of the studies consider what families actually spend on children rather than the minimum or basic needs of children. This is because the premise of most state guidelines is that children should share in the lifestyle afforded by their parents; that is, if the obligated parent's income affords the obligated parent a higher standard of living, the support order should also be more for that higher-income parent.

Four of the ten studies that form the basis of state child support guidelines are Betson-Rothbarth (BR) studies of different ages.[56] The existing Arizona child support schedule is based on the third BR study (BR3) using expenditures data collected in 1998–2004 that were updated to 2014 price levels and consider 2014 federal and state income tax and FICA. Most (37 states including Arizona) and the District of Columbia and Guam rely on a BR study as the basis of their guidelines schedule or formula. The fact that BR3 is based on expenditures data that is 16 years old underscores the need for a new study using more current data. An updated BR study using expenditures data collected in 2013–2019 was conducted for this review. It results are in Appendix A. It is considered the fifth BR study (BR5).

[56] The four Betson studies using the Rothbarth methodology were published in 1990, 1998, 2006, and 2010. The oldest study relied on expenditures data from families participating in the 1980–86 CES; the second study relied on expenditures data from families participating in the 1996–98 CES; the third study relied on expenditures data from families participating in the 1998–2004 CES; and the fourth study relied on expenditures data from families participating in the 2004–2009 CES (Betson, David M. (1990). *Alternative Estimates of the Cost of Children from the 1980–86 Consumer Expenditure Survey*. Report to U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation. University of Wisconsin Institute for Research on Poverty, Madison, WI; Betson, David M. (2001). "Chapter 5: Parental Expenditures on Children," *in* Judicial Council of California, *Review of Statewide Uniform Child Support Guidelines*, San Francisco, CA. http://www.courtinfo.ca.gov/programs/cfcc/1058files2001/CH5.PDF; Betson, David M. (2006). "Appendix I: New Estimates of Child-Rearing Costs." *In* State of Oregon Child Support Guidelines Review: Updated Obligation Scales and Other Considerations. Report to State of Oregon, Prepared by Policy Studies Inc., Denver, CO; and Betson, David M. (2010). "Appendix A: Parental Expenditures on Children." *In* Judicial Council of California, *Review of Statewide Uniform Child Support Guideline*. San Francisco, CA. Retrieved from http://www.courts.ca.gov/partners/documents/2011SRL6aGuidelineReview.pdf.

This section focuses on the changes of the BR measurements over time because it is the most appropriate for an updated schedule for Arizona. BR5 measurement is the most current measurement, use the same methodology that was used to develop the measurements of child-rearing expenditures underlying the existing schedule, and no other study is definitively better.

Changes in the Betson-Rothbarth (BR) measurements of child-rearing expenditures over time may reflect actual changes in how much families spend on their children, sampling differences in the different study years, changes in the underlying expenditures data used to develop the measurements, or a combination of these factors. In addition, changes in other factors (*e.g.*, the ratio of expenditures to after-tax income) considered in the conversion of the BR measurements, which are expressed as a percentage of total household expenditures, to a gross-income based schedule may have changed so also affect perceived changes to the BR measurements over time. Understanding the root of the changes is important to Arizona if Arizona updates its schedule using the BR5 measurement.

After discussing changes in the BR measurements over time, the most current of the alternative studies of child-rearing expenditures are discussed. Some of the more current alternatives were also considered for the basis of updating the Arizona child support schedule. However, all of them are older than the BR5, they are either not used by any state or only used by one or a few states depending on the study, and none are definitively a better measurement of child-rearing expenditures than the BR5 measurements.

Overview of Changes in Betson-Rothbarth (BR) Measurements over Time

Each of the Betson-Rothbarth (BR) studies uses more current expenditures data from the Consumer Expenditure Survey (CE). Conducted by the U.S. Bureau of Labor Statistics (BLS), the CE is a comprehensive and rigorous survey with over a hundred-year history.[57] Today, the CE surveys about 7,000 households a quarter on hundreds of expenditures items.[58] Households stay in the survey for four quarter, yet households rotate in and out each quarter. The primary purpose of the CE is to calibrate the market basket used to measure changes in price levels over time. Committed to producing data that are of consistently high statistical quality, relevance, and timeliness, the BLS closely monitors and continuously assesses the quality of the CE and makes improvements when appropriate. Some of these improvements have occurred in between BR studies and, hence, can affect differences between BR study years.

[57] U.S. Bureau of Labor Statistics (BLS). (June 28, 2018). *130 Years of Consumer Expenditures.* Retrieved from https://www.bls.gov/cex/csxhistorical.htm.

[58] There are actually two components to the CE survey. Each starts with a sample of about 12,000 households. One component is a diary survey, and the other is an interview survey. The results from the interview survey are the primary data source for measuring child-rearing expenditures. Nonetheless, the BLS uses both components to cross check the quality of the data. More information can be found at U.S. Bureau of Labor Statistics. (n.d.) *Handbook of Methods: Consumer Expenditures and Income.* p. 16. Retrieved from https://www.bls.gov/opub/hom/cex/pdf/cex.pdf.

The sampling of the CE is not designed to produce state-specific measurements of expenditures. To expand the CE so it could produce state-specific measurements would require a much larger sample and other resources and would take several years. Instead, Betson develops national measurements of child-rearing expenditures from the CE. The first BR study (BR1), which was conducted in 1990, relied on expenditures data from the 1980–86 CE, and the most recent (BR5, fifth BR study) relies on expenditure data from the 2013–2019 CE. Multiple data years are pooled to obtain an adequate sample size. Betson's sample selection is described more thoroughly in Appendix A.

Betson compiles other statistics from the same subset of CE families that he uses to measure child-rearing expenditures. These are other statistics are used to develop a child support schedule. Specifically, this includes the average ratio of expenditures to income, average childcare expenditures, and average healthcare expenses for several income ranges. This additional data is shown and explained in Appendix B.

Comparisons of BR Percentages over Time

The two major factors in determining child support are the number of children and the incomes of the parties. Child support schedules provide higher amounts when there are more children because the economic evidence on child-rearing expenditures finds more is spent when there are more children. Further, the economic evidence suggests some economies of scale: expenditures for two children are not twice that of expenditures for one child; rather, they are less than double.

Income follows a similar pattern; that is, economic evidence finds that higher incomes spend more on children and the schedule amounts reflect that. Underlying the premise of most state guidelines is that if child has a parent living outside the home whose income affords that parent a higher standard of living, that child should share that parent's standard of living. Obviously, the situation is more complicated in shared physical custody cases. For the purposes of developing a schedule, however, the schedule starts with the basis that the child is being raised in one household, then layers an adjustment for timesharing on top of that. (This is also the situation with the Arizona guidelines that provides a formula to adjust for the number of days the child is with each party.)

Comparisons by Number of Children

Exhibit 30 compares the percentage of total family expenditures devoted to child rearing for the five BR studies. Exhibit 30 shows the percentages for one, two, and three children. The sample size of families with four or more children is too small to produce measurements for larger families. Instead, as discussed in Appendix B, equivalence scales are used to adjust the measurements for larger family sizes.

Exhibit 30: Comparisons of Betson-Rothbarth (BR) Measurements over Time

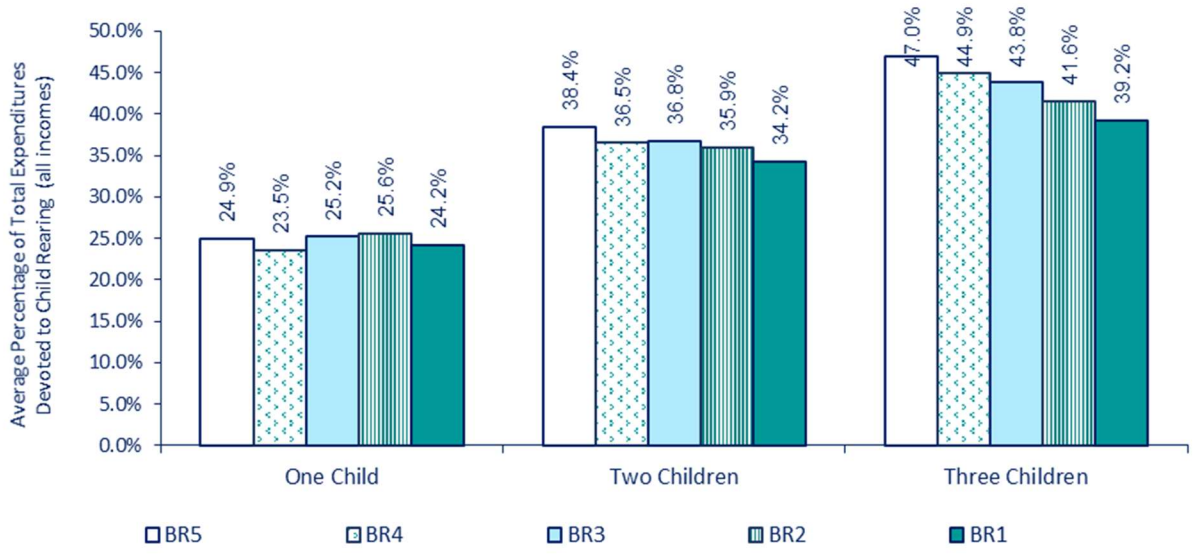


Exhibit 30 shows small variation in the percentage of total expenditures devoted to one child over time. The difference between the lowest and the highest estimate for one child is less than two percentage points. In Appendix A, Betson notes this is less than the standard deviation in the estimates due to sampling variation.[59]

For two and three children, Exhibit 30 shows the percentage of total expenditures devoted to child-rearing expenditures increasing slightly over time. However, Betson suggests that expenditures for two and three children should be examined in context of marginal expenditures: that is, starting with expenditures for the first child, how much more was spent for the second child? If the same amount is spent, the marginal increase in expenditures is 100 percent. If the amount is less than 100 percent, there is some economies of scale to having more children. The BR studies find that the marginal increase in expenditures from one to two children is about 40 to 55 percent, depending on the age of the study, and that the marginal increase in expenditures from two to three children is about 15 to 23 percent, depending on the age of the study. Generally, the older studies have smaller marginal increases, while the more recent studies have larger marginal increases. This suggests that the economies of scale of having more children is decreasing slightly. In turn, this suggests slightly larger increases to updated schedule amounts for more children.

[59] See page A-24.

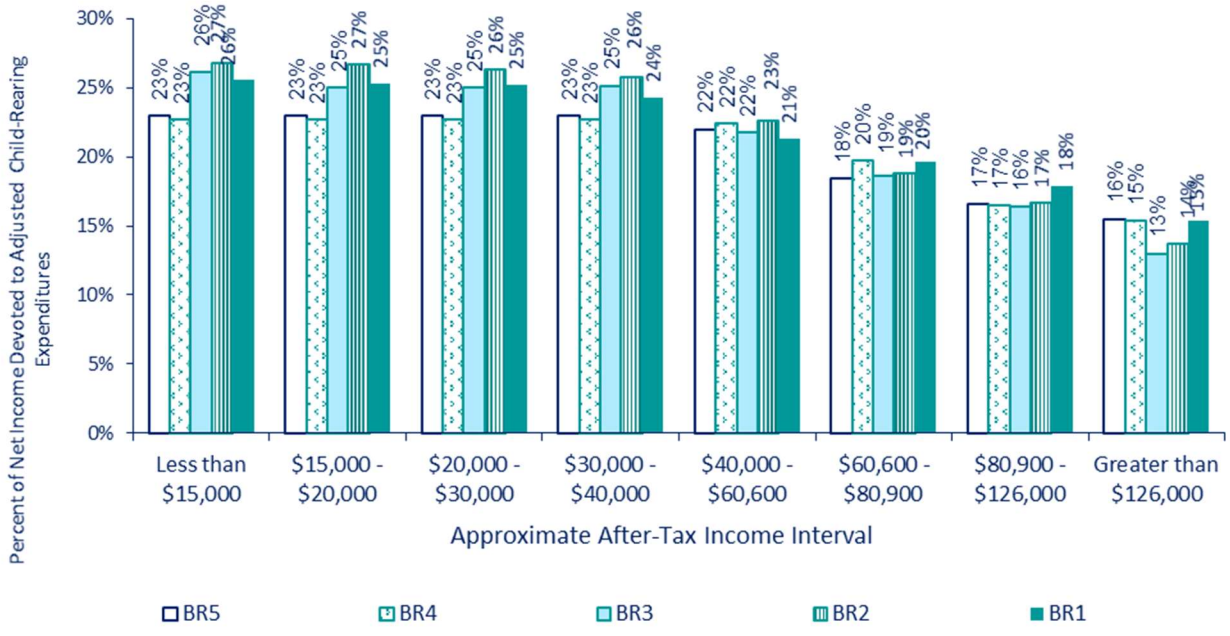
Comparisons by Income Ranges

Exhibit 31, Exhibit 32, and Exhibit 33 compare the BR measurements over time by income range. There are several adjustments made to make the comparison. Due to these adjustments, the percentages shown in the exhibits are not comparable to those in Exhibit 30,

Development of the Comparisons

Exhibit 30 measures child-rearing expenditures as a percentage of *total household expenditures*, while Exhibit 31, Exhibit 32, and Exhibit 33 measure child-rearing expenditures as a percentage of *after-tax income*. If a family spends all its after-tax income, there is no difference between using total expenditures or after-tax income as a base. However, average expenditures to after-tax income ratios from the same subset of families Betson considers when developing his measurements of child-rearing expenditures show that, on average, low-income families spend more than their after-tax income and high-income families spend less than their after-tax income (*e.g.*, they have savings, make donations, and purchase gifts for others outside the home). When child-rearing expenditures as a percentage of total expenditures are converted to a percentage of after-tax income by adjusting them for average expenditure to income ratios, it produces the downward sloping trend line evident in the exhibits. If (and when) converted to gross income, the downward trend becomes steeper because federal income tax rates are progressive (*i.e.*, tax rates become progressively higher with more income).

Exhibit 31: Comparisons of BR Measurements by After-Tax Income for One Child



Due to reasons relating to economic theory and modeling, Betson must measure child-rearing expenditures as a percentage of a household's total expenditures rather than income. For purposes of analyzing how child-rearing expenditures vary with income, Betson develops measurements of child-rearing expenditures and the ratio of expenditures to after-tax income for about 25 income ranges, with

the actual number varying by study year. (See Appendix B for the income ranges using the findings from the BR5 study.)

Exhibit 32: Comparisons of BR Measurements by After-Tax Income for Two Children

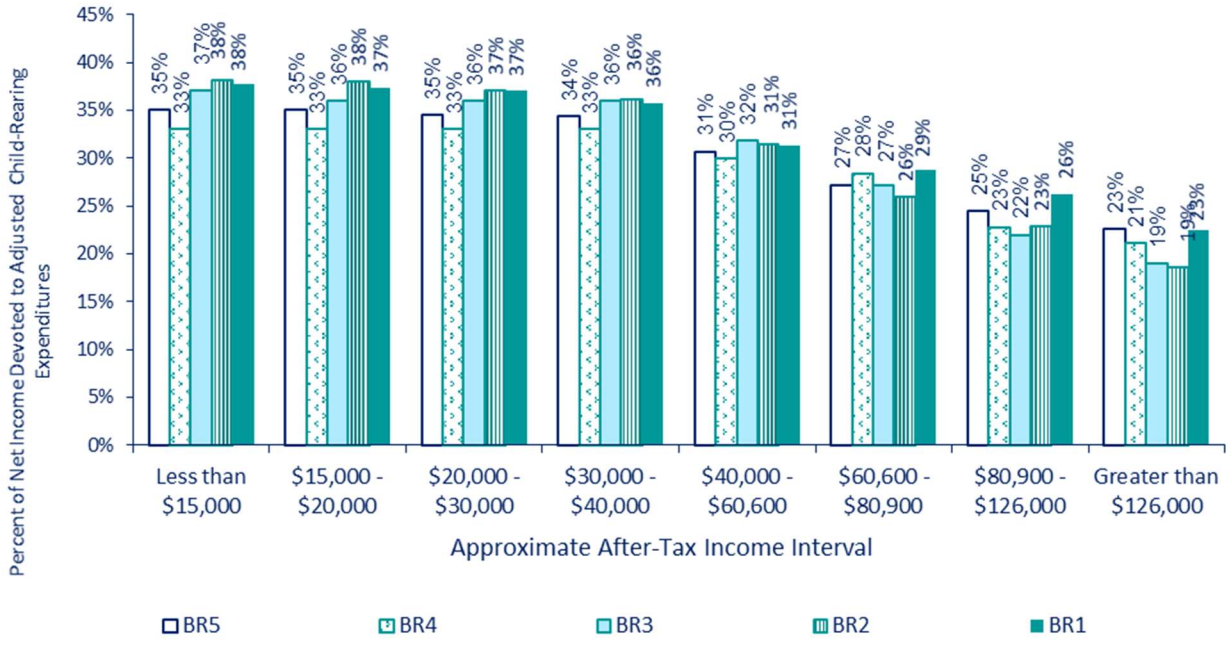
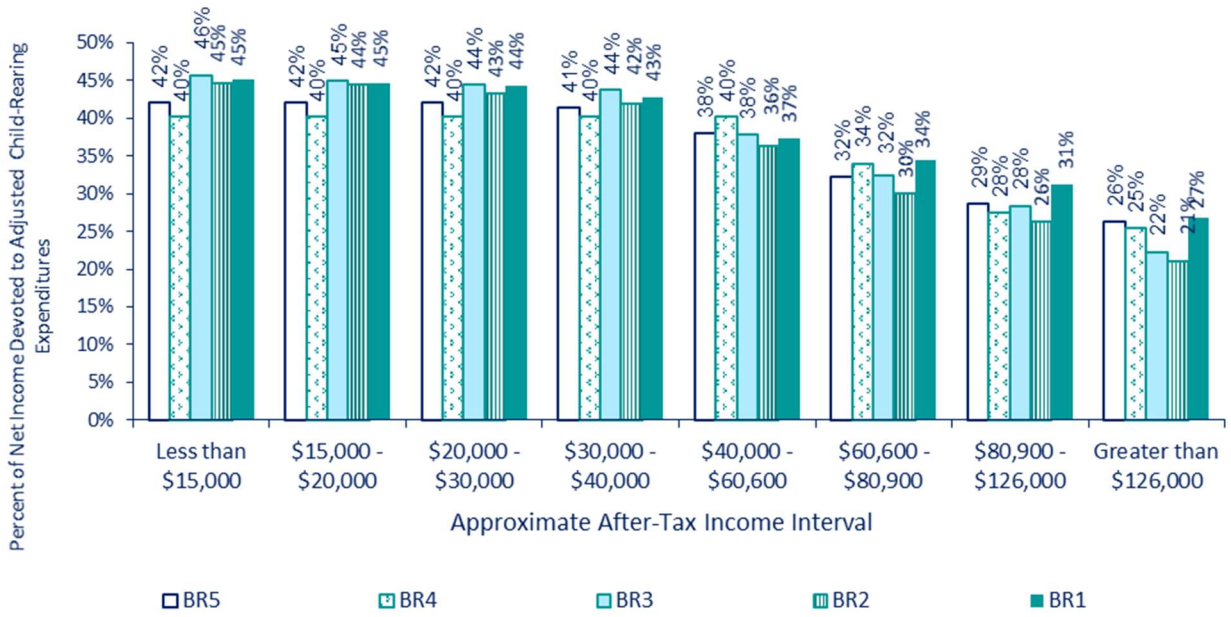


Exhibit 33: Comparisons of BR Measurements by After-Tax Income for Three Children



Another issue of comparability is that each study considers a different price level. For example, Betson's most recent study is based on 2018 price levels, while his earlier studies consider price levels from earlier years. The last three Betson studies (BR3, BR4, and BR5) are converted to 2020 incomes and exclude the child's health insurance, child's extraordinary medical expenses, and childcare expenses. Arizona and most states exclude these items from their schedules. (The exclusion of these expenses is discussed in Section 4 and Appendix B.) A final adjustment is the capping of expenditures such that they do not exceed after-tax income. The assumption is that families should not be required to spend more of their income.

What the price levels of the BR1 and BR2 measurements and whether they exclude the child's health insurance, child's extraordinary medical expenses, and childcare expenses is unclear due to the age of data. Nonetheless, they serve a useful benchmark for examining trends.

Changes in Expenditures by Income Over Time

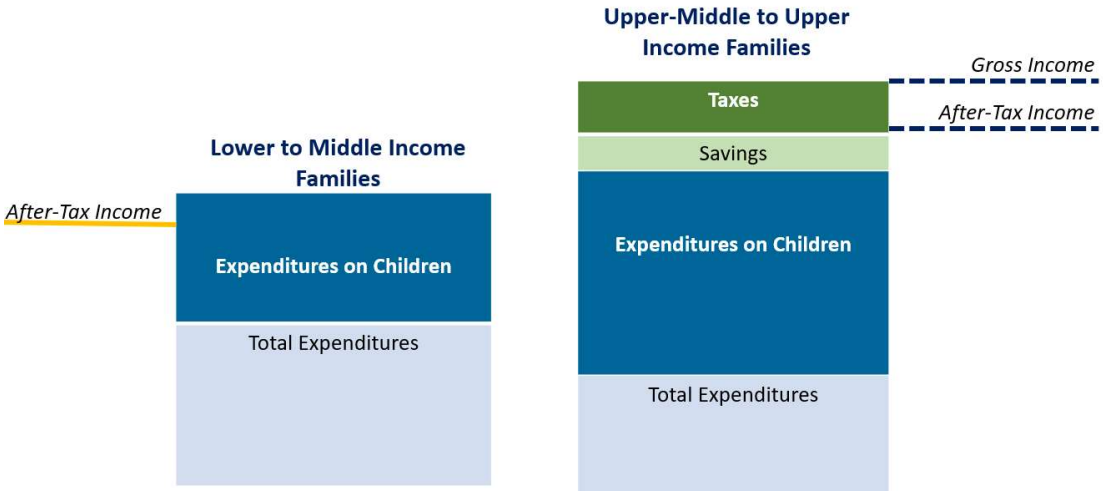
There are several points about the measurements over time that can be made from the exhibits comparing the BR measurements for the number of children over time.

- In general, there are some small changes, but the significance is questionable given the margin of error, the approximation of the income intervals to express them in 2020 price levels, and other factors.
- The observable changes consist of two changes:
  - A decrease at lower incomes (*e.g.*, see the first cluster for after-tax incomes of $15,000 per year or less); and
  - An increase at higher incomes (*e.g.*, see the last cluster for after-tax incomes of $126,000 per year or more).

Most of the observed changes can be explained by the conversion to after-tax income, improvements to the CE, or new CE data fields. To understand the changes, it is important to remember that the BR measurements of child-rearing expenditures are measured as percentages of total expenditures. As described earlier, they are first converted from total expenditures to after-tax income, then finally converted to gross income using federal and state income tax rates and FICA formulas. (The second step of converting to gross income is discussed in the next section.)

As shown in the exhibit on the next page, families may spend less, all, or more of their after-tax income. For the first step of translating the percentages of expenditures devoted to child rearing to percentages of after-tax income devoted to child rearing, CPR uses the average ratio of expenditures to income for each income range from the same subset of families Betson uses to measure child-rearing expenditures. At low incomes, families spend more than their income on average. Since most states do not want to require parents to spend more of their income, CPR caps expenditures at income.

Exhibit 34: Relationship between Expenditures and Income



At upper-middle to upper incomes, families also incur taxes and savings. This reduces the after-tax income available for child-rearing expenditures.

Changes Beginning with the BR4 Measurements and Continued with the BR5 Measurements

The BR4 and BR5 measurements contain two improvements.

- Noticing that low-income families spend more than their after-tax income on average, the U.S. Bureau of Labor Statistics, which is the organization conducting the Consumer Expenditure Survey (CE), improved how it measures income. The improvements appeared to reclassify some lower households as having more income in the BR4 and BR5 samples than would have been classified previously as low income in earlier BR samples. Indirectly, this may explain some of the decreased amounts at low incomes from the BR3 study to the BR4 and BR5 studies.

- The BR4 and BR5 studies use "outlays" instead of "expenditures" like the earlier BR studies did. Expenditures track closely with how gross domestic product (GDP) is measured. Namely, GDP considers houses to be investments (physical capital), so the BLS did not consider mortgage principal payments to be an expenditure item. (It did include and continues to include mortgage interest, HOA fees, rent, utilities, and other housing expenses.) Outlays consider all monthly expenses (*e.g.*, mortgage principal payments and interest, and payments on second mortgages and home equity loans). Outlays also include installment payments (*e.g.*, for major appliances and automobiles). Expenditures include the total price of an item at the time of purchase (yet Betson did an adjustment for automobile purchases in the BR1, BR2, and BR3 studies). In short, outlays track closer to how families spend and budget on a monthly basis. These monthly budgets consider the total mortgage payment and installment payments. The impact of the switch from expenditures to outlays appears to be increased expenditures on children at higher incomes from the BR3 studies to the BR4 and BR5 studies. This is likely because higher income families are more likely to purchase

items via installments, have higher installment payments, and more mortgage principal that they are paying down.

Changes Beginning with the BR5

The major change with the BR5 study was an improvement in how taxes were measured. In prior surveys, households would self-report taxes. The BLS learned that families underestimated taxes paid, particularly at high incomes; hence, their after-tax income (spendable income) was smaller than measured. Beginning in 2013, the BLS began using their internal tax calculator (similar to TurboTax) to calculate each household's taxes. This effectively reduced the after-tax income available for expenditures. Another indirect impact was to the average ratio of expenditures to after-tax income, which is used in the conversion of the measurement of child-rearing expenditures to a child support schedule, increased. (This can be illustrated through Exhibit 34, by assuming a drop in the after-tax income line for the cluster of families to the right that have higher incomes.) This increases the amounts from BR4 to BR5 for high-income families because they pay a larger amount of taxes. Their after-tax income is less; hence, the ratio of expenditures to after-tax income is larger.

In addition, a small improvement to the child's share of healthcare expenses was made for BR5. It better reflects the child's share of the family's total out-of-pocket expenses. This results in nominal increases at very low incomes and nominal decreases at very high incomes.

Alternative Measurements of Child-Rearing Expenditures

As mentioned earlier, the updated schedule developed in the next section use the most current Betson-Rothbarth (BR) measurements of child-rearing expenditures as its basis. This subsection, however, explores the impact of using three other recent measurements of child-rearing expenditures,[60] as well as how using the most current BR study would compare to using older BR studies, and BR5 measurements from alternative samples.

Of the three recent studies, only the U.S. Department of Agriculture (USDA) study is used by any state: it is used by Maryland as the basis of its schedule amounts at higher incomes and by Kansas to adjust for the number of children, but another study is used for the Kansas basic obligation amounts. An older USDA study, which is about two decades old, is also used as the basis of the Minnesota child-rearing

[60] The three studies are the USDA study, a study conducted for California by Professor William Rodgers, Rutgers University and a study lead by Professor Emeritus, William Comanor, University of California at Santa Barbara; Lino, Mark. (2017). *Expenditures on Children by Families: 2015 Annual Report.* U.S. Department of Agriculture, Center for Nutrition and Policy Promotion. Miscellaneous Publication No. 1528-2015, Washington, D.C. Retrieved from http://www.cnpp.usda.gov/publications/crc/crc2012.pdf; Rodgers, William M. (2017). "Comparative Economic Analysis of Current Economic Research on Child-Rearing Expenditures." *In* Judicial Council of California, *Review of Statewide Uniform Child Support Guideline 2017*. San Francisco, CA. Retrieved from http://www.courts.ca.gov/documents/lr-2018-JC-review-of-statewide-CS-guideline-2017-Fam-4054a.pdf; Comanor, William, Sarro, Mark, and Rogers, Mark. (2015). "The Monetary Cost of Raising Children." *In* (ed.) *Economic and Legal Issues in Competition, Intellectual Property, Bankruptcy, and the Cost of Raising Children* (Research in Law and Economics), Vol. 27). Emerald Group Publishing Limited, pp. 209–51.

expenditures. In general, older studies form the basis of most other state's guidelines, so they are not appropriate for updating Arizona's child support guidelines.

Graphical comparisons of the existing schedule and schedule amounts using the BR5 measurements and the other recent studies of child-rearing expenditures are show at the end of this subsection. The BR5 measurements consider the baseline sample, which is the same sample used in previous studies and is generally limited to married couple households of child-rearing age with no other adults living in the household besides the parents. There is not a clear justification for using any of the alternative samples explored by Betson.[61]

Premise of Guidelines and Use of Expenditures Studies

Most state guidelines rely on studies of child-rearing expenditures that find expenditures on children increase when the family spends more or has more income rather than studies that examine the minimum and basic needs of children. This is because the premise of most state guidelines is that children should share in the lifestyle afforded by their parents; that is, if the obligated parent's income affords the obligated parent a higher standard of living, the support order should also be more for that higher income parent.

Further, most states, including Arizona, rely on measurements of child-rearing expenditures in intact families. The Betson-Rothartth (BR) measurements and most measurements of child-rearing expenditures underlying state guidelines measure child-rearing expenditures in intact families. The underlying premises are that both parents should be responsible for the financial well-being of their children and that the child should receive the same amount of child-rearing expenditures that the child would have received had the parents lived together and shared financial resources. The principle applies to children of divorcing and separating parents, as well as never-married parents. In other words, children are treated the same regardless of their parents' decisions to marry, divorce, separate, or never marry. Some confound the issue of never-married parents, who tend to have lower income, with considering the ability to pay of very low-income obligated parents. With that said, Arizona, as federally required,[62] considers the impact of the applied schedule amount on the subsistence needs of the

[61] The alternative samples are discussed in more detail in Appendix A beginning on page A-28. The alternative samples expand the number of households used to measure child-rearing expenditures. One alternative includes families with older children, another includes families with domestic partners, and the third alternative considers quarterly wage data rather than annualized data. The first two alternatives aim to be more inclusive of the increasing diversity of family composition and living arrangements of children. As discussed in more detail in Appendix A, the inclusion of adult children produces amounts that are no different or lower than the baseline amounts. In other words, they would reduce the schedule amounts, but because the majority of households do not have adult children in their homes, this adjustment does not seem appropriate. In Appendix A (page A-33), Betson concludes that the difference in the measurements between the sample limited to married couples and sample that included married couples and domestic partners is negligible. In other words, their expenditures on children are similar. The issue of whether to use quarterly or annualized CES data responds to the BLS favoring use of quarterly data rather than annualized data in general. However, because some expenditures may be once-a-year purchases (*e.g.*, clothing), annualization seems more appropriate when the data are applied to measuring child-rearing expenditures. More detail is provided in Appendix A (p. A-35).

[62] 45 C.F.R. § 302.56(c)(1)(ii).

obligated parent. Arizona child support guidelines provides for this through a self-support reserve test that is the last step of the guidelines calculation.[63] At the discretion of court, the self-support reserve test could reduce the schedule-calculated amount.

Overview and History of Recommended Use of Rothbarth Measurements

When Congress first passed legislation (*i.e.*, the Family Support Act of 1988) requiring presumptive state child support guidelines, they also mandated the U.S. Department of Health and Human Services to develop a report analyzing expenditures on children and explain how the analysis could be used to help states develop child support guidelines. This was fulfilled by two reports that were both released in 1990. One was by Professor David Betson, University of Notre Dame.[64] Using five different economic methodologies to measure child-rearing expenditures, Betson concluded that the Rothbarth methodology was the most robust[65] and, hence, recommended that it be used for state guidelines. The second study resulting from the Congressional mandate was by Lewin/ICF.[66] It assessed the use of measurements of child-rearing expenditures, including the Betson measurements, for use by state child support guidelines.

One of the other methodologies explored by Betson was the Engel methodology. The Engel and Rothbarth methodologies are named after the economists who developed them. Both are considered marginal cost approaches; that is, they consider how much more is spent by a couple with children than a childless couple of child-rearing age. To that end, the methodologies compare expenditures of two sets of equally well-off families: one with children and one without children. The difference in expenditures between the two sets is deemed to be child-rearing expenditures. The Engel and Rothbarth methodologies use different indicators of equally well-off families. The Engel methodology uses expenditures on food, while the Rothbarth methodology relies on expenditures for adult goods to determine equally well-off families.[67] (Appendix A provides more details about the theoretical basis of the Rothbarth estimator and the empirical findings from Betson's application of the Rothbarth estimator to expenditures data.) Through calculus, economists have proven that the Engel methodology's reliance on food shares overstates actual child-rearing expenditures because children are relatively food intensive.[68] In contrast, the calculus behind using expenditures on adult goods in the Rothbarth

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[63] Arizona Child Support Guidelines, Paragraph 15.

[64] Betson, David M. (1990). *Alternative Estimates of the Cost of Children from the 1980–86 Consumer Expenditure Survey*. Report to U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation. University of Wisconsin Institute for Research on Poverty, Madison, Wisconsin.

[65] In statistics, the term "robust" means the statistics yield good performance that are largely unaffected by outliers or sensitive to small changes to the assumptions.

[66] Lewin/ICF. (1990). *Estimates of Expenditures on Children and Child Support Guidelines*. Report to U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation. Fairfax, VA.

[67] Specifically, Betson uses adult clothes, whereas others applying the Rothbarth estimator use adult clothing, alcohol, and tobacco regardless of whether expenditures are made on these items. Betson (1990) conducted sensitivity analysis and found little difference in using the alternative definitions of adult goods.

[68] A layperson's description of how the Engel estimator overstates actual child-rearing expenditures is also provided in Lewin/ICF (1990) on p. 2-28.

methodology finds that the Rothbarth estimator understates actual child-rearing expenditures because parents essentially substitute away from adult goods when they have children.[69]

At the time of Betson's 1990 study, most states, including Arizona, had already adopted guidelines to meet the 1987 federal requirement to have advisory child support guidelines. (The requirement was extended to be rebuttal presumptive guidelines in 1989.) Most states were using older measurements of child-rearing expenditures,[70] but many (including Arizona) began using the Betson-Rothbarth 1990 (BR1) study in the mid- to late 1990s. Subsequently, various states and the University of Wisconsin Institute of Research commissioned updates to the BR study over time.[71] The most recent update was commissioned by Arizona as part of this review, and shown in Appendix A.

Rothbarth as the Lower Bound of Credible Measurements

Recognizing economists do not agree on which methodology best measures actual child-rearing expenditures, Lewin/ICF was the first to assess the appropriateness of state guidelines by generally examining whether a state's guidelines amount was between the lowest and the highest of credible measurements of child-rearing expenditures. Amounts that were above the lowest credible measurement of child-rearing expenditures were deemed as adequate support for children. This also responded to a major concern in the 1980s that state child support guidelines provided inadequate amounts for children.[72]

This methodology has been used for several decades now and by several states, including Arizona, for most of their guidelines reviews. For Lewin/ICF's initial assessment, they used the Rothbarth and Engel measurements developed by Betson in his 1990 study as the lowest and highest, respectively. Not only were the empirical results from these studies the lowest and highest, but application of the economic model of each of the estimators suggests that the Rothbarth estimator understates actual child-rearing expenditures and the Engel estimator overstates actual child-rearing expenditures. Since there are no current Engel measurements of child-rearing expenditures, states have been using the U.S. Department of Agriculture measurements as the highest of the credible measurements.

Other Studies underlying Current State Guidelines

As already mentioned, the majority of states (27 states), the District of Columbia, and Guam rely on one of Betson's studies of child-rearing expenditures based on the Rothbarth methodology. The second and third most frequently used studies, both dateing back to the 1980s, are still used by 14 states.[73] An

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[69] A layperson's description of how the Rothbarth estimator overstates actual child-rearing expenditures is also provided in Lewin/ICF (1990) on p. 2-29.

[70] Many states used Espenshade, Thomas J. (1984). *Investing in Children: New Estimates of Parental Expenditures*. Urban Institute Press: Washington, D.C.

[71] See Appendix A for more information about the earlier BR studies.

[72] National Center for State Courts (1987). *Development of Guidelines for Child Support Orders, Final Report.* Report to U.S. Department of Health and Human Services, Office of Child Support Enforcement, Williamsburg, VA. p. I-6.

[73] Most states that have not made major changes to their guidelines schedule or formula for over two decades relate to one of two studies: van der Gaag, Jacques. (1981). "On Measuring the Cost of Children." *Discussion Paper* 663–81. University of

older United States Department of Agriculture (USDA) study (*i.e.*, 2002) forms the basis of the Minnesota guidelines, and the most recent USDA study (2017) is used for the high-income area of the Maryland schedule.[74] New Jersey and Kansas each developed their own study of child-rearing expenditures that forms the basis of their respective guidelines. The New Jersey study also uses the Rothbarth methodology, but it is adjusted for New Jersey's above average income so it is not appropriate for Arizona.[75] The Kansas study is also an older study and uses a unique mathematical approach developed for Kansas and is only used by Kansas.[76] Finally, there are about six states in which the economic basis is unknown.

In short, with the exception of the USDA (2017) study, none of the studies underlying current state guidelines are current or appropriate options for updating the Arizona child support schedule.

New Studies of Child-Rearing Expenditures

Like the BR measurements, the other newer studies of child-rearing expenditures also rely on the U.S. Bureau of Labor Statistics Consumer Expenditure Survey (CE). The Rodgers-Rothbarth measurements rely on the 2000–2015 CE, Comanor measurements rely on the 2004–2009 CE, and the USDA measurement rely on the 2011–2015 CE, as well as other data including the U.S. Department of Health and Human Services National Medical Expenditure Survey (MEPS)[77] and the cost of USDA food plans,[78] which are also used to determine SNAP (Supplemental Nutrition Assistance Program) benefits and military per-diem rates.

Rodgers-Rothbarth Measurements

In 2018, California published Rothbarth measurements prepared by Professor Mark Rodgers of Rutgers University using expenditures data from families participating in the 2000–2015 CE. One reason he considered a larger time period was to average out the expenditures patterns since there were some anomalous patterns associated with the Great Recession of 2007–2009 and its aftermath. Rodgers concluded there were some actual dollar declines in outlays on children in recent years. Rodgers also provides measurements from fewer years and tries to replicate the results from the fourth Betson study. Exhibit 35 shows their differences.[79] It shows that the Rodgers measurements are generally less than

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Wisconsin Institute for Research on Poverty, Madison, WI; or Espenshade, Thomas J. (1984). *Investing in Children: New Estimates of Parental Expenditures*. Urban Institute Press: Washington, D.C.

[74] Maryland also uses BR4 at low incomes.

[75] New Jersey Child Support Institute (March 2013). *Quadrennial Review: Final Report, Institute for Families*, Rutgers, the State University of New Jersey, New Brunswick, NJ. Retrieved from http://www.judiciary.state.nj.us/reports2013/F0_NJ+QuadrennialReview-Final_3.22.13_complete.pdf.

[76] William T. Terrell and Jodi Messer Pelkowski. (2010). *XII. Determining the 2010 Child Support Schedules*. Retrieved from http://www.kscourts.org/Rules-procedures-forms/Child-Support-Guidelines/PDF/Child%20Support%20Determination%20Economist%20FINAL%20REPORT.pdf.

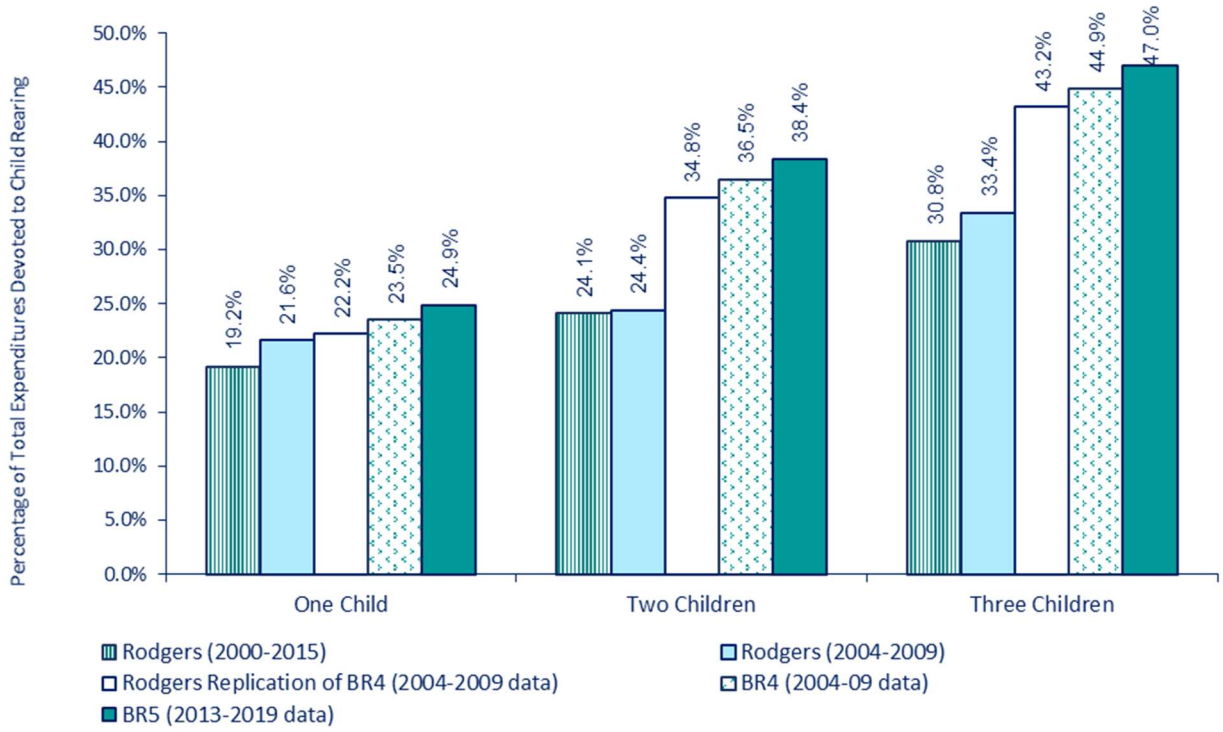
[77] More information about the MEPS is available from the U.S. Department of Health and Human Services Agency for Healthcare Research and Quality site: https://www.meps.ahrq.gov/mepsweb/.

[78] More information about the UDA Food Plans and their costs can be found at the U.S. Department of Agriculture Food and Nutrition Service website: https://www.fns.usda.gov/cnpp/usda-food-plans-cost-food-reports-monthly-reports.

[79] Rodgers measurements are from Table 11, p. 126 of the 2017 California report. Betson measurements are from Appendix A, Table 7, p. 27.

the Betson measurements, even when Rodgers attempts to replicate the results from Betson's fourth study (BR4). Nonetheless, there is never more than two percentage-point gap for the replication, so the difference may not be a statistically significant difference.[80] California did not change its child support formula based on the Rodgers 2018 study.

Exhibit 35: Comparisons of Betson and Rodgers Measurements



There is a finding from Rodgers (2000–2015 data), however, that is of concern. As shown in Exhibit 35, Rodgers finds the average share of spending devoted to children is 19.2 percent for one child and 24.1 percent for two children, which is just about a five percentage-point different. This would suggest the marginal cost of having a second child is very small.[81] A similar difference exists between the percentages for two and three children. Stated differently, the Rodgers results suggests that expenditures for two children are about 125 percent more than expenditures for one child. In contrast, Betson finds that the expenditures for two children are about 150 percent more than expenditures for one child.[82]

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[80] There is insufficient information to conduct a statistical test of the differences; however, Betson (2010, p. 152) estimates the standard errors of his estimates to be about two to three percentage points.

[81] More information about this issue is provided in Appendix A on pp. 24–25. The discrepancy appears to be derived from Rodgers's estimation of the average dollar spent per child per adult. See Rodgers (California 2017, Table 9, p. 124) and Lazaer and Michael (1988, pp. 86–87) to see Rodgers's estimates a much higher level of average dollar spent per child per adult, which, in turn, would lower his final calculation.

[82] See Appendix A, p. 26.

Differences in Application of Rothbarth. Besides differences in data years, there are many differences between Betson's approach and Rodgers's approach that may explain the differences in their results.[83] One major difference is their application of Rothbarth's theory.[84] Rothbarth asked the question, "How much additional income does a family of given size require to compensate it for the costs of an additional child?" In answering the question, Rothbarth speculated that the answer would depend on the standard of living of the parents. Further, if the answer depended on the standard of living of the parents that the parents' tastes were unaffected by the presence of additional children. Both Betson and Rodgers perceive this as indirectly estimating child-rearing expenditures from an observed level of expenditures on adult goods through principles of economic theory on consumption. Rodgers adopts Lazear and Michael's approach, which is maximizing utility given a budget constraint on expenditures on either adult goods or children goods.[85] In contrast, Betson relies on classical economic theory of consumer surplus and compensated demand, while assuming expenditures on adult goods (*i.e.*, the amount expended on adult clothing) is a normal good: that is, the demand for a normal good increases if income increases or the price of that good goes down.[86] Their difference in theory application creates differences in their estimating equations and methods. Rodgers uses a two-step approach where the first step is estimating the ratio of total expenditures on adults to observed expenditures on adults based on demographic variables and income.[87] The second step is estimating total expenditures among families with children based on the ratio from the first estimating equation and other demographic characteristics.[88] In contrast, Betson's theoretical approach does not require a two-step approach. Instead, Betson estimates how expenditures on adult goods vary with family size (that vary with the presence and number children), demographic characteristics, and total expenditures. Even when Rodgers attempts to replicate Betson, there are differences. For example, Betson and Rodgers use different functional forms to specify their estimating equation (*e.g.*, Betson uses a quadratic equation and Rodgers does not). The quadratic functional form allows the percentage of expenditures to vary as the parents' incomes increase.

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[83] Appendix A provides a more thorough discussion of the technical differences between the Betson and Rodgers measurements.

[84] Rothbarth, Erwin. (1943.) "Note on a Method of Determining Equivalent Income for Families of Different Composition." *In War Time Patterns of Savings and Spending.* Edited by Charles Madge, Cambridge, Cambridge University Press. Appendix 4.

[85] See pages 97–100 of Rodgers (2017) for the best description of Rodgers, as well as pp. 62–72 of Lazear and Michael (1988).

[86] Consumer surplus and compensated demand are typically analyzed in consumer economics through use of the "Engel" curve. It is not to be confused with the Engel methodology for measuring child-rearing expenditures, although the same economists developed them. The Engel curve is an alternative way to look at demand for a particular economic good. The ordinary demand curve examines the relationship between quantity demanded of an economic good and the price of that economic good holding income constant. The classic use of the Engel curve examines the relationship between quantity demanded of an economic good and income holding price of that economic good constant. Betson's application of the Engel curve uses total expenditures rather than income.

[87] Rodgers, William M. (2017). "Comparative Economic Analysis of Current Economic Research on Child-Rearing Expenditures." *In* Judicial Council of California, *Review of Statewide Uniform Child Support Guideline 2017*. San Francisco, CA. pp. 66 and 99. Retrieved from http://www.courts.ca.gov/documents/lr-2018-JC-review-of-statewide-CS-guideline-2017-Fam-4054a.pdf.

[88] See Edward P. Lazear and Robert T. Michael (1988). *Allocation of Income Within the Household.* University of Chicago Press, Chicago, Illinois. Equation 5.5 on p. 80.

Differences in Data. In addition, their sample selection criteria differ slightly (*e.g.*, in Betson's base sample, he excludes families with a third adult, even though the third adult may be a child of the parents in the household, while Rodgers does make an identical exclusion in his sample).[89] Still, there are other differences that are not clear. Both Rodgers and Betson, however, use expenditures on adult clothing as their measurement of adult goods. Betson makes an adjustment to adult clothing to exclude adult clothing purchased for teenage children.[90] It is not clear whether Rodgers makes a similar adjustment. Nonetheless, this is likely to only produce small differences between the Betson and Rodgers measurements and, hence, is unlikely to be the major factor contributing to their differences.

USDA Measurements

Until recently, the USDA produced annual or biannual updates to its measurements. Its most recent study considers 2015 data and was published in 2017. The USDA first measures expenditures for seven different categories (*i.e.*, housing, food, transportation, clothing, healthcare, childcare and education, and miscellaneous), then sums them to arrive at a total measurement of child-rearing expenditures. Some of the methodologies use a pro rata approach, which is believed to overstate child-rearing expenditures. The USDA provides measurements for the U.S. as a whole and four regions: the South, Mid-West, Mid-Atlantic, and West.

Using expenditure data from 2011 through 2015, the USDA found that average child-rearing expenses were $10,240 to $24,150 per year for the youngest child in a two-child family in the West in 2015. The amount varies by age of the child and household income.

Comanor et al. Study

Still another study, led by a University of California at Santa Barbara Professor Emeritus William Comanor, has been extensively vetted by Minnesota. Arguably, the Comanor study measures the child's basic needs. It is arguable because the authors believe their methodology reflects child-rearing expenditures across all income ranges, The Comanor amounts, however are very low (*i.e.*, the Comanor measurement of food costs is below what the federal government measures as the minimum amount needed to sustain and uses as the basis for Supplemental Nutrition Assistance Program–SNAP, which was formerly known as "food stamps").

In all, the Comanor amounts are near federal poverty levels. In 2018, Comanor reported that child-rearing costs of $3,421 per year for one child and $4,291 per year for two children in low-income households.[91] The 2020 federal poverty guidelines set the poverty thresholds at $12,760 per year for one person and $4,480 per year for each additional person.[92] For middle incomes (*i.e.*, married couples with an average income of $76,207 per year), Comanor reported child-rearing costs of $4,749 per year

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[89] Betson did consider this as an alternative sample as shown in Appendix A. Due to the small percentage of households with adult children and the technical issues caused in the modeling, using the findings from the alternative sample did not seem warranted.

[90] See Appendix A, p. 13.

[91] Comanor, William. (Nov. 8, 2018). *Presentation to Nebraska Child Support Advisory Commission.* Lincoln, Nebraska.

[92] U.S. Department of Health and Human Services. (2020). *2020 Poverty Guidelines for the 48 Contiguous States and the District of Columbia.* Retrieved from https://aspe.hhs.gov/2020-poverty-guidelines.

for one child and $6,633 per year for two children. These amounts are not that much more than the amounts for low incomes. Further, Comanor's one-child amount for middle incomes is almost equivalent to poverty (*i.e.*, $4,749 per year is almost equivalent to $4,480 per year albeit the amounts are not adjusted for differences in 2018 and 2020 price level), and Comanor's two-child amount for middle incomes is below poverty (*i.e.*, $6,633 is less than $8,960 per year,[93] which is twice the $4,480 amount).

Most states believe that the child support guidelines should provide for more than a basic needs amount if the obligated parent can afford a higher standard of living. In other words, if the obligated parent has sufficient income to enjoy a higher standard of living, the child should share in that higher standard of living. For these reasons, states often dismiss the Comanor study.

Comparisons of Updated Schedule to Alternative Measurements

The comparisons serve two purposes: they are to gauge the appropriateness of the existing and proposed, updated BR5 schedule, and they illustrate what the impact would be if Arizona favored updating the child support schedule using another study of child-rearing expenditures besides the BR measurements.

Exhibit 36, Exhibit 37, and Exhibit 38 compare the measurements for one, two, and three children, respectively. The USDA amounts are for the Western region. The measurements are all converted to 2020 price levels. They show the schedule amounts for a range of combined gross incomes. This is the amount owed by both parents before the obligated parent's amount is prorated and before the consideration of parenting days. The BR and Rodgers-Rothbarth measurements[94] are converted to gross income using the 2020 federal withholding tax formula and 2020 Arizona income tax rates, and same tax assumptions detailed in Appendix B.

Summary of Findings from Comparisons

There are several observations that can be made from Exhibit 36, which considers differences in the impact of using alternative studies for one child.

- The studies differ in the maximum monthly combined adjusted gross income that can be considered.
    - The current existing Arizona schedule considers combined incomes up to $20,000 per month.
    - The BR5 measurement can consider combined incomes up to $34,150 per month.
    - The USDA, Rodgers-Rothbarth, and Comanor measurements can consider combined incomes up to about $17,000 per month. Above this income, there is insufficient data to know the rate of

[93] The federal poverty guidelines are not adjusted for economies of scale: that is, the cost of two children is not necessarily double the cost of one child.

[94] The BR5 measurements are converted as described in Appendix C. The Rodgers measurements are converted using the same steps only the data are from Rodgers (2017), *supra* n. 12, Table 11a, p. 128.

increase in child support expenditures as income increases (*e.g.*, the data are insufficient to know if the curve flattens at very high incomes or continues to climb upward).

- The Comanor measurement produces the lowest amounts. As discussed earlier, the Comanor measurement produces near-poverty amounts.
- The Rodgers-Rothbarth measurements produces lower amounts than any of the BR measurements. The underlying reasons for differences in the Rodgers-Rothbarth and BR measurements were also discussed earlier. They appear to result mostly from differences in modeling assumptions.
- The USDA measurement generally produces the highest amounts, but the BR5 measurement begins to exceed the USDA measurement at combined incomes of about $15,000 gross per month.
- Above incomes of about $14,000 gross per month, the BR5 measurement produces higher amounts than the older BR measurements even when they are adjusted for 2020 price levels and tax rates.
- The BR5 measurement produces slightly lower amounts than the existing Arizona schedule for combined incomes below about $4,300 per month. This is discussed in more detail and in relationship to the minimum-wage earnings in Section 5.
- The existing Arizona amounts are generally between the lowest and the highest of the measurements. As mentioned earlier, several economists and policymakers believe that any amount between the lowest and the highest of the credible measurements is appropriate for a state's guidelines. This provides some justification to making no changes to the schedule.

The summary observations for two and three children are similar to those for one child except the decreases under the BR5 measurements, which are also very small, occur below combined incomes of $2,100 gross per month for two children and $1,150 gross per month for three children. The patterns for four and more children are very similar to that of four children. The frequencies of Arizona orders[95] by number of children are 54 percent are for one child; 32 percent are for two children; 10 percent are for three children; and 4 percent are for four or more children.

[95] This is based on preliminary analysis of court case files of orders established or modified in 2018. The analysis of case file data is being conducted to inform the guidelines review.

Exhibit 36: Comparison of Measurements: One Child

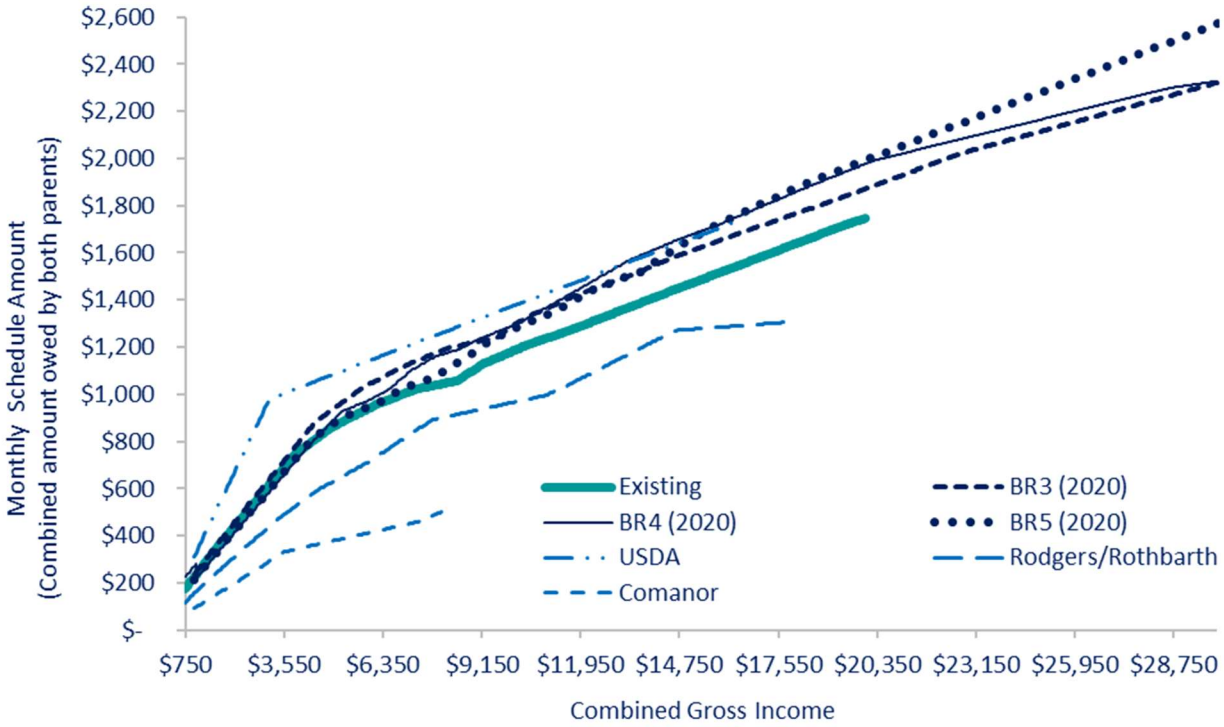


Exhibit 37: Comparison of Measurements: Two Children

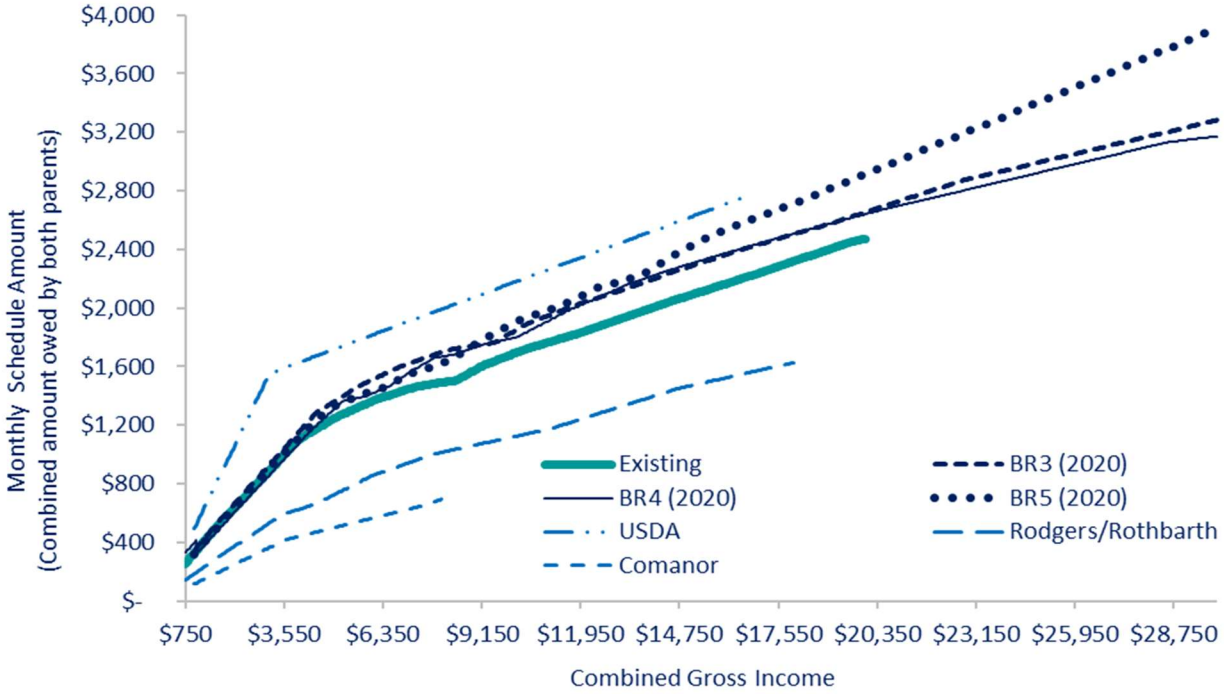
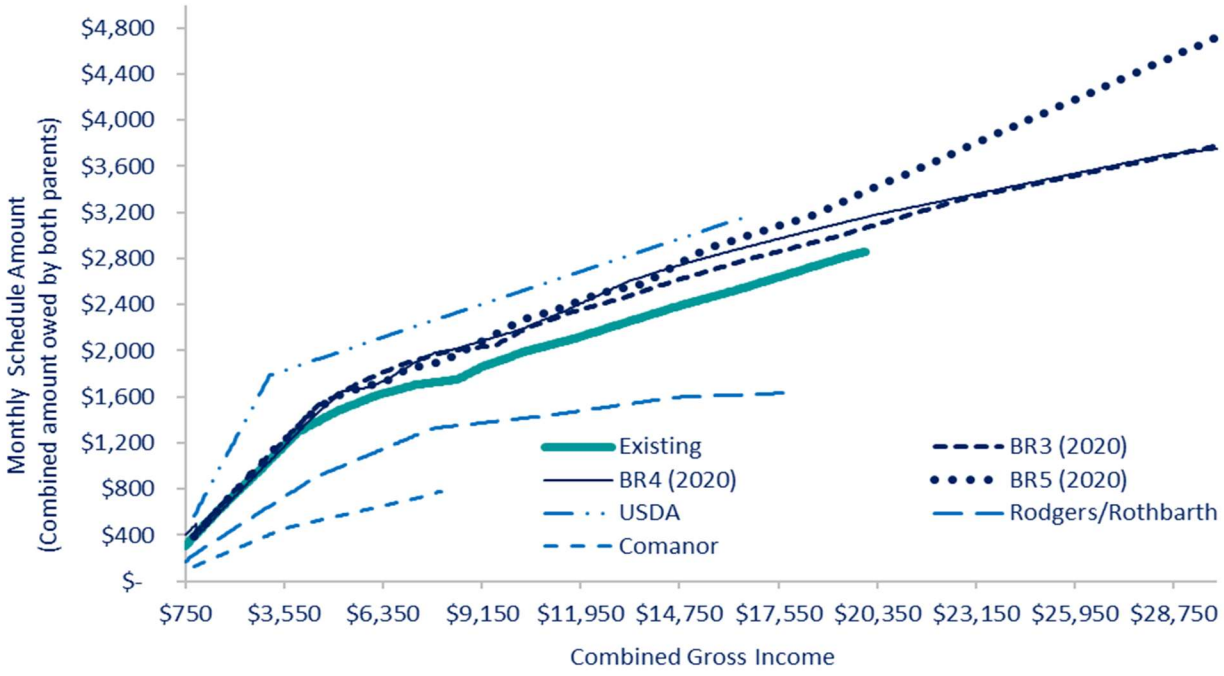


Exhibit 38: Comparison of Measurements: Three Children



Decreases at Very Low-Incomes

As noted above, the BR5 measurements produce nominal decreases at very low incomes. The decrease is believed to result from the improved definition of income discussed in Section 3.

Exhibit 39: Area and Amounts of Decreases if Schedule Updated Using BR5 Measurements

	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
Range of Combined Gross Incomes with Decreases	$750–$4,300/mo	$750–$2,100/mo	$750–$1,100/mo	$750–$1,100/mo	$750–$1,100/mo	$750–$1,100/mo
Smallest Monthly Decrease	< $1	< $1	< $1	< $1	< $1	< $1
Largest Monthly Decrease	$20	$13	$11	$11	$13	$14

Even though adopting the BR5 schedule would produce some decreases, few cases are likely to be affected for two reasons. One reason is that most of the incomes where the decreases would apply are below full-time minimum wage earnings. The second reason is that application of the self-support reserve test would reduce the order amount from the obligated parent's prorated share of the schedule amount for much of the area of the schedule where there are decreases.

The incomes of the area of the BR5 schedule were there would be decreases are generally below full-time earnings from the state minimum wage. In 2020, the state minimum wage is $12 per hour and it increased on January 1, 2021, to $12.15 per hour. Based on a 40-hour workweek, this is equivalent to $2,080 per month in 2020 and $2,105 per month in 2021. If both parents work a 40-hour workweek, the

combined income would be $4,160 per month in 2020 and $4,216 in 2021. For the guidelines calculation, it is often presumed that each parent has the capacity to earn at least full-time minimum wage earnings. Based on the analysis of guidelines worksheets from Arizona court case files, the obligated parent's income on the worksheet was less than full-time minimum wage earnings among less than 6 percent of the worksheets sampled and the income on the worksheet for the parent receiving support was less than full-time minimum wage earnings among less 9 percent of the sampled worksheets. Both parents have incomes below full-time minimum wage earnings among 2 percent of the sampled worksheets.

Arizona provides a self-support reserve equivalent to 80 percent of full-time, minimum wage earnings, which is $1,684 in 2020 and $1,685 in 2021. Based on the sampled worksheets, there was a downward adjustment to the guidelines-calculated amount for 89 percent of the obligated parents where the self-support reserve test indicated that the qualified parent was eligible for a self-support reserve adjustment. The adjustment is discretionary. The court may apply it after considering the financial impact the reduction would have on the receiving parent's household.

In all, these statistics suggest that adopting the BR5 schedule will affect a negligible number of cases due to the Arizona's minimum wage and its use to determine minimum earnings capacity and the self-support reserve.

Pros and Cons of Alternative Economic Studies

The pros of using BR5 measurements are that it is the most current study available, it is a consistent with the economic method underlying the current schedule, it is a valid and robust method, and the BR measurements have been used by several states for several decades. The cons, depending on perspective, produce some decreases while increases are expected over time, and there are some substantial proposed increases at high income that lack corroborating evidence. The next most viable study would be the USDA measurements. The pros of the USDA measurements are the methodology is sensible; the methodology is well-documented and can easily be understood by a layperson; and, until recently, the USDA measurements were regularly updated, while the BR measurements depend on a state or another organization taking the initiative to update. The cons are the most recent study considers 2015 expenditures on children; an updated USDA study is long overdue and there is no timeline when an updated study will be available; some of the levels at very low incomes exceed what can be legally be withheld from an obligated parent's paycheck, while some may perceive it to not be appropriate to set order amounts of what can be withheld from a parent's paycheck; and the multiplier for four or more children may be too high.[96] Since the Rodgers and Comanor studies are now both older, their pros are less clear. No state uses either of them. One con to the Rodgers measurements is the marginal increases for one to two children and two to three children appear very low at a practical level: they suggest that additional children have a very low marginal cost. One con to the Comanor

[96] The USDA acknowledges it had few households with four or more children to develop an appropriate multiplier. More about multipliers and their use in developing schedule amounts for four or more children is provided in Appendix A.

measurements is they are close to poverty level, while most state guidelines presume that guidelines amounts should be higher for parents with above-poverty incomes.

SECTION 4: UPDATING THE SCHEDULE: OVERVIEW OF DATA AND ASSUMPTIONS

As stated earlier, child support schedules are part policy and part economic data. Besides economic data on the cost of raising children, there are economic data and technical assumptions pertaining to price levels, tax rates, and other things. Sometimes, the policy decisions and economic data and technical assumptions are intertwined. For example, if a Rothbarth study is used, there must be assumptions to convert the Rothbarth measurements to a gross-income basis because the Rothbarth measurements relate to total household expenditures. In contrast, no conversion is necessary for the USDA measurements because they relate to gross income.

This report develops an updated schedule based on the newest Betson-Rothbarth (BR5) measurements and other assumptions outlined in which, considers several factors in the updating of the schedule:

1. Economic study to use as the basis of the child support schedule;
2. Extending the schedule to higher incomes;
3. Adjust to current price levels;
4. Exclude childcare, child's health insurance premium, and extraordinary out-of-pocket medical expenses;
5. Consider expenditures to net income ratio, which is the first step to converting BR measurements to gross-income basis;
6. Consider federal and state income taxes and FICA, which is the second step to converting BR measurements to gross-income basis;
7. Whether and how to convert the BR measurements, which are based on national data, for differences in Arizona prices; and
8. Consideration of the self-support reserve.

Each of these factors is discussed in more detail in the remainder of this section. Exhibit 40 lists each of these factors, and lists the data or assumption used for the existing schedule, the updated schedule, and any alternatives.

FACTOR 1: ECONOMIC STUDY

The range of economic studies available for updating the schedule are summarized in the previous section. The most current Betson-Rothbarth (BR5) measurements are used to develop an updated schedule for reasons that are also discussed in the previous section. Appendix A details the development of the BR5 measurements. Appendix B provides more in-depth, technical information about the conversion of the BR5 measurements to an updated schedule. Appendix C provides an updated schedule based on the BR5 measurements.

Exhibit 40: Summary of Other Considerations and Steps Used to Update the Schedule

Factor	Basis of Existing	Basis of Updated Schedules	Other Alternatives
1. Economic study	• BR3	• BR5 (baseline sample)	• Other studies: USDA, Rodgers-Rothbarth, Comanor et al., BR3, or BR4 • BR5 from alternative samples
2. Extending schedule to higher combined gross incomes and whether to adjust the amounts at high incomes	• $20,000 per month	• BR5 allows for the schedule to be extended to $34,000 per month	• Schedule can be extended to higher incomes • Adjustment at high income due to new measurements and lack of checks
3. Adjust to current price levels	• April 2014 price levels	• October 2020 price levels[97]	• More current price levels
4. Exclude childcare, child's health insurance premium, and extraordinary out-of-pocket medical expenses	• Excludes all but the first $250 per child per year in ordinary, out-of-pocket medical expenses	• No change	• Retain assumption • Exclude all • Ohio approach
5. Consider expenditures to net income ratio	• Converts expenditures to net income using ratios from same families in CE that Betson uses • Caps expenditures at 100%	• No change	• Assume all after-tax income is spent
6. Consider federal and state income taxes and FICA	• 2014 federal and state income tax withholding formulas for a single taxpayer	• 2020 tax rates for single taxpayer	• Various tax assumptions, including tax rates of married couple with children

[97] This was the most recent month available when the subcommittee reviewed the schedule.

7. Adjust for Arizona's cost of living	• No adjustment to national data	• No adjustment to national data	• Adjustment for Arizona's price parity (96.5%)[98] or another index
8. Consideration of the self-support reserve	• Adjustment made in worksheet • Self-support reserve is 80% of state minimum wage	• No change	• Incorporate adjustment into schedule • Alternative self-support reserve amounts

[98] U.S. Bureau of Economic Analysis. (May 2020). *Real Personal Income By State and Metropolitan Area, 2018.* https://www.bea.gov/news/2020/real-personal-income-state-and-metropolitan-area-2018.

FACTOR 2: UPDATE AT HIGH INCOMES

As previously mentioned, the current schedule considers combined gross incomes up to $20,000 per month and a BR5 schedule could extend the schedule to combined gross incomes of about $34,000 per month. Extending the schedule would produce greater consistency in order amounts for higher incomes and predictability of order amounts for parents with high income. Based on the analysis of guidelines worksheets sampled from Arizona court case files, the combined income was above $20,000 for about 3 percent of sampled cases. This is up from 1 percent from the last case file review that considered orders established or modified in 2013. According to the 2018 U.S. Census American Community Survey,[99] 11 percent of all Arizona married-couple families have incomes more than $200,000 per year. The percentage will undoubtedly continue to grow. Some of these families may eventually dissolve and there will be a need for child support. Extending the schedule to higher incomes will better serve these families if this situation is to occur.

Adjusting the BR5 Measurements at Very High Incomes

The economic evidence suggests increased schedule amounts for high incomes, yet the concern is whether the BR5 amounts are too much of an increase, particularly for one child for combined incomes above about $15,000 gross per year. An increase is confirmed by comparing the existing schedule amounts to the BR3 amounts adjusted for increases in price levels and changes in federal and state income taxes and FICA. Recent federal income tax rates have decreased the effective tax rate, hence providing more spendable income that can be spent, among other things, on children. Other evidence suggests higher incomes are also spending more. For example, the U.S. Bureau of Labor Statistics finds that household expenditures increased by 3 percent from 2018 to 2019.[100]

As shown in Exhibit 41, the increases at higher incomes under a BR5 schedule exceed the USDA measurements for one child, but not for two or more children. (The patterns for four or more children are similar to those for three children.) In all, the information available to check the amount of the increase is limited. Other studies of child-rearing expenditures that are used as a gauge do not go as high in income and are based on older data. For example, the USDA study considers expenditures data from 2011–2015 and only considers gross incomes up to $17,000 per month. The USDA is the preferred barometer because it is historically the upper bound of credible measurements of child-rearing expenditures. As previously mentioned, the Rothbarth methodology is theoretically known to understate actual child-rearing expenditures, and many economists believe the USDA overstates actual child-rearing expenditures. To this end, BR5 measurements should be less than USDA measurements. This is not the observation in Exhibit 41 for one child at high incomes. It is not known whether a comparison to a more current USDA study (*i.e.*, more current than expenditures data collected in 2011–

[99] U.S. Census. Data retrieved https://data.census.gov/cedsci/.
[100] U.S. Bureau of Labor Statistics. (Sept 2020). *Consumer Expenditures: 2019.* Retrieved from https://www.bls.gov/news.release/cesan.nr0.htm.

2015) would produce a different result, particularly since the underlying data are based on expenditures in years prior to 2018 federal income tax reform and in some years before the U.S. Bureau of Labor Statistics, which may have vastly changed the relationship between income and expenditures, or household expenditures have increased recently in general. Another issue is that there is a margin of error to the measurements. Due to this, it could be that if another sample were drawn, it may have lower amounts. It would not be good policy to increase the amounts by over 20 percent and then reduce them next time just because of the margin of error.

Exhibit 41: Amount of Proposed Increases for Combined Incomes above $15,000 per Month

	One Child	Two Children	Three Children
Increases under USDA[101]	$189–$190 (12%)	$532–$551 (25%–26%)	$586–$610 (24%)
Increases under BR3 (2020)	$121–$138 (7%–9%)	$171–$199 (7%–10%)	$197–$237 (7%–10%)
Increases under BR5	$185–$247 (13%–14%)	$331–$439 (16%–18%)	$390–$520 (16%–18%)

Possible Options at High Incomes and Their Pros and Cons

One option is to cap the increase to 12 percent, which is the maximum increase under the USDA measurement for one child. (Note this is a cap to the increase, not a cap to the schedule amount.) The capped increase could be applied to just one child or all number of children, and it could vary by the number of children. Another option would be to use the BR3 or BR4 as a cap.

There are least two pros to the cap. First, it provides some leeway if future measurements show a lesser amount. The second pro is the capped increase would be under the 15 percent modification threshold, which some may perceive as favorable. For the purposes of modification, at least a 15 percent difference between the existing amount and the guidelines-applied amount is considered evidence of substantial and continuing change of circumstances. The cons of capping the increase are it could be shortchanging children of higher income parents and it could necessitate even larger increases next review if future measurements suggest even a larger increase.

FACTOR 3: PRICE LEVELS

The third factor noted in Exhibit 40 is the year of the price level used to develop or update the schedule. All of the economists used the Consumer Price Index, which is the major price index used across the nation. The existing schedule considers April 2014 price levels, while Betson provides the information in May 2020 price levels. CPR updates the May 2020 amounts for October 2020 prices, the most current

[101] The USDA increases only concern incomes up to combined incomes of about $17,000 per month, while the BR measurements consider combined gross incomes up to $20,000 per month.

month for which price levels are published. Prices have increased 20.2 percent since the existing schedule was developed. This does not mean a 20.2 percent increase to the schedule amounts is appropriate. Much of the price increase has been offset by increases to income. However, it is not a wash. There have too many nuanced changes to spending patterns (*e.g.*, more cell phone use and the cost of clothing was stabilized for several years due to knock-offs and imports) and variation between income ranges in expenditure changes. Updating the schedule for more recent data is the best way to recalibrate the schedule for these changes.

Factor 4: Exclude Childcare Expenses and Out-of-Pocket Healthcare Costs

The measurements of child-rearing expenditures cover *all* child-rearing expenditures including childcare expenses and the out-of-pocket healthcare expenses for the child. This includes out-of-pocket insurance premium on behalf of the child and out-of-pocket extraordinary medical expenses such as deductibles. These expenses are widely variable among cases (*e.g.*, childcare costs for an infant are high and there is no need for childcare for a teenager). Instead of putting them in the schedule, the actual amount of the expense is addressed on a case-by-case basis in the worksheet. To avoid double-accounting in the updated schedule, these expenses are subtracted from the measurements when developing the updated schedule. Appendix B provides the technical details on how this is done.

Inclusion of $250 per Child per Year for Out-of-Pocket Medical Expenses

However, there is an exception to excluding the child's medical expenses. An amount to cover ordinary out-of-pocket healthcare expenses (*e.g.*, aspirin and copay for well visit) was retained in all of the schedules. The current schedule assumes up to $250 per child per year for ordinary out-of-pocket healthcare expenses based on data. That assumption is retained for the proposed, updated schedule because the average is still near $250 per child per year. The concern, however, is the amount varies significantly among those with Medicaid and those with private insurance, particularly with high deductibles. The 2015 Medical Expenditure Panel Survey (MEPS) finds that the average out-of-pocket medical expense per child was $248 per year but varied depending on whether the child was enrolled in public insurance such as Medicaid or had private insurance. Based on MEPS data, out-of-pocket medical expenses averaged $63 per child per year for children who had public insurance and $388 per child per year for those with private insurance.[102] The 2017 MEPS data has not drilled down to the public insurance and private insurance level, but they do report an average for all children, $271 per child, so still close to the $250 level.

Some states are responding to the disparity in out-of-pocket expenses between those with public insurance and those with private insurance two ways. One way is to include *no* ordinary out-of-pocket

[102] U.S. Department of Health & Human Services Agency for Healthcare Research and Quality. (n.d.) *Medical Expenditure Panel Survey*. Retrieved from https://www.meps.ahrq.gov/mepsweb/data_stats/meps_query.jsp.

medical expenses (*e.g.*, Connecticut and Virginia) in the schedule. This would reduce the schedule amounts. This means parents must share receipts for *all* out-of-pocket medical expenses, not just those exceeding $250 per child per year. The pros are this approach is more accurate and can better address a range of parenting days where both parents may incur out-of-pocket medical expenses since the child is in the care of each parent some of the time. In addition to including no ordinary out-of-pocket medical expenses in the schedule, the second method actually just takes the first method one step further. It does not include an amount for out-of-pocket medical expenses in the schedule, but it provides for a standardized amount of out-of-pocket medical expenses that could differ depending on whether the child is enrolled in Medicaid. This standard amount is added on a line in the worksheet similar to the add-on for childcare except it is the same amount for each child depending on whether the child is on Medicaid or not. The standard amount is provided in the guidelines. Michigan and Ohio use this approach. (An example from Ohio is provided in Exhibit 42. It considers annual income rather than monthly because Ohio bases its guidelines on annual income. However, the annual amount is more comparable to the $250 per child per year amount.) The cons are that it makes the calculation more cumbersome and requires knowledge of whether the children are enrolled in Medicaid (which may change frequently). The pros are the same as the first method.

Exhibit 42: Illustration of Ohio's Alternative Approach to Out-of-Pocket Medical Expenses

Worksheet Calculation			
	Parent A	Parent B	Combined
1. Annual Income	$40,000.00	$40,000.00	$80,000.00
2. Share of Income	50%	50%	
3. Schedule Amount (Annual)			$20,000.00
4. Annual Cash Medical			$388.70
5. Total Obligation			$20,388.70
6. Each Parent's Share (Line 2 x Line 5)	$10,194.35	$10,194.35	

Cash Medical Obligation	
Number of Children	Annual Cash Medical Amount
1	$388.70
2	$777.40
3	$1,166.10
4	$1,554.80
5	$1,943.50
6	$2,332.20

Pure or Adjusted Per-Capita Extraordinary Medical Expenses

In addition to the alternative concerning the $250 per child per year in out-of-pocket medical expenses included in the schedule, there is an alternative to how the cost of the child's share of extraordinary medical and health insurance are subtracted from the measurements of child-rearing expenditures. Because the child's share of the expense cannot be determined, Betson provides the average per-capita share of extraordinary medical expenses and health insurance (after adjusting for the $250 per person per year). Because it is a per-capita amount, it considers the two parents and the number of children. CPR, as described in Appendix B, makes a further adjustment to account for the fact that adults incur a higher level of medical expenses than children. This results in less being subtracted than if the per-

capita amount were subtracted. In turn, this adjustment (which is the adjustment used to develop the proposed schedule) increases the schedule amount. The pro of the alternative approach (which does not adjust for children's healthcare costs being less than adult's healthcare costs) is it is easier to calculate. The con is it is less accurate. The alternative approach would reduce the schedule amounts slightly.

Factor 5: Conversion of Expenditures to Net Income

The need for this conversion is illustrated by Exhibit 34 on page 54. As stated earlier, Betson reports the measurements of child-rearing expenditures as a percentage of total expenditures. Thus, they must be converted from total expenditures to after-tax income than gross income for the purposes of a gross-income based schedule. The conversion to after-tax income for the proposed updated schedule is done by taking the expenditures-to-income ratio for the same subset of CE families used to develop the measurements. (These ratios are show in Appendix B.) This is weighted by measurement of child-rearing expenditures. For example, if a family devotes 20 percent of its expenditures to one child, on average, for a particular income range and the families of the same income range spend an average of 80 percent of their income, then a net-income based schedule assumes 16 percent of after-tax income (where 16% is 20% multiplied by 80%) is spent on child-rearing expenditures. If the ratio is greater than 100 percent, which means the family spends more than their income, it is capped at 100 percent. This implies that families cannot spend more than their income. This is the assumption used to develop the existing schedule as well as the proposed, updated schedule. As shown in Appendix B, families with after-tax income below about $3,333 per month (which is about $4,000 gross per month) spend more than their income on average.

There are at least two alternatives. One would be to eliminate the cap, which would increase the schedule amounts below incomes of about $4,000 gross per month. The cons of this approach are that it is essentially asking families to spend more than their after-tax income, and it would not affect many cases anyway due to the common presumption that each parent can at least earn full-time, minimum wage and the application of the self-support reserve test that affects cases with incomes in this range.

Another alternative assumption is that families spend all of their after-tax income. Under this assumption, family expenditures and after-tax income are equal, so no additional adjustment is necessary. The District of Columbia is the only state to make this assumption. This would increase the schedule amounts.

Factor 6: Conversion to Gross Income

After the measurements of child-rearing expenditures are converted to after-tax income as described above, then they are converted to gross income. The conversion to gross income relies on the federal withholding formula and state income tax rates. The IRS Method 5, which is to be used with the 2019

IRS W-4, is used to calculate the federal income tax.[103] Two allowances are assumed, which is the amount to be used for a single individual with no dependents. This yields the exact same federal tax as application of IRS Method 4, which is to be used with the 2020 IRS W-4 assuming that all income is taxed at the rate of a single individual who has no second job, claims no dependents, and has no other deductions. In short, although the IRS provides five different withholding methods, they do not vary in their result.

The federal withholding formula also considers FICA. The Social Security and Medicare tax is 6.2 percent for incomes up to $137,700 per year.[104] Above that level, the Medicare tax of 1.45 percent applies. In addition, the 0.9 percent additional Medicare tax for incomes above $200,000 per year is also considered.

The state income tax is more complicated. Arizona is unique in that it allows an employee to elect how much to withhold. Specifically, Arizona provides employees with check boxes to elect 0.8 percent, 1.3 percent, 1.8 percent, 2.7 percent, 3.6 percent, 4.2 percent, or 5.1 percent.[105] In contrast, most states do not explicitly give employees an option on the percentage withheld. The actual Arizona income tax rates beginning in 2020 cover four income tax brackets and become progressively higher with more income.[106] For a single tax filer, the rates are 2.59 percent for incomes of $0 thru $26,500 per year, 3.34 percent for incomes of $26,501 thru $53,000 per year, 4.17 percent for incomes of $53,001 through $159,000 per year, and 4.5 percent for incomes of $159,001 or more. Since Arizona began matching the federal standard deduction in 2020, these rates are applied to federal taxable income in the income conversion.

With input from the Subcommittee, CPR also explored the impact of the income tax surcharge of 3.5 percent to be imposed on taxable incomes in excess of $250,000 per year that was passed in the November 2020 election through Proposition 208. CPR found no impact on the schedule amounts until combined adjusted gross income was at least $21,600, and that the largest impact would occur at a combined adjusted gross income of $30,000 per month. Its consideration would reduce the highest amount on the schedule from $2,572 to $2,543 per month for one child, from $3,911 to $3,860 per month for two children, $4,723 to $4,655 per month for three children, $5,276 to $5,199 per month for four children, $5,803 to $5,719 for five children, and $6,308 to $6,217 per month for six children. Due to the newness of the tax, its uncertainty to various challenges at the time, and the limited impact, the Subcommittee opted to acknowledge and document the impact of the tax, but not to adjust the schedule for it at this time.

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[103] *IRS Publication 15-A: Federal Income Tax Withholding Methods: 2020*. p. 51. Retrieved from https://www.irs.gov/publications/p15a.
[104] *IRS Publication 15-A: Federal Income Tax Withholding Methods: 2020*. Retrieved from https://www.irs.gov/publications/p15a.
[105] Arizona Department of Revenue. *Arizona Withholding Percentage Election*. Retrieved from https://azdor.gov/forms/withholding-forms/arizona-withholding-percentage-election.
[106] Arizona Department of Revenue. (n.d.) *Updated Guidance for Arizona Individual Income Taxpayers*. Retrieved from https://azdor.gov/news-events-notices/news/updated-guidance-arizona-individual-income-taxpayers.

Using federal and state income tax withholding formulas and assuming all income is taxed at the rate of a single tax filer with earned income is a common assumption among most states and the assumption underlying the existing Arizona schedule. Most alternative federal tax assumptions would result in more after-tax income, hence higher schedule amounts. For example, the District of Columbia assumes the tax-filing status is for a married couple claiming the number of children for whom support is being determined. The District used this assumption prior to 2018 tax reform that eliminated the federal tax allowance for children and expanded the federal child tax credit from $1,000 per child to $2,000 per child. The 2018 federal tax changes are scheduled to expire in 2025. Alternative state income tax assumptions could result or more or less income depending on the alternative assumption but will not have a smaller impact because the state income tax rate is considerably less than the federal income tax rate.

Since the income conversion assumes single tax filing status, there is no adjustment for the child tax credit or the Earned Income Tax Credit (EITC). The child tax credit would be impossible to include in the schedule since it applies to one parent and that parent's income must be within a certain range to receive the full child tax credit and another range to receive a partial child tax credit (which the IRS calls the additional child tax credit). In contrast, the schedule considers the combined gross income of the parents. Say the combined income of the parents is $150,000 per year. If the parents have equal incomes ($75,000 per year), either parent's income would make them income-eligible for the full child tax credit. Say, however, that the obligated parent's income is $150,000 and the other has no income, the parent without income would not be income-eligible for the child tax credit. The EITC is not considered because it is a means-tested program. Most states do not consider mean-tested income to be income available for child support.

The pro of considering an alternative tax assumption such as assuming the tax-filing status is married better aligns with the economic measurements of child-rearing expenditures because the measurements consider households in which the parents and children live together, so they would probably file as a married couple. They also could be set up to include the federal child tax credit, the additional child tax credit, the earned income tax credit, or a combination of these child-related tax credits. The cons are that this would be a change in the previous assumption that is not necessarily justifiable and inconsistent with how Arizona currently provides for the federal tax exemption for dependent children, which essentially allows parents to agree on how it will be allocated between the parents, or, if an agreement is absent, essentially allows the parents to prorate the tax exemption between them through rotating years (*e.g.*, if there is one child and one parent has one-third of the income and the other parents has two-thirds of the income, the lower-income parent would claim the children every third year and the higher income would claim the child for two of the three year) or another method that achieves similar results.

Factor 7: Adjustment for Differences between Arizona and U.S. Average Prices

The BR measurements consider U.S. averages. Some states where incomes or the cost of living is considerably more or less than the national average adjust the national measurements of child-rearing

expenditures for that state's income or cost of living. For example, the New Jersey child support schedule is based on measurements of child-rearing expenditures developed from national data and then adjusted for New Jersey's income. Arkansas is an example of a low-income state that adjusts the Betson-Rothbarth measurements downward.

According to the most recently published price parities by the U.S. Bureau of Economic Analysis (BEA), for every $1.00 spent on the U.S. on average, $0.965 is needed for the same level of expenditures in Arizona.[107] Most states with this small of a difference, do not make an adjustment.

Exhibit 43 shows the variation of Arizona price parity by metropolitan area and for the three categories of expenditures BEA considers: goods, rents, and other services. The BEA does not focus the cost of owner-occupied housing. One limitation of the price parity is the lag in the data, which can be exacerbated by five-year rolling averages to smooth inconsistencies when there are small sample sizes. One particular concern is Arizona housing prices, which are rising, according to other indexes with more current data.[108]

Exhibit 43: Arizona 2018 Price Parities

	All Items	Goods	Rents	Other Services
State of Arizona	96.5	95.7	94.3	99.1
Lake Havasu City-Kingman	90.0	93.5	73.4	100.4
Flagstaff, AZ	98.5	98.8	74.9	93.6
Lake Havasu City–Kingman, AZ	90.0	93.5	73.4	100.4
Phoenix-Mesa-Chandler, AZ	98.1	95.2	100.6	99.6
Tucson, AZ	93.9	93.5	86.5	100.4
Yuma, AZ	88.9	93.5	70.2	100.4
United States	100.0	98.9	101.9	100.0

No adjustment is made to the proposed schedule for Arizona prices or incomes. The alternative would be to make an adjustment. The pro of an adjustment is it would be more Arizona specific. There are several cons. Arizona's price parity indicates a small difference and is not current. The 2018 Arizona price parity may not capture recent increases to Arizona housing prices. Several states with lower price parities than Arizona's have rejected a state-specific adjustment for various reasons. Missouri rejected it because they did not want to further reduce the schedule cognizant that the Rothbarth estimator, which forms the basis of the Missouri schedule, understates actual child-rearing expenditures. Iowa rejected an adjustment based on Iowa's price parity because of its high weight on rents, while housing prices are escalating in some areas of Iowa.

[107] U.S. Bureau of Economic Analysis. (2020). *2018 Regional Price Parities by State (US = 100).* Retrieved from https://www.bea.gov/news/2019/real-personal-income-states-and-metropolitan-areas-2018.

[108] For example, Zillow reports an 11.2% increase in Arizona home values in the past year and forecasts an 8.2% increase in the next year. Retrieved from https://www.zillow.com/az/home-values/.

Further, whether Arizona rents are truly below the national average is questionable. The 2018 U.S. American Community Survey[109] finds little difference: the median U.S. gross rent is $1,058 per month while the median Arizona gross rent is $1,036 per month. (Gross rent includes utilities.) Similarly, the same data source finds little difference in owner-occupied housing costs among those with mortgages. The U.S. median is $1,566 per month and the Arizona median is $1,417 per month.

Factor 8: Consideration of the Self-Support Reserve

As previously mentioned, the existing Arizona child support guidelines provides for a self-support reserve (SSR) equivalent to 80 percent of the monthly full-time earnings at the state minimum wage at the time of the order establishment. As of 2021, the Arizona minimum wage is $12.15 per hour, which is more than the federal minimum wage of $7.25 per hour. The 2021 Arizona minimum wage yields a SSR of $1,685 per month. This is highest amount of any state. Colorado has next highest SSR: $1,500 per month. Colorado arrived at that amount by taking its minimum wage at the time of its last review and multiplying it by 30 hours per week.[110] Colorado, unlike Arizona, does not update its SSR annually or with changes to the state minimum wage. The Colorado amount is set at $1,500 per month by state statute. It cannot be updated without legislative changes.

Besides Arizona and Colorado, no other state relates its SSR to the minimum wage. Instead, most states relate their SSR to the federal poverty guidelines (FPG) for one person. In 2021, that amount is $1,073 per month.[111] Some states increase the FPG to account for payroll taxes or align it to income thresholds for public assistance programs (*e.g.*, the income eligibility threshold for Supplemental Food and Nutrition Program benefits is 130% of the FPG). The highest SSR relating to the FPG is 135 percent of the FPG: this is the SSR of New York. Few states (*e.g.*, Minnesota, New York, Oregon, and Washington) index their SSR; that is, update it for annual changes to the FPG. Instead, most states set the SSR in relationship to the FPG in the year that they last updated their schedule.

Many states (*e.g.*, Colorado) incorporate their SSR into the schedule. The advantage of this is it is simple to calculate. The major disadvantages to it are that it is difficult to update and must apply before consideration of add-ons for childcare expenses or extraordinary educational expenses or other expenses. As a consequence, the inclusion of these expenses after application of the SSR test (say, childcare expenses of $1,000 per month for an infant that are to be divided equally between the parties) could result in an order amount that does not leave an obligated parent sufficient income to cover the SSR. Arizona guidelines conducts the SSR test at the very end of the guidelines calculation, so all factors considered in the calculation are considered in the SSR test.

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[109] Data retrieved https://data.census.gov/cedsci/.
[110] Colorado Child Support Commission. (Jul. 2019.) *Final Report.* Retrieved from https://childsupport.state.co.us/sites/default/files/2019-08/DCSS%20Commission%20FINAL%20PRINT%20DOCUMENT%206-17-19-smaller%20file%20%281%29%20%281%29.pdf.
[111] U.S. Department of Health and Human Services. (Jan. 2021). *HHS Poverty Guidelines for 2021*. Retrieved from https://aspe.hhs.gov/poverty-guidelines.

SECTION 5: IMPACT OF UPDATED SCHEDULE

This section explores the impact of updating the schedule using case examples. It also compares the amounts to neighboring states. Exhibit 44 shows the states compared and compares some of their guidelines factors and socioeconomic characteristics to those of Arizona.

- All states but California base their guidelines schedule/formula on gross income. California's child support guidelines calculator includes a gross-to-net income calculator.[112] It is used to calculate the California amounts.
- All states rely on the income shares model except Nevada, which relies on a percentage-of-obligor gross income guidelines model. It does not consider the income of the parent receiving support. California's version of the income shares model, which is a formula, is unique. Colorado, New Mexico, and Utah all use income shares schedules similar to that used by Arizona.
- Arizona, Colorado, and New Mexico are based on a Betson-Rothbarth study. Colorado relies on the fourth BR study. Arizona and New Mexico rely on the third BR study, except New Mexico's version includes several large adjustments that were made to reflect New Mexico's below-average income and to mitigate a large increase that resulted from New Mexico not updating for over a decade.
- The states use a variety of formulas to adjust for timesharing. They also require a different number of days be met before the adjustment is applied. Arizona and California have the least stringent restrictions. Arizona applies the adjustment for as little as four parenting days. California does not impose a threshold. In contrast, most states require a substantial number of parenting days before the adjustment can be applied (*e.g.*, Colorado requires at least 93 parenting days and Utah requires at least 111 parenting days).
- The states also vary in their low-income adjustment method and the incomes for which the adjustment would apply.
- Incomes and housing costs are generally similar for Arizona, Nevada, and Utah. California and Colorado are slightly above average, and New Mexico is below average.

Exhibit 44 also contrasts the minimum wage in effect in a state to that state's median wage of food preparation workers in May 2019, which is the most recent available. When a child support order is established and a parent has little employment history or work experience, income is often imputed at minimum wage. The education and experience requirements of food preparation workers are generally low, so if their average wage is much higher than the minimum wage, it may be reasonable to impute a higher income at least prior to the COVID-19 pandemic that vastly increased unemployment rates. As discussed earlier, the Accommodations and Food Services industry has been hard hit by the pandemic, so their unemployment rates are generally higher than statewide averages during the pandemic.

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[112] California Child Support Services. (2006). *Guidelines Calculator.* https://childsupport.ca.gov/guideline-calculator/.

Exhibit 44: Comparison of Selected Characteristics of Neighboring States

	U.S.	AZ	CA	CO	NM	NV	UT
Income Base	N/A	Gross	After-tax	Gross	Gross	Gross	Gross
Guidelines Model	N/A	Income Shares	Income Shares	Income Shares	Income Shares	Percentage of Obligor Income	Income Shares
Economic Study and Last Schedule Update	N/A	BR3 (2014)	van der Gaag[113] (1990s)	BR4 (2018)	BR3 adjusted (2007)	Van der Gaag (2019)	Unknown
Threshold for Adjusting for Parenting Days	N/A	4 days or more	1 day or more	93 days or more	35% or more (128 days)	40% or more (146 days)	111 days or more
Low-Income Adjustment or Self-Support Reserve (SSR)	N/A	SSR = 80% state min. wage	Formula for incomes < $1,807/mo	Sliding scale for incomes < $1,500/mo	SSR of less than $850/mo	Sliding scale for incomes < $1,595/mo	Sliding scale for incomes < $1,050/mo
2018 Median Income (married with children)	$100,115	$87,646	$106,011	$107,561	$78,333	$84,768	$94,179
2018 Median Income (female householder with children)	$ 29,240	$31,614	$32,660	$35,016	$22,593	$34,319	$32,154
2018 Median Gross Rent[114]	$1,058	$1,036	$1,520	$1,289	$830	$1,108	$1,043
2018 Median Owner-Occupied Housing Costs[115]	$1,566	$1,417	$2,345	$1,741	$1,234	$1,528	$1,531
Minimum Hourly Wage (2018)[116]	$7.25	$12.00	$12.00	$12.00	$9.00	$9.00	$7.25
Median hourly wage of food preparation worker [117]	$11.92	$12.06	$13.25	$12.92	$10.51	$13.86	$11.76
Unemployment Rate • **Sept. 2020[118]** • **Sept. 2019**	 7.9% 3.5%	 6.7% 4.9%	 11.0% 4.0%	 6.4% 2.7%	 9.4% 4.9%	 12.6% 3.2%	 5.0% 2.7%
Price Parity	100.0	96.5	115.4	101.9	91.1	97.5	96.6

[113] Also considered Espenshade, *supra n. 5.*

[114] Gross rent includes utilities. The data source is the 2018 U.S. Census American Community Survey. Data retrieved https://data.census.gov/cedsci/.

[115] For those with mortgages. The data source is the 2018 U.S. Census American Community Survey. Data retrieved https://data.census.gov/cedsci/.

[116] U.S. Department of Labor. (n.d.). *State Minimum Wage Laws.* Retrieved from https://www.dol.gov/agencies/whd/minimum-wage/state.

[117] As of May 2018: Source is U.S. Bureau of Labor Statistics. (n.d.) Retrieved from https://www.bls.gov/oes/current/oes_nat.htm#35-0000.

[118] U.S. Bureau of Labor Statistics. (n.d.) Retrieved from https://data.bls.gov/search/query/results?cx=013738036195919377644%3A6ih0hfrgl50&q=state+unemployment+rate.

Exhibit 45 shows the case scenarios used for the comparisons. They were developed from actual case file data; that is, the sample of court case files analyzed for the guidelines review. There are three clusters: minimum-wage earners, cases where the child resides with mostly one parent, and essentially equal custody cases. To develop the case scenarios for the last two scenarios, combined incomes were divided into quartiles (*i.e.*, divided into four categories by ranking of combined income: those in the 1st to 25th percentile; those in the 26th to 50th percentile; those in the 51st to 75th percentile; and those in the 76th to 100th percentile). The median incomes of each party and the median number of days for each category were used to develop a case scenario for that particular category. The first quintile (*i.e.*, the 1st to 25th percentile) was skipped as a scenario in the cluster where the child resides mostly with one parent because the median earnings of parents in that cluster approximated minimum wage incomes.

Exhibit 45: Case Scenarios Used for Comparison

Case Scenario	Number of Children	Gross Income of Obligated Parent	Gross Income of Receiving Parent	Number of Days per Year with Obligated Parent
Minimum-Wage Scenarios				
1. Obligated parent has full-time, minimum-wage earner and other parent's income is zero	1	$2,105/mo	$0	12 days
2. Both parents are minimum wage earners	1	$2,105/mo	$2,105/mo	30 days
3. Both parents are minimum wage earners	2	$2,105/mo	$2,105/mo	48 days
Scenarios where the Child Resides Mostly with One Parent				
4. Median incomes for those in the 26**th** to 50**th** percentile of combined incomes	1	$2,919/mo	$2,369/mo	91 days
5. Median incomes for those in the 51**st** to 75**th** percentile of combined incomes	1	$3,813/mo	$2,987/mo	95 days
6. Median incomes for those in the 76**th** to 100**th** percentile of combined incomes	2	$6,543/mo	$4,946/mo	125 days
Essentially Equal Custody Scenarios				
7. Essentially equal custody for those in the 1**st** to 25**th** percentile in combined incomes	1	$2,105/mo	$2,280/mo	182.5 days
8. Median incomes for essentially equal custody for those in the 26**th** to 50**th** percentile in combined incomes	2	$3,500/mo	$2,600/mo	182.5 days
9. Median incomes for essentially equal custody for those in the 51**st** to 75**th** percentile in combined incomes	2	$5,054/mo	$3,120/mo	182.5 days
10. Median incomes for essentially equal custody for those in the 76**th** to 100**th** percentile in combined incomes	2	$8,802/mo	$5,000/mo	182.5 days

The minimum wage case scenarios consider the 2021 state minimum wage of $12.15 per hour at 40-hour workweeks and use the median days from those cases in the sample that had minimum wage incomes. A self-support reserve test (SSR) using the $12.15 minimum wage is applied; when the SSR is not met, the order is the difference between the obligated parent's gross income and the SSR. The case scenarios assume no adjustments to income, add-ons, or other permissible guidelines adjustments. The

comparisons use the current Table A adjustment for the number of days the child is with the other parent or the essentially equal custody formula. For the age adjustment when there are two children, it is assumed either both children are eligible for the age adjustment or both children are not eligible for the age adjustment.

Exhibit 46, Exhibit 47, and Exhibit 48, respectively, compare the guidelines amounts for the minimum wage scenarios, scenarios where the child resides mostly with one parent, and the essentially equal custody scenarios. There are several salient findings from the exhibits.

- For the minimum wage scenarios, the amounts are generally about the same, with a few nominal decreases (*i.e.*, decreases of $2 to $13 per month for Scenarios 1 and 2). The decreases result from the new Betson-Rothbarth measurements, which produces some decreases in the schedule amounts at very low incomes.

- For higher income scenarios, updating the schedule will generally produce small increases (*i.e.*, less than $50 per month) for most case scenarios, with the exception of Scenario 6, which involves high-income parents where the child lives mostly with one parent. The increase for this scenario is $87 or $101 depending on the age of the child.

- With the exception of Scenario 3, where the SSR is applied, Arizona typically ranks the second or third highest among neighboring states.
    - California is often the highest because its guidelines reflect its higher cost of living. Depending on the case scenario, Nevada sometimes is the highest (*e.g.*, Scenario 6). This is because it does not consider the income of the other parent in the calculation and its timesharing formula does not apply to lower levels of timesharing. In contrast, the guidelines of other bordering states consider the other parent's income in the calculation, specifically, the income of the other parent reduces the guidelines-calculated amount.
    - New Mexico is generally a low guidelines state for two reasons: it was adjusted for New Mexico's lower income and the state has not ever fully updated for new economic data. Colorado's schedule is based on economic data available in 2010. Although the Utah schedule does not clearly relate to an economic study, it also has not changed for at least a decade.

Exhibit 46: Comparisons of Case Scenarios where Obligated Parent's Income Equals Minimum Wage

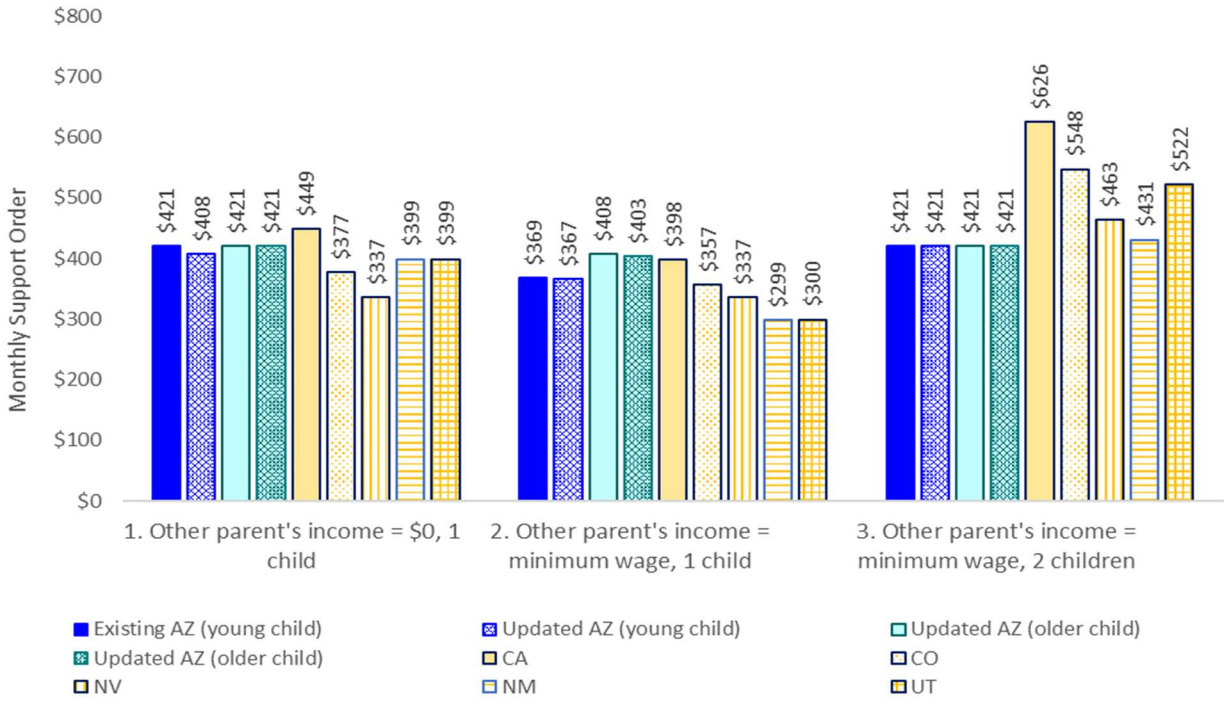


Exhibit 47: Comparisons of Case Scenarios using Table A for Timesharing Adjustment

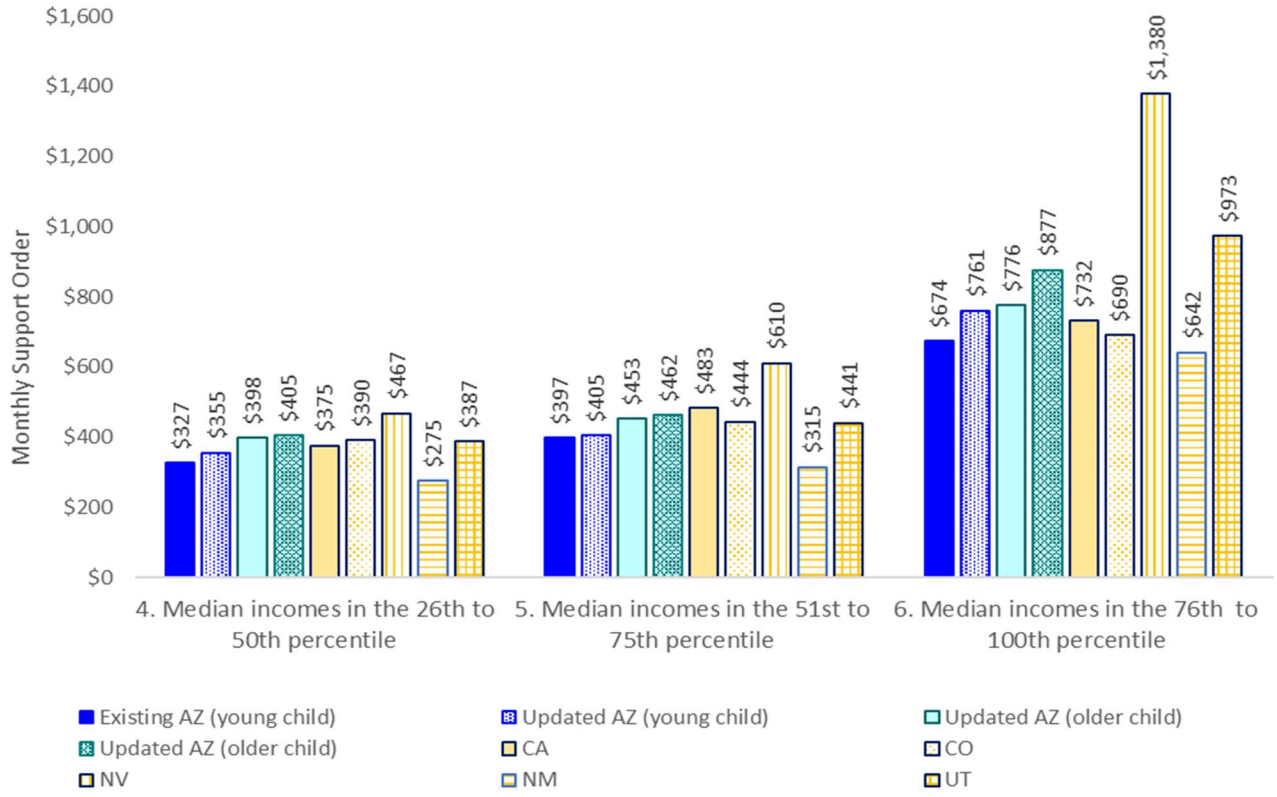
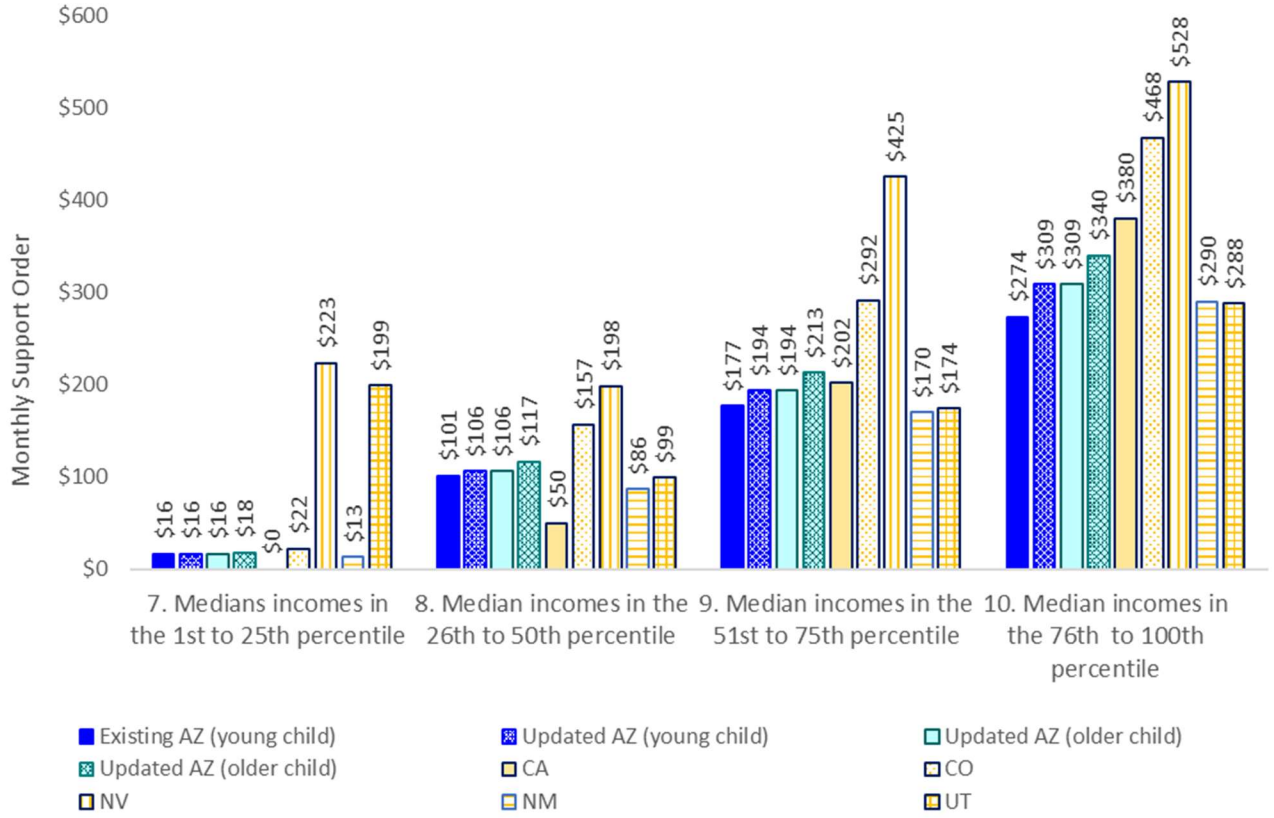


Exhibit 48: Comparison of Scenarios Involving Essentially Equal Physical Custody



SECTION 6: SUMMARY AND CONCLUSIONS

Arizona is reviewing its child support guidelines. The Arizona Child Support Guidelines Review Subcommittee has conducted the review and developed recommendations. In turn, their recommendations will be submitted to the Arizona Supreme Court for final approval. In reviewing the guidelines, the Subcommittee met all federal and state requirements of the guidelines review process.

Overview of Report

This report is essentially the compilation of technical considerations that the Subcommittee considered as well as detailed documentation of the proposed, updated schedule. The Center for Policy Research (CPR) prepared this report and was retained by the Court to assist with the technical issues of the guidelines review, namely, the review and development of economic data on the cost of raising children, updating the schedule, and the analysis of case file data and labor market data. The CPR provided much of the information in this report in draft form to the Subcommittee during its meetings from April 2020 through December 2020. The Subcommittee also considered information from numerous other sources, including public comment. The Subcommittee also obtained input from specific groups mentioned in the federal requirements (45 C.F.R. § 302.56(h)(3)) through their representation on the Subcommittee as well as through solicitation of public comment.

Technical Considerations Including Analysis of Economic Data

The Subcommittee considered economic data on the cost of raising children as federally required (45 C.F.R. § 302.56(h)(1)). This included a new Betson study, which is provided in Appendix A. The new Betson study considers the most current expenditures data available: expenditures from families participating in the 2013–2019 U.S. Bureau of Labor Statistics Consumer Expenditure (CE) Survey. In contrast, the existing Arizona schedule is based on expenditures from families in the 1998–2004 CE Survey. The most current Betson measurements form the basis of the proposed, updated schedule, which is shown in Appendix C. The updated schedule is also updated for changes in price levels and federal and state income taxes and FICA, since Arizona last reviewed its guidelines. It extends the highest income considered in the schedule from a combined adjusted gross income of $20,000 per to $30,000 per month.

Analysis of Case File Data and Labor Market Data

Arizona met the federal requirements to analyze case file data from two different sources: court case files and ATLAS, which is the information tracking system for government child support cases and also contains the state registry to track all payments regardless whether there is a government child support case. Neither source alone has sufficient data to fulfill federal requirements. The court case files have been used in the past to meet federal requirements to analyze guidelines application and deviation. They contain very detailed information about how the guidelines are applied to arrive at the order amount. The same level of detail is not available from ATLAS. However, ATLAS, contains payment

information, which must be examined to fulfill federal requirements to analyze child support payments. Improvements to each or either data source could be made to ease the measurements of specific federal requirements such as income imputation and default. For the court cases, this would be checkboxes on the worksheet to indicate income was imputed and clearly noting whether the order was entered through stipulation, hearing, or default in the order. For ATLAS, this would mean adding data fields indicating income imputation, default, and application of the self-support reserve test. Another option to explore is whether the information could be extracted from the Court's automated guidelines calculator. Other states use information from their automated guidelines calculators to fulfill federal review requirements, but their automated calculators are usually attached to their version of ATLAS, so they can also obtain payment information simultaneously.

The intent of the federal requirements to analyze case file data and labor market data are multifaceted. One reason for the analysis of case file data is to measure the frequency to which the guidelines are not applied: that is, there is a deviation from the guidelines. As noted in the federal requirement (45 C.F.R. § 302.56(h)(2)), the analysis of the deviation date is ". . . to ensure that deviations from the guidelines are limited and guideline amounts are appropriate . . . ." The analysis of Arizona case file data found a guidelines deviation rate of 27 percent. It was slightly more than the rate found from the last review, which was 26 percent.

Case file data were also analyzed to fulfill the federal requirements (45 C.F.R. § 302.56(h)(2)) to examine the rates of application of the low-income adjustments, income imputation, and defaults. The intent of these provisions is to inform the low-income adjustment and income imputations provisions. The federal intent of analyzing defaults is to make states more aware of issues surrounding default orders and, in turn, to encourage policies that limit default and encourage the engagement of the obligated parent in both the child support process and the healthy development of the child. Income appeared to impute to 15 percent of the obligated parents and 22 percent of the receiving parties in the court case sample. The default rate appears to be lower than the income imputation rate. The self-support reserve (SSR) was applied to 8 percent of the obligated parents in the court case file sample. Arizona's SSR is the highest in the nation.

The federal requirement of labor market data also appears to aim at informing low-income adjustments and income imputation provisions. This review was conducted during the COVID-19 pandemic, which vastly altered the labor market in Arizona and the world. If any relevance to child support, it underscores how pandemics and natural disasters can limit employment opportunities. This complicates and limits a presumption of full-time employment in situations where income imputation to a party may be appropriate.

Analysis of the Impact of a Guidelines Update

Federal regulation (45 C.F.R. § 302.56(h)(1)) also requires the analysis of the impact of the guidelines particularly on those with incomes below 200 percent of poverty. The subcommittee considered case scenarios using actual Arizona wages and earnings to fulfill this requirement. They are shown in this

report. The case scenarios generally show small changes to the order amounts based on the proposed, updated schedule.

Conclusion

In all, Arizona's review and the recommended guidelines changes meet all federal and state requirements. Moreover, they will better serve Arizona families and children by providing appropriate, consistent, and predictable child support order amounts.

Appendix A:
Parental Expenditures on Children: Rothbarth Estimates

David M. Betson
University of Notre Dame

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A report prepared for the Center for Policy Research
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Introduction

Child support guidelines have been developed to assist the courts in setting the financial obligations for children after the divorce or separation of the biological parents and in cases of paternity. The Income Shares model of child support seeks to maintain the level of parental spending on children. Knowledge of child spending patterns when both parents live with the children are required to implement this guideline model. This report provides estimates of this essential information from recent consumption data available from the Bureau of Labor Statistics' Consumer Expenditure Survey (CE).

Determining how much parents devote of the family's spending to their children would seem to be rather simple and straightforward exercise. Ask parents to keep track of their outlays for a year. Then ask them to take the receipts and place them into one of three boxes labeled "For the Children," "For the Parents," and "Can't Determine." For some goods, the allocation of the consumption could be done with some confidence since the purchase was made for a specific individual. For example, the purchase of a pair of shoes would be allocated to the person for whom the shoes were purchased. In other cases, the spending could be allocated on the basis of a reasonable assumption or additional information. Consider food purchases by the family. While purchases at the grocery store are typically not made for individual members, it could be possible to observe the actual consumption of the meal and then allocate the cost of the meal to the individual members based upon their consumption. Or alternatively the allocation of the food bill could be done in proportion to the nutritional requirements of the various family members. If one member requires twice the nutrition content as another member, then we could assume that the first individual had consumed twice as much food. But how does one allocate spending that is made on behalf of the whole family and not one individual? For example, how should expenditures on shelter and utilities be allocated to the children? What is a reasonable assumption to make in this situation? One approach would be to allocate the total family spending on housing and other "publicly consumed" goods equally across all family members. While an allocation to either the parents or children would always be possible, there is no guarantee that the allocation would be a representation of the actual division of consumption to adults and children. In truth, most outlays that a family undertakes would be placed in the third box—"Can't Determine."

Because parents would have difficulty in determining for whom the purchase was made, economists approach the problem of allocating consumption to individual family members in a different manner. Instead of trying to allocate the outlay on each item separately, economists ask how much total spending would a childless couple require to be equally well off as two parents with a child and a given amount of total spending? If the couple were childless, it stands to reason that the couple without children could make do with less spending. The difference between their spending with the children and the equivalent spending without the children is equated to what the parents spent on the children. The problem that we need to address is how to determine the amount of spending the parents would require so they were equally well off with or without the children.

The report is organized as follows. The next section describes the assumptions and methods used by alternative approaches to estimating parental spending and provides a rationale for why we have chosen the Rothbarth approach to estimating parental spending on children. The second section describes how we have implemented the Rothbarth model. The third section describes how we constructed the baseline sample from Consumer Expenditure Survey (CE) data and the characteristics of the sample. The empirical estimates

derived from the Rothbarth approach will be presented and compared to previous estimates by the author and other researchers in the fourth section. The fifth section of the report presents a sensitivity test of our estimates through the use of alternative samples. We conclude the report with some remarks about the conclusions of this research and suggestions about future directions.

I. Alternative Methodologies for Allocating Family Expenditures to Children

> "There is universal agreement that parents devote considerable resources to their children when they are young. This has led to an extremely large, venerable, and confused literature on the costs of children."
>
> Martin Browning (1992)

For laypersons and experts alike, the economic literature on the cost of children can be confusing. One source of confusion, especially among the laypersons, is the presumption that there exists a unique and correct methodology to use spending data to produce estimates of how much parents spend on children. If this presumption is correct, then why should there be differences in what the experts are reporting? Are the differences the result of mistakes or deliberate choices made by the researcher to manipulate the results? This state of affairs has contributed to contentious debates in the child support arena over how economic data should be used in determining the level of financial obligations of parents to their children after their parents separate.[1]

The inconvenient truth is a unique methodology for determining what a family "actually" spends on their children doesn't and won't exist. To understand this claim, let us assume we approach a family and ask them to keep the receipts for all of the purchases they have made over the course of, say, a year. We give them three boxes and label them "For the Children," "For the Parents," and "Can't Determine." For some goods, it is clear for whom the purchase was made and the parents could place them in the appropriate box. For example, purchases of clothing should be easy for the parents to determine for whom it was purchased. The nature of the good could also be used to determine whether the purchase was for adults or children—alcohol and tobacco for adults; and toys, playground equipment, and childcare for children. But for the majority of the family's spending, would the parents be able to allocate the purchases when the family member for whom the purchase was made was not clear? While we could determine how much was spent on food, how would one allocate the food purchases to the parents and the children? For goods that are purchased for the family and are shared by all family members (public goods) such as housing and transportation, how would you allocate what was spent on these items to the parents and children. The inconvenient truth would be the box labeled "Can't Determine" will be overflowing. If the parents can't determine how to allocate these expenditures they have made, how can third parties make that determination with even less information than is available to the parents? It should not be surprising that reasonable individuals could differ on how to take the receipts in the third box and allocate its contents to either of the other two boxes.

[1] A child(ren) reflects a relationship between an adult and another person that has been established through birth or adoption. But since we explicitly will be addressing child support, we limit our discussion to "young" children those individuals who are less than 18 years old for whom a legal duty to support can be established.

Direct Allocation Methods: Per Capita, USDA, and Comanor et al. [2]

The purpose of this research is to allocate the family's spending to the children in the family. Economists define a private good as a good whose consumption will benefit only a single individual. For example, if an apple is purchased, then the purchase can be attributed to the family member who eats the apple. If all goods were private goods, then all receipts should in principle be able to place in either the "For the Children" or "For the Parents" boxes. There are private goods where, at the time of purchase, the parents are not aware for whom they are purchasing the good. Consider the case of food where the parents purchase $100 worth of food. Without also observing who consumed each food item, how will the parents decide how much of the food was allocated to individual family members?

The family also purchases goods such as shelter and utilities that allow all family members to consume or enjoy the benefits that will occur with the purchase of the good. Economists denote these goods as "public goods." The value of the consumption of a public good can vary across the individuals and there is no agreed upon method to allocate either the consumption value or the amount of outlays made to individual family members. Given the goal of the research is to allocate all spending made by the family to adults and children, the general approach is to treat spending on public goods as one would allocate spending on private goods—the sum of the allocation of the spending on any good (private or public) to family members should equal what the family spent on the good.

The question faced by researchers can be thought of as how to allocate the dollars of spending in the third box to the adults and children in the family.

One approach would take the unallocated amount and divide the dollar receipts between the first two boxes on a per-capita basis. For example, if the family was composed of the two parents and one child, then 33% ($=K/(A+K)$ where A is the number of adults in the family and K is the number of children in the family) of the amount in the third box would be allocated to the child and the remaining to the parents. If the parents couldn't allocate any spending to either themselves or to the children, then this approach would assign a per-capita share of total expenditures to the children. To the extent the parents can make assignments to either themselves or their children, the proportion of the family's expenditures devoted to the children will be smaller than their per-capita share. Using a per-capita allocation scheme assumes that adult and children "count" the same in consumption decisions and there are no economies of scale in consumption. These assumptions are simplistic and run counter to what we think about the economics of family consumption.

[2] As we will see, the alternative approaches take different paths to allocating the contents of the third box. Some approaches will try to allocate what is in the third box to the children and then add this amount to the amount found in the "For the Children" box. We denote these approaches as "Direct." Other approaches allocate what is in the third box to adults. Consequently, the family's total outlays minus what is in the "For the Parents" box and the allocation to the adults of the third box will reflect what the parents have spent on the children. We will denote these approaches as "Indirect."

Instead of solely relying upon and equal share allocation of spending, the U.S. Department of Agriculture (USDA)[3] utilizes additional information from other government surveys that shed light on the differential consumption of adults and children for some of the goods included in the third box. The USDA has conducted numerous studies about the allocation of the prepared food to individual members in the household. The Department of Transportation conducts studies why individuals use transportation and can assign those uses to children and parents. For medical care, the U.S. Department of Health and Human Services (HHS) has numerous studies that examine adult's and children's use of medical care and how much children can add to premiums for health insurance. The USDA is currently using a "marginal cost" approach to allocate shelter and utility expenses to the children and relies on its food budget studies to determine food cost for the children. For all other expenses found in the third box, the USDA employs a per-capita allocation.

Comanor, Sarro, and Rogers (hereafter referred to as CSR)[4] propose an alternative to the USDA approach. For goods found in the third box, do not use allocations based upon other government studies but assign to the children the difference between what the average family with K children and T amount of total outlays would spend on the good minus what the average childless couple ($K=0$) and T amount of total outlays would spend on the good. The authors claim that the amount spending on each good found in the third box attributed to the children would reflect the marginal cost of the K children. While this approach may seem reasonable, the use of a childless couple with T total outlays as the comparison group to compute the "marginal cost" conflates two changes in the family's situation. While the difference in the families' spending does reflect the difference in the number of children, it also reflects a change in real income or well-being of the adults. A family with no children but the same amount of total expenditures as a family with K children will be materially better off. This implies that a truly equivalent family without children would have less than T total outlays. It can be shown that the CSR approach assigns too little of the spending on a good found in the third box to the children and consequently, overall spending for the children will be understated.

Indirect Allocation Methods: Rothbarth, Lazear and Michael, and Engel

The next methodologies abandon trying to assign the spending found in the third box to the children. But instead, several economists use indirect approaches. The first two discussed (Rothbarth[5] and Lazear and Michael[6]) use variations of a methodology that determine a single allocation of total expenditures to the adults in the family by examining how parents spend on themselves. Another approach also abandons to directly attribute spending to children. The Engel approach uses information on how families allocate

[3] Lino, Mark. (2017). *Expenditures on Children by Families: 2015 Annual Report.* U.S. Department of Agriculture, Center for Nutrition and Policy Promotion. Miscellaneous Publication No. 1528-2015, Washington, D.C. Retrieved from http://www.cnpp.usda.gov/publications/crc/crc2012.pdf.
[4] Comanor, William, Sarro, Mark, & Rogers, Mark. (2015). "The Monetary Cost of Raising Children." *In* (ed.) *Economic and Legal Issues in Competition, Intellectual Property, Bankruptcy, and the Cost of Raising Children* (Research in Law and Economics), Vol. 27). Emerald Group Publishing Limited, pp. 209–51.
[5] Rothbarth, Erwin, (1943.) "Note on a Method of Determining Equivalent Income for Families of Different Composition." In *War Time Patterns of Savings and Spending.* Edited by Charles Madge, Cambridge, Cambridge University Press. Appendix 4.
[6] Lazear, Edward P. & Michael, Robert T. (1988). *Allocation of Income Within the Household.* University of Chicago Press, Chicago, Illinois.

their total spending to food (a commodity consumed by both adults and children) to determine how parents allocate spending to their children.

While we directly observe only a portion of the total spending on the adults in terms of spending on what we could denote as adult goods (goods that are consumed only by adults or clearly identified as being consumed by adults), total spending by parents on themselves needs to be determined if we are to be able to determine spending on the children (total outlays minus total spending on adults). Rothbarth (1943) observed that adults with children spend less on adult goods than a childless adult with the same amount of total spending. Just as we remarked about the CSR approach, the comparison of adults with children to adults without children conflates two differences—a difference in family composition and size and a difference in the material standard of living of the parents. In order to restrict the comparison to just the difference due to the presence of the children, Rothbarth suggested that for a childless couple and the parents with children should be equally well off. For this to occur, the total outlays of the childless couple should be less. But how much less? Rothbarth observed that for the childless couple to spend the same amount on adult goods (*AG*) as the parents with a child spent, the childless couple would require *TO* amount of total outlays. If this occurred then the childless couples and parents with the child would be equally well-off because total spending on the adults would be the same.[7] The difference between the total outlays of the adults with children and without children, *T-TO*, would represent what the parents spent on the children.

To implement the Rothbarth approach, information on how parents with and without children allocate their total outlays to spending on adult goods is required to determine *TO*. Using data for married couples with and without children, data from the U.S. Bureau of Labor Statistics (BLS) Consumer Expenditure Survey (CE) is utilized. Empirical estimates of the relationship between spending on adult goods and total outlays for families with and without children are obtained using multivariate regression analysis. We would hypothesize that adult goods are normal goods, hence increases in total outlays would be positively related to total outlays. If children impose a material cost on the well-being of the parents then holding total outlays constant, we would expect that spending by childless couples on adult goods to be higher than spending by married couples with children. The following figure captures these relationships. Consequently, if a married couple has *T* amount of total outlays, the couple would be expected to spend *AG* on adult goods. In order for a childless couple to spend the same amount on adult goods, the couple would need *TO* of total spending. The difference in total outlays (*T-TO*) reflects the parents' spending on the children or (*T-TO*)/*T* reflects the proportion of the family's total spending devoted to the children.

[7] Note that the equality of well-being is between the adults not between the well-being of the childless couple and the well-being of parents and the child.

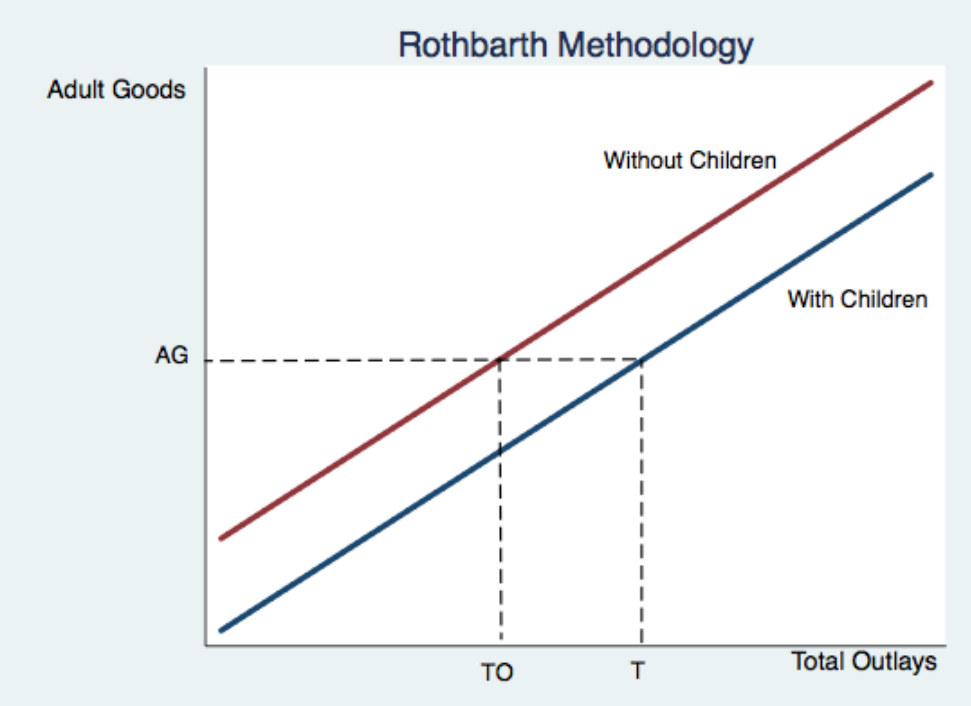

Figure 1
The Rothbarth Approach

The Rothbarth methodology was empirically implemented by estimating the relationship between spending on adult goods and factors believed to determine spending on adult goods by regressing spending on adult goods on these factors. The regression estimates are represented in the two lines in Figure 1 for the two adults with and without children. At a minimum, the other factors that would be included in the empirical analysis would include the total outlays of the family and a series of variables that captured the size and composition of family. Using the estimated relationship, the level of total outlays for a childless couple could be determined that was consistent with the childless couple spending the same amount on adult goods as the family with children. This level of total spending by the childless couple was interpreted by Rothbarth as the amount of total spending the adults with children spent on themselves. Consequently, the remainder of the family's spending reflected the spending the parents made on behalf of the children.

In 1988, Lazear and Michael (hereafter referred to as L/M) proposed an alternative empirical strategy to estimate the parents' spending on children based upon the Rothbarth methodology. Since the goal of Rothbarth methodology is to determine the total outlays of a childless couple that is consistent with the childless couple spending the same amount on adult goods as the couple with children, L/M estimate the relationship of total spending given how much a family spends on adult goods instead of the relationship of spending on adult goods given the level of total spending of the family. While in theory the L/M approach is identical to the Rothbarth approach, the differences in their empirical implementations give rise to different estimates of spending on children.

Figure 2 depicts the L/M methodology. Comparing Figures 1 and 2, we see the axes are reversed from each other depicting how the relationships between spending on adult goods and total outlays are estimated. In the L/M approach, if the couple with children spends *AG* on themselves, then they would be expected to have *T* total outlays. But if they didn't have children but spent the same amount on adult goods, then they would be expected to have *TO* in total outlays. Just as Rothbarth infers, the amount *TO* reflects the total spending that the parents with children spend upon themselves as opposed to their children. Consequently, the difference *T-TO* reflects what the parents have spent on their children.

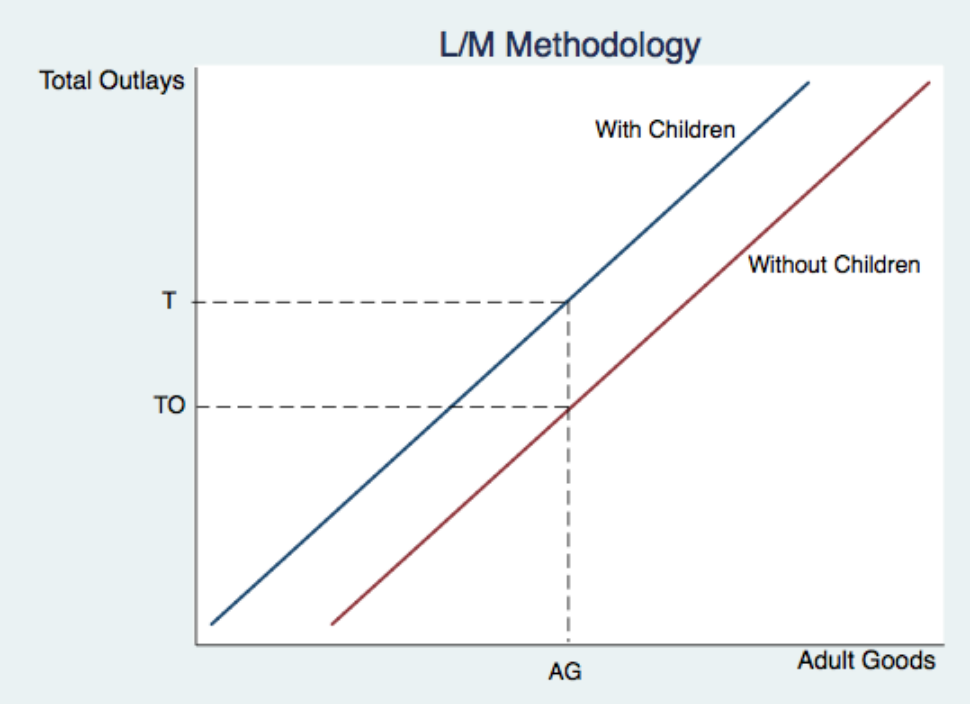

Figure 2
L/M Methodology

The implementation of the Rothbarth and the L/M approaches also reflect the choice they make with regard to how to characterize how family size and the age composition of the family members determine the amount of equivalent spending with and without children. As the number of family members increases, the family may experience economies of scale in consumption. For example, a married couple will not need twice as much consumption to be equally well off as a single individual. The composition of the family is also equally important to consumption choices. Children are often thought to have less consumption needs compared to an adult; consequently, the impact of adding a child, as opposed to an adult, to the family is likely to have a smaller impact on consumption than adding an adult. In Appendix A, we show that our implementation of the Rothbarth model assumes that children count the same as an adult but there are economies of scale. We also show that the L/M characterizes the differences between different families as how you count children as adults but assumes no explicit economies of scale.

The final methodology we will discuss is actually the first approach ever to be suggested on how to allocate the family's spending to children. This approach, like the Rothbarth, approach is an indirect methodology, but instead of focusing upon the adult good spending, the Engel approach focus upon a private good that is consumed by both adults and children: food. Engel proposed the share of total outlays devoted to food was an inverse indicator of the family's well-being. He made this claim based upon the following observations. Engel noted when the family's total outlays increased, the food share of total outlays would decline. When holding total outlays constant as the number of children increased from no children, the food share would increase.

If we knew how the food share varied with total outlays and the number of children, then we could determine how much of total spending the parents devoted to the children in the following manner. A family with children and *T* dollars of total outlays would be expected to spend FS proportion of their total outlays on food. For a childless couple to spend the same proportion of their total outlays on food, they would have to have *TO* dollars in total outlays. The difference *T-TO* reflects how much the parents are assumed to spend on the children. Figure 3 depicts the Engel approach to determining *TO*.

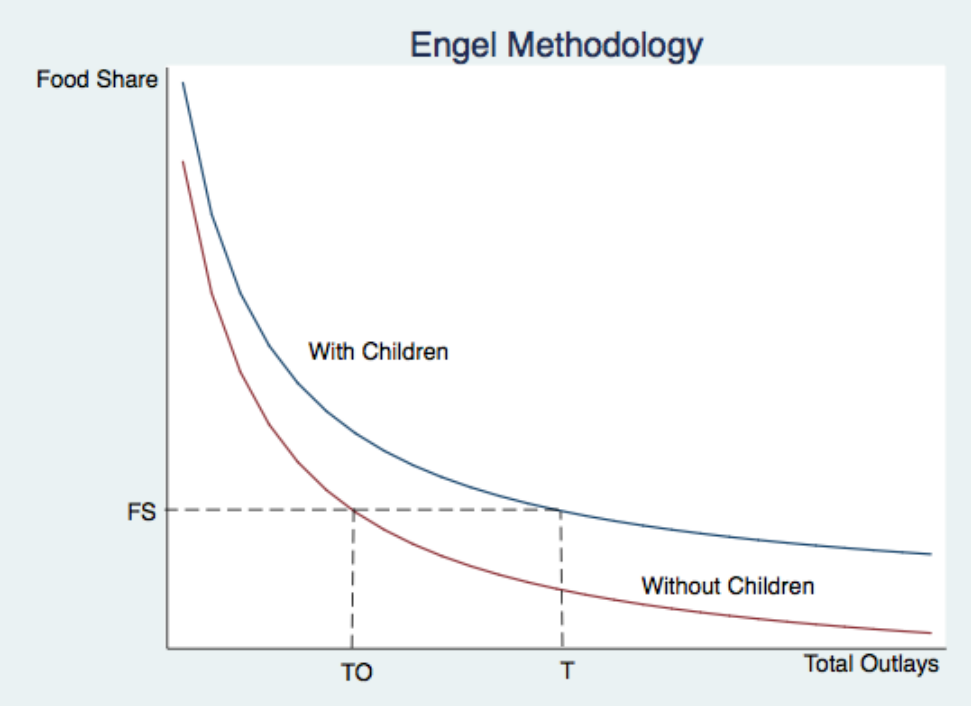

Figure 3
Engel Methodology

Appendix B provides more detailed but mathematical presentations of these alternative methodologies and the assumptions underlying their approaches.

Why Favor the Rothbarth Approach

Reasonable individuals can differ over a method to allocate spending to children because there doesn't exist a unique and correct manner to determine how families make this allocation. However, a reasonable person should not rely upon unreasonable assumptions to justify their methodology. For this reason, we believe that the Comanor et al. approach should be discarded from consideration.

Gorman has demonstrated that in order to conclude the family's share of total outlays devoted to food reflects the family's well-being, the economies of scale in consumption found in food had to be the same as for all other goods. While this approach seems to be reasonable and similar to the Rothbarth, not all goods have the same economies of scale as food. For example, you would expect there to be little or no economies of scale in adult clothing, while for children's clothing there might some scale economies due the use of hand me downs from older children in the family. On the hand, the economies of scale in shelter and utilities would be expected to have more economies of scale than food. We don't believe that the Engel approach is based upon reasonable assumption, even though many of the early child support guidelines employed Espenshade's estimates of parental spending on children, which used the Engel methodology.

While the per-capita approach is easy to understand and implement, its simplicity in assumptions—children count the same as adults and there are no economies of scale in consumption—provide a barrier to the method's wide acceptance. This leaves the USDA, Rothbarth, and L/M approaches as potentially appropriate methodologies that should be considered for use in construction of support guidelines.

The USDA approach is straightforward and relatively easy to communicate how it allocates reported spending to the children on a good-by-good basis. Only the reasonability of the specific allocations and the use of per-capita allocations for some goods limit the acceptability of this approach. The explicit assumptions about its allocation procedure makes it more accessible for the lay person to either agree or disagree with their estimates. We believe that the accessibility of the USDA approach is a virtue, but we should be open to exploring other methodologies.

The indirect approaches, L/M and Rothbarth, are not easy for the layperson to understand, which creates a barrier to gaining acceptance for use in the policy area. The assumptions needed by these approaches are technical and hard to convey to the lay audience. For example, these approaches require that we assume that well-being of adults in the family to be additively separable from the well-being of the children and are homothetic (see Appendix B). While for those versed in economics should understand the meaning of these assumptions, the consequence of violations of these assumptions for the allocation of spending to children is not well understood even by "experts."

The Rothbarth and L/M approaches differ with respect to their empirical implementation of basically the same strategy of identifying how much parents with children spend on themselves. The Rothbarth approach relies upon estimating the expected value of spending on adult goods given total outlays, the composition of the family, and other factors. The L/M approach is based upon estimating the "reversed" relationship of the expected amount of total outlays given the spending on adult goods, the composition of the family, and other factors. In his article, Rothbarth recognized that both empirical approaches were possible. But Rothbarth's concern with his ability to accurately estimate the relationship of total outlays

given spending on adult goods lead him to favor the alternative strategy which have denoted as the Rothbarth approach. In Appendix B, we further discuss what we see as the advantages of the Rothbarth approach over the L/M methodology to estimate how married parents devote spending to their children.

II. Empirical Implementation of the Rothbarth Model

The Income Shares model attempts to maintain spending on children at the level of spending that the parents would have made if they were married. Consequently, the empirical implementation will be restricted to examining the spending patterns in married couple families with and without children. The number of adults in the family will always be 2 but the number of children (K) will vary from 0 to K. While the model that we will estimate will allow for nonlinear effects of total outlays on adult good spending, in this presentation, we will consider the case when the effect of total outlays is linear (see Appendix C for when the effect of total outlays is nonlinear and how the estimates are used in the nonlinear specification to determine the level of spending on adults). If we assume that the log of spending is linear in terms of the log of per-capita total spending, the empirical model that we will estimate can be expressed as

$$ln(AC) = \mu(X) + \alpha\, ln(2+K) + \beta\, ln\left(\frac{T}{2+K}\right) + \epsilon \qquad (1)$$

where AC denotes the dollar purchases of adult clothing, T is the total outlays in the family, $\mu(X)$ is the effect of a set of characteristics of the adults in the family and other control variables (X) and unmeasured factors (ϵ).

For adult goods to proxy the family's well-being, increases in total spending should increase spending on adult goods (β>0). As additional children join the family while holding total spending constant, then adult spending (well-being) should decline. This latter condition requires that

$$(\alpha - \beta)ln(2+K) < 0 \;\; or \;\; \alpha < \beta\,.$$

Ignoring the impact that the relative age composition has on adult clothing purchases, this restriction will be met if α is less than β. This condition does not require α to be negative.

After the empirical model has been estimated (the parameters α and β are determined), the Rothbarth methodology then calculates the level of total spending for a childless couple would require so that they would spend the same amount on adult goods as does the parents with K children and T_K amount of total spending (A_K). This level of total spending (TO) would need to satisfy the following relationship

$$\mu(X) + \alpha ln(2) + \beta ln\left(\frac{TO}{2}\right) + \epsilon = ln(A_K) = \mu(X) + \alpha ln(2+K) + \beta ln\left(\frac{T_K}{2+K}\right) + \epsilon\,.$$

After solving for TO,

$$TO = T_K\left(\frac{2}{2+K}\right)^{1-\frac{\alpha}{\beta}}.$$

Attributing the difference in total spending as the amount of spending the parents make on their children, then the share of total spending that was devoted to the children would be equal to

$$\frac{T_K - TO}{T_K} = 1 - \left(\frac{2}{2+K}\right)^{1-\frac{\alpha}{\beta}}.$$

If $\alpha<\beta$ (holding total outlays constant, additional children lower spending on adult goods), then the estimated percentage of total spending devoted to the children will be less than their per-capita share (33%, 50%, and 60% for one, two, and three children, respectively, where implicitly α/β equals 0).

The above linear specification implies that the percentage of outlays devoted to children will be the same for all families regardless of the level of total outlays. To allow for the percentage of outlays devoted to the children to vary with the level of total outlays, we estimated a model that includes not only the log of the per-capita outlays but also the square of the log of per-capita total outlays

$$ln(AC) = \mu(X) + \alpha\, ln(2+K) + \beta_1\, ln\left(\frac{T}{2+K}\right) + \beta_2 \left(ln\left(\frac{T}{2+K}\right)\right)^2 + \epsilon$$

For our study, we used spending on adult clothing as the spending on adult goods (*A*). The dependent variable in the Rothbarth approach is the log of the adult clothing purchases (*lnacloth*). In the collection of data for the Consumer Expenditure Survey (CE), which is the data set used for the estimation, the U.S. Bureau of Labor Statistics (BLS) classifies adult clothing as purchases made for persons who are 16 years old or older. Hence, some of the purchases of adult clothing are, in fact, purchases made for children, not adults. The question is how to account for this definition of adult clothing in the CE? Lazear and Michael chose not to include any consumer unit with children 16 and 17 years old in their analysis sample. We have chosen a different solution. We included consumer units with children 16 and 17 years old but allocated spending on adult clothing on a per-capita basis—the proportion of adult clothing allocated to adult (18 years old and older) was the number of adults divided by the number of adults plus the number of children 16 and 17 years old.

The principle independent variables used reflect the log of family size (*lnfs* = *ln*(2+*K*)), the log of per-capita total outlays (*lnpctout* = *T*/(2+*K*)) and the square of the log of per-capita total outlays (*lnpctout2*). The definition of a family's total outlays will be described in the next section.

The other independent variables (*X*) in the estimation of the Rothbarth model

black = 1 if the race of the reference person is black, 0 otherwise
hnohs = 1 if the husband doesn't have a high school degree, 0 otherwise
hcollege = 1 if the husband has a four-year college degree, 0 otherwise
wnohs = 1 if the wife doesn't have a high school degree, 0 otherwise
wcollege = 1 if the wife has a four-year college degree, 0 otherwise
wweek = the number of weeks worked in the past year by the wife (range 0 to 52)
wfull = 1 if the wife worked more than 30 hours per week, 0 otherwise
bothwork = 1 if both the husband and wife worked in the previous year, 0 otherwise
ne = 1 if the consumer unit lived in the Northeast census region, 0 otherwise
south = 1 if the consumer unit lived in the Southern census region, 0 otherwise
west = 1 if the consumer unit lived in the Western census region, 0 otherwise
y2013 = 1 if the last interview was conducted in 2013, 0 otherwise
y2014 = 1 if the last interview was conducted in 2014, 0 otherwise
y2015 = 1 if the last interview was conducted in 2015, 0 otherwise

y2017 = 1 if the last interview was conducted in 2017, 0 otherwise
y2018 = 1 if the last interview was conducted in 2018 or 2019, 0 otherwise

where the omitted group was those units whose last interview was conducted in 2016.

III. Sample Selection and Data Employed in Study

The data used in this study is drawn from the Consumer Expenditure Survey (CE) conducted by the Bureau of Labor Statistics (BLS). The survey is based upon quarterly interviews of roughly 7,000 consumer units (families). This data is used for the periodic revisions of the Consumer Price Index as well as other economic research and analysis of the spending patterns of American families. The CE is the only nationally representative sample of American families that collects detailed information on the spending habits of families. As such, it is the only available national survey suited for estimating parental spending patterns.

CE Sample Selection Criteria

The data used in this study are from the interview component of the CE beginning in the second quarter of 2013 through the first quarter of 2019. While the BLS treats each quarterly response as an independent observation, our analysis file is constructed from the quarterly files to reflect a family's annual expenditures and outlays. While any unit can have up to four quarterly interviews, some households can't be located or refuse to be interviewed each quarter and hence will have fewer than four interviews.

This study was intended to focus upon the spending patterns on children in families where both parents were present but other adult relatives or nonrelatives were not present. Consequently, the following sample restrictions were made to form the baseline sample:

- The consumer unit contained a *married* couple between the ages of 18 and 60 years old;
- The consumer unit contained six or less children;
- The consumer unit did not have any other adults (individuals 18 years old or older) present in the unit even if these adults were the children of the couple; and
- The consumer unit didn't have a change in family size or composition over the period that the unit was interviewed.[8]

These restrictions yielded a sample of 13,885 consumer units, where 5,830 observations were childless married couples and 8,055 were married couples with children. Table 1 presents the distribution of units by the number of children (age less than 18).

[8] See Appendix D for the details of how these sample selection criteria as well as how additional sample criteria used in latter analysis affected the size of the analysis sample.

Table 1
Sample Observations by Number of Children

Number of Children:	0	1	2	3	4	5 or 6
Number of Observations:	5,830	2,777	3,368	1,342	415	153

Source: calculations by author

Given the rather small sample sizes for four and more children, most of the report's analysis will group three and more children families into a single category for presentation purposes. While families with four and more children will be included in the analysis, estimates for the cost of children will be presented for one through three children only.

Distribution of Total Outlays[9]

The major focus of this study is an examination of how families allocate their total spending to their children, and consequently, an initial first step is to define total spending. The BLS produces two measures of total spending in the consumer unit. The first is their expenditure concept (TOTEXPPQ and TOTEXPCQ)[10] while the other is denoted as the unit's outlays (ETOTALP and ETOTALC). The principle difference between these two concepts is the outlay concept includes principle payments for any loans while the expenditure concept doesn't include these payments. Both of the above BLS summary measures include two forms of what most economists would call savings: payment of Social Security payroll taxes and payments to retirement plans. For the purpose of this study, these forms of saving were subtracted from both specifications of the family's total spending.

In the past, some researchers have adopted the family's total expenditures as their measure of total spending, but as noted, this concept doesn't reflect the family's principal payments on their debt, in particular, the principal payments on their home mortgages. For families with little or no debt or for families with debt that has recently been financed (especially home purchases), the amount of principal repayment will be small and, consequently, the difference between the two spending concepts will be small. However, as the family lives in the same home for a sufficiently long enough period, the difference between the two concepts will grow as the mortgage payment reflects more principal payments than interest payments. Given the emphasis on outlays made by the family on their children during at a minimum of 18 years, it was determined that the primary focus of the analysis will be on the family's outlays.

Table 2 displays the distribution of total family outlays by the composition of the family. All spending and income amounts have been expressed in constant 2018 dollars. Without controlling for available

[9] Appendix E contains a more detailed description of the construction of variables used in this report.
[10] The last letter in BLS's naming scheme refers to the time period the spending was made – "P" refers to the fact the spending occurred in the quarter prior to the quarter in which the interview was conducted, and "C" refers to the quarter in which the interview was made. The sum of the two periods represents one quarter (three months) of spending reported by the family.

income, families with one and two children on average spend more than childless couples who on average spend slightly more than families with three or more children. As a percentage of their available income, families with children have more current outlays than do childless couples.

Table 2

Distribution of Total Outlays by Family Composition

	Childless Couple	One Child	Two Children	Three or More Children
Average Net Income	$83,097	$86,733	$92,231	$86,026
Average Total Outlays	$60,205	$64,615	$70,513	$68,831
Average Propensity to Spend[11]	72.4%	74.5%	76.5%	80.0%
Total Outlays at:				
5th percentile	$ 20,721	$ 22,834	$ 25,168	$ 25,236
25th percentile	35,655	39,205	43,510	40,419
50th percentile (median)	51,129	55,173	62,090	58,752
75th percentile	72,029	78,295	86,298	82,707
95th percentile	127,604	137,161	141,164	147,312

Source: calculations by author (all dollar amounts are in June 2018 dollars)

For all family types, the average total spending of the family exceeds the median indicating that the distribution of spending is not symmetrical around the average but "right skewed." The skewed distribution of both income and spending suggests that a proportional model based upon the log of spending amounts would be more consistent with the data than a model based upon levels.

Spending by Expenditure Category

Table 3 presents the sample mean of total family outlays by the number of children as well as the budget share devoted to some of the BLS major consumption categories.

[11] The average propensity to consume was computed as the ratio of average outlays to net income and not the average of the ratio of outlays to net income.

Table 3
Average Spending by Family Composition

	Childless Couple	One Child	Two Children	Three or More Children
Total Outlays	$60,205	$64,615	$70,513	$68,831
Budget Share (% of Total Outlays)				
Housing	41.0%	43.7%	44.0%	42.3%
Transportation	16.3%	16.1%	15.7%	15.4%
Food	18.0%	18.2%	19.0%	20.7%
Entertainment	5.1%	4.6%	5.1%	5.2%
Health Care	8.9%	8.0%	7.3%	6.5%
Apparel	1.8%	2.2%	2.4%	2.8%
Tobacco and Alcohol	2.1%	1.5%	1.3%	1.0%
Education and Reading	1.8%	1.9%	1.6%	1.7%
Personal Care	.7%	.6%	.6%	.6%
All other	4.3%	3.1%	3.1%	3.8%

Source: calculations by author

The presence and number of children increases the proportion of the family's budget devoted to housing, food, and apparel purchases. For all other consumption categories, the addition of children is found to either not affect the budget share or to lower the proportion of outlays devoted to that category.

Table 3 suggest the difficulty one would encounter when pursuing to directly allocate consumption spending to adults and children—consumption items where it is fairly obvious for whom the purchase was made account for a rather small proportion of all outlays. While adult clothing, alcohol, and tobacco purchases can safely be identified as adult purchases and child clothing, childcare, toys, and education might be classified as child purchases, these items would constitute roughly 15% of total outlays. The remaining 85% of the family's budget would have to be allocated using additional information or assumptions.

IV. Estimates of the Rothbarth Model

Estimates from the Current Study

In our baseline sample, we have 13,885 annual observations of consumer units composed of married couples with and without children. However, given our choice of a log-log specification of the empirical model, observations with zero annual spending on adult clothing are dropped from the estimation sample. Since in our sample all units have at least one dollar of total expenditures, 86% of the baseline sample (11,923 observations) remain in the sample used in the estimation. We estimated a logistic model to determine the probability of being dropped from the sample (not having any expenditures on adult clothing) and found the only explanatory variable that had an effect on the probability was total outlays. Those families with below average total outlays had a greater probability of being dropped from the sample. Having children or the number of children didn't have a significant effect on the probability of being dropped from the sample.[12]

Table 4 presents our estimates of the relationship between log of spending on adult clothing (*ln(A)*) and factors believed to determine this level of spending: the log of family size (*lnfs*), the log of per-capita total outlays (*lnpctout)*, the log of per-capita total outlays squared (*lnpctout2*), and other factors using the baseline sample of the CE. The Rothbarth approach is based upon two conditions on this relationship: as total outlays increases, then spending on adult clothing should increase and as the number of children (*K*) increase (in our sample, family size increases since there are always two adults) spending on adult clothing should decline.

Since the coefficients on *lnpctout* and *lnpctout2* are both positive, then the estimates indicate that as total outlays rise, spending on adult clothing will increase at an increasing rate. The second condition is a little harder to confirm since the number of children appears in three independent variables: *lnfs*, *lnpctout*, and *lnpctout2*. However, it can be shown that

$$\frac{\partial AC}{\partial K} = (\alpha - \beta_1 - 2\beta_2)\frac{AC}{2+K}$$

where *AC* is the dollar spending on adult clothing. Given that the estimate of β_1 is greater than the estimate of α and β_2 is positive, then spending adult clothing is estimated to decline as the number of children increases, holding total outlays constant.

[12] Other researchers such as Lazear and Michael also drop from their analysis families who report not spending on adult clothing even though they do not adopt log transformations of the data.

Table 4
Rothbarth Model Results

Source	SS	df	MS	Number of obs	=	11,923
Model	4861.86358	19	255.887557	F(19, 11903)	=	242.23
Residual	12574.3079	11,903	1.05639821	Prob > F	=	0.0000
				R-squared	=	0.2788
Total	17436.1715	11,922	1.46252067	Adj R-squared	=	0.2777
				Root MSE	=	1.0278

lnacloth	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnfs	.3274874	.0308219	10.63	0.000	.2670715	.3879033
lnpctout	.7228983	.1037464	6.97	0.000	.5195383	.9262582
lnpctout2	.060969	.016579	3.68	0.000	.0284714	.0934665
black	.1500696	.0388457	3.86	0.000	.0739257	.2262135
hnohs	.0808483	.0411846	1.96	0.050	.0001197	.161577
hcollege	.0467993	.0233964	2.00	0.045	.0009385	.0926601
wnohs	.253389	.0449199	5.64	0.000	.1653386	.3414394
wcollege	.076044	.0232754	3.27	0.001	.0304203	.1216676
wweek	-.0012988	.0007522	-1.73	0.084	-.0027733	.0001756
wfull	.0066976	.0272434	0.25	0.806	-.0467038	.0600991
bothwork	.1477821	.0330065	4.48	0.000	.083084	.2124802
ne	.0409191	.0304511	1.34	0.179	-.0187699	.1006082
south	-.0539059	.0255391	-2.11	0.035	-.1039666	-.0038451
west	.0145282	.0271328	0.54	0.592	-.0386566	.067713
y2013	-.0714169	.0368745	-1.94	0.053	-.143697	.0008632
y2014	-.0657672	.0341526	-1.93	0.054	-.1327119	.0011775
y2015	-.0131699	.0328325	-0.40	0.688	-.0775271	.0511873
y2017	-.0774704	.0334949	-2.31	0.021	-.1431259	-.0118149
y2018	-.0716392	.0304411	-2.35	0.019	-.1313087	-.0119697
_cons	3.109207	.1738063	17.89	0.000	2.768518	3.449896

If we had estimated a specification that was linear in per-capita total outlays, we have shown that we can explicitly determine from estimates the proportion of total outlays devoted to children

$$1-\left(\frac{2}{2+K}\right)^{1-\frac{\alpha}{\beta}}.$$

Estimating the linear specification on the baseline sample, we obtained a value of .9986 for α and 1.0970 for β. This would imply that parents would be estimated to spend 24.5%, 38.1%, and 46.9% on one, two, and three children, respectively.

The allocations to children based upon the nonlinear specification that we have used in previous studies can't be explicitly determined as a function of the estimated parameters. Consequently, we had to resort to numerically determining the percentage of total spending devoted to the children (see Appendix C). Table 5 presents the results of these calculations based upon the estimated parameters in Table 4.

Table 5
Percentage of Total Outlays Devoted to Children

Total Outlays	One Child	Two Children	Three Children
$10,000	22.5%	34.7%	42.6%
$20,000	23.5%	36.2%	44.4%
$30,000	24.0%	37.0%	45.3%
$40,000	24.3%	37.5%	45.9%
$50,000	24.6%	37.9%	46.3%
$60,000	24.7%	38.1%	46.7%
$70,000	24.9%	38.4%	46.9%
$80,000	25.0%	38.5%	47.2%
$90,000	25.1%	38.7%	47.4%
$100,000	25.2%	38.9%	47.5%

Source: Calculations by author

As total outlays in the family increase, holding all else constant, the percentage of total outlays devoted to the children increases due to the estimated positive value for β_2 (coefficient on *lnpctout2*). While the percentages increase with total outlays, they increase at decreasing rate. The average annual outlays in our baseline sample for parents with children and spending on adult clothing is $70,832. The predicted share of total spending devoted to children at the average outlays are 24.9%, 38.4%, and 47.0% for one, two, and three children, respectively. The estimates for the linear version of our model are 24.5%, 38.1%, and 46.9%, which are similar to the nonlinear estimates computed at the sample mean. The advantage of the nonlinear specification is that it does allow for the percentage of total outlays devoted to children to vary with total outlays.

Another perspective to examine the estimates of child spending is to compute the marginal increase in spending on the subsequent children. In general, we would expect that two children would cost more than one child but not twice as much. The marginal impact of the second (and third) child to the family can be calculated by computing the percentage difference in the share of total outlays for two (three) children minus for one child (two children). For example, the percentage increase in child spending for the second child at $70,000 of total outlays would be equal to 100*(38.4%/24.9%-1) or 54.2%. Table 6 reports upon the percentage increase in child spend for the second and third child in the family at various levels of total outlays.

Table 6
Marginal Increase in Child Spending

Total Outlays	Increase in Child Spending Due to: Second Child	Third Child
$10,000	54.5%	22.6%
$20,000	54.4%	22.5%
$30,000	54.3%	22.5%
$40,000	54.2%	22.4%
$50,000	54.2%	22.4%
$60,000	54.2%	22.4%
$70,000	54.2%	22.4%
$80,000	54.0%	22.3%
$90,000	54.0%	22.3%
$100,000	54.0%	22.3%

Source: Calculations by author

The additional spending for the second child is roughly 54% of what was spent on the first child, suggesting that there are economies of scale in child consumption. These scale economies continue, suggesting that the additional spending on the third child is roughly 22% less than one-half the additional spending on the second child. The increase in spending for subsequent children is fairly stable with regards to the total level of outlays: as total outlays increase, the marginal spending on subsequent children shows a modest decline.

Comparing the Current Estimates to Previous Rothbarth Estimates

The purpose of this section is to compare our current Rothbarth estimates with four previous studies we have conducted, selected estimates of spending on children that were available at the time when guidelines were first being constructed, and the estimates from the USDA approach and L/M methodology. (More information about each of these studies and references to these studies provided earlier in the CPR report.) Table 7 compares estimates of the proportion of a family's spending devoted to the children from various studies ranging from 1972–73 to the present study. Table 7 reports upon the estimates of the percentage of total outlays devoted to children for one, two, and three children. The percentage estimates for each study were computed for the approximate average total outlays in each study sample.

While Table 7 presents the percentages for one, two, and three children, we will focus upon the estimates for one child. Instead of comparing the estimates for two and three children, Table 8 presents the marginal cost of adding the second and third child. By examining the marginal cost of additional children instead of the percentage of outlays (Table 7), we can control for differential costs of previous children. For example, consider two studies where the marginal cost of the second child are equal, but one study's estimate of spending on the first child is larger than the other study. Comparing the two studies, we would

infer that one study estimated higher level of spending for both one and two children, even though the marginal increase in spending on the second child was the same in the two studies.

Table 7

Estimates of the Allocation of Spending to Children

	Number of Children: 1	2	3
1972–1973 CE			
Engel[13]	24.0%	41.0%	51.0%
Lazear and Michael[14]	19.0%	31.0%	39.0%
1980–1986 CE[15]			
Rothbarth	24.2%	34.2%	39.2%
1996–1998 CE[16]			
Rothbarth	25.6%	35.9%	41.6%
1998–2003 CE[17]			
Rothbarth	25.2%	36.8%	43.8%
2004–2009 CE[18]			
Rothbarth	23.5%	36.5%	44.9%
2013–2019 CE[19]			
Rothbarth	24.9%	38.4%	47.0%
Replications and Other Estimates:			
2004–2009 CE[20]			
Rothbarth	22.2%	34.8%	43.2%
Lazear and Michael	21.5%	24.4%	33.4%
2000–2015 CE[21]			
Rothbarth	20.4%	32.3%	40.3%
Lazear and Michael	19.2%	24.1%	30.8%
USDA—2011–2015 CE[22]	26.0%	39.0%	49.0%

[13] Espenshade (1984), as reported in McCaleb, Macpherson, & Norrbin (2008).
[14] Lazear & Michael (1988), reported in Rodgers (2017).
[15] Betson (1990).
[16] Betson (2000).
[17] Betson (2006).
[18] Betson (2010).
[19] Betson (2020), present study.
[20]Rodgers (2017), replication of Betson (2010).
[21]Rodgers (2017).
[22] Lino et al. (2017).

Early estimates of parental spending on children were based upon the 1972–73 CE data. Espenshade's estimates of cost of children using the Engel method published in 1986 were utilized by many states to construct their initial child support guidelines in response to the federal requirements set out in the 1988 Family Support Act. For families with average levels of total spending, Espenshade's estimates were that 24%, 41%, and 51% of the family's total spending was devoted to one, two, and three children, respectively. Employing the same CE data but utilizing their version of the Rothbarth approach, Lazear and Michael (1988) produced estimates of the share of total spending of 19%, 31%, and 39% of total spending. L/M's estimates were considerably lower than Espenshade's estimates.

The 1988 Family Support Act not only required states to adopt child support guidelines but directed the Department of Health and Human Services to conduct research on the economic estimates of the cost of raising children. The 1990 study by Betson on the cost of raising children represented the Department's response to this directive. In this study, the Rothbarth models, as well as numerous other approaches (but not the L/M approach), were estimated using the CE data from 1980 to 1986. The Rothbarth estimates produced higher estimates (24%, 34%, and 39%) than the Lazear and Michael estimates for one and two children. Compared to Espenshade's estimates, the estimates for one child were roughly identical, but for two and three children were considerably lower and much closer to the Lazear and Michael's Rothbarth estimates.

In 2000, with funding from the Institute on Poverty at the University of Wisconsin, we replicated the 1990 study using data drawn from the 1996 through 1998 CE data (first quarter of 1996 through first quarter of 1998). Compared to the 1990 estimates, the 2000 Rothbarth estimates showed a small but not statistically significant increase (26%, 36%, and 42%) over the 1990 estimates.

In 2006, with funding from the State of Oregon, we produced a new set of Rothbarth estimates using data from the 1998 through 2003 CE. The estimated Rothbarth percentages were 26%, 37%, and 44% for one, two, and three children, respectively. While the estimates for one child remained constant, there was a slight but not statistically significant increase in the spending shares for two and three children.

The next set of estimates is from a study we conducted for the state of California based upon CE data from 2004 through 2009. While income of the family is not used in the estimation of the Rothbarth model, with interviews starting in 2004, the BLS provided imputed income for units whose income reported to the CE was viewed as "incomplete." This study also represents a shift in how we defined total spending in the family. Previous to this study, we had employed a modified version of total expenditures. For this study, we switched to a concept of outlays where the most important difference was that with outlays, the principal payments on loans were included as family spending where previously they had been excluded. The Rothbarth estimates from this study were 24%, 37%, and 45%.

Over time, our estimates for one child have displayed variation, but have not shown any trend over time (24.2%, 25.6%, 25.2%, 23.5%, and 24.9%). The range in our Rothbarth estimates is 2.1 percentage points, which is on the order of the standard deviation in the Rothbarth estimates due to sampling variation (see Betson (1990)). While some might find some concern with the variation in estimates, we see consistency in these estimates.

In 2017, Rodgers produced a study for the state of California that produce estimates of spending on children using the L/M approach. Contrary to our approach, Rodgers utilized a long time period for his analysis using the CE data from 2000 to 2015—roughly fifteen years of data. While a longer time span may seem preferable, Rodgers not only uses net income to restrict his sample, but to analysis his results and conclude that child-rearing expenditures have increased over time. Over this time period, nonetheless, there have significant changes in the BLS's processing of the CE data. As we mentioned, in 2004 the BLS has provided imputed income amounts for those viewed to be underreporting their before-tax income. In 2013, the BLS began estimating the family's tax liabilities using the National Bureau of Economic Research's (NBER) TAXSIM model, and in the first quarter of 2015 stopped asking units to report the taxes they have paid and will rely solely upon the estimates of taxes from TAXSIM. In each instance, the BLS believed these changes to be improvements to the quality of the CE data. But given the long time, it is impossible for Rodgers to construct a consistently determined amount of after-tax income of the family.

Rogers's estimates of child spending using the L/M model produced almost identical percentages for one child—19.2%, while the original L/M estimates based upon 1972/73 CE data was 19.0%. But for two and three children, the Rodgers's estimates (24.2% and 30.8%) are significantly smaller than the original L/M estimates (31.0% and 39%). Using the same CE data (2000 to 20015), Rodgers estimated our Rothbarth model. Rodgers's replication of our Rothbarth model yielded slightly larger estimates for one child compared to his L/M estimates but considerable larger estimates than the L/M model's estimates for two and three children (32.3% and 40.3%). However, his Rothbarth estimates using the 2000–2015 data are considerably smaller than any of our current Rothbarth estimates for one and two children using data from 2013 to 2019 CE. Only for three children is Rodgers's Rothbarth estimate inside the range of our estimates.

In his study, Rodgers attempted to replicate our 2010 study using the CE data from 2004 to 2009. While replication is often easier said than done, we did notice one aspect where he deviated from our specification. In estimating the Rothbarth model, Rodgers employed the log of total outlays and its square instead of the per-capita outlay variables we employed in our California study: the log of per-capita total outlays and its square. The impact of this difference in variable construction on the estimate of child spending is difficult to determine a priori. Rodgers's estimate of the percentage of total outlays devoted to one child to be 22.2%—1.3 percentage points lower than our estimate of 23.5%, or 5.6% less spending on the child.

Finally, the latest USDA estimates published in 2017 used data from 2011 to 2015 CE. They report that their estimates imply that in two-parent families 26%, 39%, and 47% of total expenditures are spent on one, two, and three children. These percentages represent the largest estimates of the percentage of total outlays devote to children since the 1972–73 estimates by Espenshade.

To compare the estimates for the second and third children, we will examine the marginal increases in spending for the second and third children. The estimates of marginal increase in spending on children are presented in the following table for all of the studies we have discussed.

Table 8
Marginal Increase in Child Spending

	Increase in Child Spending Due to: Second Child	Third Child
1972–1973 CE		
Engel	70.8%	24.4%
Lazear and Michael	63.2%	25.8%
1980–1986 CE		
Rothbarth	41.3%	14.6%
1996–1998 CE		
Rothbarth	40.2%	15.9%
1998–2003 CE		
Rothbarth	46.0%	19.0%
2004–2009 CE		
Rothbarth	55.3%	23.0%
2013–2019 CE		
Rothbarth	54.2%	22.4%
Replications and Other Estimates:		
2004–2009 CE (Rogers Replication)		
Rothbarth	56.8%	24.1%
Lazear and Michael	13.5%	36.9%
2000–2015 CE		
Rothbarth	58.3%	24.8%
Lazear and Michael	25.5%	27.8%
USDA—2017 Report	50.0%	25.6%

To put these numbers in perspective, consider if the family spent the same amount on the second child as the first child. This would imply that the marginal cost of the second child would be 100%. In this case, the family's total spending on children would double when the second child was added, holding total spending constant. Typically, we would expect when a second child is added, total spending on children would not double (average spending per child remain the same), implying that the marginal cost of the second child would be less what was spent on the first. Hence, the marginal cost of the second child should be less than 100%. The more the marginal cost of the second child deviates from 100%, the greater economies of scale in child consumption are present. By similar logic, we would expect that the marginal cost of the third child to be less than the marginal cost of the second child.

All of the studies with the exception of Rodgers's estimates of the L/M model meet these rather broad expectations. In both samples, Rodgers's L/M estimates of the marginal cost of the second child appear to be so small that they are less than the marginal cost of the third child, which are similar to the estimates of marginal costs of the third child from the Rothbarth, Engel, and USDA estimates. Even the Lazear and Michael's estimates of their own model indicate that the marginal cost of the second child exceeds the marginal cost of the third child.

While our Rothbarth estimates have not display any time trend, the estimates of the marginal cost of the second and third children clearly show an upward trend. In our early studies (using CE data prior to 2004), the marginal cost of the second child was below 50% and the marginal cost of the third child were below 20% and were all significantly below the Espenshade and L/M estimates that used the 1972–73 CE data. The last two studies we have conducted using CE data collected after 2003 have produced estimates of the marginal cost of the second child that exceed 50% and exceed 20% for the third child. Yet these estimates of the marginal costs of the second and third children are less than the estimates found in the early studies by Espenshade and L/M.

V. Alternative Samples: Including Adult Children, Domestic Partners and Utilizing Quarterly Data

The baseline sample of consumer units we have employed in all of our past studies are restricted to married couples either without children or with own children all who are under 18 years old.[23] Historically, this sample has been chosen to reflect the type of family envisioned to be used as the "standard" family type used to determine guideline amounts under an Income Shares model.[24] Two groups of families are specifically excluded from this baseline sample: families with own children who are 18 years old or older and consumer units with domestic partner.[25]

The composition of families can be even more complex than the type of families considered in this study. For example, other relatives such as grandparents, aunts, or uncles may also reside with the married couple. Nonrelatives (adults) of the parents could reside in the household. In either case, the entire consumer unit was eliminated from the sample. Families were also excluded if there were children who were not the "own" children of either adult of the married couple. The question is whether these exclusions would have an impact upon the estimates of spending on children.

In the baseline sample, the parents of the children needed to be married to be included in the sample. An interesting question is whether those couples who are not married but reveal themselves as "domestic partners" behave the same as married couples whose children are both of theirs.

In previous studies, we and other researchers have used the CE quarterly data to construct a single record for each consumer unit that reflect the unit's annual spending amounts. However, the BLS recommends that quarterly data be treated as independent of other quarterly observations from the same consumer unit. While we believe that the BLS recommendation is based upon a questionable assumption of independence, in this section, we will examine the effect of adopting the BLS recommendation on the estimates of parental spending on children.

Including Adult Children

If a married couple has any own children who are 18 years old or older, they are excluded from the baseline sample. This restriction excludes two types of families. One set of families would be married couples whose own children residing with them are all 18 years or older. The other set of families would be married couples with own children both under 18 years old and 18 years old and older.

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[23] There are other sample restrictions employed, such as must have reported food purchases, the female-adult parent should be less than 60 years old, the consumer unit can only contain the own children of the couple, and when using annual observations there can't be a change in the number of unit members over the various interviews completed by the unit.

[24] With the Income Shares approach, the parent's combined obligation for the children (under 18 years old) should equal what the parents would spend on the children if they had remained married or had been married.

[25] Same-sex couples who are married are included in the baseline sample, even though we often refer to the "husband" and "wife" or "male" and "female." When a same-sex couple is married, the youngest of the couple is designated as the "wife" or "female" regardless of their gender.

When we started examining the type of consumer units with own children who are adults, we found a significant number of units we felt were not appropriate to include. For example, there were "older" married couples where their "older" own children living with them. Given that the age of the adult children exceeded 30 years old, we felt that using these families would not be appropriate to studying the "allocation" of spending to the own child. A second and we feel more important reason is the potential that who is designated the "reference person" in the interview might determine who is included or excluded from the sample.[26] Had the older own child been the respondent to the interview, they would have been designated as the "reference person" and their parents would have been designated as "parents of the reference person." Based upon this designation, the consumer unit would have been excluded the baseline sample. If we allowed all married couples with own children either less than 18 years or older than 18 years old to be part of the sample and one of "older" parents was the reference person, the consumer unit would have been included in the sample. In our opinion, who is designated as the "reference person" shouldn't influence whether you are in the sample. To examine how the inclusion of adult children might affect the estimates, we chose to include along with the baseline sample the consumer units who married couples with own children who are 18 years old to 26 years old.[27]

When we included consumer units who have adult children who are less than 26 years old, 2,378 additional consumer units were added to the sample. The additional observations are almost equally divided between units who have children under 18 years old (51%) and those who don't (49%). Given that in the baseline sample 58% of the observations contained children under 18 years old, the "new" sample will contain slightly fewer observations with children under 18 (57%).

In the baseline sample, the number of adults in the unit is always two. Hence, when family size (FS) is equal to two, this will denote a childless couple unit, but if FS is greater than two, it will represent a family with two adults and FS-2 children. This implies that is a one-to-one relationship between family size and the number of children in the unit. But if we include adult children into the mix, there is no longer a one-to-one relationship between family size and the number of children in the unit. For example, for family size of three, the family could be composed of the married couple with one adult child or the married couple with a child under 18 years old. While the specification of the regression model would assume both units would spend the same amount on adult goods, in reality we would expect that the unit with three adults would spend considerably more on adult goods than the married couple with one child. If we are to include adult children into the sample, the regression model needs to be altered in a manner that allows adult children to have a differential impact on adult goods spending compared to children under 18 years old.

To examine the potential impact on the baseline estimates, we produced two sets of estimates of the percentage of total outlays spent on the children using the sample that includes adult children under 26 years old. The first set (navy color in the following figure) is based upon using exactly the same model specification used in the baseline analysis. The second set (maroon) reflect a modification to the baseline specification to account for the presence of adult children by including four additional variables to the baseline model specification:

[26] The reference person is who responds to the interview.
[27] If there was own child was 26 years old or older present in the unit, then they were not included in the sample. Also, we limited the number of adult children the unit could have and still be in the sample to a maximum of three adult children.

ac1 = 1 if there is one adult child in the unit, 0 otherwise
ac2m = 1 if there are two more adult children in the unit, 0 otherwise
wc_ac1 = 1 if there is an adult child and at least one child (less than 18) in the unit, 0 otherwise, and
wc_ac2m = 1 if there are two or more adult children and at least one child in the unit, 0 otherwise.

The rationale for using these categorical variables in the analysis was to allow for the spending patterns of the newly added units to be different from those in the baseline specification. If these additional variables were not included in the estimation, then an unit with three adults and no children (excluded in the baseline) would be "forced" by the baseline specification to have the same expected spending on adult clothing as a married couple with one child.

Even though there are adult children in the analysis sample, the percentage of total outlays devoted to the children under 18 years assumes that there are no adult children present. The difference in the percentages reflects the impact of including adult children on the parameter estimates (α, β_1, and β_2). Figure 4 reflects percentage difference between these two sets of estimates and the baseline for one to three children.

If the baseline specification of the model are used, the estimated percentage of total expenditure devoted to one child was 18% lower if we included adult children who are less than 26 years old into the sample (the navy lines in the figure). For two and three children, the effect of adding the adult children is only slightly smaller (17% and 16%, respectively). This is a significant reduction in the estimates, but as we have noted, the application of the same model specification to this sample of consumer units is at best problematic because it fails to capture how adult children affect spending on adult goods in a realistic manner.

In our baseline sample, we found that parents with an average level of total outlays spent 24.9% of their family spending on a single child. Including adult children lowered estimated spending on the child by 18% or to 21.4% of total outlays. In the original L/M study, adult children as well as other complex family structures were included in their analysis sample. While this evidence is not conclusive, the above comparison suggests that lower estimates of child spending is the result of how was included in their sample. It is a topic that should be examined to better understand why the Rothbarth and L/M arrive at such different estimates of spending on children since the L/M measurements are estimated without the restriction to two-parent households

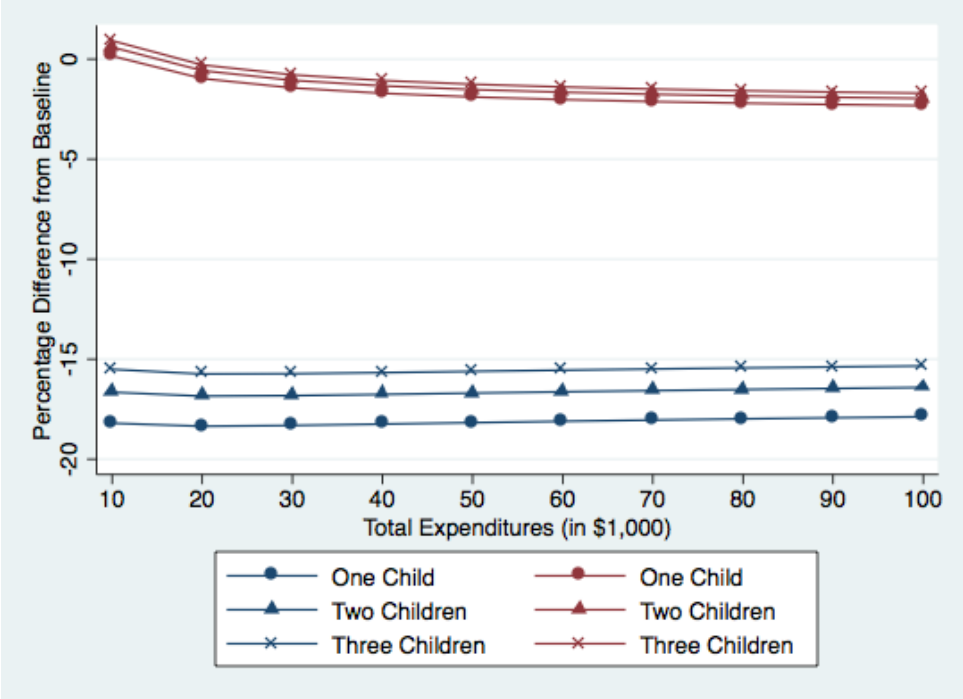

Figure 4
Impact of Adding Adult Children

When we "crudely" account for how adult children might affect purchases of adult goods by including four categorical variables to allow for mean differences in average spending for units with adult children (units with one adult child but no children under 18 years old; units with two or more children but no own children under 18; units with one adult child and own children under 18 years old; and units with two or more adult children and own children under 18 years old). By controlling for these four groups in the empirical estimation of the model using the expanded sample with adult children, the estimated percentage difference between these estimates and the baseline estimates is now quite small (1% to 2% smaller than the baseline). Our interpretation of this result is twofold. First, one can't estimate the same model on a sample with a different composition without modelling how those differences will affect the dependent variable (in our case, spending on adult goods). Secondly, we concluded that when one has accounted for the differences in samples in the estimation the use of the baseline sample doesn't have a significant impact upon our baseline estimates.

Including Domestic Partners

In the CE, it is possible to examine couples who identify themselves as "domestic partners." While we exclude these units from the baseline analysis, we chose to examine the impact of including them in the analysis. If we allow for "domestic partners" to be in analysis sample, we would add 2,525 units to the baseline sample where 66% of those added to the analysis sample were childless couples. In this sample, having adult children of the partners present in the consumer unit will result in the unit being eliminated from the sample.

Including these consumer units into the analysis may appear to be simple and straightforward, the problem is identifying the children of these domestic partners. While the CE identifies the own children of

the reference person, it does not identify the own children of a domestic partner who is not the reference person. If the domestic partner who is not the reference has children of their own, they will be designated as a "unrelated person" to the reference even though they are related to the individual identified as a "domestic partner." Consequently, we have to make the assumption that if there are unrelated persons under the age of 18 years old present in the unit, they are the own children of the domestic partner. The number of children of this relationship would be the combined number of own children of the reference person and the individual designated as the domestic partner.

If we include domestic partners and their children in the analysis sample without making any changes to the model specification, we are assuming that married couples and domestic partners make the same decisions about the allocation of consumption within the consumer unit. If we make that assumption, the estimate of the percentage of total outlays devoted to the children increases. Figure 5 plots the percentage difference between estimates based upon the two samples. While the alternative estimates are consistently larger for all values of total outlays, the impact of using "domestic partners" never exceed 4% and at average levels of total outlays the impact is only 2%. In our judgment, this is not a significant amount.

To test the assumption that domestic partners make similar consumption decisions as married couples, we included the following two categorical variables:

partner = 1 if a domestic partner is present in unit, 0 otherwise
wc_partner = 1 if a domestic partner is present as well as own children under 18, 0 otherwise.

The coefficient on partner will indicate the difference in spending on adult goods between married couple and domestic partners without children. While the coefficient on wc_partner indicates the difference in spending of domestic partners with and without children. Our estimates indicate that domestic partners without children spend statistically more on adult goods than married couples without children. However, domestic partners with children don't significantly spend more on adult goods than domestic partners without children. Consequently, the percentage of total outlays devoted to the children by married couples and domestic partners are statistically the same. However, this doesn't imply that the estimates of the percentage of total outlays devoted to the children by married couples in the new sample will be the same as in the baseline because the alternative sample can affect the estimates of the three parameters, α, β_1, and β_2. When the alternative sample is utilized along with the two additional variables in the model, Figure 5 shows the percentage difference between the alternative estimate of spending on children by married couples relative to the baseline estimates (depicted in maroon for one to three children).

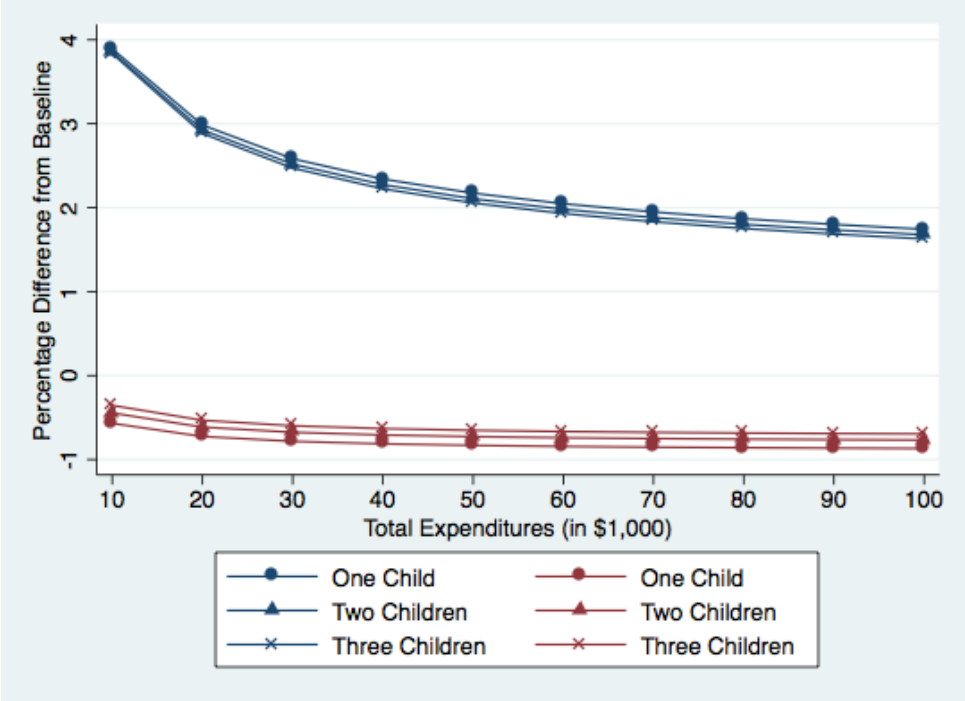

Figure 5
Impact of Including Domestic Partners

While the alternative estimates are consistently below the baseline estimates of the cost of children, the percentage difference are small. The absolute value of the percentage difference never exceeds .9%. In our judgment, the inclusion of domestic partners doesn't affect our estimates of the cost of children to married couples. However, this doesn't argue for their inclusion nor their exclusion. It is just reassuring that this decision whether to include them will not affect our view of how married couples allocate expenditures to their children.

Including Both Adult Children and Domestic Partners

Figure 6 reflects the impact of including both adult children and domestic partners on our estimates of the percentage of total outlays devoted to the children. Recall when we just added adult children to the sample, the estimates of the percentage of outlays to children significantly declined. For example, the estimates of child spending were 18% lower for one child. Add domestic partners to the sample lead to marginally higher estimates of child spending. We see when we include both groups and don't control for the presence of these additions (navy lines), the effect of adding adult children is dominant resulting in still a net decreases in spending on children but not as much when we just included adult children. But when we do utilize the same controls discussed previously, the net effect is negative but quite small.

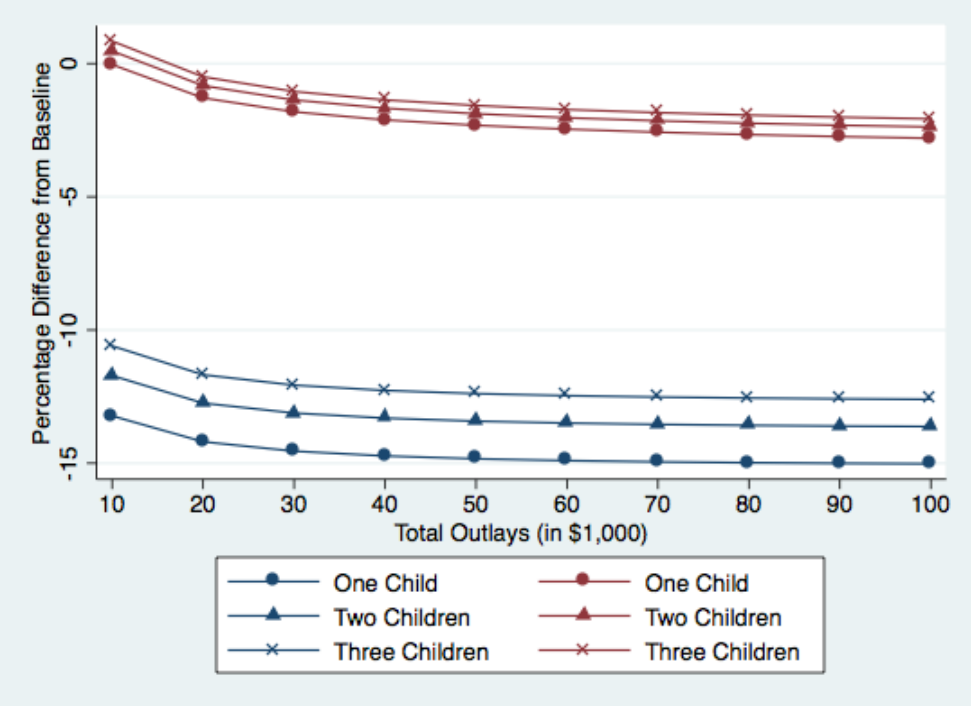

Figure 6
Impact of Including Both Adult Children and Domestic Partners

Using Quarterly Data

In previous reports, we have argued for basing the analysis on an annual perspective rather than the quarterly perspective. We made this judgement based upon statistical reasons. If we had employed the quarterly perspective, families would be in the sample more than once but would be in the sample the number of times that they had completed a survey during the sample time frame. At a minimum, the quarterly perspective creates a sample where the regression assumption of independence between observations is being violated. While we were never were certain about the impact of using the quarterly perspective, we have never produced estimates of child spending using the quarterly framework recommended by the BLS. Figure 7 presents the significant impact of using quarterly data instead of the annual perspective in the baseline analysis on the percentage of total outlays devoted to the children.

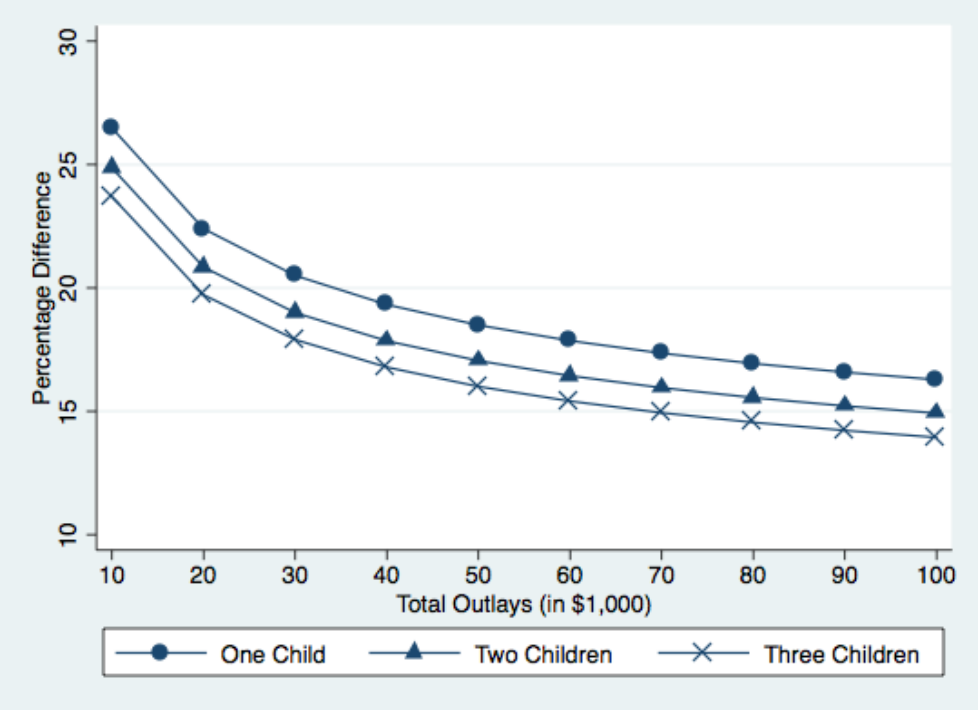

Figure 7
Impact of Using Quarterly Data

The use of quarterly data instead of annual not only substantially increases the Rothbarth estimates overall but has a larger impact at lower levels of total outlays in our sample. Given the finding that the percentage of total outlays devoted to children increases with total outlays, Figure 7 (the percentage difference declines with total outlays) suggest that use of quarterly data will "flatten" out the relationship between child spending and total outlays.

Apart from the USDA, researchers have adopted the annual perspective in their studies. Should we infer from this result that the choice of using an annual perspective leads to an understatement of spending on children? We wish to caution against making this inference. First of all, this is just one data point that pertains only to the Rothbarth approach and the time period we have studied. The conclusions could be different for different methodologies as well as different time periods.

Secondly, to infer that the annual perspective understates what is spent on children implies that the quarterly perspective does reflect what parents are spending on children. At best, what is can be inferred is that in this instance, the annual perspective leads to lower estimates. These lower estimates could, in fact, reflect what the parents are on average spending on their children.

Conclusions

In this report, we have examined alternative methodologies to determine how parents devote family spending toward their children. Each method has its strengths and its weaknesses. The USDA approach is transparent and more accessible for the layperson. However, it is difficult to verify their accuracy of the specific allocations of goods that could be assigned to either the parents or the children. Indirect methods, such as Rothbarth or Lazear-Michael approaches, require other assumptions about parental choices to identify how much more or less spending families of different compositions need to maintain a given standard of living. The validity of the assumptions underlying the indirect approaches should also be questioned. However, given the numerous replications of both the USDA and Rothbarth methodologies and their relative stability over time, both of these methods deserve our attention. While we have updated our estimates of the Rothbarth approach in this study, some research effort should be given to updating the USDA estimates. While the USDA report in the past has been issued on an annual basis, the underlying estimates from new CE data is done roughly once every five years. In the interim years, the previous estimates are updated to reflect changes in prices that have occurred over the year. Given the budget restrictions in government, there is some question whether the USDA will provide a full update of their estimates by utilizing more recent CE data. We also believe that it is desirable that others outside of government seek to replicate their work. For these reasons, it is desirable to update the USDA estimates.

Recently Rodgers (2017) has resurrected the Lazear-Michael (L/M) approach to estimating the Rothbarth model. The original estimates by L/M showed parental spending on children to be smaller than the Engel estimates done by Espenshade using the 1972–73 CE data. Rodgers has estimated the L/M model using CE data from 2000 to 2015 and has obtained estimates of child spending that are lower than what are obtained from the Rothbarth approach estimated with the same sample. For one child, the Rodgers estimates and the original L/M estimates are almost identical. However, Rodgers finds the marginal increase in spending for the second child to be lower than what other researchers have found including L/M but also low compared to the marginal cost of the third child. This result is quite concerning and gives one pause when considering these new Rodgers estimates for a basis of determining child support obligations.

At this time, we don't have sufficient evidence to answer the question of why there is a difference in the estimates from the Rothbarth and L/M approaches. In this paper, we construct an argument that in principle these two models should yield the same the same estimates of child spending. The difference is how the model is estimated. The Rothbarth approach focuses upon estimating the relationship of spending on adult clothing as a function of total outlays while the L/M approach does the reverse—total outlays as a function of spending on adult clothing. Rothbarth recognized that both empirical strategies are possible but was sufficiently concerned with the potential statistical problems of the L/M approach that he chose to establish the empirical relationship between adult purchases given the total outlays of the family. We too have the same concerns and that is the primary reason why we favor the Rothbarth estimates over the L/M estimates. However, we do believe that additional research should be undertaken to understand why these two approaches lead to different estimates of parental spending on children.

Beside updating the Rothbarth, a contribution of this study has been to examine how the design of the analysis sample (the sample used in the estimation) affects the estimates of parental spending on children. While we maintain that restricting the sample solely to those families with a married couple without children or with own children only under the age of 18 years old is the appropriate sample to use, others hold different beliefs and feel that the estimation should include at a minimum families with adult own children. We found that the inclusion of families with adult children will significantly reduce the estimates of spending on children when the presence of the adult children is reflected just as additional adults in the family. If additional controls are included in the estimation to account for any other difference the families with adult children may have on spending on adult clothing, the difference in the estimate of parental spending on children resulting from including adult children is almost erased.

To determine what is the appropriate sample, we have to ask the question of how guidelines should incorporate the adult children as a factor determining a support obligation. Consider a family composed of a 22-year-old adult child who lives with their parents and a younger sibling who is 12 years old. Now consider a second family composed of a 12-year-old child living with both of their parents (no adult child). If the parents in both families divorce, should the guidelines provide the same level of combined support to the 12-year-old child? Given that the parents with adult child are likely to spend less on their younger child than the parents with only a 12-year-old, one could argue that at least the presence of adult children should be a factor in setting the guideline support. But current guidelines treat the adult child as not being present—neither contributing to the family's spending nor benefiting from the family's spending. If ignoring adult children is the approach taken in the guidelines, then a sample that excludes families that contain adult children as well as other relatives in the consumer unit is, in our opinion, the appropriate direction to take with respect to the estimation of the cost of children in the family.

Finally, we found that whether one adopts an annual or quarterly time period for the analysis has a substantial impact on the estimates of spending on children. Adopting a quarterly time period for the analysis resulted in a 15% to 17% increase in the amount that parents undertake for their children. While the BLS has reasons for their recommendation for treating quarterly interviews from the same consumer unit, we continue to hold that the annual time frame is more appropriate, but it is not without its own problems.

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Appendix A: Equivalence Scales and Cost of Children

An equivalence scale is a commonly used concept to make comparisons between families of different sizes and composition of adults and children. An equivalence scale reflects how much consumption a family with *A* adults and *K* children would require to be equivalent (equally well off) to a single adult. The NRC Panel on Poverty Measurement (see Citro and Michael (1995)) proposed the following two-parameter formula to capture how an equivalence scale (ES) would vary with the number of adult and children

$$ES(A,K) = (A + \kappa K)^{1-\sigma}$$

where

$$ES(1,0) = 1.0 \ .$$

This formulation assumes that the equivalence scales are independent of the level of total expenditures.

The parameter κ reflects how children "count" as an adult. The value of κ is reasoned to between zero and one where a value of one implies that a child is equivalent to an adult. If κ is zero, then children do not count in determine the "size" of the family. If equivalence is based upon consumption, then the per-capita spending on children relative to the per-capita spending on adults would capture this equivalence. L/M denoted this ratio as $\phi(X)$, which was a function of the characteristics of the family with children such as the number of adults and the number of children in the family.

The second parameter, σ, captures the economies of scale in consumption. If σ is zero, then there are no economies of scale in consumption and the equivalence scale would be just the number of adult equivalent members in the family ($A+\kappa K$). If σ equals one (what we denote as infinite economies of scale), then adding another member to the family would not require any additional consumption—*ES(A,K)* would equal one for all *A* and *K*.[28]

For the NRC Panel's report on poverty measurement, Betson and Michael (1993) suggested that the two parameters of this specification of equivalence scales could be estimated from the literature on parental spending on children. In this literature, researchers estimate and report the percentage of total expenditures that parents allocate to their children. Let $P[A, K]$ denote the proportion of expenditures devoted to *K* children when there are *A* number of adults in the family

$$P[A,K] = \frac{T - T^*}{T} = \frac{T - \frac{ES(A,0)}{ES(A,K)} \times T}{T} = \frac{ES(A,K) - ES(A,0)}{ES(A,K)}.$$

Betson and Michael then proposed estimating the two parameters, κ and σ, by selecting studies of parental spending on children in one and two parent families (*A*=1 and 2 and *K*= 1, 2, and 3) by selecting the parameters that minimized the following sum squared residuals

[28] If σ is greater than 1.0, then additional family members would require less consumption not more. For this reason, we would expect that σ would be greater than or equal to zero but less than or equal to one.

$$Residual = P[A,K] - \left[\frac{(A+\kappa K)^{1-\sigma} - (A)^{1-\sigma}}{(A+\kappa K)^{1-\sigma}}\right]$$

Their estimated value of κ was .70 and .24 for σ. Given these estimates, the calculated percentages of a married couples total expenditures would be 20.4%, 33.2%, and 42.0% for one, two, and three children, respectively. After deliberation, the Panel recommended that a value of .70 be assumed for κ and that a value for σ be chosen from the range of .25 and .35.[29]

Let us consider the specification of the amount of spending on adult goods (Rothbarth model) where the log of spending on adult goods, ($\tilde{T}_A$), is linear in the log of family size and the log of per-capita total expenditures

$$ln(\tilde{T}_A) = \gamma(Z) + \alpha \ln(A+K) + \beta \ln\left(\frac{T}{A+K}\right)$$

It can be shown that the equivalence scale for this specification of the Rothbarth is

$$ES(Rothbarth) = (A+K)^{1-\frac{\alpha}{\beta}}$$

The equivalence scales differ across families due solely to economies of scale in consumption, σ = α/β but not the composition of the family.

The equivalence scales implicit in the L/M approach are

$$ES(L/M) = (A+\phi(K)K)^{1-0} = A+\phi(K)K\,.$$

where ϕ(*K*) reflects the fact that ϕ is a function of the number of children as well as other characteristics. While this specification of the equivalence scale doesn't contain explicit economies of scale in consumption (σ), economies of scale in consumption is reflected in these scales when the number of children is negatively correlated with ϕ.

[29] The Supplemental Poverty Measure uses a three-parameter specification where the first child in a single parent family "counts" more than subsequent children and children in multiple adult families. There are also one parameter scales, such as the Watts Scales, where the equivalent scales are the square root of family size – κ is 1 and σ is .50.

Appendix B: Technical Description of Alternative Methodologies

The purpose of this study is to determine how parents allocate the family's spending to either to themselves (adults) or to their children. This Appendix provides more technical detail about the alternative methodologies summarized in Section I. Before providing this detail, we summarize some of the background information in the Introduction to provide context to the technical details.

Economists define a private good as a good whose consumption benefits a single individual. For example, if an apple is purchased, then the purchase can be attributed to the family member who eats the apple. In the case of private goods, the goal of attributing the purchase to an individual family member makes logical sense. However, the family also purchases goods such as shelter and utilities that allow all family members to consume or enjoy the purchase of the good. Economists denote these goods as "public goods." The value of the consumption of a public good can vary across the individuals and there is no agreed-upon method to allocate the expenditures on these goods to individual family members. Given the goal of the research is to allocate all spending made by the family to adults and children, the general approach taken by all of the methodologies discussed in this appendix is to treat spending on public goods as one would allocate spending on private goods—the sum of the allocation of the spending on any good (private or public) to family members should equal what the family spent on the good. In essence, all allocation methods that we will consider here assume that all goods purchased by the family can be considered private goods.

In the text, we conceptualized how we might ask parents to allocate their spending to family members as approaching the family and asking them to keep the receipts for all of the purchases they have made over the course of, say, a year. We give the parents three boxes and label them "For the Children," "For the Parents," and "Can't Determine." For some goods, it is clear for whom the purchase was made and the parents could place the receipt in the appropriate box. For example, purchases of clothing should be easy for the parents to determine for whom it was purchased. The nature of the good could also be used to determine whether the purchase was for adults or children—alcohol and tobacco for adults; toys, playground equipment, and childcare for children. But for the majority of the family's spending, would the parents be able to allocate the purchases to either the parents or the children? While we could determine how much the family spent on food, how would one allocate the food purchases to the parents and the children? For goods that are purchased for the family and are shared by all family members (public goods) such as housing and transportation, how would you allocate what was spent on these items to the parents and children? Let us assume after the parents have done their allocations of the receipts, there is $\tilde{T}_A$ dollars of spending in the "For the Parents" box and $\tilde{T}_K$ dollars in the "For the Children" box. If the family's total expenditures are T dollars (the dollar amount of receipts in all three boxes), the amount of spending in the "Can't Determine" box is $\tilde{T}_3 (= T - \tilde{T}_A - \tilde{T}_K)$. While we would expect the dollar amount of receipts in the third box to be larger than the combined amounts in the other two boxes, the problem faced by researchers can be thought of how to allocate the $\tilde{T}_3$ dollars to the adults and children in the family? We now turn to providing a description of several alternative methodologies and the underlying assumptions of each approach.

Per Capita

One approach would take the unallocated amount and split it between the first two boxes on a per-capita basis. For example, if the family were composed of the two parents and one child, then 33% ($K/(A+K)$) would be allocated to the child and the remaining 67% to the parents. The total amount of family spending devoted to the children would equal

$$T_K = \tilde{T}_K + \frac{K}{A+K}\,\tilde{T}_3$$

where T_K is the total amount spending on the children. The total spending on adults, T_A, would equal $T\text{-}T_K$. The proportion of the family's total expenditures devoted to the children would equal

$$P(per\ capita) = \frac{T_K}{T} = \frac{K}{A+K} - \left[\left(1 - \frac{K}{A+K}\right) \times \frac{\tilde{T}_K}{T} + \frac{K}{A+K} \times \frac{\tilde{T}_A}{T}\right].$$

If the parents hadn't allocated any spending to either themselves or to the children, then this approach would assign a per-capita share of total expenditures to the children. To the extent the parents can make assignments to either themselves or their children, the proportion of the family's expenditures devoted to the children will be smaller than their per-capita share. Using a per-capita allocation scheme assumes that adult and children "count" the same in consumption decisions and there are no economies of scale in consumption.

USDA

The USDA has for several decades been publishing a report detailing their estimates of what parents spend on children.[30] The USDA utilizes information from sources other than the Consumer Expenditure Survey to allocate spending in the third box. The USDA has conducted studies on the allocation of the prepared food to individual members in the household. The Department of Transportation conducts studies why individuals use transportation and can assign those uses to children and parents. For medical care, DHHS has conducted studies that examine the adult and children use of medical care and how much children can add to the family's premiums for health insurance. The USDA is currently using a "marginal cost" approach to allocate shelter and utility expenses to the children. For all other expenses found in the third box, the USDA employs a per-capita allocation.

Let $\rho(K)$ denote the proportion of the dollar amount of receipts in the third box that the USDA assigns to the children, based upon findings from other surveys or studies. In general, we would expect that $\rho(K)$ would be less than the per-capita share of the children, but there is no guarantee that $\rho(K)$ would be less than $K/(A+K)$. The proportion of the family's total expenditures the USDA would assign to children would be equal to

[30] The most recent USDA study is Lino et al. (2017).

$$P(USDA) = \rho(K) - \left[\left(1 - \rho(K)\right) \times \frac{\tilde{T}_K}{T} + \ \rho(K) \times \frac{\tilde{T}_A}{T}\right].$$

The next two methodologies, Rothbarth and Lazear/Michael (L/M), abandon trying to assign on a good-by-good basis to the children the spending found in the third box. Instead, they chose to develop a methodology that determines a single allocation spending found in the third box—in essence, treating all of the spending in the third box as a single good. Instead of trying to allocate a proportion of the third box to the children, these approaches allocate spending found in the third box to the parents first. This allocation is inferred by examining how couples without and with children spend on goods that are clearly meant for adults: adult goods.

Rothbarth

The Rothbarth approach was developed to determine the allocation of rationing coupons to British families of different sizes and composition during WWII.[31] For our purposes, Rothbarth began by considering a married couple with K children and T total expenditures where we observe the couple spending $\tilde{T}_A$ on adult goods—goods that are clearly intended for the adults in the family and can be observed in data. The adults are assumed to allocate a portion of the spending in the third box to themselves, $\bar{T}_A$. Consequently, the total amount that the parents spent on themselves is equal to

$$T_A = \ \bar{T}_A + \tilde{T}_A \, .$$

If T_A were known, then the parents would have spent T-T_A on the children. The problem is that neither T_A nor $\bar{T}_A$ can directly be observed in the data.

Rothbarth reasoned that if he could identify a childless couple who was equally well off as the parents with the K children, then the total expenditures of the childless couple should be equal to what the parents with K children spent on themselves, T_A. But how we would know that the two couples would be equally well off? Rothbarth suggested that when both couples spent the same amount on adult goods they would equally well off.[32] If the childless couple had T^* of total expenditures, they would spend the same amount on adult goods that the parents with K children would have spent if they had T dollars of total expenditures. Rothbarth then inferred that T^* (the amount that the childless couple spent on themselves) would be equal to T_A (the total spending on adults in the family with K children).

To illustrate how our implementation of the Rothbarth methodology determines T^*, let us assume that the log of spending on adult goods is a linear function of the log of family size (A+K), the log of per-capita family total expenditures and the other factors, V

$$ln\left(\tilde{T}_A\right) = \ \alpha \ ln(A + K) + \beta \ ln(T/(A + K)) + \nu_0 + \sum_{i=1}^{N} \nu_i V_i \, .$$

[31] See Rothbarth (1943).

[32] It is important to recognize that Rothbarth was considering the situation where the adults were equally well off not the families were equally well off.

The above relationship (the parameters α, β, and ν's) can be estimated from a sample of childless couples and married parents with children. A couple (A=2) had K children with T amount of total expenditures would be expected to spend

$$\alpha\ ln(2+K) + \beta\ ln(T/(2+K)) + \nu_0 + \sum_{i=1}^{N} \nu_i V_i$$

while a childless couple with T^* total expenditures and the same value of the characteristics in V would spend on adult goods

$$\alpha\ ln(2) + \beta\ ln(T^*/2) + \nu_0 + \sum_{i=1}^{N} \nu_i V_i$$

For the two families to spend the same amount on adult goods

$$\alpha\ ln(2) + \beta\ ln(T^*/2) + \nu_0 + \sum_{i=1}^{N} \nu_i V_i = \alpha\ ln(2+K) + \beta\ ln(T/(2+K)) + \nu_0 + \sum_{i=1}^{N} \nu_i V_i$$

$$T^* = T\left(\frac{2}{2+K}\right)^{1-\alpha/\beta}.$$

This implies that the proportion devoted to the K children would be equal to

$$P(Rothbarth) = 1 - \left(\frac{2}{2+K}\right)^{1-\alpha/\beta}$$

In order to compare the well-being of the adults with and without children, the utility of the parents' utility would need to be independent of the presence of children or what the children consume—the utility of the children. Secondly, the Rothbarth methodology utilizes the inference that when a couple with children spends the same amount on adult goods as a couple without children, then they are equally well off? What assumptions must be made for both of these claims to be realized?

We can meaningfully compare the well-being of childless couples to the well-being of parents with children only if the well-being of adults (childless couples or parents with children) depends solely on their consumption of adult goods ($\tilde{T}_A$) and other goods they consume ($\bar{T}_A$) but not on the presence of children or what they consume

$$Utility_{Adults} = U_A(\tilde{T}_A, \bar{T}_A).$$

We will assume that the well-being of the children similarly depends upon what the children consume and not what their parents consume. Consequently, the utility of the family will be assumed to reflect the well-being of the adults and children

$$U_{Family} = U_A(\tilde{T}_A, \bar{T}_A) + U_K(\tilde{T}_K, \bar{T}_K; K) .$$

The technical phrase for this specification of utility function is that the family's utility is additive separable with regards to adult and child consumption in the family.

This assumption about the family's well-being implies that the parents with *K* children will engage in a two-step procedure to allocate spending to family members in order to maximize their well-being. In the first step, the parents decide how to allocate their total expenditures, *T*, to spending on adults (T_A) and to the children (T_K). The second step of the parent's decision is to allocate total spending for adults into the two components of how much to spend on adult goods ($\tilde{T}_A$) and other goods they consume ($\bar{T}_A$). Similarly, the parents will decide how to allocate the total spending on children to child goods ($\tilde{T}_K$) and other goods the children will consume ($\bar{T}_K$). If the adults are childless, then total spending on the adults (*T*) will also be equal to T_A. The adults will allocate spending on adult goods ($\tilde{T}_A$) and other goods ($\bar{T}_A$) in the same manner as the parents with children will.

If the family's well-being is additive separable, then the presence of children should not affect how the parents allocate the total spending on themselves (T_A) to the consumption of adult goods ($\tilde{T}_A$) and other goods they consume ($\bar{T}_A$). Let τ denote the ratio of other goods consumed by the adults to the consumption of adult goods

$$\tau(T_A) = \frac{\bar{T}_A}{\tilde{T}_A} \quad or \quad \bar{T}_A = \tau(T_A)\,\tilde{T}_A$$

This ratio will depend upon the total expenditures devoted to the adults (T_A) but not the presence of children or what the children consume. The well-being of the couple with the children and childless couple would equal be to

Couple with children: $U_{Adults}(\tau(T_A)\tilde{T}_A, \tilde{T}_A)$

Couple without children: $U_{Adults}(\tau(T^*)\tilde{T}_A, \tilde{T}_A)$.

and hence the well-being of the two couples would be equal if spending on adult goods was identical and

$$\tau(T_A) = \tau(T^*) .$$

While spending the same amount on adult goods is necessary for the two couples to have the same well-being, it is not sufficient. We must either assert that *T** is equal to T_A or adopt an assumption about the adult's well-being that guarantees that τ is equal across the two couples. If we assume that the adult's utility

is homothetic, then τ will be invariant to the level of total spending on the adults—τ is a constant with respect total spending on the adults.[33] We can meaningfully compare the well-being of the two couples.

The fact that Rothbarth needed to employ assumptions about the family's preferences to justify his approach is not surprising given the allocation problem we are trying to address can't be accomplished solely using data solely from the CE. Additional information in the form of external data (USDA) or assumptions about the relationships between the existing data must be brought to bear to solve the allocation problem. The Rothbarth methodology requires three assumptions. First, all goods are private goods. Second, the presence of children and what they consume doesn't affect how parents allocate the spending on themselves (additive separable). This assumption creates the possibility that by examining how childless couples spend upon themselves we can gain insights about how parents with children allocate the spending to themselves. The second assumption of homothetic adult utility was needed to guarantee that when the couples they spent the same amount on adult goods then they were equally well off.

Lazear and Michael

Lazear and Michael (L/M) proposed an alternative strategy to identify spending on children but attempts to avoid referencing the well-being of the adults that is present in the Rothbarth approach. L/M begin with the identity employed by all other researchers that the spending on adults and children must sum to the total spending done by the family

$$T = T_A + T_K.$$

The allocation of spending into spending on adults and children implicitly assumes that all goods are private goods—the same assumption we have made in the Rothbarth approach.

L/M introduce two terms, λ and ϕ, which reflect relationships between spending decisions made by the adults that can't be directly observed in the survey data. λ represents the ratio of total spending on the adults relative to the amount spent on adult goods

$$\lambda = \frac{T_A}{\tilde{T}_A}$$

The second term, ϕ, is the ratio of per capita spending on children relative to the per capita spending on the adults in the family

$$\phi = \frac{T_K/K}{T_A/A} \quad or \quad T_K = \phi T_A \frac{K}{A} = \phi\lambda\tilde{T}_A \frac{K}{A}\ .$$

Combining all three relationships into one, we have the following

[33] In general, the ratio τ will depend upon relative prices of goods consumed by adults and the number and characteristics of the adults. Since relative prices do not play a role in this formulation, τ is in essence a constant.

$$T = \lambda \tilde{T}_A + \phi \lambda \tilde{T}_A \frac{K}{A} \qquad (1)$$

While we can observe the family's total expenditures (T), spending on adult goods $\tilde{T}_A$, and the number of adults and children, we can't identify both parameters, λ and ϕ, from the data without any additional information or assumptions. But if we know λ, then we would know T_A because we can directly observe spending on adult goods by the parents

$$T_A = \lambda \tilde{T}_A .$$

Equation (1) implies if we know T_A, the value of ϕ would equal

$$\phi = \frac{T - \lambda \tilde{T}_A}{\lambda \tilde{T}_A} \left(\frac{A}{K}\right) = \frac{T - T_A}{T_A} \left(\frac{A}{K}\right).$$

Hence, if we can identify λ, then the determination of ϕ would follow without any further information or assumption. It is important to note that ϕ doesn't contain any information that is not contained in λ.

Empirical work will often require additional data or assumptions to identify estimates the desired parameters. The identification strategy L/M employs is based upon the assumption that we can use the sample of childless couples to estimate values of λ that can then be imputed to the parents with children. For this strategy to be successful requires two additional assumptions. The first is that the presence of children shouldn't affect how the parents allocate the purchase of goods intended for themselves. This assumption was needed by Rothbarth and can be justified if the family's well-being is additive separable in adult and child consumption. But this assumption is not sufficient. The value of λ is equal to one over the budget share of adult goods. Hence, unless adult preferences are homothetic, the budget share and hence λ will depend upon how much is the total spending on adults (T_A). While we can estimate the expected value of λ given the characteristics of the childless couple, how can we impute λ to the sample with children unless we already know T_A? The only way to meaningful impute λ to the sample with children is that λ doesn't depend upon T_A—adult preferences are homothetic.[34] In summary, L/M must make the same assumptions as Rothbarth about the preferences of families.

The empirical implementation of the L/M approach begins by first estimating λ using the sample of childless couples. L/M assume that λ is a linear function of the characteristics of the childless couple

$$\lambda = \lambda_0 + \sum_{i=1}^{M} \lambda_i Z_i$$

While in the sample of childless couples a value of λ can be directly computed from the observed data, L/M instead regress T (=T_A) on $\tilde{T}_A$ and $\tilde{T}_A$ interacted with each of the Z characteristics

[34] In the Rothbarth approach, we required that ω be independent of T_A, yet in the L/M approach we required that λ be independent of T_A. Given that λ is equal to 1 plus ω, these restrictions are in essence the same.

$$T = \lambda_0 \tilde{T}_A + \sum_{i=1}^{M} \lambda_i \tilde{T}_A Z_i$$

This regression should be estimated without a constant term. The characteristics that should be included in *Z* should be characteristics of the adults but should not contain the number or characteristics of the children (there are none in childless couples) nor the total spending or income of the couple.[35] The estimated values of λ_i and characteristics of the parents (*Z*) are then used to impute a value of λ to the sample of parents with children.

L/M assume that ϕ is also a linear function of characteristics of the families with children

$$\phi = \phi_0 + \sum_{i=1}^{N} \phi_i X_i$$

Using the imputed value for λ and $\tilde{T}_A$, for each family with children, L/M create two variables to be used in the next step of the estimation

$$D_0 = \lambda \tilde{T}_A \quad and \; D_1 = D_0 \frac{K}{A}.$$

L/M then estimate equation (1) without a constant term or

$$T = D_0 + \phi_0 D_1 + \sum_{i=1}^{N} \phi_i D_1 X_i + \psi$$

where ψ is a random disturbance. The estimated values of ϕ_i can then be used to determine the value of ϕ for any type of family with children with characteristics *X*. Note that the characteristics *X* reflect the characteristics of the family with children and as such would contain the number of children.

Engel

The final methodology we will discuss is actually the first approach ever to be suggested to allocate family's spending to children. This approach deviates from the three-box strategy by assuming that the only spending data that is know is the total expenditures of the family and what the family has spent on food. Engel proposed the share of total expenditures devoted to food was an inverse indicator of the family's well-being.[36] He noted that holding the number and composition of the family constant when the family's total expenditures increased, the food share of total expenditures would decline. He also noted that holding total expenditures constant as the number of children increased from no children, the food share

[35] If adult preferences are homothetic, then λ should be independent of total spending or income of the childless couples or parents in families with children. However, L/M include income which in our opinion is an error. While they included income, their estimates show that the impact of income on λ is both small and not significantly different from zero.

[36] See Engel (1895).

would increase indicating that the family was materially worse off. Denote θ as the share of total expenditures devoted to food

$$\theta = \theta(A, K, T, V)$$

where

$$\frac{\partial \theta}{\partial A} > 0 \quad \frac{\partial \theta}{\partial K} > 0 \quad \frac{\partial \theta}{\partial T} < 0 \, .$$

He reasoned the amount of spending on the *K* children would equal

$$T - T^{**}$$

where *T*** is total amount of spending by a childless couple so they would devote the same share of total spending to food as a couple with *K* number of children and *T* total expenditures

$$\theta(2, K = 0, T^{**}, V) = \theta(2, K, T, V) \, .$$

Deaton and Muellbauer (1980) have demonstrated that in order to conclude the food share reflected the family's well-being, the economies of scale in consumption found in food had to be the same as for all other goods. While this approach seems to be reasonable, not all goods have the same economies of scale as food. For example, you would expect there to be little or no economies of scale in adult clothing, while for children's clothing there might some scale economies due the use of hand-me-downs from older children in the family. On the one hand, the economies of scale in shelter and utilities would be expected to have more economies of scale than food. Even though there were doubts about the validity of this approach, many of the early child support guidelines employed Espenshade's estimates of parental spending on children, which used the Engel methodology.

Reconciling L/M and Rothbarth – Different Choices

The L/M and Rothbarth methodologies utilize the same data and assumptions about underlying family preferences. Why are there differences in the estimates of how much of the family's spending is directed to the children? Shouldn't these two approaches produce the same results? In this section, we suggest the reasons for the differences are twofold. While the theory suggests that both approaches should produce the same estimate, the differences in the empirical implementations of each approach will produce differences in the estimates of spending on children.

The second reason pertains to how each approach attempts to capture the impact of additional family members on needed spending for the family. Typically, we assume that as a family becomes larger, the needed spending in the family doesn't increase proportionately to the increase in family size because of economies of scale. When you get married, you don't need twice the housing but something less than twice the amount of housing. But the needed amount of spending would also depend upon whether the additional person was a child or an adult. As we showed in Appendix A, our implementation of the Rothbarth methodology captures the impact of additional family members as solely a result of economies of scale. On the hand, the L/M approach seeks to frame the impact of children on family spending as reflecting that per-child spending on children is less than per-adult spending on adults that captured by their term ϕ.

Differences in Empirical Implementations

Both approaches, L/M and Rothbarth, are trying to estimate the same concept—the total amount of spending on adults (T_A or T^*)—but implement the estimation from different empirical perspectives. While in theory the two approaches should arrive at the same determination of spending on adults, in practice they come to different estimates. This is not an uncommon problem. The measurement of personal saving encounters this problem. There are two different approaches to measuring saving. One approach captures the amount of saving as the difference between household's income and consumption, while the other measures savings as the change in the net worth of the household. If all concepts are properly and accurately measured, then both approaches should lead to the same determination of the household's saving. But in practice, the two approaches lead to significantly different measures of the household's amount of saving.

Let us assume that a couple with K children and T total expenditures is expected to spend AG on adult goods. To provide an estimate of what the parents spends on themselves, the Rothbarth approach determines the level of total spending for a childless couple so they also would spend the same amount, AG, on adult goods. To make that determination, Rothbarth could utilize a sample of childless couples to estimate the relationship between spending on adult goods and the total expenditures (T). We will assume that the only observed factor determining spending on adult goods is the total spending on adults. In the case of childless couples, this would equal the couples total spending, T. For the relationship to be consistent with the assumption of homothetic adult preferences, the empirical specification could be in the following functional form (no constant term)

$$\tilde{T}_A = \omega T + \varepsilon$$

where ε is a random variable reflecting unobserved factors that determine spending on adult goods.[37] We will assume that the expected value of ε is zero and that total spending of the couple is uncorrelated with ε ($E(\varepsilon\,|T) = 0$). Given our assumptions about ε, the conditional expectation spending of spending on adult goods given total spending of the couple is

$$E[\tilde{T}_A|T] = E[\omega T|T] + E[\varepsilon|T] = \omega T$$

where ω can be estimated via a linear regression of $\tilde{T}_A$ on T without a constant term using only the sample of childless couples. The regression coefficient for T should be an unbiased estimate of ω.

Consequently, for the childless couple to have the same expected level of spending on adult goods as the parents with K children and T total spending on the family, the total spending of the childless couple would be equal to

$$T^* = \frac{1}{\omega} AG$$

[37] ε could also reflect measurement errors in spending on adult goods.

The L/M approach takes a different empirical path when using the data on childless couples. Recognizing that spending on adults for childless couples, T_A, is equal to the total spending of the family, T, L/M's empirical implementation can be represented as

$$T = T_A = \lambda \tilde{T}_A + \eta .$$

Using the sample of childless couples, the parameter λ can be estimated without a constant term using ordinary least squares by regression total spending of the childless couples on their spending of adult goods. The estimated value of λ can be used to determine how much the parents with *K* children with *T* dollars of total expenditures spent on themselves, T_A

$$T_A = \lambda AG .$$

Consequently if λ is equal to 1/ω, the value for *T** from the Rothbarth approach should be equal to T_A derived from the L/M methodology and the same portion of total spending will be allocated to the children. But will the estimates of λ from the L/M methodology be equal to 1/ω from the Rothbarth estimates?

The Rothbarth methodology is based estimating the relationship of spending on adult goods given the level of total spending while L/M's methodology is based on the reverse of the relationship—the total spending of the family given spending on adult goods. In terms of the population, a linear regression can be interpreted as an estimate of the conditional expectation function. Earlier, we demonstrated that the regression should lead to an unbiased estimate of ω. To estimate λ, the L/M approach views the relationship between spending on adult goods and total spending from the reverse perspective of Rothbarth

$$T = \lambda \tilde{T}_A + \eta = \frac{1}{\omega}\tilde{T}_A + \left(-\frac{\varepsilon}{\omega}\right)$$

where

$$\eta = -\frac{\varepsilon}{\omega} \quad and\ E[\eta] = 0$$

Consequently, the population regression of *T* on $\tilde{T}_A$ would equal

$$E[T|\tilde{T}_A] = \lambda \tilde{T}_A + E[\eta|\tilde{T}_A] = \lambda \tilde{T}_A - \frac{1}{\omega}E[\varepsilon\,|\tilde{T}_A] < \lambda \tilde{T}_A.$$

While ε is assumed to be uncorrelated with *T*, ε will be positively correlated with spending on adult goods. Consequently, $E[\varepsilon|\tilde{T}_A]$ will be positive implying that estimate of λ will be a biased and smaller estimate of 1/ω. This demonstrates that L/M's empirical implementation leads to a smaller value of T_A $(= \lambda AG)$ than would be implied from the Rothbarth's *T** $(= AG/\omega)$. Given this specification of the relationship between total spending and spending on adult goods, the L/M approach leads to more of the family's total spending being allocated to the children.

L/M estimate of how much the adult spend upon themselves is based upon a biased estimate of λ. While L/M never acknowledge this property of the estimate of λ, it is telling that they don't base their allocation

of spending within the family directly upon λ but use their estimate of λ to identify ϕ in much the same way instrumental variables are used in the identification of endogenous variables. The empirical model that L/M use to estimate ϕ on the sample of couples with children can be rewritten as

$$T = D_0\left(1 + \phi_0\frac{K}{A} + \sum_{i=1}^{N}\phi_i X_i\frac{K}{A}\right) + \psi$$

where

$$D_0 = \lambda\tilde{T}_A$$

Viewed from this perspective, the value of λ estimated using the sample of childless couples and the level of spending on adult goods in the family with children (D_0) is used to "scale" the determinants of ϕ. If the assumption that the value of λ should be the same for couples with and without children, then scaling should not have any impact on the estimates of ϕ and its determinants. However, the coefficient on D_0 should be equal to one. To the extent the coefficient on D_0 differs from one, then L/M note there is evidence that the assumption that the values of λ are not the same for couples with and without children. If the values of λ based upon spending patterns of childless couples are larger than the values of λ for couples with children, the coefficient on D_0 will be less than one. Recall that the regression will be estimated without a "true" intercept and hence the coefficient on D_0 will serve as a constant term to equate the mean of T to the mean of the predicted values of T.

In their 1988 study using data from the 1972–73 CE, L/M estimate a coefficient on D_o that was very close to one—its theoretical value. They were reassured by this result. However, in recent work by Rodgers, who has replicated L/M on more recent data (2000 to 2015 CE), the estimated coefficient on D_o was significantly less than one suggesting that imputed values of λ for couples with children are too large. However, the consequence for the estimates of the ϕ parameters are not clear.

The purpose of this discussion was to demonstrate that in "theory," both the Rothbarth and L/M methodologies should provide the same allocation of total spending to the children ($T^* = AG/\omega = \lambda AG = T_A$), the differences in the empirical implementation of each approach can lead to different allocations. The previous discussion has focused upon the potential biases in the L/M approaches by utilizing a "reverse" regression to estimate λ instead of ω. However, there are other choices that have been made that could affect the estimates of allocation of spending to children.

The sample used by L/M differs substantially from the sample we have employed. In our sample, we restricted ourselves to married couples without or with children (under 18 years old). Single individuals and single-parent families were excluded, as well as married couples living with related adult children, other related adults, or unrelated adults. L/M didn't make these exclusions and potentially could affect the estimates of T^* (Rothbarth) and ϕ (L/M) for married couples with children.

Earlier in this report, we examined the impact of including adult children to our baseline sample. We found that the inclusion of this group produced significantly lower estimates of the spending on children under 18 years old when the empirical specification was not modified to account for differences in these family types. This finding is consistent with the finding that studies that have used the L/M framework and

included families with more than two adults (married couples) find that less of the family's resources are devoted to "young" children.

The final and perhaps the most important difference in implementation is the assumption made about the statistical distributions of the observed variables—the family's spending on adult goods and its total spending. We have assumed that both approaches assumed a linear relationship between spending on adult goods and total spending of childless couples. In our initial implementation of the Rothbarth approach, we have assumed that the relationship is linear in the log of spending on adult goods, the log of family size, and log of per-capita total spending

$$ln(\tilde{T}_A) = \nu_0 + \alpha\, ln(A+K) + \beta\, ln\left(\frac{T}{A+K}\right) + \gamma$$

or

$$\tilde{T}_A = T^{\beta}(A+K)^{\alpha-\beta}e^{\nu_0+\varepsilon}$$

where γ reflects unobserved factors determining spending on adult goods. We will assume that $E[\gamma]$ and $E[\gamma|ln(T)]$ are both zero, while the variance of γ is constant (σ^2) and independent of T. We made this assumption based upon the data that revealed that spending on adult goods and total spending are both highly skewed distributions that could be captured as a log normal distribution instead of a symmetric distribution such as the normal distribution. To estimate this relationship, the sample can't be restricted to childless couples but must also include parents with children. For this functional form to be consistent with homothetic preferences, the value of β should equal 1.0. For couples with children to spend less on adult goods than childless couples with identical total spending, the value of α must be less than 1.0.

The mean (average, expected value, and mean are interchangeable terms) and median are both measures of the central tendency of a distribution. If the distribution is symmetric, the mean and median will be equal. In our approach, we attempted to account for skewed distribution of spending on adult goods. If the distribution of spending on adult goods is log normal (and β is 1.0), then median value of the share of spending on adult goods given total spending would equal

$$Median[\omega|T] = (A+K)^{\alpha-1}e^{\nu_0}$$

while the expected share of spending on adult goods given a level of total spending is equal to

$$E[\omega|T] = (A+K)^{\alpha-1}e^{\nu_0+\frac{\sigma^2}{2}} = Median[\omega|T]\, e^{\frac{\sigma^2}{2}}.$$

Previously we noted when spending on adult goods is regressed on total spending and we assume that the relationship is linear, the estimated coefficient on total spending will be an unbiased estimate of ω the expected budget share of adult goods. But when a log-log specification is employed, the estimated parameters will reflect the median not average budget share for adult goods. Since the median will be insensitive to outliers (extreme values of the budget share), the use of the median as opposed to the average value of ω appears to be a prudent choice. Whether the L/M could be implemented without resorting to the assumption of linearity is an open question. On pages 68 to 69, L/M discuss an approach that is framed in

terms of a multiplicative assumption about ϕ instead of the linear assumption they employ. But they reject this direction because it can be shown that it will not lead to a full identification of ϕ.

Appendix C: Nonlinear Specification of Rothbarth Model

In the main text of the report, we described our implementation of the Rothbarth as being linear in the log of per-capita total outlays of the family and the log of family size. This functional form implied that the proportion of total spending devoted to the children as being independent of the level of total spending. To relax the functional form to allow for differences in the proportion of total spending devoted to the children to vary with total spending, we included a term reflecting the square of the log of per-capita total outlays. In particular, the Engel curve we estimated for spending on adult good (A) is the following log-log specification:

$$\ln(A|K, TE; Z) = \gamma(Z) + \alpha \ln(FS) + \beta_1 \ln\left(\frac{T}{FS}\right) + \beta_2 ln\left(\frac{T}{FS}\right)^2$$

where

$$Family\ Size = FS = 2 + K$$

and K denotes the number of children in the consumer unit with *T* total expenditures. The term $\gamma(Z)$ represents effect of factors other than the number of children and total expenditures on the adult good spending. The quadratic term creates a problem in the sense that we can longer derive an explicit solution for the level of total spending of a childless couple that would lead them to spend the same amount on adult goods (*TO*). The purpose of this appendix is to describe how we determined *TO* in this specification.

Fundamental to the Rothbarth approach is the determination of the level of total outlays for a childless couple (*TO*) so they would spend the same amount on adult goods that a couple with *K* children and *T* amount of total outlays. *TO* would need to satisfy the following relationship

$$\gamma(Z) + \alpha \ln(2) + \beta_1 \ln\left(\frac{TO}{2}\right) + \beta_2 \left(ln\left(\frac{TO}{2}\right)\right)^2$$

$$= \gamma(Z) + \alpha \ln(2 + K) + \beta_1 \ln\left(\frac{T}{2 + K}\right) + \beta_2 \left(ln\left(\frac{T}{2 + K}\right)\right)^2$$

Unless the relationship is linear in *T* (β_2=0), there won't be a single solution to this relationship but two solutions.

To simplify the above implicit function, let

$$c = \alpha\, ln\left(\frac{2}{2 + K}\right) - \beta_1\, ln\left(\frac{T}{2 + K}\right) - \beta_2 \left[ln\left(\frac{T}{2 + K}\right)\right]^2$$

$$and\ X = ln\left(\frac{TO}{2}\right).$$

Given this notation, the implicit function determining *TO* can be written as

$$c + \beta_1 X + \beta_2 X^2 = 0 .$$

The two roots (solutions to this equation) can be written as[38]

$$root_1 = -\frac{q}{2\beta_2} \quad and \quad root_2 = -\frac{2c}{q}$$

$$\text{where } q = \beta_1 + sign(\beta_1)\sqrt{{\beta_1}^2 - 4\beta_2 c} .$$

The two possible real values of *TO* that equates spending on adult goods across the units[39] can be written as

$$2\, exp^{root_1} \quad and \quad 2\, exp^{root_2} .$$

Both β_1 and β_2 as well as α have been estimated to be positive in our current work and in the previous California study. Two previous estimates (DHHS/ASPE and Oregon studies), only β_2 has ever been estimated to be negative, the other two parameters have been always positive. As long as β_1 is positive, the value of q will be positive. If β_1 and α are both positive, then the value of c will be negative. If β_2 is also positive, then $root_1$ will be negative, implying that *TO* will be less than 2.00. On the other hand, $root_2$ will be positive and hence *TO* will be greater than 2.00.

For the approach to predict a positive level of spending on the children, then *TO* must be less than *T*

$$if\ TO < T\ \ then\ root_i = ln\left(\frac{TO}{2}\right) < ln\left(\frac{T}{2}\right).$$

As long as β_2 is positive, $root_1$ will always be less than $root_2$ and both will yield a positive amount of spending on the children if

$$root_2 = -\frac{2c}{q} < ln\left(\frac{T}{2}\right)$$

[38] The equation for the roots of the quadratic equation are not the typical solutions learned in high school. While in theory they led to the same solutions, when the values of c and β_2 are small, the high school versions will lead to subtracting roughly β_1 from β_1 and erroneous calculations of the roots.

[39] We are assuming for this discussion there are two real solutions, in other words we are assuming that $\beta_1^2 - 4\beta_2 c$ is positive. If c and β_2 are opposite signs, which occurs in our estimates, then two real roots will exist.

Given the difficulty of determining whether the second root is less than $\ln(T/2)$, this was done numerically. If there are two roots consistent with a positive level of spending on the *K* children, then the larger root ($root_2$) is used because this will yield the smallest level of child spending. If the above condition is not met, then there will be only one root consistent with a positive amount of spending on the children ($root_1$).

In two of our earlier studies, β_2 was estimated to be negative while β_1 was positive, implying that spending on adult goods increased with increases in total expenditures at a decreasing rate as long

$$\beta_1 + 2\beta_2 \ln\left(\frac{TE}{2+K}\right) > 0 \, .$$

If β_2 is negative, then there is a possibility of the absence of real roots and the sign of q will depend upon the parameters and the total expenditures of the family with *K* children. In this situation, the values of roots of the implicit function are numerically determined and compared to determine which solutions lead to a smaller allocation of spending to the children. While we can't theoretically demonstrate this result, we have found that if β_2 is negative, then the percentage of total expenditure devoted to the children will decline, with increases in total expenditures of the couple with *K* children. If β_2 is positive, the percentage will increase.

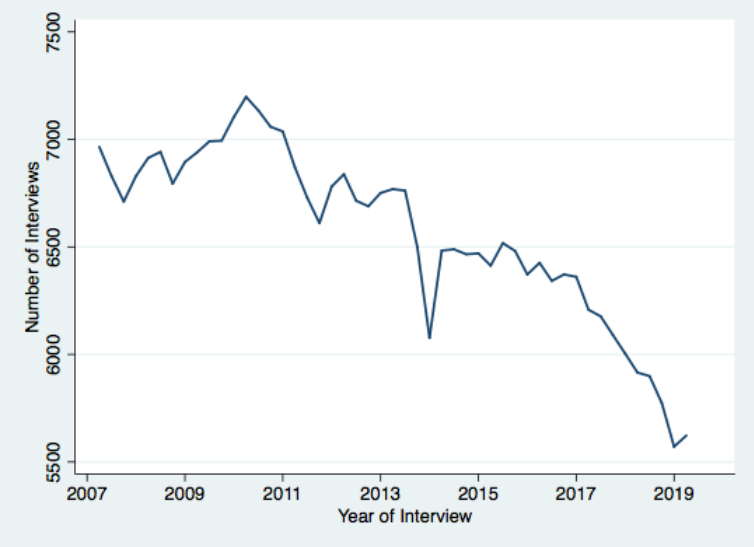
A final comment about our approach is required for the sake of transparency. While numerous variables can be added to the specification of empirical Engel curve for adult goods, $\gamma(Z)$, none of these variables and estimated correlations directly affect the estimates of the allocation of spending to children but are included to arrive at "unbiased" estimates of the three parameters: α, β_1, and β_2. If the variables, *Z*, were not included in the analysis and truly affected spending on adult goods, then their exclusion would affect the estimates of these three parameters to the extent they are correlated with the number of children and per-capita total expenditures.

Appendix D: Construction of Analysis Samples

Since 1980, the Bureau of Labor Statistics (BLS) has continuously collected data on expenditures of Americans with the Consumer Expenditures Survey (abbreviated by the BLS as the CE). While the CE's purpose is to collect sufficient data to compute the expenditures weights in the Consumer Price Index (CPI), the CE's data has been used for other research projects including studies examining spending on children. Today, the nationally representative CE sample is the most important source of information on spending patterns of Americans.

Prior to 1980, the CE was administered only once every ten years. Starting in 1980, the BLS began continuously collecting data where each quarter, new consumer units (CUs) would be introduced to the sample as previously CUs who had been in the sample left. Until 2015, each CU would be interviewed five times. The first interview was called the "bounding interview" and served to familiarize the CU about the type of questions that would be asked in future interviews as well as to collect information about the members of the CU and consumer durables the unit already had. The bounding interview was not released to the public. Only the next four quarterly interviews would be released in the CE Public Use Files. In 2015, the BLS abandoned the bounding interview and hence, the CU was contacted only four times using the same previously used interview format.

Figure D.1 shows how the number of quarterly interviews has changed from 2007 through to the present. During this past decade, there has been a steady decline in the number of completed interviews that will affect the overall sample size for our study compared to previous studies. In my previous report on child spending for the state of California, I used data from CE interviews from the first quarter of 2004 through the first quarter of 2009, or 21 quarters of data. This sample yielded 152,289 quarterly interviews. For this study, we chose to use the interviews conducted from the second quarter of 2013 through the first quarter of 2019, or 24 quarters of data. However, this sample for the more recent time period yielded only 149,733 interviews. Even though we are using a longer time period for the current study, the number of interviews on the Public Use File will be smaller due to the smaller average number of interviews per quarter in the time period we will be using in the present study.



Number of Quarterly Interviews in the CU Public Use Files
Figure D.1

For our analysis, we selected the time period of the second quarter of 2013 through the first quarter of 2019 for two reasons. First and most importantly, it represents the most recent available from the CE. Data for interviews conducted from the second quarter of 2019 through the first quarter of 2020 won't be publicly available until August 2020.

Prior to 2013, the BLS relied upon the CU's report of the amount of taxes withheld and the refunds they received to compute the amount of taxes the CU owed. Analysis of the collected data lead researchers both in the BLS and outside to question the accuracy of both CU's income and the taxes they paid. Starting in 2004, the BLS began to impute income to improve the quality of the income before taxes. For interviews starting in the second quarter of 2013, the BLS began imputing all taxes using the National Bureau of Economic Research's (NBER) TAXSIM model. This model utilizes information collected by the BLS to calculate the anticipated amount of taxes the CU will pay. Since the amount of taxes paid in the previous 12 months can span more than one calendar years, the TAXSIM model predicts taxes for both calendar years and then prorates by the percentage of number of months in each calendar year.[40] Since we believed this to be an improvement in the data, we chose to begin our sample with the beginning of the use of imputed taxes in the second quarter of 2013.

During our time frame, the BLS interviewed 57,812 distinct CUs yielding 149,733 quarterly interviews. If each of the CUs were interviewed four times, then we should have expected 231,248 quarterly interviews. The reason for the smaller number of observations is twofold. First, the maximum number of interviews for some CUs will be less than four due to right and left censoring of the sample. Consider a CU who is interviewed in the second quarter of 2013 and where this interview was their fourth and last interview. During our sample's time frame, it is plausible for the CU to have a maximum number of one interview because the previous three interviews were conducted in quarters prior to the second quarter of 2013—

[40] Our ability to examine the impact of using the imputed taxes amounts is limited because in 2015, the BLS stopped asking CUs the taxes they had withheld and the amount of refunds they had received. There will only be a two-year period with both reported and imputed taxes can be compared on the public files.

outside the sample's time frame.[41] A similar problem occurs at the other end of the sample's time frame.[42] Consider a CU whose first interview occurs in the first quarter of 2019. In reality, they can have at most one interview that falls within our sample's time frame, not four interviews. CUs who were interviewed beginning in first quarter of 2014 through first quarter of 2018 will be in our sample and had the opportunity to be interviewed four times. The maximum number of interviews that could occur in the sample is 210,600.

The second factor for the reduced number of quarterly in our sample reflects the CU's falling to respond to the BLS. Overall, the CU is collecting data from 71 percent of all the possible interviews. Let us consider only those CUs who could possibly have four interviews during the sample's time frame (those not subject to either right- or left-hand censoring). While this subgroup represents 82 percent of the total sample, 43 percent of these CUs completed all four interviews; 17 percent completed three interviews; 16 percent completed two interviews; and 24 percent completed only one interview. If nonresponse is random, then the only effect on the estimates will be reflected in a loss of precision in the estimates (more variability of the estimates) due to the smaller sample size. However, if nonresponse is correlated to factors determining how parents spend on their children, then our estimates of child spending will be biased.

Quarterly versus Annual

For CUs who have been chosen to take part in the CE interview survey (that is, they only participated in the CE diary survey), a member of the unit (reference person) is asked a series of questions pertaining to the unit's expenditures during the previous three months and other information about the unit. If a unit participates for four quarters, we could take the collected data for the CU and construct an estimate of annual spending based upon the quarterly data to use in the analysis of the spending on the children in the unit. If the unit fails to complete four interviews due to nonresponse or censoring due to the time period, one could sum the available spending data for the CU and then adjust it by the ratio of four to the number of quarters the CU did participate in the CE to arrive at an estimate of the annual spending for the CU. Alternatively, we could treat the data from each quarterly interview as observations on spending that are independent not only across units but between quarterly interviews for each CU. We will denote the first approach as "annual," where the number of observations used in the analysis is equal to the number of CUs in the sample. We will denote the second described approach as "quarterly," where the number of observations in the analysis will equal the number of quarterly interviews in the sample.

Changes in the demographic composition of the CU over time can cause difficulties in the application of sample criteria as well as construction of annual expenditure amounts. If a sample criterion (*e.g.,* the CU consists of a married couple) is imposed and a quarterly observation fails to meet the criterion in the quarterly approach, the quarterly observation is dropped and only quarterly interviews for the CU that meet the criterion will remain. Only if all of the quarterly observations fail to meet the criterion will the CU be dropped from the annual sample.

[41] To address the impact of the left-hand censoring, we could have included any interviews from CUs interviewed in our time frame but who also had interviews in quarters prior to the second quarter of 2013. We chose not to do this because it would have affected our examination of whether the use of quarterly versus annual data would affect our results. This issue is discussed in the next section of the appendix.

[42] This is denoted as right-hand censoring.

Consider a married couple who divorce between the third and fourth interview. If we impose a sample criterion that limits the sample to married couples, then in the quarterly approach, the fourth interview would be dropped from the sample and the couple would appear in sample three times. But from an annual perspective, what should we do? Should we drop the CU from the sample because the CU didn't meet the criterion in all four interviews? Or should the CU be included in the sample and base the annual amounts of spending upon the three quarterly reports of spending where the CU met the criterion? In order to minimize the differences between the quarterly and annual approaches and minimize the impact on sample size in the annual approach, we chose to employ the second option of including all CUs who have at least one quarterly interview that meets the sample criterion.

While the BLS recommends the quarterly approach, historically studies of the cost of children have utilized the annual approach. In a report on child spending for the state of California (Appendix A of Betson (2010)), the rationale for why the annual approach should be favored on a statistical basis was developed. Given that the BLS recommends the quarterly approach, we examined how the choice of annual versus quarterly affects the estimates of the cost of children. Consequently, we did the analysis twice, once utilizing the quarterly approach and a second time using the annual approach.

Sample Selection

Given the time frame for the sample, there are 149,733 quarterly observations from 57,812 distinct CUs. However not all of these interviews will be used in our analysis. Our first sample restriction was that the reference person, spouse, or domestic partner of the reference should be an adult (18 years old or older). Dropping observations where the reference person, spouse, or domestic partners were less than 18 resulted in dropping 122 quarterly observation and 48 CUs.

The second selection criterion reflected a concern about the quality of responses to the CE. Spending on any type of commodity could reasonably be zero not only for a quarter but also for all of the interviews that a CU completed. But if that commodity is total spending on food (at home and out of the home), it is hard to find that set of responses as reasonable. We chose to drop an CU if all of the spending on food was reported to be zero in all of the interviews completed by the unit. This criterion results in dropping of 387 quarterly observation and 229 CUs. After imposing both of these sample criteria, the remaining sample had 149,224 quarterly observations from 57,535 distinct CUs.

The purpose of this analysis is to estimate the amount of spending that parents in intact families devote to their children. Our general strategy is to compare the spending patterns of parents in intact families with children (less than 18 years old) to the spending patterns of adults with two or more adults without any children. Living arrangements of American families are a complex, and the difficulty of identifying whether a CU should be included is a challenge.

The relationships between members of a CU are all captured by the relationship between the reference person (the individual who is answering the survey) and each member of the CU.[43] We are interested in examining "intact" families, which we have defined to be a CU where the reference person is

[43] This information is contained in the MEMI files as well as the age of each member of the CU. In previous reports, we have used the variable FAM_TYPE found in the FAMI files to identify which CUs should be either included or excluded from the sample. This approach didn't allow for us to consider and treat domestic partners as equivalent to being married.

married to another adult residing in the unit (spouse) or is in a relationship that resembles being married (domestic parents). We have chosen to define a CU as being "intact" when the CU contains either a spouse of the reference person (married) or a domestic partner. If an intact unit is created by the presence of a domestic partner, the children of the domestic partners will not be related to the reference person but as identified as an "unrelated person" in the survey. For purpose of this analysis, we assumed that all unrelated persons who are 18 years younger than the age of the domestic partner are the domestic partner's own children (both children and adult children). Consequently, they are considered as the intact couple's children (considered as "own children") even though they do not have a legal relationship to the reference person.

A child denotes both a relationship within the family as well as the age of the member. A member who denoted as an "own child" reflects the reference person is the biological parent or adopted parent of the member. For child support where support is provided only to those children who are less than 18, the age of the child becomes important. We will denote an "own child" who is less than 18 years old as a "child." while an "own child" who is 18 years old or older as an "adult child."

Couples (the reference person with a spouse or domestic partner) can reside in the CU with relatives other than their children or with non-relatives. For example, we could have a married couple where the parents of the reference person live in the same CU. In these situations where there are extended families living together or having non-relatives in the household, we chose to eliminate CUs with the complicated living arrangement and focus upon intact families who live on their own or in other words form the entire CU.

After restricting our sample to intact families who live on their own, the remaining sample will be composed of the following groups: couples without children or adult children; couples with children and at least one adult child; couples with children and no adult children; and couples with no children but at least one adult child. When this sample selection was applied, 74,547 quarterly interviews were dropped from the sample, leaving 74,677 quarterly interviews from 28,565 distinct CUs. Roughly half of the data was lost due to this sample restriction because the CUs didn't represent the type of family structure we were interested in examining.

Ideally, we would want in the sample those couples with children (under 18 years old) and a comparable sample of couples without children. However, the proportion of couples without children who are over 60 will exceed the proportion of couples with children are greater than 60. Given that consumption patterns change with age, we could either attempt to control through modeling the impact of age or restrict the sample to those who are roughly the same age. We chose the latter option. In particular, we restricted the sample to those where the female of the couple was less than 60 years old. This restriction was applied to all observations not just to those observations of couples without children. The choice of 60 years was based upon the following rationale. We assumed that a woman's fertility was 45 years old then. If the female had a child at that age, then they would be 63 years old when the child turned 18 years old. Given the uncertainty of these calculations, we rounded the selection to be less than 60. This selection criterion eliminated 14,056 quarterly observations. This left 60,621 quarterly observations from 23,633 distinct CUs.

The next two restrictions reflect limitations on the number of children (less than 18 years old) and the number of adult children. In the CE, there are reports of the reference person having 12 or more children.

While this is possible, the child support guidelines tend to focus upon less than 7 children in the order and we decided to impose the restriction the sample would include only observations with six or fewer children.

Even though adult children (without special needs) are not eligible for child support in most states, their presence in the CU is likely to affect spending on children. We initially have decided to include CUs where adult children are present but wanted to restrict the sample where there are three or fewer adult children.

These two-sample restrictions eliminated 158 quarterly observations. This left 60,463 quarterly observations based upon 23,586 distinct CUs and represent the number of observations in the analysis that has adopted the quarterly approach.

If no further restriction were made, the annual approach would be based upon 23,586 annual observations based upon CUs who met all of the above criteria. However, we earlier note a potential concern that composition of the CU could change over time even if it met all of these criteria. For example, an adult child could leave the unit after the first interview was conducted. Ideally, we would want the same family members to be present in all of the interviews. The final sample restriction that is applied only to the annual sample and not the quarterly sample is that over the interviews that meet all of the previous criteria there is no change in the number of members of the CU. Imposing this restriction eliminated 1,959 CUs from the annual sample, leaving 21,627 CUs where the annual data will be based upon 55,208 quarterly interviews.

Analysis Samples:

To summarize, after all of the selection criteria were imposed, we will have 60,463 observations in the quarterly sample and 21,627 observations in the annual sample. In constructing these samples, we have included two groups of types of CUs that some might question their inclusion and hence we wanted to examine six additional subsamples to the two samples we are already examining. The two groups of CUs are domestic partners and CUs with adult children. In our previous analysis, both of these groups were not included. If we were to drop domestic partners from the sample, then the remaining sample would contain only married couples. If we drop CUs with adult children from the sample, then the remaining sample would contain only CUs with no other members (childless couples) or CUs with only own children under 18 years old. Since this sample reflects the sample we have employed in previous studies, we denote this as the baseline sample. Table D.1 contains the description of the eight samples we will utilize, size of sample, size of sample with a child or adult child, and the percent of the sample with a child.

While most of analysis focuses upon the annual baseline sample (A1), the alternative samples (A2 through A4) allow us to examine the impact including domestic partners with married parents and the inclusion of adult children in the sample. The remaining sample (Q1) reflects the same demographic groups in the baseline sample but from a quarterly perspective.

Table D.1

Description of Alternative Analysis Samples

		Total Number of Observations	Number with a Child or Adult Child Present	Percentage
Annual Perspective:				
A1	BASELINE	15,699	8,069	51.4%
A2	Include Domestic Partners	18,840	9,323	49.5%
A3	Include Adult Children	18,321	8,924	48.7%
A4	Include Domestic Partners OR Adult Children	21,627	10,247	47.4%
Annual Perspective:				
Q1	BASELINE but Quarterly	60,463	29,094	48.1%

Appendix E: Description and Construction of Variables

For this study, we used two variables describing spending on adult clothing and total spending. We will begin with a description of these variables.

Adult Clothing

Spending on adult goods is the adults' (parents') purchases of clothing. The BLS provides two sets of variables that capture spending on clothing for adults (MENSIXPQ, MENSIXCQ, WOMSIXPQ, and WOMSIXCQ); however, these variables capture spending on clothing made for all members of the consumer who are 16 and older. In the study, we adjusted the reported amounts to better reflect the spending by the parents and not the older children. The adjustment was a per-capita adjustment—the amount used to reflect spending on adult clothing was the reported amount times the ratio of two (the two parents) to the number of unit members 16 years old and older (the two parents and the number of children 16 and 17 years old).

Total Outlays

The BLS offers two measures of total spending in the consumer unit. The first is their expenditure concept (TOTEXPPQ and TOTEXPCQ), while the other is denoted as the unit's expenditures outlays (ETOTALP and ETOTALC). The difference between these two concepts is that the outlay concept includes principle payments for any loans are included, while the expenditure concept doesn't. Both of the above BLS summary measures include two forms of what most researchers would call savings—payment of Social Security payroll taxes and payments to retirement plans. In our definition of current spending, both of these amounts were subtracted from the above two summary measures to construct our measure of quarterly spending.

After the subtraction of payments to pension plans and Social Security taxes, the following spending categories are included in the outlay concept:

- Food: food prepared and consumed at home, food purchased and consumed away from home;
- Housing: mortgage interest and principle paid, property taxes, maintenance and repair, rent paid, home insurance, utilities, personal services including childcare, housekeeping supplies, household furnishings, and equipment;
- Apparel: clothing, footwear, cleaning services, and supplies;
- Transportation: vehicle finance charges and principle paid, leases, gas and oil, maintenance and repair, insurance, licenses and other charges, and public transportation;
- Entertainment: fees and admission, entertainment equipment, toys, and pets;
- Health Care: health insurance, non-reimbursed expenses for medical services, drugs and supplies;
- Tobacco and alcohol;
- Personal care, reading and education;

- Cash contributions to individuals outside the consumer unit;
- Personal insurance: life and other personal insurance premiums; and
- Miscellaneous: funeral expenses and plots, checking charges, legal and accounting fees, interest paid on line of credits, home equity loans, and credit cards.

Indexation of Total Outlays and Adult Goods

Each consumer could be interviewed up to four times. To construct annual spending amounts, the quarterly (three months) amounts of spending were constructed from each of the unit's available quarterly interviews. These amounts were then indexed to reflect spending in June of 2018. The price index we employed was the CPI-U (all goods index for all urban consumers). The value of the CPI-U was 251.989 for June of 2018. If a unit was interviewed in month *t*, then each spending amount was indexed to reflect an amount in 2018 by multiplying the spending amount by the following factor:

$$Price\ Adjustment_t = \frac{251.989}{(CPI_{t-1} + CPI_{t-2} + CPI_{t-3})/3}$$

Once the available quarterly spending amounts were price adjusted, they were annualized by first computing an average quarterly amount based upon the available quarterly interviews and then by multiplying by four.

Demographic Variables

To be in the sample, the consumer unit could have only two adults who were married. For this analysis, a child was defined to be a member of consumer who was less than 18 years old and was an own child of the married adults. Finally, the sample was limited to husband-wife families with six or fewer children. Consequently, the number of family members in the sample ranges from two to eight. The number of family members was characterized in two alternative ways. The first was to include a variable that was the log of the number of family members (lnfsize) that reflects the way that in the past we have captured the size of the consumer unit.

To control for other characteristics of the unit, we have included variables describing the parents with regards to their race, education, and work status. Also, we have included variables indicating the region of the country where they are located. In all cases, the data from the unit's last available unit was used to construct these variables. The variables that we included in the analysis were

black = 1 if the race of the reference person is black, 0 otherwise
hnohs = 1 if the husband doesn't have a high school degree, 0 otherwise
hcollege = 1 if the husband has a four-year college degree, 0 otherwise

wnohs = 1 if the wife doesn't have a high school degree, 0 otherwise
wcollege = 1 if the wife has a four-year college degree, 0 otherwise
ww_wife = the number of weeks worked in the past year by the wife (range 0 to 52)
wfulltime = 1 if the wife worked more than 30 hours per week, 0 otherwise
bothwork = 1 if both the husband and wife worked in the previous year, 0 otherwise
ne = 1 if the consumer unit lived in the Northeast census region, 0 otherwise
south = 1 if the consumer unit lived in the Southern census region, 0 otherwise
west = 1 if the consumer unit lived in the Western census region, 0 otherwise

Other Control Variables

While all of the spending variables were indexed, we included a series of dummy variables based upon the year that last interview for the consumer unit was conducted. The included variables were

y2013 = 1 if the last interview was conducted in 2013, 0 otherwise
y2014 = 1 if the last interview was conducted in 2014, 0 otherwise
y2015 = 1 if the last interview was conducted in 2015, 0 otherwise
y2017 = 1 if the last interview was conducted in 2017, 0 otherwise
y2018 = 1 if the last interview was conducted in 2018 or 2019, 0 otherwise

where the omitted group was those units whose last interview was conducted in 2016.

APPENDIX B: TECHNICAL DOCUMENTATION

This Appendix provides more detail to the underlying data and assumptions described to the overview of the schedule update in Section 3 that is also summarized in Exhibit 6. It also provides more detail about the underlying data. Exhibit B-1 shows the data that Professor Betson provided CPR to convert the BR5 measurements to a child support schedule that was mentioned in Section 3.

Exhibit B-1: Parental Expenditures on Children and Other Expenditures by Income Range Used in the BR5 Schedule

Annual After-Tax Income Range (2020 dollars)	Number of Observa-tions	Total Expenditures as a % of After-Tax Income	Expenditures on Children as a % of Total Consumption Expenditures (Rothbarth 2013–2019 data)			Childcare $ as a % of Consump-tion (per child)	Total Excess Medical $ as a % of Consumption	
			1 Child	2 Children	3 Children		(per capita)	(total)
$ 0 – $19,999	283	>200%	22.433%	34.670%	42.514%	0.473%	0.870%	3.005%
$20,000 – $29,999	306	134.235%	23.739%	36.642%	44.893%	0.437%	0.894%	3.208%
$30,000 – $34,999	306	107.769%	24.057%	37.118%	45.462%	0.407%	1.047%	3.722%
$35,000 – $39,999	409	103.780%	24.222%	37.364%	45.755%	0.647%	1.390%	4.878%
$40,000 – $44,999	428	100.064%	24.362%	37.571%	46.002%	0.721%	1.468%	5.301%
$45,000 – $49,999	416	97.195%	24.452%	37.705%	46.161%	0.747%	1.539%	5.485%
$50,000 – $54,999	399	92.716%	24.509%	37.789%	46.261%	0.855%	1.609%	5.887%
$55,000 – $59,999	367	90.548%	24.580%	37.894%	46.386%	1.210%	2.166%	7.389%
$60,000 – $64,999	335	86.130%	24.615%	37.945%	46.447%	0.776%	2.071%	7.474%
$65,000 – $69,999	374	84.016%	24.668%	38.025%	46.541%	1.255%	2.114%	7.525%
$70,000 – $74,999	333	82.671%	24.725%	38.108%	46.640%	1.586%	2.121%	7.375%
$74,999 – $84,999	615	82.690%	24.820%	38.249%	46.807%	1.743%	2.343%	7.894%
$85,000 – $89,999	318	78.663%	24.863%	38.311%	46.880%	1.392%	2.155%	8.331%
$90,000 – $99,999	565	76.240%	24.912%	38.384%	46.966%	1.658%	2.000%	7.888%
$100,000 – $109,999	493	75.488%	24.996%	38.508%	47.113%	2.159%	1.946%	7.121%
$110,000 – $119,999	374	73.058%	25.054%	38.593%	47.213%	2.523%	1.942%	7.583%
$120,000 – $139,999	468	71.731%	25.142%	38.722%	47.365%	2.477%	1.893%	6.494%
$140,000 – $159,999	240	70.658%	25.266%	38.904%	47.579%	3.073%	1.855%	7.516%
$160,000 – $199,999	512	62.753%	25.322%	38.986%	47.676%	1.790%	1.806%	7.037%
$200,000 or more	498	58.427%	25.571%	39.350%	48.103%	2.459%	1.554%	6.501%

Overview of Income Ranges

In all, Betson provided CPR with information for 25 income that were generally income intervals of $5,000 to $20,000 per year. CPR collapsed a few of them to average out some anomalies (*e.g.,* a spike in the percentage of total expenditures devoted to child-rearing expenditures once childcare and extraordinary medical expenses were excluded.) The collapsing resulted in the 20 income ranges shown in Exhibit B-1.

Steps to Convert to Schedule

The steps used to convert the information from Exhibit B-1 to the updated schedule in Appendix C are the same steps used to develop the existing schedule.

The steps are presented in the order that occur, not in the order that the factors discussed in Section 3.

The steps consist of:

Step 1: Exclude childcare expenses;

Step 2: Exclude child's healthcare expenses except up to the first $250 per year per child that is used to cover ordinary, out-of-pocket medical expenses for the child;

Step 3: Adjust for ratio of expenditures to after-tax income;

Step 4: Update for current price levels;

Step 5: Develop marginal percentages;

Step 6: Extend measurements to four and more children;

Step 7: Convert to gross income.

Step 1: Exclude Childcare Expenses

Childcare expenses are excluded because the actual amount of work-related childcare expenses is considered in the guidelines calculation on a case-by-case basis. The actual amount is considered because of the large variation in childcare expenses: the childcare expense is none for some children (*e.g.*, older children) and substantial for others (*e.g.*, infants in center-based care). Not to exclude them from the schedule and to include the actual amount in the guidelines calculation (typically as a line item in the worksheet) would be double-accounting.

Starting with the expenditures on children, which is shown in fourth column of Exhibit B-1, average childcare expenses are subtracted from the percentage of total income devoted to child-rearing. For example, at combined incomes of $60,000 to $64,999 per year, 37.945 percent of total expenditures is devoted to child-rearing expenditures for two children. Childcare comprises 0.776 percent of total expenditures per child. The percentage may appear small compared to the cost of childcare, but it reflects the average across all children regardless whether they incur childcare expenses. Childcare expenses may not incur because the children are older, a relative provides childcare at no expense, or another situation.

The percentage of total expenditures devoted to childcare is multiplied by the number of children (*e.g.,* 0.776 multiplied by children is 1.552%). Continuing with the example of a combined income of $60,000 to $64,999 net per month, 1.552 percent is subtracted from 37.945 percent. The remainder, 36.393, (37.945 minus 1.552 equals 36.393) is the adjusted percentage devoted to child-rearing expenditures for two children that excludes childcare expenses.

One limitation is that the CE does not discern between work-related childcare expenses and childcare expenses the parents incurred due to entertainment (*e.g.,* they incurred childcare expenses when they went out to dinner.) This means that work-related childcare expenses may be slightly overstated. In turn, this would understate the schedule amounts. Similarly, if there are economies to scale for childcare, multiplying the number of children by the percentage per child would overstate actual childcare expenses. When subtracted from the schedule, this would reduce the schedule too much. However, due to the small percentage devoted to childcare expenses, any understatement is likely to be small.

Step 2: Exclude Medical Expenses

A similar adjustment is made for the child's medical expenses except an additional step is taken. Exhibit B-1 shows the excess medical percentage, which is defined as the cost of health insurance and out-of-pocket medical expenses exceeding $250 per person per year. It is shown two ways: the per-capita amount and the average amount for the entire household. Either way considers expenditures on the two adults in the household. It is adjusted to a per-child amount since medical expenses of children are less. The underlying data do not track whether the insurance premium or medical expense was made for an adult's or child's healthcare needs.

Based on the 2017 National Medical Expenditure survey, the annual out-of-pocket medical expense per child is $270, while it is $615 for an adult between the ages of 18 and 64.[67] In other words, an adult's out-of-medical expenses is 2.28 more than a child's. This information is used to recalibrate the per-person excessive medical amount shown in Exhibit B-1 to a per-child amount. For example, at combined incomes of $60,000 to $64,999 per year, the total excess medical expense is 7.474 percent. The adjusted child amount is 7.474 divided by the weighted amounts for family members (6.1684 based on 2.28 times two adults plus the average number of children for this income range, 1.6084). The quotient, 1.212 percent, is the per-child amount for excess medical. It is less than the per-capita amount of 2.071 percent.

Continuing from the example in Step 1, where 36.393 is the percentage that excludes childcare for two children at a combined income of $60,000 to $64,999 per year, 1.212 multiplied by two children is subtracted to exclude the children's excessive medical expenses. This leaves 33.969 as the percentage of total expenditures devoted to raising two children less their childcare expenses and excess medical expenses.

Step 3: Convert to After-Tax Income

The next step is to convert the percentage from above to an after-tax income by multiplying it by expenditures to after-tax income ratios. Continuing using the example of combined income of $60,000 to $64,999 per year, the ratio is 86.130. When multiplied by 33.969, this yields 29.257 percent of after-tax income being the percentage of after-tax income devoted to raising two children, excluding their childcare and excess medical expenses.

Step 4: Adjust to Current Price Levels

The amounts in Exhibit B-1 are based on May 2020 price levels. They are converted to October 2020 price levels using changes to the Consumer Price Index (CPI-U), which is the most commonly used price index.[68] The adjustment is applied to the midpoint of each after-tax income range.

Step 5: Develop Marginal Percentages

The information from the previous steps is used to compute a tax table-like schedule of proportions for one, two, and three children. The percentages from above (*e.g.,* 29.257% for two children for the

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[67] Agency for Healthcare Research and Quality. (Jun. 2020). *Mean expenditure per person by source of payment and age groups, United States, 2017. Medical Expenditure Panel Survey*. Generated interactively: June 12, 2020, from https://www.meps.ahrq.gov/mepstrends/hc_use/.

[68] The increase from May 2020 to October 2020 is 1.558% based on 260.388 divided by 256.394 and subtracting 100% (Consumer Price Index Historical Tables for U.S. City Average: Mid–Atlantic Information Office : U.S. Bureau of Labor Statistics (bls.gov).

combined income of $60,000 to $64,999 per year) are assigned to the midpoint of that income range adjusted for inflation. Marginal percentages are created by interpolating between income ranges. For the highest income range, the midpoint was supplied by Betson, it was $258,887 per year in May 2020 dollars. When converted to October 2020 dollars and a monthly amount, it is $21,910 per month.

Another adjustment was made at low incomes. The percentages for incomes below $30,000 net per year were actually less than the amounts for the net income range $30,000 to $34,999 per year. This is an artificial result caused by the cap on expenditures in Step 3, which is also shown in Exhibit 5. Decreasing percentages result in a smooth decrease when the parent receiving support has more income. This is the general result of the steps so far. The exception is at low incomes because of the cap. Without the cap, it will also produce decreasing percentages. For the purposes of the child support schedule, the percentage from the $30,000 to $34,999 are applied to all incomes less than $30,000 per year. For one child, the percentages are actually from the $35,000 to $39,999 income range. To be clear, this is still less than what families of this income range actually spend on children.

Exhibit B-2: Schedule of Proportions for One, Two, and Three Children

Annual After-Tax Income Range (May 2020 dollars)	Monthly Midpoint of Income Range (Oct. 2020 Dollars)	One Child		Two Children		Three Children	
		Midpoint	Marginal Percentage	Midpoint	Marginal Percentage	Midpoint	Marginal Percentage
< $30,0000	$0	23.041%	23.041%	35.086%	35.086%	42.414%	42.414%
$30,000 – $34,999	$2,751	23.041%	23.041%	35.086%	30.397%	42.414%	34.813%
$35,000 – $39,999	$3,174	23.041%	20.834%	34.461%	34.031%	41.401%	40.211%
$40,000 – $44,999	$3,597	22.782%	16.965%	34.410%	25.320%	41.261%	30.000%
$45,000 – $49,999	$4,020	22.169%	10.445%	33.453%	14.985%	40.075%	17.008%
$50,000 – $54,999	$4,443	21.053%	9.406%	31.694%	10.817%	37.879%	8.818%
$55,000 – $59,999	$4,866	20.040%	13.143%	29.879%	22.110%	35.351%	29.299%
$60,000 – $64,999	$5,289	19.488%	7.992%	29.257%	9.168%	34.867%	7.438%
$65,000 – $69,999	$5,713	18.637%	11.118%	27.769%	14.584%	32.835%	14.789%
$70,000 – $74,999	$6,136	18.118%	16.525%	26.860%	23.208%	31.591%	25.699%
$74,999 – $84,999	$6,771	17.969%	12.081%	26.518%	19.891%	31.038%	25.883%
$85,000 – $89,999	$7,405	17.464%	9.419%	25.950%	13.114%	30.597%	14.370%
$90,000 – $99,999	$8,040	16.829%	12.140%	24.936%	16.107%	29.315%	16.595%
$100,000 – $109,999	$8,886	16.382%	7.712%	24.095%	9.708%	28.104%	9.272%
$110,000 – $119,999	$9,733	15.628%	14.265%	22.844%	21.151%	26.466%	24.896%
$120,000 – $139,999	$11,002	15.471%	11.375%	22.649%	15.036%	26.285%	15.418%
$140,000 – $159,999	$12,695	14.925%	9.996%	21.634%	17.177%	24.836%	23.161%
$160,000 – $199,999	$15,234	14.103%	10.376%	20.891%	14.835%	24.557%	16.780%
$200,000 or more	$21,910	12.968%		19.046%		22.187%	

Step 6: Extend to More Children

Most of the measurements only cover one, two, and three children. The number of families in the CE with four or more children is insufficient to produce reliable estimates. For many child support

guidelines, the National Research Council's (NRC) equivalence scale, as shown below, is used to extend the three-child estimate to four and more children.[69]

$$= (\text{Number of adults} + 0.7 \text{ X number of children})^{0.7}$$

Application of the equivalence scale implies that expenditures on four children are 11.7 percent more than the expenditures for three children, expenditures on five children are 10.0 percent more than the expenditures for four children, and expenditures on six children are 8.7 percent more than the expenditures for five children.

Step 7: Convert to Gross Income

The final step is to convert the schedule to a gross-income base. This is done by calculating the after-tax incomes for the gross incomes appearing in the schedule. The after-tax income equivalent is shown as a hidden column in Exhibit B-3. The schedule amounts are calculated based on the after-tax income using the information in Exhibit B-2 for one, two, and three children. For example, for two children and a combined income of $5,500 gross per month, the after-tax equivalent is $4,301 per month. From Exhibit B-2, 33.453 percent would be applied to the first $4,020 in after-tax income and 14.985 percent would apply to the next $281 ($4,301 minus $4,020). This yields a total of $1,387, which is the sum of $1,345 (33.453% of $4,020) and $42 (14.985% of $281).

The amounts for four and more children are calculated from the three-child amounts in Exhibit B-2 multiplied by the equivalence scales shown in the previous step.

Exhibit B-3: Illustration of Hidden After-Tax Income Column in Schedule

Hidden After-Tax Income	Combined Adjusted Gross Income	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
3969.00	5000	883	1332	1596	1782	1961	2131
4002.50	5050	888	1340	1606	1794	1973	2145
4036.01	5100	893	1347	1614	1803	1983	2155
4069.37	5150	896	1352	1619	1809	1990	2163
4102.46	5200	900	1357	1625	1815	1997	2170
4135.55	5250	903	1362	1631	1821	2004	2178
4168.64	5300	907	1367	1636	1828	2011	2185
4201.73	5350	910	1372	1642	1834	2017	2193
4234.82	5400	914	1377	1648	1840	2024	2200
4267.91	5450	917	1382	1653	1847	2031	2208
4301.00	5500	921	1387	1659	1853	2038	2216
4334.09	5550	924	1392	1664	1859	2045	2223
4367.18	5600	927	1397	1670	1865	2052	2231

As identified in Section 3, the conversion to gross income relies on the federal withholding formula and state income tax rates. The IRS Method 5, which is to be used with the 2019 IRS W-4, is used to calculate the federal income tax.[70] Two allowances are assumed, which is the amount recommended for a single

[69] Citro, Constance F. and Robert T. Michael, Editors. (1995). *Measuring Poverty: A New Approach*. National Academy Press. Washington, D.C.

[70] *IRS Publication 15-A: Federal Income Tax Withholding Methods: 2020*. p. 51. Retrieved from https://www.irs.gov/publications/p15a.

individual. This yields the exact same federal tax as application of IRS Method 4, which is to be used with the 2020 IRS W-4 with no allowances and assuming that all income is taxed at the rate of a single individual with no second job, no dependents, and no other deductions. In short, although the IRS provides five different withholding methods, they do not vary in their result.

The federal withholding formula also considers FICA. The Social Security and Medicare tax is 6.2 percent for incomes up to $137,700 per year.[71] Above that level, the Medicare tax of 1.45 percent is applied. In addition, the 0.9 percent additional Medicare tax for incomes above $200,000 per year is also considered.

The state income tax is more complicated. Arizona is unique in that it allows an employee to elect how much to withhold. Specifically, Arizona provides employees with check boxes to elect 0.8 percent, 1.3 percent, 1.8 percent, 2.7 percent, 3.6 percent, 4.2 percent, or 5.1 percent.[72] In contrast, most states do not explicitly give employees an option on the percentage to withhold for state taxes. The actual Arizona income tax rates beginning in 2020 cover four income tax brackets and becomes progressively higher with more income.[73] For a single tax filer, the rates are 2.59 percent for incomes of $0 through $26,500 per year, 3.34 percent for incomes of $26,501 through $53,000 per year, 4.17 percent for incomes of $53,001 through $159,000 per year, and 4.5 percent for incomes of $159,001 or more. Since Arizona began aligning its taxable income to the federal standard deduction in 2020, these rates are applied to federal taxable income in the income conversion.

Using federal and state income tax withholding formulas and assuming all income is taxed at the rate of a single tax filer with earned income is a common assumption among most states and the assumption underlying the existing Arizona schedule. Most alternative federal tax assumptions would result in more after-tax income, hence higher schedule amounts. For example, the District of Columbia assumes the tax-filing status is for a married couple claiming the number of children for whom support is being determined. The District used this assumption prior to 2018 tax reform that eliminated the federal tax allowance for children and expanded the federal child tax credit from $1,000 per child to $2,000 per child. The 2018 federal tax changes are scheduled to expire in 2025.

Alternative state income tax assumptions could result or more or less income depending on the alternative assumption but will not have a smaller impact because the state income tax rate is considerably less than the federal income tax rate. The tax assumptions used to develop the updated schedule in Appendix C do not consider the child tax credit or the Earned Income Tax Credit (EITC). Most states consider EITC to be a means-tested income and do not count means-tested income as income available for child support. There is no consideration of the child tax credit. This is consistent with the guidelines provision that allows the parents to share the child-related tax benefits. The child tax credit applies to a limited income range and, hence, would be difficult if not possible to incorporate into the schedule.

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[71] *IRS Publication 15-A: Federal Income Tax Withholding Methods: 2020*. Retrieved from https://www.irs.gov/publications/p15a.
[72] Arizona Department of Revenue. *Arizona Withholding Percentage Election*. Retrieved from https://azdor.gov/forms/withholding-forms/arizona-withholding-percentage-election.
[73] Arizona Department of Revenue. (n.d.) *Updated Guidance for Arizona Individual Income Taxpayers*. Retrieved from https://azdor.gov/news-events-notices/news/updated-guidance-arizona-individual-income-taxpayers.

Consumer Expenditure Data

Most studies of child-rearing expenditures, including the BR measurements, draw on expenditures data collected from families participating in the Consumers Expenditures Survey (CE) that is administered by the Bureau of Labor Statistics (BLS). Economists use the CE because it is the most comprehensive and detailed survey conducted on household expenditures and consists of a large sample. The CE surveys about 7,000 households per quarter on expenditures, income, and household characteristics (*e.g.*, family size). Households remain in the survey for four consecutive quarters, with households rotating in and out each quarter. Most economists, including Betson, use three or four quarters of expenditures data for a surveyed family. This means that family expenditures are averaged for about a year rather than over a quarter, which may not be as reflective of typical family expenditures. (In Appendix A, Betson does explore using quarterly wage data rather than analyzing CE data.)

In all, the BR5 study relies on expenditures/outlays data from almost 14,000 households, in which over half had a minor child present in the household. The subset of CE households considered for the BR5 measurements used to develop the existing updated schedule consisted of married couples of child-rearing age with no other adults living in the household (*e.g.*, grandparents), households with no change in family size or composition during the survey period, and households with at least three completed interviews. Other family types were considered, which also changed the sample size, but the percentage of child-rearing expenditures in these alternative assumptions did not significantly change the percentage of expenditures devoted to child-rearing expenditures. The other family types included in these expanded samples were households with adult children living with them and domestic partners with children.

The CES asks households about expenditures on over 100 detailed items. Exhibit B-4 shows the major categories of expenditures captured by the CE. It includes the purchase price and sales tax on all goods purchased within the survey period. In recent years, the CE has added another measure of "expenditures" called "outlays." The key difference is that outlays essentially include installment plans on purchases, mortgage principal payments, and payments on home equity loans, while expenditures do not. To illustrate the difference, consider a family who purchases a home theater system during the survey period, puts nothing down, and pays for the home theater system through 36 months of installment payments. The expenditures measure would capture the total purchase price of the home theater system. The outlays measure would only capture the installment payments made in the survey period.

The BLS designed the CE to produce a nationally representative sample and samples representative of the four regions (Midwest, Northeast, South, and West). The sample sizes for each state, however, are not large enough to estimate child-rearing costs for families within a state. We know of no state that has seriously contemplated conducting a survey similar to the CE at a state level. The costs and time requirements would be prohibitive.

Outlays include mortgage principal payments, payments on second mortgages, and home equity payments, which is what the 2020 Betson-Rothbarth (BR) measurement considers. As explained in Section 2, this is a change from BR measurements underlying the existing schedule. The CE traditional

measure of expenditures does not consider these outlays. The merit of using expenditures, which does not include mortgage principal payments, is that any equity in the home should be considered part of the property settlement and not part of the child support payments. The limitations are that not all families have substantial equity in their homes and some families have second mortgages or home equity loans that further reduce home equity. The merit of using outlays is that it is more in line with family budgeting on a monthly basis in that it considers the entire mortgage payment including the amounts paid toward both interest and principal, and the amount paid toward a second mortgage or home equity loan if there is such a payment. Both measures include payment of the mortgage interest, rent among households dwelling in apartments, utilities, property taxes, and other housing expenses as indicated in the above table. Housing-related items, which are identified in Exhibit B-4, comprise the largest share of total family expenditures. As shown in Appendix A, housing expenses compose about 40 percent of total family expenditures.

Exhibit B-4: Partial List of Expenditure Items Considered in the Consumer Expenditure Survey	
Housing	Rent paid for dwellings, rent received as pay, parking fees, maintenance, and other expenses for rented dwellings; interest and principal payments on mortgages, interest and principal payments on home equity loans and lines of credit, property taxes and insurance, refinancing and prepayment charges, ground rent, expenses for property management and security, homeowners' insurance, fire insurance and extended coverage, expenses for repairs and maintenance contracted out, and expenses of materials for owner-performed repairs and maintenance for dwellings used or maintained by the consumer unit. Also includes utilities, cleaning supplies, household textiles, furniture, major and small appliances, and other miscellaneous household equipment (tools, plants, decorative items).
Food	Food at home purchased at grocery or other food stores, as well as meals, including tips, purchased away from home (*e.g.*, full-service and fast-food restaurant, vending machines).
Transportation	Vehicle finance charges, gasoline and motor oil, maintenance and repairs, vehicle insurance, public transportation, leases, parking fees, and other transportation expenditures.
Entertainment	Admission to sporting events, movies, concerts, health clubs, recreational lessons, television/radio/sound equipment, pets, toys, hobbies, and other entertainment equipment and services.
Apparel	Apparel, footwear, uniforms, diapers, alterations and repairs, dry cleaning, sent-out laundry, watches, and jewelry.
Other	Personal care products, reading materials, education fees, banking fees, interest paid on lines of credit, and other expenses.

Transportation expenses account for about one-sixth of total family expenditures. In the category of "transportation," the CES includes net vehicle outlays; vehicle finance charges; gasoline and motor oil; maintenance and repairs; vehicle insurance; public transportation expenses; and vehicle rentals, leases, licenses, and other charges. The net vehicle outlay is the purchase price of a vehicle less the trade-in value. Net vehicle outlays account for just over one-third of all transportation expenses. Net vehicle outlays are an important consideration when measuring child-rearing expenditures because the family's use of the vehicle is often longer than the survey period. In Betson's first three studies, he excluded them because in his earlier estimates that consider expenditures the vehicle can be sold again later, after the survey period. In contrast, Betson's 2020 estimates that consider outlays capture vehicle payments made over the survey period. The USDA, which relies on expenditures, includes all transportation expenses including net vehicle outlays. There are some advantages and disadvantages to each approach. Excluding it makes sense when the vehicle may be part of the property settlement in a

divorce. An alternative to that would be to include a value that reflects depreciation of the vehicle over time, but that information is not available. Including the entire net vehicle outlay when expenditures are used as the basis of the estimate likely overstates depreciation. When the basis of the estimates is outlays, it includes only vehicle installment payments rather than net vehicle outlays. This effectively avoids the issues of vehicle equity and depreciation.

Betson excludes some expenditure items captured by the CE because they are obviously not child-rearing expenses. Specifically, he excludes contributions by family members to Social Security and private pension plans, and cash contributions made to members outside the surveyed household. The USDA also excludes these expenses from its estimates of child-rearing expenditures.

Gross and net incomes are reported by families participating in the CE. The difference between gross and net income is taxes. In fact, the CE uses the terms "income before taxes" and "income after taxes" instead of gross and net income. Income before taxes is the total money earnings and selected money receipts. It includes wages and salary, self-employment income, Social Security benefits, pension income, rental income, unemployment compensation, workers' compensation, veterans' benefits, public assistance, and other sources of income. Income and taxes are based on self-reports and not checked against actual records.

The BLS has concerns that income may be underreported in the CE. Although underreporting of income is a problem inherent to surveys, the BLS is particularly concerned because expenditures exceed income among low-income households participating in the CE. The BLS does not know whether the cause is underreporting of income or that low-income households are actually spending more than their incomes because of an unemployment spell, the primary earner is a student, or the household is otherwise withdrawing from its savings. In an effort to improve income information, the BLS added and revised income questions in 2001. The new questions impute income based on a relationship to its expenditures when households do not report income. The 2010 and 2020 Betson-Rothbarth measurements rely on these new questions. Previous Betson measurements do not.

The BLS also had concerns with taxes being under-reported. Beginning in 2013, the BLS began calculating taxes for families using a TurboTax-like tax calculator. This also affected differences between the BR5 measurements and earlier measurements.

The BLS also does not include changes in net assets or liabilities as income or expenditures. In all, the BLS makes it clear that reconciling differences between income and expenditures and precisely measuring income are not parts of the core mission of the CES. Rather, the core mission is to measure and track expenditures. The BLS recognizes that at some low-income levels, the CES shows that total expenditures exceed after-tax incomes, and at very high incomes, the CES shows total expenditures are considerably less than after-tax incomes. However, the changes to the income measure, the use of outlays rather than expenditures, and use of the tax calculator have lessened some of these issues.

APPENDIX C: PROPOSED, UPDATED SCHEDULE

Arizona
Proposed Updated Schedule of Basic Support Obligations

Combined Adjusted Gross Income	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
750	159	243	293	328	360	392
800	170	258	312	349	384	417
850	180	274	331	370	407	443
900	190	290	351	392	431	468
950	201	306	370	413	454	494
1000	211	321	389	434	477	519
1050	221	337	407	454	500	543
1100	230	351	424	473	521	566
1150	239	365	441	492	542	589
1200	249	379	458	511	562	611
1250	258	393	475	530	583	634
1300	267	407	491	549	604	656
1350	276	421	508	568	625	679
1400	285	435	525	587	645	702
1450	295	449	542	606	666	724
1500	304	463	559	625	687	747
1550	313	477	576	643	708	769
1600	322	491	593	662	729	792
1650	331	504	610	681	749	815
1700	340	518	627	700	770	837
1750	350	532	644	719	791	860
1800	359	546	661	738	812	882
1850	368	560	678	757	832	905
1900	377	574	694	775	853	927
1950	386	588	711	794	873	949
2000	395	601	727	812	893	971
2050	404	615	744	831	914	993
2100	413	629	760	849	934	1015
2150	422	642	777	867	954	1037
2200	431	656	793	886	974	1059
2250	440	670	810	904	995	1081
2300	449	683	826	923	1015	1103
2350	458	697	842	941	1035	1125
2400	467	711	859	959	1055	1147
2450	476	724	875	978	1076	1169
2500	485	738	892	996	1096	1191
2550	494	751	908	1015	1116	1213
2600	502	765	925	1033	1136	1235
2650	511	779	941	1052	1157	1257
2700	520	792	958	1070	1177	1279

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Proposed Updated Schedule of Basic Support Obligations

Combined Adjusted Gross Income	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
2750	529	806	974	1088	1197	1301
2800	538	820	991	1107	1218	1323
2850	547	833	1007	1125	1238	1345
2900	556	847	1024	1144	1258	1367
2950	565	861	1040	1162	1278	1389
3000	574	874	1057	1180	1298	1411
3050	583	888	1073	1198	1318	1433
3100	592	901	1089	1217	1338	1455
3150	601	915	1106	1235	1358	1477
3200	609	928	1122	1253	1379	1498
3250	618	942	1138	1271	1399	1520
3300	627	955	1155	1290	1419	1542
3350	636	968	1170	1307	1438	1563
3400	645	980	1184	1322	1454	1581
3450	654	992	1197	1337	1471	1599
3500	663	1003	1210	1352	1487	1617
3550	672	1015	1224	1367	1504	1634
3600	680	1027	1237	1382	1520	1652
3650	689	1038	1251	1397	1537	1670
3700	698	1050	1264	1412	1553	1688
3750	707	1062	1277	1427	1570	1706
3800	716	1073	1291	1442	1586	1724
3850	725	1085	1304	1457	1602	1742
3900	733	1097	1318	1472	1620	1761
3950	741	1110	1334	1490	1639	1781
4000	750	1123	1349	1507	1658	1802
4050	758	1137	1365	1524	1677	1823
4100	766	1150	1380	1542	1696	1843
4150	774	1163	1396	1559	1715	1864
4200	782	1176	1411	1576	1734	1885
4250	790	1189	1427	1593	1753	1905
4300	798	1202	1442	1611	1772	1926
4350	806	1215	1458	1628	1791	1947
4400	813	1228	1472	1644	1809	1966
4450	820	1239	1485	1659	1825	1984
4500	826	1247	1495	1670	1837	1997
4550	831	1256	1505	1681	1850	2010
4600	837	1264	1515	1693	1862	2024
4650	843	1273	1525	1704	1874	2037
4700	848	1281	1535	1715	1887	2051
4750	854	1289	1545	1726	1899	2064
4800	860	1298	1556	1738	1911	2078
4850	865	1306	1566	1749	1924	2091

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Proposed Updated Schedule of Basic Support Obligations

Combined Adjusted Gross Income	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
4900	871	1315	1576	1760	1936	2104
4950	877	1323	1586	1771	1948	2118
5000	883	1332	1596	1782	1961	2131
5050	888	1340	1606	1794	1973	2145
5100	893	1347	1614	1803	1983	2155
5150	896	1352	1619	1809	1990	2163
5200	900	1357	1625	1815	1997	2170
5250	903	1362	1631	1821	2004	2178
5300	907	1367	1636	1828	2011	2185
5350	910	1372	1642	1834	2017	2193
5400	914	1377	1648	1840	2024	2200
5450	917	1382	1653	1847	2031	2208
5500	921	1387	1659	1853	2038	2216
5550	924	1392	1664	1859	2045	2223
5600	927	1397	1670	1865	2052	2231
5650	931	1402	1676	1872	2059	2238
5700	934	1407	1681	1878	2066	2246
5750	938	1411	1685	1882	2070	2251
5800	941	1414	1688	1885	2074	2254
5850	944	1418	1691	1889	2078	2258
5900	947	1421	1694	1892	2081	2262
5950	950	1425	1697	1895	2085	2266
6000	953	1429	1700	1899	2088	2270
6050	956	1432	1703	1902	2092	2274
6100	959	1436	1705	1905	2096	2278
6150	962	1439	1708	1908	2099	2282
6200	966	1443	1711	1912	2103	2286
6250	969	1447	1714	1915	2106	2290
6300	972	1450	1717	1918	2110	2293
6350	975	1454	1720	1921	2113	2297
6400	979	1461	1729	1932	2125	2310
6450	984	1468	1739	1942	2137	2322
6500	988	1475	1749	1953	2148	2335
6550	992	1483	1758	1964	2160	2348
6600	997	1490	1768	1975	2172	2361
6650	1001	1497	1778	1986	2184	2374
6700	1005	1505	1787	1996	2196	2387
6750	1010	1512	1797	2007	2208	2400
6800	1014	1519	1807	2018	2220	2413
6850	1018	1527	1816	2029	2232	2426
6900	1023	1534	1826	2040	2244	2439
6950	1027	1541	1836	2051	2256	2452
7000	1031	1548	1845	2060	2266	2464

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Proposed Updated Schedule of Basic Support Obligations

Combined Adjusted Gross Income	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
7050	1034	1551	1847	2063	2269	2467
7100	1036	1554	1850	2066	2273	2470
7150	1039	1557	1852	2069	2276	2474
7200	1042	1560	1854	2071	2279	2477
7250	1044	1563	1857	2074	2282	2480
7300	1047	1566	1859	2077	2285	2483
7350	1050	1569	1862	2080	2288	2487
7400	1052	1572	1864	2082	2291	2490
7450	1055	1575	1867	2085	2294	2493
7500	1058	1578	1869	2088	2297	2497
7550	1060	1581	1872	2091	2300	2500
7600	1063	1584	1874	2093	2303	2503
7650	1066	1588	1877	2097	2307	2507
7700	1070	1593	1882	2103	2313	2514
7750	1073	1598	1887	2108	2319	2521
7800	1077	1602	1892	2113	2325	2527
7850	1081	1607	1897	2119	2331	2534
7900	1084	1612	1902	2124	2337	2540
7950	1088	1617	1907	2130	2343	2547
8000	1092	1622	1912	2135	2349	2553
8050	1095	1627	1917	2141	2355	2560
8100	1099	1631	1921	2146	2361	2566
8150	1103	1636	1926	2152	2367	2573
8200	1106	1641	1931	2157	2373	2579
8250	1110	1646	1936	2162	2379	2586
8300	1114	1652	1942	2170	2387	2594
8350	1120	1659	1951	2179	2397	2605
8400	1125	1667	1959	2188	2407	2616
8450	1130	1674	1967	2197	2417	2627
8500	1135	1681	1975	2206	2427	2638
8550	1141	1689	1984	2216	2437	2649
8600	1146	1696	1992	2225	2447	2660
8650	1151	1704	2000	2234	2457	2671
8700	1157	1711	2008	2243	2468	2682
8750	1162	1719	2017	2252	2478	2693
8800	1167	1726	2025	2262	2488	2704
8850	1173	1734	2033	2271	2498	2715
8900	1178	1741	2041	2280	2508	2726
8950	1183	1748	2050	2289	2518	2737
9000	1188	1756	2058	2299	2528	2748
9050	1194	1763	2066	2308	2539	2759
9100	1199	1771	2074	2317	2549	2770
9150	1204	1778	2083	2326	2559	2781

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Proposed Updated Schedule of Basic Support Obligations

Combined Adjusted Gross Income	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
9200	1210	1786	2091	2335	2569	2792
9250	1215	1793	2099	2345	2579	2803
9300	1219	1800	2107	2354	2589	2814
9350	1223	1806	2116	2363	2599	2826
9400	1227	1813	2124	2372	2610	2837
9450	1231	1819	2132	2382	2620	2848
9500	1235	1825	2141	2391	2630	2859
9550	1239	1832	2149	2400	2640	2870
9600	1243	1838	2157	2410	2650	2881
9650	1246	1845	2165	2419	2661	2892
9700	1250	1851	2174	2428	2671	2903
9750	1254	1857	2182	2437	2681	2914
9800	1258	1864	2190	2447	2691	2925
9850	1262	1870	2199	2456	2701	2937
9900	1266	1876	2207	2465	2712	2948
9950	1270	1883	2215	2474	2722	2959
10000	1274	1889	2224	2484	2732	2970
10050	1277	1896	2232	2493	2742	2981
10100	1281	1902	2240	2502	2753	2992
10150	1285	1908	2248	2512	2763	3003
10200	1289	1915	2257	2521	2773	3014
10250	1293	1921	2265	2530	2783	3025
10300	1296	1926	2270	2536	2789	3032
10350	1299	1930	2275	2541	2795	3038
10400	1302	1934	2279	2546	2800	3044
10450	1305	1938	2284	2551	2806	3050
10500	1308	1942	2288	2556	2812	3056
10550	1311	1947	2293	2561	2817	3063
10600	1314	1951	2298	2566	2823	3069
10650	1317	1955	2302	2572	2829	3075
10700	1320	1959	2307	2577	2834	3081
10750	1323	1963	2312	2582	2840	3087
10800	1326	1968	2316	2587	2846	3093
10850	1329	1972	2321	2592	2851	3100
10900	1332	1976	2325	2597	2857	3106
10950	1335	1980	2330	2603	2863	3112
11000	1338	1984	2335	2608	2868	3118
11050	1341	1989	2339	2613	2874	3124
11100	1344	1993	2344	2618	2880	3130
11150	1347	1997	2348	2623	2885	3137
11200	1350	2001	2353	2628	2891	3143
11250	1354	2006	2358	2634	2897	3149
11300	1357	2011	2363	2640	2903	3156

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Proposed Updated Schedule of Basic Support Obligations

Combined Adjusted Gross Income	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
11350	1361	2016	2368	2645	2910	3163
11400	1365	2021	2374	2651	2917	3170
11450	1369	2026	2379	2657	2923	3177
11500	1373	2032	2385	2664	2930	3185
11550	1378	2037	2390	2670	2937	3193
11600	1382	2043	2396	2677	2944	3200
11650	1386	2049	2402	2683	2951	3208
11700	1390	2054	2408	2690	2959	3216
11750	1395	2060	2414	2696	2966	3224
11800	1399	2066	2420	2703	2973	3232
11850	1403	2071	2425	2709	2980	3239
11900	1407	2077	2431	2716	2987	3247
11950	1412	2083	2437	2722	2995	3255
12000	1416	2088	2443	2729	3002	3263
12050	1420	2094	2449	2735	3009	3271
12100	1425	2100	2455	2742	3016	3278
12150	1429	2105	2461	2748	3023	3286
12200	1433	2111	2466	2755	3030	3294
12250	1437	2117	2472	2761	3038	3302
12300	1442	2122	2478	2768	3045	3310
12350	1446	2128	2484	2774	3052	3317
12400	1450	2134	2490	2781	3059	3325
12450	1454	2139	2496	2788	3066	3333
12500	1458	2144	2500	2792	3071	3339
12550	1460	2147	2503	2796	3075	3343
12600	1463	2150	2506	2799	3079	3347
12650	1466	2154	2509	2803	3083	3352
12700	1468	2157	2513	2807	3087	3356
12750	1471	2161	2516	2810	3091	3360
12800	1474	2164	2519	2814	3095	3365
12850	1477	2167	2522	2818	3099	3369
12900	1479	2171	2526	2821	3103	3373
12950	1482	2174	2529	2825	3107	3378
13000	1485	2178	2532	2829	3111	3382
13050	1487	2181	2536	2832	3115	3386
13100	1490	2185	2539	2836	3119	3391
13150	1493	2188	2542	2839	3123	3395
13200	1496	2191	2545	2843	3127	3400
13250	1498	2195	2549	2847	3131	3404
13300	1501	2198	2552	2850	3135	3408
13350	1504	2202	2555	2854	3139	3413
13400	1506	2205	2558	2858	3143	3417
13450	1509	2208	2562	2861	3147	3421

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Proposed Updated Schedule of Basic Support Obligations

Combined Adjusted Gross Income	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
13500	1512	2212	2565	2865	3151	3426
13550	1515	2215	2568	2869	3155	3430
13600	1517	2219	2571	2872	3160	3434
13650	1520	2222	2575	2876	3164	3439
13700	1524	2228	2581	2883	3172	3448
13750	1529	2236	2590	2893	3183	3459
13800	1534	2243	2599	2903	3193	3471
13850	1539	2250	2608	2913	3204	3483
13900	1544	2258	2616	2923	3215	3495
13950	1549	2265	2625	2932	3226	3506
14000	1554	2273	2634	2942	3236	3518
14050	1559	2280	2643	2952	3247	3530
14100	1564	2288	2651	2962	3258	3541
14150	1569	2295	2660	2971	3268	3553
14200	1574	2302	2669	2981	3279	3564
14250	1579	2310	2678	2991	3290	3576
14300	1584	2317	2686	3001	3301	3588
14350	1589	2325	2695	3010	3311	3599
14400	1594	2332	2704	3020	3322	3611
14450	1599	2339	2712	3030	3333	3623
14500	1604	2347	2721	3040	3343	3634
14550	1609	2354	2730	3049	3354	3646
14600	1614	2362	2739	3059	3365	3658
14650	1619	2369	2747	3069	3375	3669
14700	1624	2375	2755	3077	3385	3679
14750	1628	2382	2763	3086	3394	3690
14800	1632	2389	2770	3094	3404	3700
14850	1637	2395	2778	3103	3413	3710
14900	1641	2402	2786	3112	3423	3721
14950	1646	2408	2793	3120	3432	3731
15000	1650	2415	2801	3129	3442	3741
15050	1655	2421	2809	3138	3451	3752
15100	1659	2428	2817	3146	3461	3762
15150	1663	2434	2824	3155	3470	3772
15200	1668	2441	2832	3163	3480	3783
15250	1672	2448	2840	3172	3489	3793
15300	1677	2454	2848	3181	3499	3803
15350	1681	2461	2855	3189	3508	3813
15400	1686	2467	2863	3198	3518	3824
15450	1690	2474	2871	3207	3527	3834
15500	1694	2480	2878	3215	3537	3844
15550	1699	2487	2886	3224	3546	3855
15600	1703	2493	2893	3232	3555	3864

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Proposed Updated Schedule of Basic Support Obligations

Combined Adjusted Gross Income	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
15650	1707	2498	2898	3237	3561	3870
15700	1710	2502	2903	3242	3567	3877
15750	1714	2507	2907	3248	3572	3883
15800	1717	2512	2912	3253	3578	3890
15850	1721	2516	2917	3258	3584	3896
15900	1724	2521	2922	3264	3590	3902
15950	1728	2526	2927	3269	3596	3909
16000	1731	2530	2931	3274	3602	3915
16050	1735	2535	2936	3280	3608	3922
16100	1738	2540	2941	3285	3614	3928
16150	1742	2544	2946	3290	3619	3934
16200	1745	2549	2951	3296	3625	3941
16250	1749	2554	2955	3301	3631	3947
16300	1752	2558	2960	3306	3637	3954
16350	1756	2563	2965	3312	3643	3960
16400	1760	2568	2970	3317	3649	3966
16450	1763	2572	2974	3322	3655	3973
16500	1767	2577	2979	3328	3661	3979
16550	1770	2582	2984	3333	3666	3985
16600	1774	2586	2989	3338	3672	3992
16650	1777	2591	2994	3344	3678	3998
16700	1781	2596	2998	3349	3684	4005
16750	1784	2600	3003	3354	3690	4011
16800	1788	2605	3008	3360	3696	4017
16850	1791	2609	3012	3365	3701	4023
16900	1795	2614	3017	3370	3707	4030
16950	1798	2619	3022	3375	3713	4036
17000	1802	2623	3027	3381	3719	4042
17050	1805	2628	3031	3386	3725	4049
17100	1808	2632	3036	3391	3730	4055
17150	1812	2637	3041	3397	3736	4061
17200	1815	2642	3045	3402	3742	4068
17250	1819	2646	3050	3407	3748	4074
17300	1822	2651	3055	3412	3754	4080
17350	1826	2655	3060	3418	3759	4086
17400	1829	2660	3064	3423	3765	4093
17450	1833	2665	3069	3428	3771	4099
17500	1836	2669	3074	3433	3777	4105
17550	1840	2674	3078	3439	3783	4112
17600	1843	2678	3083	3444	3788	4118
17650	1847	2683	3088	3449	3794	4124
17700	1850	2688	3093	3454	3800	4130
17750	1854	2692	3097	3460	3806	4137

Arizona Proposed Updated Schedule of Basic Support Obligations						
Combined Adjusted Gross Income	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
17800	1857	2697	3102	3465	3811	4143
17850	1861	2701	3107	3470	3817	4149
17900	1864	2706	3111	3476	3823	4156
17950	1868	2711	3116	3481	3829	4162
18000	1871	2715	3121	3486	3835	4168
18050	1875	2720	3126	3491	3840	4175
18100	1878	2724	3130	3497	3846	4181
18150	1882	2729	3135	3502	3852	4187
18200	1885	2734	3140	3507	3858	4193
18250	1888	2738	3144	3512	3864	4200
18300	1892	2743	3149	3518	3869	4206
18350	1895	2747	3154	3523	3875	4213
18400	1898	2752	3161	3531	3884	4222
18450	1901	2757	3168	3538	3892	4231
18500	1904	2762	3174	3546	3900	4240
18550	1907	2767	3181	3553	3909	4249
18600	1910	2772	3188	3561	3917	4258
18650	1913	2777	3195	3568	3925	4267
18700	1916	2782	3201	3576	3933	4276
18750	1918	2787	3208	3583	3942	4285
18800	1921	2792	3215	3591	3950	4294
18850	1924	2797	3221	3598	3958	4303
18900	1927	2802	3228	3606	3966	4312
18950	1930	2807	3235	3613	3975	4321
19000	1933	2812	3242	3621	3983	4330
19050	1936	2817	3248	3628	3991	4339
19100	1939	2822	3255	3636	4000	4348
19150	1942	2827	3262	3644	4008	4357
19200	1945	2832	3269	3651	4016	4366
19250	1948	2837	3275	3659	4024	4375
19300	1950	2842	3282	3666	4033	4384
19350	1953	2847	3289	3674	4041	4393
19400	1956	2852	3296	3681	4049	4402
19450	1959	2857	3302	3689	4058	4411
19500	1962	2862	3309	3696	4066	4420
19550	1965	2867	3316	3704	4074	4429
19600	1968	2872	3322	3711	4082	4437
19650	1971	2877	3329	3719	4091	4446
19700	1974	2882	3336	3726	4099	4455
19750	1977	2887	3343	3734	4107	4464
19800	1979	2892	3349	3741	4115	4473
19850	1982	2897	3356	3749	4124	4482
19900	1985	2902	3363	3756	4132	4491

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Proposed Updated Schedule of Basic Support Obligations

Combined Adjusted Gross Income	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
19950	1988	2907	3370	3764	4140	4500
20000	1991	2912	3376	3771	4149	4509
20050	1994	2917	3383	3779	4157	4518
20100	1997	2922	3390	3786	4165	4527
20150	2000	2927	3397	3794	4173	4536
20200	2003	2932	3403	3801	4182	4545
20250	2006	2937	3410	3809	4190	4554
20300	2009	2942	3417	3817	4198	4563
20350	2011	2947	3423	3824	4206	4572
20400	2014	2952	3430	3832	4215	4581
20450	2017	2957	3437	3839	4223	4590
20500	2020	2962	3444	3847	4231	4599
20550	2023	2967	3450	3854	4240	4608
20600	2026	2972	3457	3862	4248	4617
20650	2029	2977	3464	3869	4256	4626
20700	2032	2982	3471	3877	4264	4635
20750	2035	2987	3477	3884	4273	4644
20800	2038	2992	3484	3892	4281	4653
20850	2041	2997	3491	3899	4289	4662
20900	2043	3002	3498	3907	4297	4671
20950	2046	3007	3504	3914	4306	4680
21000	2049	3012	3511	3922	4314	4689
21050	2052	3017	3518	3929	4322	4698
21100	2055	3022	3525	3937	4331	4707
21150	2058	3027	3531	3944	4339	4716
21200	2061	3032	3538	3952	4347	4725
21250	2064	3037	3545	3959	4355	4734
21300	2067	3042	3551	3967	4364	4743
21350	2070	3047	3558	3974	4372	4752
21400	2072	3052	3565	3982	4380	4761
21450	2075	3057	3572	3990	4388	4770
21500	2078	3062	3578	3997	4397	4779
21550	2081	3067	3585	4005	4405	4788
21600	2084	3072	3592	4012	4413	4797
21650	2087	3077	3599	4020	4422	4806
21700	2090	3082	3605	4027	4430	4815
21750	2093	3087	3612	4035	4438	4824
21800	2096	3092	3619	4042	4446	4833
21850	2099	3097	3626	4050	4455	4842
21900	2102	3102	3632	4057	4463	4851
21950	2104	3107	3639	4065	4471	4860
22000	2107	3112	3646	4072	4479	4869
22050	2110	3117	3652	4080	4488	4878

Arizona Proposed Updated Schedule of Basic Support Obligations						
Combined Adjusted Gross Income	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
22100	2113	3122	3659	4087	4496	4887
22150	2116	3127	3666	4095	4504	4896
22200	2119	3132	3673	4102	4513	4905
22250	2122	3137	3679	4110	4521	4914
22300	2125	3142	3686	4117	4529	4923
22350	2128	3147	3693	4125	4537	4932
22400	2131	3152	3700	4132	4546	4941
22450	2134	3157	3706	4140	4554	4950
22500	2136	3162	3713	4147	4562	4959
22550	2139	3167	3720	4155	4571	4968
22600	2142	3172	3727	4163	4579	4977
22650	2145	3177	3733	4170	4587	4986
22700	2148	3182	3740	4178	4595	4995
22750	2151	3187	3747	4185	4604	5004
22800	2154	3192	3753	4193	4612	5013
22850	2157	3197	3760	4200	4620	5022
22900	2160	3202	3767	4208	4628	5031
22950	2163	3207	3774	4215	4637	5040
23000	2165	3212	3780	4223	4645	5049
23050	2168	3217	3787	4230	4653	5058
23100	2171	3222	3794	4238	4662	5067
23150	2174	3227	3801	4245	4670	5076
23200	2177	3232	3807	4253	4678	5085
23250	2180	3237	3814	4260	4686	5094
23300	2183	3242	3821	4268	4695	5103
23350	2186	3247	3828	4275	4703	5112
23400	2189	3252	3834	4283	4711	5121
23450	2192	3257	3841	4290	4719	5130
23500	2195	3262	3848	4298	4728	5139
23550	2197	3267	3854	4305	4736	5148
23600	2200	3272	3861	4313	4744	5157
23650	2203	3277	3868	4320	4753	5166
23700	2206	3282	3875	4328	4761	5175
23750	2209	3287	3881	4336	4769	5184
23800	2212	3292	3888	4343	4777	5193
23850	2215	3297	3895	4351	4786	5202
23900	2218	3302	3902	4358	4794	5211
23950	2221	3307	3908	4366	4802	5220
24000	2224	3312	3915	4373	4810	5229
24050	2227	3317	3922	4381	4819	5238
24100	2229	3322	3929	4388	4827	5247
24150	2232	3327	3935	4396	4835	5256
24200	2235	3332	3942	4403	4844	5265

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Proposed Updated Schedule of Basic Support Obligations

Combined Adjusted Gross Income	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
24250	2238	3337	3949	4411	4852	5274
24300	2241	3342	3955	4418	4860	5283
24350	2244	3347	3962	4426	4868	5292
24400	2247	3352	3969	4433	4877	5301
24450	2250	3357	3976	4441	4885	5310
24500	2253	3362	3982	4448	4893	5319
24550	2256	3367	3989	4456	4901	5328
24600	2258	3372	3996	4463	4910	5337
24650	2261	3377	4003	4471	4918	5346
24700	2264	3382	4009	4478	4926	5355
24750	2267	3387	4016	4486	4935	5364
24800	2270	3392	4023	4493	4943	5373
24850	2273	3397	4030	4501	4951	5382
24900	2276	3402	4036	4509	4959	5391
24950	2279	3407	4043	4516	4968	5400
25000	2282	3412	4050	4524	4976	5409
25050	2285	3416	4056	4531	4984	5418
25100	2288	3421	4063	4539	4992	5427
25150	2290	3426	4070	4546	5001	5436
25200	2293	3431	4077	4554	5009	5445
25250	2296	3436	4083	4561	5017	5454
25300	2299	3441	4090	4569	5026	5463
25350	2302	3446	4097	4576	5034	5472
25400	2305	3451	4104	4584	5042	5481
25450	2308	3456	4110	4591	5050	5490
25500	2311	3461	4117	4599	5059	5499
25550	2314	3466	4124	4606	5067	5508
25600	2317	3471	4131	4614	5075	5517
25650	2320	3476	4137	4621	5084	5526
25700	2322	3481	4144	4629	5092	5535
25750	2325	3486	4151	4636	5100	5544
25800	2328	3491	4158	4644	5108	5553
25850	2331	3496	4164	4651	5117	5562
25900	2334	3501	4171	4659	5125	5571
25950	2337	3506	4178	4667	5133	5580
26000	2340	3511	4184	4674	5141	5589
26050	2343	3516	4191	4682	5150	5598
26100	2346	3521	4198	4689	5158	5607
26150	2349	3526	4205	4697	5166	5616
26200	2352	3531	4211	4704	5175	5625
26250	2354	3536	4218	4712	5183	5634
26300	2357	3541	4225	4719	5191	5643
26350	2360	3546	4232	4727	5199	5652

Arizona Proposed Updated Schedule of Basic Support Obligations						
Combined Adjusted Gross Income	One Child	Two Children	Three Children	Four Children	Five Children	Six Children
26400	2363	3551	4238	4734	5208	5661
26450	2366	3556	4245	4742	5216	5670
26500	2369	3561	4252	4749	5224	5679
26550	2372	3566	4259	4757	5232	5688
26600	2375	3571	4265	4764	5241	5697
26650	2378	3576	4272	4772	5249	5706
26700	2381	3581	4279	4779	5257	5715
26750	2383	3586	4285	4787	5266	5724
26800	2386	3591	4292	4794	5274	5733
26850	2389	3596	4299	4802	5282	5742
26900	2392	3601	4306	4809	5290	5751
26950	2395	3606	4312	4817	5299	5760
27000	2398	3611	4319	4824	5307	5769
27050	2401	3616	4326	4832	5315	5778
27100	2404	3621	4333	4840	5323	5787
27150	2407	3626	4339	4847	5332	5796
27200	2410	3631	4346	4855	5340	5805
27250	2413	3636	4353	4862	5348	5814
27300	2415	3641	4360	4870	5357	5823
27350	2418	3646	4366	4877	5365	5832
27400	2421	3651	4373	4885	5373	5841
27450	2424	3656	4380	4892	5381	5850
27500	2427	3661	4386	4900	5390	5859
27550	2430	3666	4393	4907	5398	5868
27600	2433	3671	4400	4915	5406	5877
27650	2436	3676	4407	4922	5414	5886
27700	2439	3681	4413	4930	5423	5895
27750	2442	3686	4420	4937	5431	5904
27800	2445	3691	4427	4945	5439	5913
27850	2447	3696	4434	4952	5448	5922
27900	2450	3701	4440	4960	5456	5931
27950	2453	3706	4447	4967	5464	5940
28000	2456	3711	4454	4975	5472	5948
28050	2459	3716	4461	4982	5481	5957
28100	2462	3721	4467	4990	5489	5966
28150	2465	3726	4474	4997	5497	5975
28200	2468	3731	4481	5005	5505	5984
28250	2471	3736	4487	5013	5514	5993
28300	2474	3741	4494	5020	5522	6002
28350	2476	3746	4501	5028	5530	6011
28400	2479	3751	4508	5035	5539	6020
28450	2482	3756	4514	5043	5547	6029
28500	2485	3761	4521	5050	5555	6038

Arizona Proposed Updated Schedule of Basic Support Obligations							
Combined Adjusted Gross Income		One Child	Two Children	Three Children	Four Children	Five Children	Six Children
28550		2488	3766	4528	5058	5563	6047
28600		2491	3771	4535	5065	5572	6056
28650		2494	3776	4541	5073	5580	6065
28700		2497	3781	4548	5080	5588	6074
28750		2500	3786	4555	5088	5597	6083
28800		2503	3791	4562	5095	5605	6092
28850		2506	3796	4568	5103	5613	6101
28900		2508	3801	4575	5110	5621	6110
28950		2511	3806	4582	5118	5630	6119
29000		2514	3811	4588	5125	5638	6128
29050		2517	3816	4595	5133	5646	6137
29100		2520	3821	4602	5140	5654	6146
29150		2523	3826	4609	5148	5663	6155
29200		2526	3831	4615	5155	5671	6164
29250		2529	3836	4622	5163	5679	6173
29300		2532	3841	4629	5170	5688	6182
29350		2535	3846	4636	5178	5696	6191
29400		2538	3851	4642	5186	5704	6200
29450		2540	3856	4649	5193	5712	6209
29500		2543	3861	4656	5201	5721	6218
29550		2546	3866	4663	5208	5729	6227
29600		2549	3871	4669	5216	5737	6236
29650		2552	3876	4676	5223	5745	6245
29700		2555	3881	4683	5231	5754	6254
29750		2558	3886	4690	5238	5762	6263
29800		2561	3891	4696	5246	5770	6272
29850		2564	3896	4703	5253	5779	6281
29900		2567	3901	4710	5261	5787	6290
29950		2569	3906	4716	5268	5795	6299
30000		2572	3911	4723	5276	5803	6308