Analysis of the Virginia Family Survey Data Addressing

Part C SPP/APR Indicator #4:

Final Report

Report prepared for the

University of Kentucky Research Foundation

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TABLE OF CONTENTS

Section

SECTION 1

EXECUTIVE SUMMARY

In accordance with federal reporting requirements mandated by the U.S. Department of Education, Office of Special Education Programs (OSEP), Part C Lead Agencies under the Individuals with Disabilities Education Act must report annually on 14 performance indicators related to early intervention services for children ages birth to three. This report presents findings of a survey conducted by the State of Virginia to address Indicator #4, the "percent of families participating in Part C who report that early intervention services have helped the family a) know their rights, b) effectively communicate their children's needs, and c) help their children develop and learn."

The survey administered by the State of Virginia included two rating scales developed and validated by the National Center for Special Education Accountability Monitoring (NCSEAM). The 22-item Impact on Family Scale (IFS) measures the extent to which early intervention helped families achieve positive outcomes, including the three outcomes specified in Indicator #4. The 25-item Family-Centered Services Scale (FCSS) measures the quality of family-centered services provided to families.

Surveys were returned by 2,736 families receiving early intervention services. From these responses, a random sample of 1,937 families reflecting the distribution of race/ethnicity in the larger population was selected for data analysis. This number exceeds the minimum number required for an adequate confidence level based on established survey sample guidelines (e.g., http://www.surveysystem.com/sscalc.htm)

Data from each of the scales were analyzed through the Rasch measurement framework. For each scale, the analysis produces a measure for each survey

4

respondent. Individual measures can range from 0 to 1,000. For the Impact on Family Scale, each family's measure reflects the extent to which the family perceives that early intervention has helped them achieve positive family outcomes. The IFS measures of all respondents were averaged to yield a mean measure reflecting the overall performance of the state in regard to the impact of early intervention on family outcomes.

As noted above, OSEP requires that the state's performance be reported as the *percent* of families who report that early intervention services helped them achieve specific outcomes. Deriving a percent from a continuous distribution requires application of a standard, or cut-score. The State of Virginia elected to apply the Part C standards recommended by a nationally representative stakeholder group convened by NCSEAM. The recommended standards, established based on item content expressed in the scale, were as follows: for Indicator 4a, know their rights, a measure of 539; for Indicator 4b, effectively communicate their children's needs, a measure of 556; and for Indicator 4c, help their children develop and learn, a measure of 516.

The following points represent the major findings related to Indicator #4:

1. Statewide Mean Measure on the IFS

The mean measure on the IFS was 617.4. The standard deviation was 154.0, and the standard error of the mean was 3.51. The 95% confidence interval for the mean was 610.5 – 624.3. This means that there is a 95% likelihood that the true value of the mean is between these two values.

2. Statewide Percent on Indicators 4a, 4b, and 4c

The percent of families who reported that early intervention services helped them *know their rights* (Indicator 4a) was 62.6%. The 95% confidence interval for the true

population percentage is 60.4% – 64.7%. This means that there is a 95% likelihood that the true value of the state percentage for Indicator 4a is between these two values.

The percent of families who reported that early intervention services helped them *communicate their child's needs* (Indicator 4b) was 58.9%. The 95% confidence interval for the true population percentage is 56.7% - 61.1%.

The percent of families who reported that early intervention services helped them *help their child develop and learn* (Indicator 4c) was 77.2%. The 95% confidence interval for the true population percentage is 75.3% - 79.0%.

3. Minimum Measurable Target Percentage

Given Virginia's average measure of 617.4 on the IFS, and based on guidance from NCSEAM regarding the establishment of measurable and rigorous targets, it is estimated that an increase in the measure to 627.3 (9.9 units) would represent a statistically significant improvement on the indicator. This amount of gain would result in reportable percentages of 66.6%, 60.8%, and 80.6% for Indicators 4a, 4b, and 4c, respectively.

4. Statewide Mean Measure on the FCSS

The mean FCSS measure for families participating in the Virginia survey was 563.9 with a standard deviation of 97.3 and a standard error of the mean of 2.21. The 95% confidence interval for the mean was 559.6 - 568.2. Because there is no federal requirement to report families' perceptions of the quality of early intervention services, no standard was set for this scale. Further descriptive information is found in Section 7.

SECTION 2

BACKGROUND

2.1. Federal Requirements

State Lead Agencies under Part C of the Individuals with Disabilities Education Improvement Act (IDEA 2004) are currently required to report data annually addressing 14 key performance indicators. Each state was required to submit a State Performance Plan (SPP) to OSEP detailing its plan to collect data addressing the 14 indicators, as well as baseline data for indicators on which the states had previously been required to report data to the federal government. Indicator #4, the "percent of families participating in Part C who report that early intervention services have helped the family a) know their rights, b) effectively communicate their children's needs, and c) help their children develop and learn," is a new indicator in the federal accountability system. Thus, states did not have to report baseline data on this indicator until February 2007.

State-level performance on the indicator must be reported annually. Data on program-level performance on the indicator must be collected at least once in the 6-year period of the SPP.

2.2. Survey Instrument

The Impact on Family Scale (IFS) and the Family-Centered Services Scale (FCSS) were developed by the National Center for Special Education Accountability Monitoring (NCSEAM) to provide states with valid and reliable instruments to measure (a) positive outcomes that families experience as a result of their participation in early intervention and (b) families' perceptions of the quality of early intervention services. Items were developed with substantial input from families and other key stakeholders

across the country. A full description of the development of the item content is available on the NCSEAM website, http://www.monitoringcenter.lsuhsc.edu.

As part of its National Item Validation Study, NCSEAM collected data from a nationally representative sample of over 1,700 families participating in early intervention. Results of NCSEAM's data analyses supported the high reliability and validity of both scales. It was determined that scale reliabilities of .90 or above could be achieved with 22 items for the IFS and 25 items for the FCSS. NCSEAM provided states with an appropriate sample item set for each scale, as well as instructions for customizing the scales by drawing on the larger bank of piloted items that NCSEAM made available on its website.

2.3. Standards

The State of Virginia elected to apply the standards recommended by NCSEAM as a way of deriving the percents to be reported for Indicators 4a, 4b, and 4c.

To establish a recommended standard, NCSEAM convened a group of nationally representative stakeholders, including parents of children with disabilities, state directors of special education, state early intervention coordinators, district and program personnel, advocates, attorneys, and community representatives. Participants were invited to examine a set of items from the IFS, laid out in their calibration order (see Table 4.2). The items towards the bottom of the scale, having lower calibrations, are items that families tend to agree with most. The items towards the top of the scale, having higher calibrations, are items that families tend to agree with least. Because of the robust structure of the scale, a respondent who agrees with a given statement will

have a very high likelihood of agreeing, or agreeing even more strongly, with all the items below it on the scale.

For indicator 4a, the stakeholder group agreed that families needed to endorse all items up to and including the item, "Over the past year, early intervention services have helped me and/or my family know about my child's and family's rights concerning Early Intervention services." For indicator 4b, the stakeholder group agreed that families needed to endorse all items up to and including the item, "Over the past year, early intervention services have helped me and/or my family communicate more effectively with the people who work with my child and family. For indicator 4c, the stakeholder group agreed that families needed to endorse all items up to and including the item, "Over the past year, early intervention services have helped me and/or my family understand my child's special needs." These standards were operationalized by designating as the numerical standard the measure that, in each case, corresponds to the threshold item's calibration. For indicators 4a, 4b, and 4c, the measures representing the standards are 539, 556, and 516, respectively. This ensures that in each case, families with a measure at or above the standard have a .95 likelihood of agreeing with the threshold item.

SECTION 3

CHARACTERISTICS OF THE SAMPLE DATA

Surveys were returned by 2736 individuals. Of these individuals, 2 cases were deleted due to missing or redundant identification numbers. An additional 67 cases had no reported value for race/ethnicity, and were also removed from the data set. Using the remaining 2667 cases, a random sample of cases was drawn to yield a final sample with a distribution of race/ethnicity that was representative of that observed in the population of families served under Part C for the State of Virginia. The final sample consisted of 1937 cases.

3.1. Distribution of Race/Ethnicity in the Sample

The tables below display the distribution of race/ethnicity in the survey sample, compared to the distribution reported in Virginia's 2005 618 data for Part C (https://www.ideadata.org/tables29th/ar_6-7.htm). As can be seen in the tables, the distribution of race/ethnicity in the sample is highly reflective of the distribution of race/ethnicity in the population of families receiving early intervention services in Virginia.

Table 3.1. Comparison of State and Survey Samples by Race/Ethnicity (number)

Infants and toddlers receiving early intervention services under IDEA, Part C, by race/ethnicity and state: Fall 2005

	Number					
	American Indian/ Alaska Native	Asian/ Pacific Islander	Black (not Hispanic)	Hispanic	White (not Hispanic)	Multiracial
Virginia	x	x	1,116	514	3,495	-

Distribution of Race/Ethnicity in Virginia Part C Sample: 2005-06 Parent Survey

Survey	5	80	372	180	1,180	120

Table 3.2. Comparison of State and Survey Samples by Race/Ethnicity (percent)

Infants and toddlers receiving early intervention services under IDEA, Part C, by race/ethnicity and state: Fall 2005

	Percent of race/ethnicity total					
	American Indian/ Alaska Native (%)	Asian/ Pacific Islander (%)	Black (not Hispanic) (%)	Hispanic (%)	White (not Hispanic) (%)	Multiracial (%)
Virginia	.	.	20.91	9.63	65.47	-

Distribution of race/ethnicity in Virginia Part C sample: 2005-06 Parent Survey

Survey	0.3	4.1	19.2	9.3	60.9	6.2

3.2. Distribution of Child's Gender in the Sample

Table 3.3, below, displays the distribution of child's gender in the sample.

Table 3.3. Distribution of Child's Gender in the Sample		
Gender	**N**	**Percentage[1]**
Male	1201	62.0%
Female	730	37.7%
Missing	6	0.3%
Total	1937	100%

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[1] Percentages have been rounded and may not sum to exactly 100%.

SECTION 4

RESULTS PERTAINING TO INDICATOR #4

4.1 Distribution of IFS Measures

Of the 1937 respondents included in the representative sample, 1919 had valid responses to the IFS. The distribution of IFS measures for the 1919 respondents is shown in the figure below.

Each bar indicates the number of respondents with measures at the value indicated on the x-axis. The vertical black lines correspond to the three standards applied to Indicator 4a (539), 4b (556), and 4c (516).

Figure 1. Distribution of IFS Measures
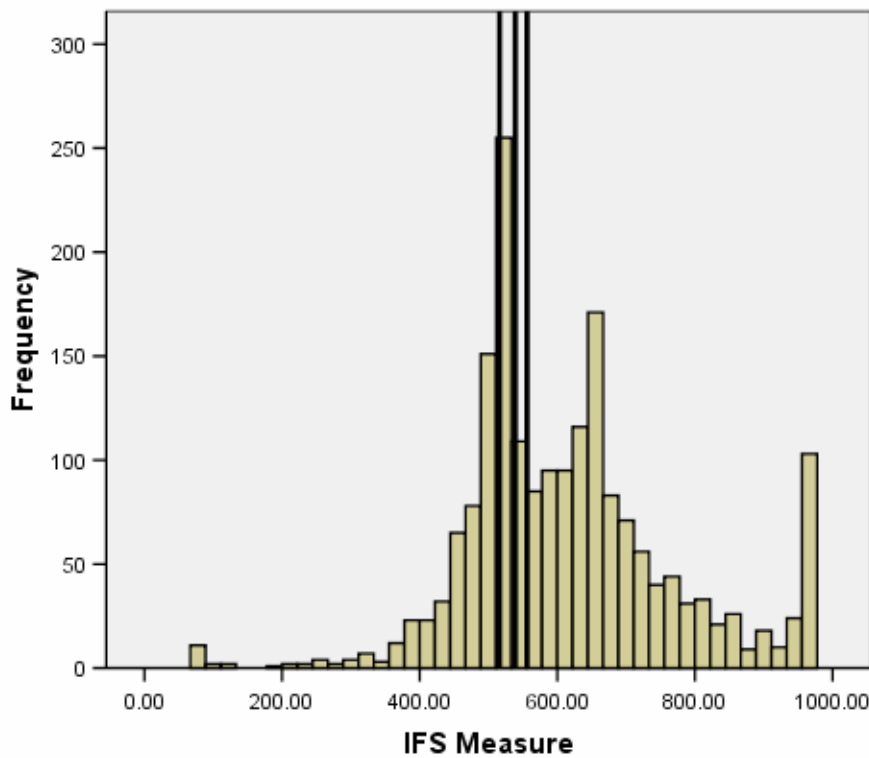
As can be seen in Figure 1, the values representing the three standards lie in the lower half of the measure distribution. That is, the majority of respondents reported a level of impact (i.e., had an IFS measure) that exceeded the three standards.

The distribution of measures approximates a normal distribution, with three exceptions. The first exception is the unexpectedly high number of respondents with measures at the extreme positive end of the scale, represented by the high bar at the extreme right of the graph. These individuals responded in the "very strongly agree" category to each and every item. The second exception is the unexpectedly high number of respondents with measures at a value close to the standard values, represented by the high bar between the first two standard values. Many of these individuals responded in the "agree" category to each and every item. The third and more minor exception is the somewhat elevated number of respondents with measures at the extreme negative end of the scale, represented by the extended bar at the extreme left of the graph. When individuals fail to make any distinction among items that are known to have different levels of agreeability, they are said to display a "response set," that is, a uniform way of responding that makes it hard to judge whether the responses are authentic or are, in effect, a way of complying with the task that does not really provide useful information. This phenomenon should be taken into consideration when interpreting the findings.

The statistical properties of the IFS measures are displayed in Table 4.1 below.

Table 4.1. Properties of IFS Measures for the Representative Sample			
Sample Mean	Standard Deviation	Standard Error of the Sample Mean	95% Confidence Interval for the Population Mean
617.4	154.0	3.51	610.5 – 624.3

4.2. Interpretation of the Mean IFS Measure

The state's performance on the IFS conveys information that goes beyond the three outcomes that are addressed in OSEP's Indicator #4. A mean measure of 617.4 on the IFS indicates that the Virginia early intervention system is helping families to achieve many positive outcomes. These positive outcomes are evident from the response percentages displayed in Table 4.2, below. (The table also displays each item's calibration value, to be discussed in Section 6.)

Table 4.2. Percent of Families Expressing Agreement with IFS Items			
Item Calibration	Item Stem: Over the past year, Early Intervention services have helped me and/or my family:	% Strongly/ Very strongly agree	% Agree in any category
678	Participate in typical activities for children and families in my community.	25	60
656	Know about services in the community.	31	73
640	Know where to go for support to meet my family's needs.	36	77
625	Keep up friendships for my child and family.	38	78

609	Know where to go for support to meet my child's needs.	42	85
584	Be more effective in managing my child's behavior.	46	87
577	Find information I need.	45	89
570	Improve my family's quality of life.	45	88
565	Feel that I can get the services and supports that my child and family need.	51	91
562	Feel that my family will be accepted and welcomed in the community	49	90
559	Feel more confident in my skills as a parent.	52	91
559	Feel that my child will be accepted and welcomed in the community.	50	90
556	Communicate more effectively with the people who work with my child and family.	52	92
553	Understand how the Early Intervention system works.	51	93
546	Understand the roles of the people who work with my child and family.	52	94
540	Figure out solutions to problems as they come up.	47	91
539	Feel that I can handle the challenges of parenting a child with special needs.	51	91
539	Know about my child's and family's rights concerning Early Intervention services.	56	94
534	Be able to evaluate how much progress my child is making.	57	93
516	Understand my child's special needs.	60	96
498	Feel that my efforts are helping my child.	63	96
498	Do things with and for my child that are good for my child's development.	62	96

As seen in the table, over 95% of families agreed, with approximately 60% expressing strong or very strong agreement, that early intervention helped them do things with and for their child that are good for their child's development, feel that their efforts are helping their child, and understand their child's special needs.

Over 90% of families agreed, with somewhat over 50% expressing strong or very strong agreement, that early intervention helped them be able to evaluate how much progress their child is making, feel that they can handle the challenges of parenting a child with special needs, understand the roles of the people who work with their child and family, understand how the early intervention system works, and communicate more effectively with the people who work with their child and family.

Between 85% and 90% of families agreed, with approximately 45%-50% expressing strong or very strong agreement, that early intervention helped them feel that their family will be accepted and welcomed in the community, improve their family's quality of life, and be more effective in managing their child's behavior.

Approximately 75% of families agreed, with about one-third expressing strong or very strong agreement, that early intervention helped them keep up friendships for their child and family, know where to go for support to meet the family's needs, and know about services in the community. Only 60% of families agreed, with 25% expressing strong or very strong agreement, that early

intervention helped them participate in typical activities for children and families in their community.

For reference, the frequency distribution of responses to all the items in the IFS is provided in Appendix A.

4.3. Percentage Meeting Each of the Standards for Indicator #4

Table 4.3 presents the percentage of respondents having an IFS measure that meets or exceeds each of the three standards for Indicator #4, as well as a 95% confidence interval for the true population percentage. Note that the confidence interval is asymmetric about the sample percentage, in that there is a greater distance in the confidence interval below the sample percentage than above the sample percentage. The asymmetric confidence interval represents a more accurate confidence interval for percentages than normal-distribution based symmetric confidence intervals (due to the fact that percentages are bounded between 0 and 100). The asymmetric confidence interval reported here is the Score interval proposed by Wilson (1927), and described in greater detail in Agresti (1996) and Penfield (2003).

Table 4.3. Percent of Respondents Meeting or Exceeding Each of the Standards for Indicator #4			
	Indicator 4A **Percent of families who report that early intervention services helped them know their rights**	**Indicator 4B** **Percent of families who report that early intervention services helped them effectively communicate their children's needs**	**Indicator 4C** **Percent of families who report that early intervention services helped them help their child develop and learn**
Percentage	62.6%	58.9%	77.2%
95% Confidence Interval	60.4% - 64.7%	56.7% – 61.1%	75.3% – 79.0%

4.4 Percentage Meeting Each of the Standards by Race/Ethnicity

Table 4.4. presents the percentage of respondents with measures that met or

exceeded each of the three standards, by racial/ethnic category.

Race/Ethnicity	Indicator 4A Percent of families who report that early intervention services helped them know their rights	Indicator 4B Percent of families who report that early intervention services helped them effectively communicate their children's needs	Indicator 4C Percent of families who report that early intervention services helped them help their child develop and learn
White/Caucasian (N = 1174)	64.6% 95% CI: 61.8% - 67.2%	60.2% 95% CI: 57.4% - 63.0%	77.8% 95% CI: 75.3% - 80.1%
Black or African American (N = 364)	59.1% 95% CI: 54.0% - 64.0%	56.9% 95% CI: 51.8% - 61.9%	75.6% 95% CI: 70.9% - 79.7%
Hispanic or Latino (N = 177)	59.9% 95% CI: 52.5% - 66.8%	56.5% 95% CI: 49.1% - 63.6%	81.9% 95% CI: 75.6% - 86.9%
Asian or Pacific Islander (N = 79)	64.6% 95% CI: 53.6% - 74.2%	58.2% 95% CI: 47.2% - 68.4%	73.4% 95% CI: 62.7% - 81.9%
American Indian (N = 5)	60.0% 95% CI: 23.1% - 88.2%	60.0% 95% CI: 23.1% - 88.2%	80.0% 95% CI: 37.6% - 96.4%
Multiracial/Other (N = 120)	57.5% 95% CI: 48.6% - 66.0%	55.8% 95% CI: 46.9% - 64.4%	73.3% 95% CI: 64.8% - 80.4%

Table 4.4. Percent of Respondents Meeting or Exceeding Each of the Standards for Indicator #4%, by Race/Ethnicity

4.5. Percentage Meeting Each of the Standards by Local System

Table 4.5 presents the percentage of respondents with measures that met or exceeded each of the three standards, by local Part C system.

Table 4.5. Percent of Respondents Meeting or Exceeding Each of the Standards for Indicator #4%, by Local System				
Local System	N	Indicator 4A	Indicator 4B	Indicator 4C
Alexandria	56	53.6%	51.8%	69.6%
Alleghany Highlands	19	78.9%	73.7%	89.5%
Arlington	137	62.8%	57.7%	76.6%
Central Virginia	79	49.4%	41.8%	63.3%
Chesapeake	98	69.4%	64.3%	84.7%
Chesterfield	59	67.8%	62.7%	79.7%
Crater District	29	44.8%	41.4%	75.9%
Cumberland Mountain	31	64.5%	64.5%	80.6%
Danville-Pittsylvania	21	52.4%	47.6%	81.0%
Dickenson	6	*	*	*
Fairfax-Falls Church	405	64.4%	59.8%	74.6%
Goochland-Powhatan	27	59.3%	59.3%	74.1%
Hampton/Newport News	99	63.6%	60.6%	77.8%
Hanover	39	76.9%	76.9%	84.6%
Harrisonburg/Rockingham	41	70.7%	58.5%	80.5%
Henrico	118	51.7%	48.3%	66.1%
LENOWISCO	15	*	*	*
Loudon	98	62.2%	61.2%	76.5%
Middle Peninsula	52	71.2%	67.3%	88.5%
Mount Rogers	18	55.6%	55.6%	77.8%
Norfolk	109	71.6%	68.8%	89.0%
PIPS	25	68.0%	68.0%	84.0%
Planning District 14	8	*	*	*
Portsmouth	31	41.9%	41.9%	67.7%
Prince William	158	57.6%	53.2%	74.7%
Rappahannock Rapidan	51	58.8%	51.0%	70.6%
Rappahanock Area	118	66.9%	64.4%	76.3%
Richmond	52	59.6%	57.7%	76.9%
Shenandoah	45	31.1%	26.7%	42.2%
Southside	12	*	*	*
the Blue Ridge	69	65.2%	60.9%	84.1%
the Highlands	16	62.5%	62.5%	93.8%
the New River Valley	54	75.9%	70.4%	88.9%
the Piedmont	36	61.1%	55.6%	75.0%
the Roanoke Valley	95	63.2%	58.9%	76.8%
the Rockbridge Area	19	89.5%	89.5%	89.5%
Va. Beach	189	59.8%	57.1%	75.7%
Valley	41	65.9%	56.1%	78.0%
Western Tidewater	67	55.2%	55.2%	65.7%
Williamsburg-James City-York-Poqouson	63	73.0%	68.3%	87.3%

* In order to ensure the confidentiality of respondents and high confidence that the results accurately reflect the status of the local system, percentages are not reported for local systems with a total number of respondents (N) of 15 or less.

4.6. Setting Measurable and Rigorous Targets for Future Performance

OSEP requires that states set measurable and rigorous targets for improved performance on the SPP indicators. Setting a measurable target can be accomplished by determining the amount of gain that would be statistically significant, given the state's current level of performance and the size of the samples that provide data at baseline and at a future measurement time point. A gain that is statistically significant at a probability level of .05 is much more likely to represent real change than to be due to random ups and downs in the measure owing to sampling error. Setting a rigorous target involves making a judgment as to the amount of change that will lead to meaningful improvement in services and results for children with disabilities. OSEP advises that this judgment be made in consultation with stakeholders. Setting appropriate targets also involves estimating what amount of improvement is possible to accomplish over a given amount of time. Though it is optimal to establish statistically significant targets for each year's performance, the amount of gain necessary to achieve those targets may be larger than is realistically feasible, particularly in the case of relatively small sample sizes (because the smaller the sample size on which the calculation is made, the larger the gain that is necessary in order to achieve a given level of statistical significance). Thus, NCSEAM recommends

that at a minimum, a statistically significant target be established for the end of the 6-period of the SPP.

The minimum amount of gain, in Virginia, that would be statistically significant can be estimated as follows. If it is assumed that next year's data collection yields a representative sample size and sample standard deviation of the IFS measure that are identical to those of this year (i.e., N = 1919, SD = 154.0), then the improvement must be equal to approximately 2.82 estimated standard errors of the mean in order for the improvement to be deemed statistically significant ($p < .05$). The estimated standard error of the mean is equal to 3.51 (obtained by dividing the standard deviation by the square root of the sample size), and thus the gain required to attain a statistically significant improvement is 2.82 × 3.51, which is equal to approximately 9.9. That is, the mean IFS measure must increase by 9.9 units to represent a statistically significant increase.

Applying the assumptions mentioned in the previous paragraph, a mean IFS measure of 627.3 would give rise to reportable percentages of 66.6%, 60.8%, and 80.6% for Indicators 4a, 4b, and 4c, respectively. These figures represent a percent increase of 4.0% for Indicator 4a, 1.9% for Indicator 4b, and 3.4% for Indicator 4c. It is important to remember, however, that these targets are based only on statistical grounds, and do not incorporate information concerning what level of gain would be substantively meaningful.

Target measures and corresponding percentage gains can also be estimated using NCSEAM's Improvement Calculator, available at

, which applies the same calculations described above.

If the State of Virginia were to seek statistically significant gains on the IFS each year, the expected percentages are shown in Table 4.6. These percentages were obtained by shifting the current year's distribution of IFS scores up by 9.9 units for each successive year (corresponding to the necessary increase in the mean score for a statistically significant increase), and then computing the percentage of the resulting distribution of IFS measures that has a value above each of the three standard values. Note, however, that NCSEAM's improvement calculator yields values that are based on a normal approximation (as opposed to the actual distribution of the sample data), and thus the obtained values may differ slightly from those reported below in Table 4.6.

		Table 4.6. State Targets for 2008-2011 **Assuming an Annual Gain that is Statistically Significant:** **Percent of Respondents Meeting or Exceeding Each of the Standards for Indicator #4%**		
Year	**Target Mean**	**Target % for Indicator 4A** Percent of families who report that early intervention services helped them know their rights	**Target % for Indicator 4B** Percent of families who report that early intervention services helped them effectively communicate their children's needs	**Target % for Indicator 4C** Percent of families who report that early intervention services helped them help their child develop and learn
2008	627.3	66.6%	60.8%	80.6%
2009	637.2	74.4%	64.3%	83.3%

2010	647.1	78.1%	67.1%	86.6%
2011	657.0	82.9%	75.2%	88.2%

SECTION 5

MEASUREMENT FRAMEWORK

The measurement approach used by NCSEAM, known as the Rasch framework, applies a series of parametric models to estimate the properties of each survey item and each respondent in a way that places individuals and items on a common metric (Bond & Fox, 2001; Fischer & Molenaar, 1995; Rasch, 1960; Wright & Masters, 1982). The Rasch approach offers many advantages over typical approaches to survey development. First, it is possible to test whether the items administered belong together, that is, whether they are all related to the construct that the scale is supposed to measure. Ongoing confirmation of the fit of the items helps to maintain the quality of the measurement system. It is also possible to test whether the response categories are operating in the expected fashion. Often, the way in which respondents actually use the response categories does not correspond to the equidistant way in which they are laid out on paper. Extreme categories (e.g., "very strongly disagree") are sometimes used so infrequently that it makes sense to combine them with an adjacent, less extreme, category ("very strongly disagree/strongly disagree").

Second, it is possible to determine where each item is located on the measurement ruler. The item's location is referred to as the item's "calibration." Typically, items in a test or survey are not all equal with respect to the amount of the attribute or quality that the items are measuring. It has been empirically demonstrated, in fact, that items in the IFS are not all of equal agreeability. Items range from those that are most likely to draw agree responses to those that are least likely to draw agree responses. Highly agreeable items have low calibrations; less agreeable items have higher calibrations. Table 5.1, below, displays the IFS items in calibration order.

Table 5.1. IFS Items in Calibration Order	
Item Calibration	**Item** **_Stem_: Over the past year, Early Intervention services have helped me and/or my family:**
678	Participate in typical activities for children and families in my community.
656	Know about services in the community.
640	Know where to go for support to meet my family's needs.
625	Keep up friendships for my child and family.
609	Know where to go for support to meet my child's needs.
584	Be more effective in managing my child's behavior.
576	Make changes in family routines that will benefit my child with special needs.
576	Do activities that are good for my child even in times of stress .
570	Improve my family's quality of life.
565	Feel that I can get the services and supports that my child and family need.
563	Get the services that my child and family need.
562	Feel that my family will be accepted and welcomed in the community

559	Feel more confident in my skills as a parent.
559	Feel that my child will be accepted and welcomed in the community.
556	Communicate more effectively with the people who work with my child and family.
553	Understand how the Early Intervention system works.
546	Understand the roles of the people who work with my child and family.
539	Know about my child's and family's rights concerning Early Intervention services.
534	Be able to evaluate how much progress my child is making.
516	Understand my child's special needs.
498	Feel that my efforts are helping my child.
498	Do things with and for my child that are good for my child's development.

The fact that items have highly stable calibrations (agreeability levels) regardless of the population that is asked to respond to the items is a very important attribute of well-constructed measurement scales. This stability means that items with similar calibrations are, for all intents and purposes, interchangeable. As an example, this is why the SAT is the "same" test each time it is administered, even though it contains different items each time. The score achieved on any particular version of the SAT is comparable to the score achieved on any other version. Thus, a state can change some of the items on the survey from year to year, and still have validly comparable IFS measures across successive years. Guidelines for creating comparable item sets are available at:

http://www.monitoringcenter.lsuhsc.edu/PDF%20Word/Guidelines%20for%20Item%20Shopping%20December%202006.pdf.

Third, a Rasch analysis condenses information from a person's responses to all the items in a scale into a single number. That number is the person's measure on the scale. Since the Rasch framework puts measures on the same metric as item calibrations, a person's measure on a scale can be meaningfully interpreted in terms of the items on the scale. A person with a higher measure is expressing more agreement with items, overall, than a person with a lower measure. When IFS measures from a representative sample of parents are aggregated, the average value represents a reliable and highly interpretable measure of the extent to which schools are facilitating parent involvement.

Fourth, a Rasch analysis yields an estimate of the reliability of both the calibration values (related to the items) and the measures (related to people's responses). Scientific approaches to measurement require that the amount of "error," or imprecision, in the system be estimated, so that interpretations based on the measures can take this into consideration.

For a more detailed explanation of these concepts, please refer to Bond and Fox (2001) and Wright and Masters (1982).

SECTION 6

RESULTS PERTAINING TO THE PSYCHOMETRIC PROPERTIES OF THE

IMPACT ON FAMILIES SCALE (IFS)

6.1 Psychometric Properties of the IFS Measures

In assessing the quality of the person-level measures derived from the

IFS, it is germane to consider the issues of reliability and validity. The reliability of

the obtained IFS measures pertains to the extent to which a particular individual

is expected to attain the same IFS measure if the IFS were to be administered to

the individual multiple times. That is, reliability concerns the stability of the IFS

measure[2] (Crocker & Algina, 1986; Lord, 1980; Traub, 1994); low reliability

coincides with a low level of stability, and high reliability coincides with a high

level of stability. Reliability can range from 0 (lack of any stability) to 1 (perfect

stability). In contrast to reliability, the validity of the IFS measures concerns the

extent to which they are actually representative of the intended trait (i.e., level of

impact on family).[3] The validity of the IFS measures can be assessed using

numerous approaches, several of which are described below.

Statistics used to express measurement reliability range from 0 (indicating

lack of any stability) to 1 (indicating perfect stability). The reliability of the IFS

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[2] A definition of reliability that is more theoretically accurate describes reliability as the extent to which a given respondent's measure is determined by random error versus his or her true level of the trait being measured; low reliability coincides with a high level of measurement error, and high reliability coincides with a high low level of measurement error (Crocker & Algina, 1986; Lord, 1980; Traub, 1994).

[3] This definition of validity is a simplification of the definition now endorsed by the technical measurement community. The contemporary definition of validity describes it as the extent to which evidence and theory support the interpretations of the scale measures entailed by the proposed use of the scale (AERA/APA/NCME, 1999; Osterlind, 2006). That is, the validity of the IFS measures is based on how much evidence we have that the measures support the intended purposes of the use of the measures (i.e., are the measures behaving as they are supposed to behave, and leading to the correct decisions about individuals).

measures for the Virginia sample was measured in the Rasch framework to be .93. An alternative approach to estimating the reliability of the IFS measures is to employ Cronbach's alpha, which makes no assumptions about the fit of the responses to any particular model (Cronbach's alpha is based on the simpler true score model, and is commonly used in the behavioral sciences as a model-free index of reliability). The value of Cronbach's alpha was 0.96, which is consistent with the value of .93 obtained from the Rasch analysis. These results suggest that the measures obtained from the IFS serve as stable measures of the underlying trait.

Support for the validity of the measures obtained by the IFS comes from several lines of evidence. First, items for the IFS were developed in consultation with multiple groups of individuals, including parents, school personnel, district-level administrators, and advocates, with direct and extensive experience related to schools' efforts to encourage parent involvement and to ensure that parents are active participants in decision-making related to their child's education. Subsequent review of the items by expert panels, researchers, and NCSEAM's Parent/Family Involvement Workgroup confirmed that the item content maps onto the intended content domain of the IFS. Second, dimensionality analysis (i.e., principal components analysis and factor analysis) indicates that the items of the IFS are all measuring one primary construct, which is likely the intended one, i.e., positive family outcomes achieved as a result of early intervention services. The results of the dimensionality analyses are presented in Winsteps output

displayed in Appendix E. A third line of evidence is related to a characteristic of

items known as discrimination, discussed in section 6.1 below. The

 high discrimination indices of the IFS items (see Table 6.1) indicate that the

items are providing useful information concerning the construct that is intended to

be measured. All of these types of evidence support the claim that the measures

obtained using the IFS are valid.

6.2 Psychometric Properties of the IFS Items

Table 6.1, below, gives the calibration of each item (previously presented

in Table 5.1 above), along with indices of the item's fit to the Rasch model. The

column labeled "Item Calibration" provides the value of the location parameter of

the item. The higher the value of the item calibration, the greater the overall

positive impact of early intervention services on family outcomes. The "Infit" and

"Outfit" columns provide two measures of how well the Rasch model fits the

responses provided to each item. In general, values of 1.0 indicate very good fit.

Values approaching 2, or less than 0.5, suggest poorer fit (Bond & Fox, 2001).

Table 6.1. Calibration, Fit, and Discrimination of the IFS Items				
Item	Item Calibration	Infit	Outfit	Discrimination
q26	677.5	1.74	1.96	0.63
q27	656.0	1.34	1.43	0.73
q28	569.8	0.95	1.02	0.82
q29	608.8	0.83	0.81	0.85
q30	639.8	0.94	0.97	0.82
q31	539.0	0.91	0.99	0.84
q32	559.3	0.82	0.83	0.85
q33	624.8	1.19	1.26	0.76
q34	576.8	0.74	0.71	0.86
q35	583.5	0.85	0.87	0.86

q36	540.4	0.79	0.84	0.87
q37	564.5	0.67	0.64	0.88
q38	552.9	0.81	0.82	0.82
q39	534.4	0.78	0.81	0.85
q40	559.1	0.82	0.81	0.85
q41	562.2	0.82	0.8	0.85
q42	555.9	0.67	0.65	0.87
q43	545.5	0.64	0.6	0.87
q44	538.9	0.88	0.91	0.82
q45	497.8	0.78	0.75	0.84
q46	516.1	0.73	0.73	0.84
q47	498.1	0.8	0.78	0.84

The rightmost column of the table presents an index of discrimination for each item, calculated as the corrected item-total correlation coefficient. The values in this column are all relatively high (> 0.6), indicating that each item is discriminating well between respondents who had more positive versus more negative perceptions of schools' facilitation of parent involvement.

While Item q26 ("Over the past year, early intervention services helped me and/or my family participate in typical activities for children and families in my community") displays a less than ideal level of fit, it nevertheless has a strong discrimination index, which provides evidence that it is a useful item. Therefore, this item appears to be measuring the intended construct relatively well, but is not a very good fit for the Rasch framework, which employs specific assumptions concerning the properties of the items.

SECTION 7

RESULTS PERTAINING TO THE

FAMILY-CENTERED SERVICES SCALE (FCSS)

<u>7.1. Results Pertaining to the Mean Measure on the FCSS</u>

Table 7.1, below, displays statewide results for the FCSS. The statewide mean was 563.9, with a standard deviation of 97.3 and a standard error of the sample mean equal to 2.21. The 95% confidence interval for the mean was 559.6 – 568.2.

Table 7.1. Properties of FCSS Measures for the representative sample			
Sample Mean	**Standard Deviation**	**Standard Error of the Sample Mean**	**95% Confidence Interval for the Population Mean**
563.9	97.3	2.21	559.6 – 568.2

A mean of 563.9 indicates that families have a .95 likelihood of agreeing with all items in the scale except the item with the highest calibration value ("Someone from the Early Intervention program went out into the community with me and my child to help get us involved in community activities and services"), for which there was a considerably smaller likelihood of overall agreement. Table 7.2, below, displays the percent of families that agreed, as well as the percent that expressed strong or very strong agreement, with each item in the FCSS.

Table 7.2. Percent of Families Expressing Agreement with FCSS Items

Item Calibration	Item *Stem*: Over the past year, Early Intervention services have helped me and/or my family:	% Strongly/ Very strongly agree	% Agree in any category
606.95	Someone from the Early Intervention program went out into the community with me and my child to help get us involved in community activities and services.	16.3	35.5
558.89	My family was given information about opportunities for my child to play with other children.	31.5	63.3
554.64	My family was given information about ways of connecting with other families for information and mutual support.	32.0	66.7
541.91	My family was asked whether other children in the family needed help in understanding the needs of the brother or sister with a disability.	37.2	70.4
530.42	My family was given information about how to advocate for my child and my family.	37.6	79.5
528.38	My family was given information about community programs that are open to all children.	41.9	77.2
528.23	My family was given information about where to go for help or support if I feel worried or stressed.	42.5	79.9
525.17	I was offered help I needed, such as child care or transportation, to participate in the Individualized Family Service Plan (IFSP) meeting(s).	41.7	78.1
519.01	Someone from the Early Intervention program asked if I was having any problems getting the services I needed.	43.9	80.3
512.78	My family was given information about what my options are if I disagree with a decision about my child's services.	46.0	85.3
511.28	My family was given information about the public school system's programs and services for children age three and older.	47.5	82.9
503.24	Someone from the Early Intervention program asked whether the services my family was receiving were meeting our needs.	50.1	87.5
495.32	I was given information to help me prepare for my child's transition.	53.5	88.0
483.10	The IFSP is keeping up with my family's changing needs.	58.1	92.9
481.33	My service coordinator is available to speak with me on a regular basis.	58.9	91.6
476.76	I know who to call if I have problems with the services and supports my child and family are	61.4	93.3

	receiving.		
465.71	The Early Intervention service provider(s) that work with my child do what they say they are going to do.	64.6	94.8
464.92	Written information I receive is written in an understandable way.	64.3	96.6
464.91	My family was given information about activities that I could do with my child in our everyday lives.	66.3	94.3
464.06	My family's daily routines were considered when planning for my child's services.	67.0	94.6
462.05	My service coordinator is knowledgeable and professional.	65.7	95.7
459.05	My family was given information about the rights of parents regarding Early Intervention services.	67.0	96.5
456.16	I have felt part of the team when meeting to discuss my child.	69.7	96.1
456.03	The Early Intervention service provider(s) that work with my child show a willingness to learn about the strengths and needs of my child and family.	68.5	95.2
449.71	The Early Intervention service provider(s) that work with my child are easy for me to talk to about my child and my family.	70.6	95.9

7.2. Psychometric Properties of the FCSS Measures and Items

An initial analysis and Rasch calibration of the FCSS was conducted to provide information concerning the reliability and validity of the FCSS measures. The response frequencies for each of the 25 items of the FCSS are provided in Appendix B. The reliability of the FCSS measures estimated within the Rasch framework was .93, which was consistent with the value of .97 obtained using Cronbach's alpha. The properties of the items of the FCSS (calibrations, fit indices, and discrimination) are displayed in Table 7.3. The results suggest that overall the fit of the items to the Rasch model was adequate – only one item displayed substantially poor fit (q1). The discrimination of the items was typically greater than 0.5, suggesting that all items are providing useful information concerning the primary target (i.e., all items are successfully discriminating

between individuals with a high versus low level of endorsement of the quality of

early intervention services).

Table 7.3. Calibration, Fit, and Discrimination of the FCSS Items				
Item	Location	Infit	Outfit	Discrimination
q1	525.17	1.61	1.73	0.61
q2	528.23	1.18	1.23	0.69
q3	476.76	1.01	1.08	0.72
q4	464.06	0.90	0.95	0.76
q5	456.16	0.82	0.82	0.75
q6	483.10	0.74	0.75	0.80
q7	464.91	0.91	0.96	0.76
q8	459.05	0.85	0.81	0.78
q9	528.38	1.12	1.11	0.76
q10	554.64	1.23	1.27	0.72
q11	511.28	1.28	1.30	0.67
q12	558.89	1.38	1.43	0.68
q13	530.42	0.88	0.90	0.77
q14	512.78	0.88	0.90	0.79
q15	519.01	1.08	1.09	0.74
q16	503.24	0.82	0.82	0.81
q17	606.95	1.70	2.18	0.51
q18	465.71	0.76	0.75	0.80
q19	449.71	0.76	0.70	0.77
q20	456.03	0.76	0.70	0.79
q21	481.33	0.93	0.92	0.76
q22	462.05	0.73	0.70	0.80
q23	464.92	0.71	0.74	0.80
q24	495.32	0.89	0.86	0.79
q25	541.91	1.43	1.46	0.67

It is important to recognize that the Rasch calibration of the FCSS was not

equated to that of the IFS. As a result, valid comparisons across the two scales

cannot be made. For example, the three standards for the IFS associated with

Indicator #4 have no meaning with respect to the FCSS. Similarly, the item

calibrations of the IFS and FCSS are not comparable. The Rasch calibration

provided in this report is intended to provide an initial glimpse at the properties of

the items and the relative locations of the items within the FCSS (not in relation

to the IFS).

SECTION 8

THE RELATIONSHIP BETWEEN IFS AND FCSS MEASURES

The relationship between the IFS and FCSS measures is shown in the figure below. In general, the relationship follows a linear trend – as the FCSS measure increases, so does the IFS measure. That is, having a higher endorsement of the quality of family-centered services is associated with a higher level of positive impact on the family (but note that this does not necessarily mean that the relationship is causal).

Associations between two variables can be expressed mathematically as a correlation. A correlation of 0 indicates no relationship between the variables; a correlation of 1 indicates a perfect relationship in the positive direction. The correlation between the IFS and FCSS measures is .88. The high positive correlation is also evident form the scatterplot below, in which pairs of measures from each respondent, when plotted on the graph, create a grouping of points around a diagonal line moving from the lower left to the upper right.

Figure 2. Scatterplot of IFS and FCSS Measures
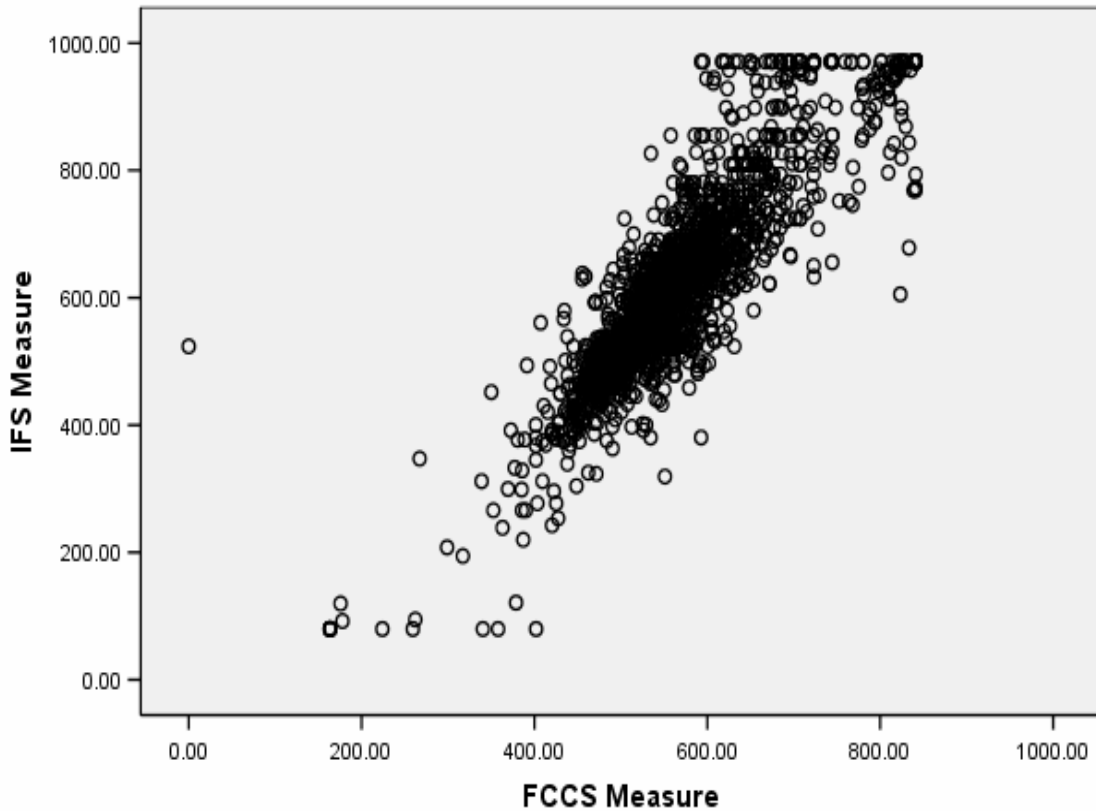
The chart below provides a different way of illustrating the relationship between the IFS and FCSS measures. Measures on the FCSS are grouped into five different ranges. The bars represent the mean measure on the IFS that is associated with FCSS measures in each range. As the measure of quality of services increases, so does the measure of the impact of services on family outcomes.

Figure 3. Mean IFS Measure by FCSS Category
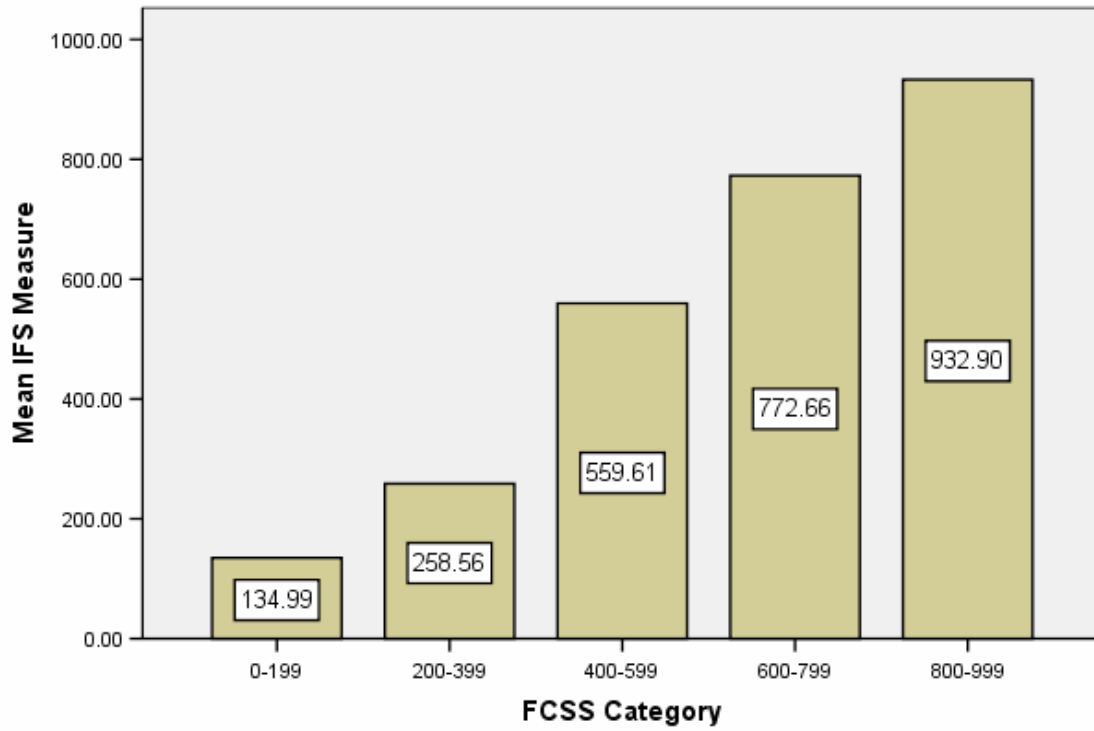
SECTION 9

CALIBRATION METHODOLOGY FOR THE IFS

The Rasch calibrations of the IFS were conducted using the Winsteps software program. All items were fit using the Rating Scale Model (Wright & Masters, 1982). The metric of the calibration was set by equating 21 of the 22 items in relation to the calibrated values obtained by Dr. William Fisher, Consultant to NCSEAM, for a large dataset of five states (one of the items on the IFS was not contained in Dr. Fisher's analyses). The mean and logit scale of the current calibration were also set equal to those generated in the larger analysis on five states conducted by Dr. Fisher. These equating procedures were conducted so that the scale measures obtained in the current calibration have equivalent meanings to those of other states' data calibrated by Dr. Fisher.

Based on the analysis of the current data and on the results of Dr. Fisher's combined multi-state analysis, it was decided to combine the response categories "very strongly disagree" and "strongly disagree" into a single category. The rationale for combining the two categories was based on two factors: (a) low response rates (i.e., < 5%) in these two categories making their corresponding threshold parameter estimates relatively unstable, and (b) the two category threshold estimates were not far enough apart to indicate that the two categories served to meaningfully distinguish between individuals having substantially different levels of the trait being measured. As a result, the final analysis was based on five-category response structure for each item. The control file used in

the current analysis is given in Appendix C. The pertinent output related to the

Rasch analysis of the IFS is given in Appendix E.

SECTION 9

CALIBRATION METHODOLOGY FOR THE FCSS

The Rasch calibrations of the FCSS were conducted using the Winsteps software program. All items were fit using the Rating Scale Model (Wright & Masters, 1982). The metric of the calibration was set by establishing a center of the scale (i.e., mean of item location estimates) equal to 500, and by setting one logit equal to 50 scale units.

Based on the analysis of the current data, and Dr. Fisher's combined multi-state analysis, it was decided to combine the response categories "very strongly disagree" and "strongly disagree" into a single category. The rationale for combining the two categories was based on two factors: (a) low response rates (i.e., < 5%) in these two categories making their corresponding threshold parameter estimates relatively unstable, and (b) the two category threshold estimates were not far enough apart to indicate that the two categories served to meaningfully distinguish between individuals having substantially different levels of the trait being measured. As a result, the final analysis was based on five-category response structure for each item. The control file used in the current analysis is given in Appendix D.

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Frequency Table

Participate in typical activities for children and families in my community.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	84	4.3	5.4	5.4
	Strongly Disagree	66	3.4	4.3	9.7
	Disagree	469	24.2	30.3	40.0
	Agree	544	28.1	35.2	75.2
	Strongly Agree	186	9.6	12.0	87.2
	Very Strongly Agree	198	10.2	12.8	100.0
	Total	1547	79.9	100.0	
Missing	System	390	20.1		
Total		1937	100.0		

Know about services in the community.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	65	3.4	3.8	3.8
	Strongly Disagree	57	2.9	3.3	7.1
	Disagree	339	17.5	19.7	26.8
	Agree	733	37.8	42.7	69.5
	Strongly Agree	272	14.0	15.8	85.3
	Very Strongly Agree	252	13.0	14.7	100.0
	Total	1718	88.7	100.0	
Missing	System	219	11.3		
Total		1937	100.0		

Improve my family's quality of life.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	37	1.9	2.1	2.1
	Strongly Disagree	18	.9	1.0	3.1
	Disagree	153	7.9	8.6	11.7
	Agree	772	39.9	43.4	55.1
	Strongly Agree	418	21.6	23.5	78.7
	Very Strongly Agree	379	19.6	21.3	100.0
	Total	1777	91.7	100.0	
Missing	System	160	8.3		
Total		1937	100.0		

Know where to go for support to meet my child's needs.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	47	2.4	2.6	2.6
	Strongly Disagree	21	1.1	1.2	3.8
	Disagree	207	10.7	11.6	15.4
	Agree	764	39.4	42.8	58.2
	Strongly Agree	391	20.2	21.9	80.1
	Very Strongly Agree	355	18.3	19.9	100.0
	Total	1785	92.2	100.0	
Missing	System	152	7.8		
Total		1937	100.0		

Know where to go for support to meet my family's needs.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	46	2.4	2.7	2.7
	Strongly Disagree	36	1.9	2.1	4.9
	Disagree	309	16.0	18.4	23.3
	Agree	680	35.1	40.5	63.7
	Strongly Agree	341	17.6	20.3	84.0
	Very Strongly Agree	269	13.9	16.0	100.0
	Total	1681	86.8	100.0	
Missing	System	256	13.2		
Total		1937	100.0		

Feel that I can handle the challenges of parenting a child with special needs.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	28	1.4	1.6	1.6
	Strongly Disagree	24	1.2	1.4	3.0
	Disagree	102	5.3	5.9	8.9
	Agree	687	35.5	39.9	48.9
	Strongly Agree	421	21.7	24.5	73.3
	Very Strongly Agree	459	23.7	26.7	100.0
	Total	1721	88.8	100.0	
Missing	System	216	11.2		
Total		1937	100.0		

Feel more confident in my skills as a parent.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	34	1.8	1.9	1.9
	Strongly Disagree	12	.6	.7	2.6
	Disagree	112	5.8	6.3	8.8
	Agree	702	36.2	39.2	48.1
	Strongly Agree	478	24.7	26.7	74.8
	Very Strongly Agree	451	23.3	25.2	100.0
	Total	1789	92.4	100.0	
Missing	System	148	7.6		
Total		1937	100.0		

Keep up friendships for my child and family.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	44	2.3	2.8	2.8
	Strongly Disagree	32	1.7	2.1	4.9
	Disagree	265	13.7	17.0	21.9
	Agree	621	32.1	39.9	61.7
	Strongly Agree	293	15.1	18.8	80.6
	Very Strongly Agree	303	15.6	19.4	100.0
	Total	1558	80.4	100.0	
Missing	System	379	19.6		
Total		1937	100.0		

Find information I need.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	42	2.2	2.4	2.4
	Strongly Disagree	20	1.0	1.1	3.5
	Disagree	145	7.5	8.1	11.6
	Agree	771	39.8	43.3	54.9
	Strongly Agree	377	19.5	21.2	76.0
	Very Strongly Agree	427	22.0	24.0	100.0
	Total	1782	92.0	100.0	
Missing	System	155	8.0		
Total		1937	100.0		

Be more effective in managing my child's behavior.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	37	1.9	2.2	2.2
	Strongly Disagree	26	1.3	1.6	3.8
	Disagree	147	7.6	8.9	12.7
	Agree	685	35.4	41.3	54.0
	Strongly Agree	403	20.8	24.3	78.3
	Very Strongly Agree	359	18.5	21.7	100.0
	Total	1657	85.5	100.0	
Missing	System	280	14.5		
Total		1937	100.0		

Figure out solutions to problems as they come up.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	29	1.5	1.6	1.6
	Strongly Disagree	18	.9	1.0	2.7
	Disagree	112	5.8	6.3	9.0
	Agree	776	40.1	43.9	52.9
	Strongly Agree	428	22.1	24.2	77.1
	Very Strongly Agree	405	20.9	22.9	100.0
	Total	1768	91.3	100.0	
Missing	System	169	8.7		
Total		1937	100.0		

Feel that I can get the services and supports that my child and family need.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	39	2.0	2.1	2.1
	Strongly Disagree	19	1.0	1.0	3.2
	Disagree	103	5.3	5.6	8.8
	Agree	725	37.4	39.7	48.6
	Strongly Agree	455	23.5	24.9	73.5
	Very Strongly Agree	483	24.9	26.5	100.0
	Total	1824	94.2	100.0	
Missing	System	113	5.8		
Total		1937	100.0		

Understand how the Early Intervention system works.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	28	1.4	1.5	1.5
	Strongly Disagree	11	.6	.6	2.1
	Disagree	88	4.5	4.7	6.8
	Agree	785	40.5	41.8	48.5
	Strongly Agree	461	23.8	24.5	73.1
	Very Strongly Agree	506	26.1	26.9	100.0
	Total	1879	97.0	100.0	
Missing	System	58	3.0		
Total		1937	100.0		

Be able to evaluate how much progress my child is making.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	27	1.4	1.4	1.4
	Strongly Disagree	15	.8	.8	2.2
	Disagree	84	4.3	4.5	6.7
	Agree	688	35.5	36.7	43.5
	Strongly Agree	512	26.4	27.3	70.8
	Very Strongly Agree	547	28.2	29.2	100.0
	Total	1873	96.7	100.0	
Missing	System	64	3.3		
Total		1937	100.0		

Feel that my child will be accepted and welcomed in the community.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	27	1.4	1.6	1.6
	Strongly Disagree	15	.8	.9	2.5
	Disagree	129	6.7	7.8	10.4
	Agree	650	33.6	39.4	49.8
	Strongly Agree	395	20.4	23.9	73.7
	Very Strongly Agree	434	22.4	26.3	100.0
	Total	1650	85.2	100.0	
Missing	System	287	14.8		
Total		1937	100.0		

Feel that my family will be accepted and welcomed in the community.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	28	1.4	1.7	1.7
	Strongly Disagree	13	.7	.8	2.5
	Disagree	126	6.5	7.8	10.3
	Agree	662	34.2	41.0	51.3
	Strongly Agree	366	18.9	22.7	74.0
	Very Strongly Agree	420	21.7	26.0	100.0
	Total	1615	83.4	100.0	
Missing	System	322	16.6		
Total		1937	100.0		

Communicate more effectively with the people who work with my child and family.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	28	1.4	1.6	1.6
	Strongly Disagree	11	.6	.6	2.3
	Disagree	97	5.0	5.6	7.8
	Agree	700	36.1	40.4	48.2
	Strongly Agree	432	22.3	24.9	73.2
	Very Strongly Agree	465	24.0	26.8	100.0
	Total	1733	89.5	100.0	
Missing	System	204	10.5		
Total		1937	100.0		

Understand the roles of the people who work with my child and family.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	26	1.3	1.4	1.4
	Strongly Disagree	12	.6	.7	2.1
	Disagree	69	3.6	3.8	6.0
	Agree	750	38.7	41.7	47.7
	Strongly Agree	457	23.6	25.4	73.1
	Very Strongly Agree	484	25.0	26.9	100.0
	Total	1798	92.8	100.0	
Missing	System	139	7.2		
Total		1937	100.0		

Know about my child's and family's rights concerning Early Intervention services.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	17	.9	.9	.9
	Strongly Disagree	15	.8	.8	1.7
	Disagree	71	3.7	3.8	5.6
	Agree	716	37.0	38.6	44.2
	Strongly Agree	464	24.0	25.0	69.2
	Very Strongly Agree	570	29.4	30.8	100.0
	Total	1853	95.7	100.0	
Missing	System	84	4.3		
Total		1937	100.0		

Do things with and for my child that are good for my child's development.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	23	1.2	1.2	1.2
	Strongly Disagree	10	.5	.5	1.8
	Disagree	35	1.8	1.9	3.7
	Agree	629	32.5	33.9	37.5
	Strongly Agree	498	25.7	26.8	64.4
	Very Strongly Agree	662	34.2	35.6	100.0
	Total	1857	95.9	100.0	
Missing	System	80	4.1		
Total		1937	100.0		

Understand my child's special needs.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	25	1.3	1.4	1.4
	Strongly Disagree	12	.6	.7	2.1
	Disagree	39	2.0	2.2	4.2
	Agree	634	32.7	35.4	39.6
	Strongly Agree	485	25.0	27.0	66.6
	Very Strongly Agree	598	30.9	33.4	100.0
	Total	1793	92.6	100.0	
Missing	System	144	7.4		
Total		1937	100.0		

Feel that my efforts are helping my child.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	27	1.4	1.4	1.4
	Strongly Disagree	8	.4	.4	1.9
	Disagree	43	2.2	2.3	4.2
	Agree	607	31.3	32.6	36.8
	Strongly Agree	484	25.0	26.0	62.7
	Very Strongly Agree	694	35.8	37.3	100.0
	Total	1863	96.2	100.0	
Missing	System	74	3.8		
Total		1937	100.0		

Frequency Table

I was offered help I needed, such as child care or transportation, to participate in the Individualized Family Service Plan (IFSP) meeting(s).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	70	3.6	5.1	5.1
	Strongly Disagree	39	2.0	2.8	8.0
	Disagree	192	9.9	14.0	22.0
	Agree	498	25.7	36.4	58.3
	Strongly Agree	260	13.4	19.0	77.3
	Very Strongly Agree	311	16.1	22.7	100.0
	Total	1370	70.7	100.0	
Missing	System	567	29.3		
Total		1937	100.0		

My family was given information about where to go for help or support if I feel worried or stressed.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	69	3.6	4.0	4.0
	Strongly Disagree	37	1.9	2.1	6.2
	Disagree	239	12.3	13.9	20.0
	Agree	644	33.2	37.4	57.5
	Strongly Agree	418	21.6	24.3	81.8
	Very Strongly Agree	314	16.2	18.2	100.0
	Total	1721	88.8	100.0	
Missing	System	216	11.2		
Total		1937	100.0		

I know who to call if I have problems with the services and supports my child and family are receiving.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	29	1.5	1.5	1.5
	Strongly Disagree	21	1.1	1.1	2.7
	Disagree	77	4.0	4.1	6.7
	Agree	600	31.0	31.9	38.6
	Strongly Agree	532	27.5	28.3	66.9
	Very Strongly Agree	624	32.2	33.1	100.0
	Total	1883	97.2	100.0	
Missing	System	54	2.8		
Total		1937	100.0		

My family's daily routines were considered when planning for my child's services.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	29	1.5	1.5	1.5
	Strongly Disagree	18	.9	.9	2.5
	Disagree	55	2.8	2.9	5.4
	Agree	524	27.1	27.6	33.0
	Strongly Agree	577	29.8	30.4	63.4
	Very Strongly Agree	694	35.8	36.6	100.0
	Total	1897	97.9	100.0	
Missing	System	40	2.1		
Total		1937	100.0		

I have felt part of the team when meeting to discuss my child.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	25	1.3	1.3	1.3
	Strongly Disagree	12	.6	.6	1.9
	Disagree	36	1.9	1.9	3.8
	Agree	501	25.9	26.4	30.2
	Strongly Agree	574	29.6	30.2	60.5
	Very Strongly Agree	750	38.7	39.5	100.0
	Total	1898	98.0	100.0	
Missing	System	39	2.0		
Total		1937	100.0		

The IFSP is keeping up with my family's changing needs.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	33	1.7	1.8	1.8
	Strongly Disagree	21	1.1	1.2	3.0
	Disagree	76	3.9	4.2	7.2
	Agree	629	32.5	34.8	42.0
	Strongly Agree	471	24.3	26.1	68.0
	Very Strongly Agree	578	29.8	32.0	100.0
	Total	1808	93.3	100.0	
Missing	System	129	6.7		
Total		1937	100.0		

My family was given information about activities that I could do with my child in our everyday lives.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	25	1.3	1.3	1.3
	Strongly Disagree	14	.7	.7	2.0
	Disagree	69	3.6	3.6	5.6
	Agree	536	27.7	28.0	33.7
	Strongly Agree	562	29.0	29.4	63.1
	Very Strongly Agree	706	36.4	36.9	100.0
	Total	1912	98.7	100.0	
Missing	System	25	1.3		
Total		1937	100.0		

My family was given information about the rights of parents regarding Early Intervention services.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	23	1.2	1.2	1.2
	Strongly Disagree	13	.7	.7	1.9
	Disagree	29	1.5	1.5	3.4
	Agree	567	29.3	29.5	32.9
	Strongly Agree	525	27.1	27.3	60.3
	Very Strongly Agree	763	39.4	39.7	100.0
	Total	1920	99.1	100.0	
Missing	System	17	.9		
Total		1937	100.0		

My family was given information about community programs that are open to all children.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	53	2.7	2.9	2.9
	Strongly Disagree	41	2.1	2.2	5.1
	Disagree	323	16.7	17.6	22.7
	Agree	647	33.4	35.3	58.0
	Strongly Agree	391	20.2	21.3	79.4
	Very Strongly Agree	378	19.5	20.6	100.0
	Total	1833	94.6	100.0	
Missing	System	104	5.4		
Total		1937	100.0		

My family was given information about ways of connecting with other families for information and mutual support.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	66	3.4	3.7	3.7
	Strongly Disagree	63	3.3	3.5	7.3
	Disagree	461	23.8	26.0	33.2
	Agree	616	31.8	34.7	67.9
	Strongly Agree	311	16.1	17.5	85.5
	Very Strongly Agree	258	13.3	14.5	100.0
	Total	1775	91.6	100.0	
Missing	System	162	8.4		
Total		1937	100.0		

My family was given information about the public school system's programs and services for children age three and older.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	40	2.1	2.5	2.5
	Strongly Disagree	35	1.8	2.2	4.7
	Disagree	199	10.3	12.5	17.1
	Agree	566	29.2	35.4	52.6
	Strongly Agree	362	18.7	22.7	75.2
	Very Strongly Agree	396	20.4	24.8	100.0
	Total	1598	82.5	100.0	
Missing	System	339	17.5		
Total		1937	100.0		

My family was given information about opportunities for my child to play with other children.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	80	4.1	4.7	4.7
	Strongly Disagree	68	3.5	4.0	8.7
	Disagree	473	24.4	27.9	36.6
	Agree	540	27.9	31.8	68.4
	Strongly Agree	274	14.1	16.1	84.6
	Very Strongly Agree	262	13.5	15.4	100.0
	Total	1697	87.6	100.0	
Missing	System	240	12.4		
Total		1937	100.0		

My family was given information about how to advocate for my child and my family.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	48	2.5	2.7	2.7
	Strongly Disagree	38	2.0	2.2	4.9
	Disagree	273	14.1	15.6	20.5
	Agree	735	37.9	41.9	62.4
	Strongly Agree	346	17.9	19.7	82.1
	Very Strongly Agree	314	16.2	17.9	100.0
	Total	1754	90.6	100.0	
Missing	System	183	9.4		
Total		1937	100.0		

My family was given information about what my options are if I disagree with a decision about my child's services.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	44	2.3	2.4	2.4
	Strongly Disagree	32	1.7	1.7	4.1
	Disagree	194	10.0	10.5	14.7
	Agree	723	37.3	39.3	53.9
	Strongly Agree	441	22.8	23.9	77.9
	Very Strongly Agree	408	21.1	22.1	100.0
	Total	1842	95.1	100.0	
Missing	System	95	4.9		
Total		1937	100.0		

Someone from the Early Intervention program asked if I was having any problems getting the services I needed.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	57	2.9	3.1	3.1
	Strongly Disagree	38	2.0	2.1	5.1
	Disagree	269	13.9	14.5	19.7
	Agree	673	34.7	36.4	56.1
	Strongly Agree	381	19.7	20.6	76.7
	Very Strongly Agree	431	22.3	23.3	100.0
	Total	1849	95.5	100.0	
Missing	System	88	4.5		
Total		1937	100.0		

Someone from the Early Intervention program asked whether the services my family was receiving were meeting our needs.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	46	2.4	2.4	2.4
	Strongly Disagree	26	1.3	1.4	3.8
	Disagree	166	8.6	8.8	12.6
	Agree	705	36.4	37.4	50.0
	Strongly Agree	452	23.3	24.0	73.9
	Very Strongly Agree	492	25.4	26.1	100.0
	Total	1887	97.4	100.0	
Missing	System	50	2.6		
Total		1937	100.0		

omeone from the Early Intervention program went out into the community with me and my child to help get us involved in community activities and services.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	167	8.6	10.9	10.9
	Strongly Disagree	127	6.6	8.3	19.2
	Disagree	694	35.8	45.3	64.4
	Agree	295	15.2	19.2	83.7
	Strongly Agree	128	6.6	8.3	92.0
	Very Strongly Agree	122	6.3	8.0	100.0
	Total	1533	79.1	100.0	
Missing	System	404	20.9		
Total		1937	100.0		

he Early Intervention service provider(s) that work with my child do what they say they are going to do.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	29	1.5	1.5	1.5
	Strongly Disagree	19	1.0	1.0	2.5
	Disagree	51	2.6	2.7	5.2
	Agree	580	29.9	30.2	35.4
	Strongly Agree	511	26.4	26.6	62.0
	Very Strongly Agree	730	37.7	38.0	100.0
	Total	1920	99.1	100.0	
Missing	System	17	.9		
Total		1937	100.0		

he Early Intervention service provider(s) that work with my child are easy for me to talk to about my child and my family.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	22	1.1	1.1	1.1
	Strongly Disagree	9	.5	.5	1.6
	Disagree	47	2.4	2.4	4.0
	Agree	489	25.2	25.3	29.4
	Strongly Agree	517	26.7	26.8	56.2
	Very Strongly Agree	846	43.7	43.8	100.0
	Total	1930	99.6	100.0	
Missing	System	7	.4		
Total		1937	100.0		

The Early Intervention service provider(s) that work with my child show a willingness to learn about the strengths and needs of my child and family.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	21	1.1	1.1	1.1
	Strongly Disagree	14	.7	.7	1.8
	Disagree	58	3.0	3.0	4.8
	Agree	512	26.4	26.7	31.5
	Strongly Agree	518	26.7	27.0	58.5
	Very Strongly Agree	797	41.1	41.5	100.0
	Total	1920	99.1	100.0	
Missing	System	17	.9		
Total		1937	100.0		

My service coordinator is available to speak with me on a regular basis.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	37	1.9	2.0	2.0
	Strongly Disagree	23	1.2	1.2	3.2
	Disagree	98	5.1	5.2	8.4
	Agree	616	31.8	32.7	41.0
	Strongly Agree	457	23.6	24.2	65.3
	Very Strongly Agree	655	33.8	34.7	100.0
	Total	1886	97.4	100.0	
Missing	System	51	2.6		
Total		1937	100.0		

My service coordinator is knowledgeable and professional.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	23	1.2	1.2	1.2
	Strongly Disagree	14	.7	.7	1.9
	Disagree	44	2.3	2.3	4.3
	Agree	570	29.4	30.0	34.3
	Strongly Agree	464	24.0	24.4	58.7
	Very Strongly Agree	783	40.4	41.3	100.0
	Total	1898	98.0	100.0	
Missing	System	39	2.0		
Total		1937	100.0		

Written information I receive is written in an understandable way.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	21	1.1	1.1	1.1
	Strongly Disagree	8	.4	.4	1.5
	Disagree	35	1.8	1.8	3.4
	Agree	616	31.8	32.3	35.7
	Strongly Agree	509	26.3	26.7	62.4
	Very Strongly Agree	717	37.0	37.6	100.0
	Total	1906	98.4	100.0	
Missing	System	31	1.6		
Total		1937	100.0		

I was given information to help me prepare for my child's transition.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	36	1.9	2.2	2.2
	Strongly Disagree	17	.9	1.0	3.2
	Disagree	144	7.4	8.8	12.0
	Agree	567	29.3	34.5	46.5
	Strongly Agree	377	19.5	22.9	69.4
	Very Strongly Agree	503	26.0	30.6	100.0
	Total	1644	84.9	100.0	
Missing	System	293	15.1		
Total		1937	100.0		

My family was asked whether other children in the family needed help in understanding the needs of the brother or sister with a disability.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Strongly Disagree	62	3.2	4.6	4.6
	Strongly Disagree	51	2.6	3.8	8.3
	Disagree	288	14.9	21.2	29.6
	Agree	450	23.2	33.2	62.8
	Strongly Agree	236	12.2	17.4	80.2
	Very Strongly Agree	269	13.9	19.8	100.0
	Total	1356	70.0	100.0	
Missing	System	581	30.0		
Total		1937	100.0		

Appendix C: Control File for the Winsteps Rasch Analysis of the IFS

```
&INST  ; THIS FILE MUST BE SAVED AS ASCII DOS TEXT BEFORE USE WITH WINSTEPS
Title="Virginia Impact all individuals: Rescaled 1"
ITEM1=1
DELIMITER=TAB ;          specifies a tab as a delimiter
;FITI=7
;FITP=7
ITLEN=15 ;max length of item label
LCONV=0.0001
RCONV=0.001
RESCOR=2
NEWSCR="112345"
DATA=N:\consulting\Virginia\Report2\data1.TXT ; Name of data file
NI=55
XWIDE = 1
CODES = "123456"
IDFILE=*
1-55
+29-50
*
;ISELECT=E
IAFILE=*
29 677.5
30 656.0
31 569.8
32 608.8
33 639.8
34 539.0
35 559.3
36 624.8
38 583.5
39 540.4
40 564.5
41 552.9
42 534.4
43 559.1
44 562.2
45 555.9
46 545.5
47 538.9
48 497.8
49 516.1
50 498.1
*
SAFILE=*
  2 = -220.93
  3 = -147.88
  4 = 55.95
  5 = 128.99
*
NAME1 = 2; Column containing person name
NAMLEN = 15; Length of person name
PRCOMP=S
UDECIM=2
UMEAN=568.3
USCALE=58.91
CSV=S
HLINES=N
IFILE=ItemStats.sav ;Name of file containing item-level statistics
PFILE=PersonStats.sav ;Name of file containing person-level statistics
REALSE=Y
TABLES=1110000001001100000000100011
&END
language
id
csbn
q1
q2
q3
q4
q5
q6
q7
q8
q9
q10
q11
q12
```

```
q13
q14
q15
q16
q17
q18
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q20
q21
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q24
q25
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q27
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q29
q30
q31
q32
q33
q34
q35
q36
q37
q38
q39
q40
q41
q42
q43
q44
q45
q46
q47
q48
q49
q50
q51
q52
END NAMES
```

Appendix D: Control File for the Winsteps Rasch Analysis of the FCSS

```
&INST  ; THIS FILE MUST BE SAVED AS ASCII DOS TEXT BEFORE USE WITH WINSTEPS
Title="Virginia family-centered services all individuals: Rescaled 1"
ITEM1=1
DELIMITER=TAB ;  specifies a tab as a delimiter
;FITI=7
;FITP=7
ITLEN=15 ;max length of item label
LCONV=0.0001
RCONV=0.001
RESCOR=2
NEWSCR="112345"
DATA=N:\consulting\Virginia\Report2\data1.TXT ; Name of data file
NI=55
XWIDE = 1
CODES = "123456"
IDFILE=*
1-55
+4-28
*
NAME1 = 2; Column containing person name
NAMLEN = 15; Length of person name
PRCOMP=S
UDECIM=2
UMEAN=500
USCALE=50
CSV=S
HLINES=N
IFILE=ItemStats.sav ;Name of file containing item-level statistics
PFILE=PersonStats.sav ;Name of file containing person-level statistics
REALSE=Y
TABLES=1110000001001100000000100011
&END
language
id
csbn
q1
q2
q3
q4
q5
q6
q7
q8
q9
q10
q11
q12
q13
q14
q15
q16
q17
q18
q19
q20
q21
q22
q23
q24
q25
q26
q27
q28
q29
q30
q31
q32
```

q33
q34
q35
q36
q37
q38
q39
q40
q41
q42
q43
q44
q45
q46
q47
q48
q49
q50
q51
q52
END NAMES

Appendix E: Winsteps Output File for the IFS

```
TABLE 3.1 Virginia Impact all individuals: Rescal ZOU497ws.txt Dec 20 15:37 2006
INPUT: 2128 PERSONS, 55 ITEMS  MEASURED: 2098 PERSONS, 22 ITEMS, 5 CATS    3.57.1
--------------------------------------------------------------------------------

       SUMMARY OF 1858 MEASURED (NON-EXTREME) PERSONS
+-----------------------------------------------------------------------------+
|           RAW                         REAL        INFIT       OUTFIT         |
|          SCORE     COUNT    MEASURE   ERROR    MNSQ   ZSTD   MNSQ   ZSTD     |
|-----------------------------------------------------------------------------|
| MEAN      69.4     19.9     591.11    25.81     .95    -.6    .94    -.6     |
| S.D.      20.9      4.0     115.71    10.91     .89    2.3    .95    2.2     |
| MAX.     109.0     22.0     898.18   136.05    9.12    9.9   9.90    9.9     |
| MIN.       3.0      1.0     151.90    18.12     .00   -6.0    .00   -5.6     |
|-----------------------------------------------------------------------------|
| REAL RMSE  28.02  ADJ.SD  112.27  SEPARATION  4.01  PERSON RELIABILITY  .94 |
| MODEL RMSE 24.72  ADJ.SD  113.04  SEPARATION  4.57  PERSON RELIABILITY  .95 |
| S.E. OF PERSON MEAN = 2.69                                                  |
+-----------------------------------------------------------------------------+
  MAXIMUM EXTREME SCORE:    218 PERSONS
  MINIMUM EXTREME SCORE:     22 PERSONS
     LACKING RESPONSES:     30 PERSONS
      VALID RESPONSES:  90.6%

       SUMMARY OF 2098 MEASURED (EXTREME AND NON-EXTREME) PERSONS
+-----------------------------------------------------------------------------+
|           RAW                         REAL        INFIT       OUTFIT         |
|          SCORE     COUNT    MEASURE   ERROR    MNSQ   ZSTD   MNSQ   ZSTD     |
|-----------------------------------------------------------------------------|
| MEAN      71.3     19.8     622.64    35.26                                 |
| S.D.      23.4      4.2     163.55    28.23                                 |
| MAX.     110.0     22.0     970.75   136.05                                 |
| MIN.       3.0      1.0      79.82    18.12                                 |
|-----------------------------------------------------------------------------|
| REAL RMSE  45.17  ADJ.SD  157.19  SEPARATION  3.48  PERSON RELIABILITY  .92 |
| MODEL RMSE 43.43  ADJ.SD  157.67  SEPARATION  3.63  PERSON RELIABILITY  .93 |
| S.E. OF PERSON MEAN = 3.57                                                  |
+-----------------------------------------------------------------------------+
PERSON RAW SCORE-TO-MEASURE CORRELATION = .75 (approximate due to missing data)
CRONBACH ALPHA (KR-20) PERSON RAW SCORE RELIABILITY = 1.00 (approximate due to missing
data)

       SUMMARY OF 22 MEASURED (NON-EXTREME) ITEMS
+-----------------------------------------------------------------------------+
|           RAW                         REAL        INFIT       OUTFIT         |
|          SCORE     COUNT    MEASURE   ERROR    MNSQ   ZSTD   MNSQ   ZSTD     |
|-----------------------------------------------------------------------------|
| MEAN    5859.3   1683.4     568.27    2.39     .94   -2.5    .96   -1.7     |
| S.D.     747.9     97.1      46.36     .21     .25    5.3    .31    5.2     |
| MAX.    7007.0   1821.0     677.50    3.16    1.82    9.9   2.07    9.9     |
| MIN.    4074.0   1469.0     497.80    2.24     .67   -9.9    .62   -9.8     |
|-----------------------------------------------------------------------------|
| REAL RMSE   2.40  ADJ.SD   46.30  SEPARATION 19.27  ITEM   RELIABILITY 1.00 |
| MODEL RMSE  2.32  ADJ.SD   46.30  SEPARATION 19.93  ITEM   RELIABILITY 1.00 |
| S.E. OF ITEM MEAN = 10.12                                                   |
+-----------------------------------------------------------------------------+
              DELETED:    33 ITEMS
UMEAN=568.300 USCALE=58.910
ITEM RAW SCORE-TO-MEASURE CORRELATION = -.91 (approximate due to missing data)
```

```
TABLE 3.2 Virginia Impact all individuals: Rescal ZOU497ws.txt Dec 20 15:37 2006
INPUT: 2128 PERSONS, 55 ITEMS  MEASURED: 2098 PERSONS, 22 ITEMS, 5 CATS    3.57.1
--------------------------------------------------------------------------------


SUMMARY OF CATEGORY STRUCTURE.  Model="R"
+------------------------------------------------------------------
|CATEGORY    OBSERVED|OBSVD SAMPLE|INFIT OUTFIT||STRUCTURE|CATEGORY|
|LABEL SCORE COUNT %|AVRGE EXPECT| MNSQ  MNSQ||CALIBRATN| MEASURE|
|------------------+------------+------------++---------+--------+
|  1   1    1173   3|-197.2 -233.| 1.39  1.46||  NONE   |-295.89)| 1
|  2   2    3767   9|-114.5 -110.| 1.02   .96||-220.93A|-185.38 | 3
|  3   3   15662  38| -28.4 -22.9|  .84   .92||-147.88A|-45.97  | 4
|  4   4    8954  22|  77.7  68.2|  .77   .73||  55.95A| 93.44  | 5
|  5   5    7479  18| 180.3 184.0| 1.05  1.13|| 128.99A|(203.95)| 6
|------------------+------------+------------++---------+--------+
|MISSING     3841   9|  -.7      |          ||         |        |
+------------------------------------------------------------------
OBSERVED AVERAGE is mean of measures in category. It is not a parameter estimate.


+-------------------------------------------------------------------------------
-----+
|CATEGORY      STRUCTURE   |  SCORE-TO-MEASURE   | 50% CUM.| COHERENCE|ESTIM| OBSERVED-
EXPECTED |
| LABEL     MEASURE   S.E. | AT CAT. ----ZONE----|PROBABLTY| M->C C->M|DISCR|RESIDUAL
DIFFERENCE|
|--------------------------+---------------------+---------+----------+-----+-------------
-----|
|   1      NONE            |-295.89) -INF -247.18|         | 73%  34%|     |  -9.5%    -
123.4 | 1
|   2     -220.93A  2.12 |-185.38-247.18-127.29| -233.39 | 51%  44%| .83|  -1.9%    -
71.5 | 3
|   3     -147.88A  1.15 | -45.97-127.29  35.36| -137.30 | 73%  78%|1.00|   1.6%
239.6 | 4
|   4      55.95A   .88 |  93.44  35.36 155.24|  45.40 | 54%  65%|1.16|   2.6%
229.6 | 5
|   5     128.99A  1.06 |(203.95)155.24  +INF | 141.45 | 81%  61%|1.03|  -3.5%    -
273.9 | 6
+-------------------------------------------------------------------------------
-----+
M->C = Does Measure imply Category?
C->M = Does Category imply Measure?

        CATEGORY PROBABILITIES: MODES - Structure measures at intersections
P    ++-------+-------+-------+-------+-------+-------+-------++
R 1.0 +                                                       +
O     |111                                             55|
B     |   11                                         555 |
A     |     11                                      55   |
B  .8 +       11                                   5     +
I     |         1                33               5      |
L     |          1            33  33             5       |
I     |           1          33      3          5        |
T  .6 +            1         3         3        5         +
Y     |             1       3           3      5         |
   .5 +             1    22  3        3   44  5          +
O     |              *22  2*          344  4*          |
F  .4 +             2  1    32         443    544        +
     |             2  1 3  2       4   3  5   4        |
R     |            22   1 3   22     4   35    4         |
E     |           2      *     2     4    53     44      |
S  .2 +          2       3 1    2  44    5  3     4      +
P     |         22     3   11    224    5    3    44     |
O     |      222    33      1  44422  55     33    444   |
N     |222        333        1***    2***       333    44|
S  .0 +*********************555******111********************+
E     ++-------+-------+-------+-------+-------+-------+-------++
    -400   -300   -200   -100    0    100    200    300
        PERSON [MINUS] ITEM MEASURE


TABLE 10.1 Virginia Impact all individuals: Resca ZOU497ws.txt Dec 20 15:37 2006
INPUT: 2128 PERSONS, 55 ITEMS  MEASURED: 2098 PERSONS, 22 ITEMS, 5 CATS    3.57.1
--------------------------------------------------------------------------------
PERSON: REAL SEP.: 4.01  REL.: .94 ... ITEM: REAL SEP.: 19.27  REL.: 1.00

         ITEM STATISTICS:  MISFIT ORDER

+--------------------------------------------------------------------------------+
|ENTRY   RAW                  REAL |  INFIT  | OUTFIT  |PTMEA|        |        |
|NUMBER SCORE  COUNT  MEASURE  S.E. |MNSQ  ZSTD|MNSQ  ZSTD|CORR.|DISPLACE| ITEM   |
```
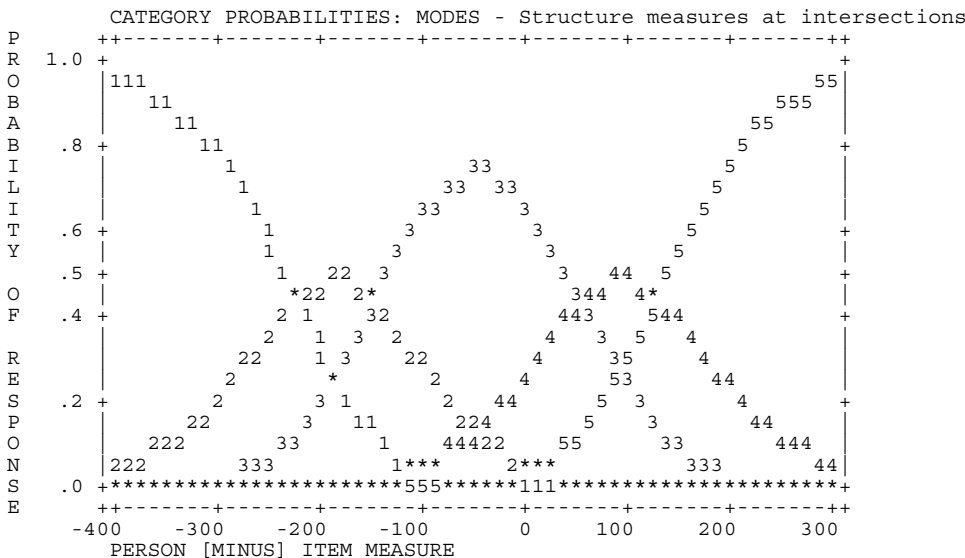
```
---------------------------+---------+---------+-----+--------+---------
| 29    4074    1515    677.5A    3.2|1.82    9.9|2.07    9.9|A .73|      .5| q25    |
| 30    4883    1672    656.0A    2.6|1.38    9.9|1.48    9.9|B .79|    -7.8| q26    |
| 36    4583    1469    624.8A    2.8|1.29    7.1|1.36    7.7|C .80|    -4.4| q32    |
| 31    5837    1707    569.8A    2.3|1.02     .5|1.10    2.2|D .81|     6.8| q27    |
| 34    5823    1638    539.0A    2.4| .99    -.4|1.05    1.0|E .82|    16.5| q30    |
| 47    6651    1793    538.9A    2.3| .96   -1.1|1.01     .2|F .80|    -6.5| q43    |
| 33    4967    1625    639.8A    2.3| .95   -1.4| .98    -.6|G .84|   -11.3| q29    |
| 35    6093    1718    559.3A    2.3| .91   -2.7| .91   -2.1|H .82|    -2.0| q31    |
| 38    5364    1588    583.5A    2.4| .90   -2.7| .91   -2.2|I .84|     -.2| q34    |
| 39    5938    1707    540.4A    2.3| .85   -4.3| .91   -2.1|J .85|    28.6| q35    |
| 44    5400    1530    562.2A    2.4| .89   -2.9| .87   -3.0|K .83|    -1.4| q40    |
| 43    5572    1569    559.1A    2.4| .89   -3.0| .87   -2.9|k .82|    -1.9| q39    |
| 41    6592    1821    552.9A    2.2| .88   -3.7| .88   -2.9|j .82|    -6.4| q37    |
| 32    5640    1724    608.8A    2.3| .86   -4.1| .85   -4.0|i .85|   -10.1| q28    |
| 42    6624    1804    534.4A    2.3| .81   -5.7| .85   -3.5|h .82|     4.0| q38    |
| 50    7007    1791    498.1A    2.3| .82   -5.3| .76   -4.9|g .80|     2.8| q46    |
| 48    6964    1793    497.8A    2.3| .81   -5.8| .76   -4.9|f .80|     8.1| q44    |
| 37    5849    1713    577.7     2.3| .81   -5.8| .78   -5.8|e .85|      .0| q33    |
| 49    6560    1716    516.1A    2.4| .79   -6.2| .79   -4.6|d .81|     -.3| q45    |
| 40    6226    1755    564.5A    2.3| .73   -8.6| .71   -7.8|c .85|    -5.7| q36    |
| 45    6000    1666    555.9A    2.3| .71   -8.8| .69   -7.9|b .84|    -5.8| q41    |
| 46    6257    1721    545.5A    2.3| .67   -9.9| .62   -9.8|a .85|     -.2| q42    |
---------------------------+---------+---------+-----+--------+---------
| MEAN  5859.3 1683.4    568.3    2.4| .94   -2.5| .96   -1.7|     |        |        |
| S.D.   747.9   97.1     46.4     .2| .25    5.3| .31    5.2|     |        |        |
+-----------------------------------------------------------------------------------+
```