Creation of Child Well-Being Index Using the Survey of Income and Program Participation

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Abstract: This paper utilizes data from the Survey of Income and Program Participation (SIPP) to create an individual-level child well-being index. Using Kenneth Land's framework, we assign SIPP variables to seven domains and use a factor analysis to analyze if these variables load together on specific factors that reasonably represent the domains. After a preliminary analysis of a subset of variables from the material well-being, productive activity, place in community, social relationships and emotional well-being domains, we find that four domains, consisting of socio-economic characteristics, school engagement, parental involvement and social interactions, are a better fit for the SIPP data currently available. We assign values to each indicator based on these factor loading results and weight the domains by their contribution to the measure, to produce an index for each child in the sample. Correlations of the index will be assessed within families and across characteristics of the child and family.

Introduction and Overview

Both the academic community and government agencies acknowledge the importance of understanding the factors that influence child well-being. The economic, social, and physical environment effect the likelihood that a child will grow to be a well-educated, economically stable, productive, healthy adult (Federal Interagency Forum on Child and Family Statistics, 2011). The goal of this analysis is to create an index of child well-being that enables researchers to use a summary measure of child well-being in their research, allow us to track changes in child well-being across time, and where possible, across data sources, create indices based on restricted sets of covariates which will be evaluated for alignment with the full version of the index.

This paper uses data from the 2008 Panel of the Survey of Income and Program Participation (SIPP) to create an index of child well-being using the domains identified in Land et al (2001). Because SIPP is a longitudinal survey, we are able to track child well-being for the same sample of children across time based on mixes of the covariates available at different times during the panel.

Indicators of Child Well-being

The Child and Youth Well-Being Index (CWI) developed by Kenneth Land is widely accepted as a comprehensive framework of child well-being. Using the framework developed by Land et al. (2001), we focus on seven domains identified as having an effect on quality of life: material well-being, health, safety, productive activity, place in community, social relationships, and emotional well-being. Land defined these domains using 28 indicators, using survey data aggregated from a number of statistical sources.

For this paper, we will be creating an individual child well-being index using data on child, parent, and neighborhood characteristics. Table 1 identifies the indicators from SIPP used to define each domain.

Data

SIPP is a nationally-representative, longitudinal survey of the non-institutionalized population. SIPP respondents in original sample households are typically in sample for three to four years. Respondents are interviewed every four months, either at the original sample address or a new address if a move occurred.

Each interview consists of a core set of questions which are asked in every wave, and a set of topical module questions which are asked two to three times over the course of the panel. All members of the household are interviewed, including children (using a proxy adult respondent). Respondents are randomly assigned to one of four rotation groups for SIPP interviewing, and one rotation group is interviewed in each month. The reference period for questions is the preceding four months before the interview. For the 2008 Panel, the Child Well-Being topical module is first fielded during Wave 4 and the reference periods cover May 2009 to November 2009.

The 2008 SIPP sample consisted of 65,500 housing units, which yielded 42,000 eligible households at Wave 1. For this analysis, we have narrowed the sample, selecting cases with data in Wave 4, to households with children. SIPP defines a child as a household member between the ages of zero and fifteen. Our sample consists of 22,680 children, weighted to represent the 73 million children in the United States.

Analysis

Creating the child well-being index consists of three stages: determining the correlations of variables within each domain, performing a factor analysis, and then creating the index using the factor loadings. At this stage of the analysis, we have included selected indicators from the material well-being, productive activity, place in community, social relationships and emotional well-being domains. Additional domains will be added as the analysis progresses. Variables that do not load definitively on one factor will be dropped from the analysis.

Using the method outlined in Bradshaw, Hoelscher, and Richardson (2006), we look at each variable's distance from the mean and assign the z-score to each indicator. Once the z-score is assigned, we average the z-scores for indicators in the same domain. At that point, depending on the weight assigned to each domain, we calculate the child's overall well-being score. Once the child well-being score is calculated, correlations of the index are assessed within families and across other characteristics of the child and family, such as region of residence and selected demographic characteristics.

Preliminary Results

Based on a factor analysis that included the variables from the material well-being (excluding parental employment status and health insurance coverage), productive activity, place in

community, social relationships and emotional well-being domains, we are able to show initial factor loadings (Table 2). Three variables were dropped from the analysis due to failure to load significantly on any factor: on-track school enrollment, if the child moved in the last year, and participation in religious events. Because the domains are correlated with each other, we use an oblique rotation method. The scree plot indicated that six domains would be appropriate, but after running the analysis, the variables were not loading definitively on all six factors. After repeating the process with five factors, and yielding similar results, we reduced the number of factors to four. The eigenvalues for the four factors are in Table 3.

The factor analysis results indicated that four domains would be more appropriate than the five domains, outlined in Land's framework, initially included in the analysis. The four domains represent socio-economic characteristics, school engagement, parental involvement, and social interactions. The variables in each domain are as follows: socio-economic (family poverty range, average monthly income range, mother or guardian's educational attainment, presence of two parents), school engagement (does the child like school, is the child interested in school work, does the child work hard at school), parental involvement (does the parent take the child on outings, read to the child, give the child praise, play with the child, eat breakfast and/or dinner with child) and social involvement (child participate in gifted classes, clubs, sports and lessons).

These results provide the initial input for creating the child well-being index based on the weighted contribution of the domains. As additional domains become available, these results will be revised in preparation for the final creation and evaluation of a SIPP child well-being index.

References

Bradshaw, Jonathan, Petra Hoelscher and Dominic Richardson. 2006. "An Index of Child Well Being in the European Union". Social Indicators Research. 80:133-177.

Federal Interagency Forum on Child and Family Statistics. *America's Children: Key National Indicators of Well-Being, 2011.* Washington, DC: U.S. Government Printing Office.

Land, Kenneth C., Vicki Lamb, and Sarah Kahler Mustillo. 2001. "Child and Youth Well-Being in the United States, 1975-1998: Some Findings from a New Index." *Social Indicators Research.* 56: 241-320.

Table 1: Indicators for SIPP Child Well-Being Index

Material Well-Being	Family Poverty Range Monthly Family Income Range Mother (or Guardian) Educational Attainment Parental Employment Status* Health Insurance Coverage*
Health	Child's Health Status* Does child have disability?* Does child have activity limitations?*
Safety	Are there safe places to play outside?* Do you keep your child inside because of danger in the community?* Are there trustworthy adults in neighborhood?* Are there people you can count on in the community?*
Productive Activity	On-track School Enrollment Enrollment in Gifted Classes
Place in Community	Participation in clubs, sports, lessons Frequency of weekly outings
Social Relationships	Two Parent Family Did child move in the last year?
Emotional Well-Being	Participation in religious events <u>School engagement :</u> Does child like school? Is child interested in schoolwork? Does child work hard in school? <u>Parent's engagement with child:</u> Do parents read to child? Do parents talk to child? Do parents play with child? Do parents eat with child (breakfast or dinner)?

*Indicators currently excluded from analysis. Analysis will be updated for final draft.

Table 2: Sample Factor Scores (Standardized Regression Estimates using obliquely rotated factors)

	Factor 1	**Factor 2**	**Factor 3**	**Factor 4**
Variables	**Socio-Economic Characteristics**	**School Engagement**	**Parental Involvement**	**Social Interaction**
Poverty Range	0.84264	-0.03966	0.03693	0.07186
Family Income Range	0.87516	-0.02157	0.02832	0.07422
Parent's Educational Attainment	0.40589	-0.01824	0.08135	0.24658
Presence of Two Parents	0.47250	0.05603	0.02934	-0.05446
Like School	0.00578	0.74236	-0.00111	0.05257
Interest School	-0.01045	0.80954	0.03002	0.02651
Works Hard	-0.00631	0.72022	0.05625	0.03828
Outings	0.09312	0.04857	0.45656	-0.14199
Freq. parent reads to child	0.16147	0.00121	0.39143	-0.08575
Parental Praise	-0.09367	-0.03126	0.68564	0.14851
Parent Play	-0.13261	-0.05504	0.65564	0.17450
Parent eats dinner with child	0.05082	0.07994	0.37923	-0.23637
Parent eats breakfast with child	0.12129	0.09543	0.42003	-0.19524
Gifted Classes	-0.00392	0.10193	-0.16956	0.40028
Participate in Clubs	0.04907	0.01206	-0.07521	0.44311
Participate in Sports	0.08653	0.04056	-0.09616	0.36253
Participate in Lessons	0.09046	0.03553	-0.01199	0.41413

Table 3: Eigenvalues for Factors using Squared-Multiple Correlation (SMC)

Factor	Eigenvalue
1	2.501
2	1.927
3	1.287
4	0.611