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Growth Norms for the Teaching Strategies
GOLD Assessment System

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Purpose

The Technical Manual for the Teaching Strategies GOLD Assessment System (Lambert, Kim, Taylor, & McGee, 2010) contains norm tables for both raw and scale scores for each developmental domain that are based on a cross-sectional research design in the sense that they establish expected scores for three month age bands using only the fall assessment checkpoint. The expected growth for individual children can be inferred from these tables by tracking a child across the age bands as the child gets older. Given that the measure has been in use for several complete academic years since those tables were created, and users have gained more experience and training, it is important to extend the findings of that report. This report provides a supplement to those tables by tracking groups of children across a single academic year to directly observe their growth and development using a longitudinal design.

The growth norms reported in this report are based on the results of a research study conducted to accomplish five specific goals:

1.) Gather evidence that teacher ratings of child developmental status made with the Teaching Strategies GOLD assessment system can be used to track growth across time,

2.) Create norm tables for each scale score, based on a nationally representative sample, that indicate how children of different ages should be expected to score at the beginning of the academic year,

3.) Create norm tables which illustrate expected growth across the academic year for children of different ages,

4.) To establish reliability and validity evidence to support the Teaching Strategies GOLD Assessment System using the norm sample created for this research study,

5.) Create norm tables which illustrate expected scores at kindergarten entry.

Norm Sample

A norm sample was created from the entire population of children served by teachers who used the Teaching Strategies GOLD Assessment System. Children were eligible for admission into the sample if the teachers in the program they attended had met the following criteria: 1.) used GOLD for the entire 2011-12 academic year, 2.) successfully completed an inter-rater reliability check conducted by Teaching Strategies, 3.) successfully completed all required face-to-face GOLD assessment training sessions, and 4.) successfully completed all online GOLD assessment training modules. These criteria helped insure that the teacher ratings came from users who understood how the tool was intended to be used to assess children's skills, knowledge, and behaviors. These criteria identified 81,375 children eligible for inclusion in the norm sample.

For this sub-population, children with complete data across three checkpoints were selected. Many programs record ratings for less than three checkpoints or do not follow a traditional academic year format. Typically programs require teachers to use an October due date for the fall checkpoint, a January due date for the winter checkpoint, and an April due date for the spring checkpoint. However, the exact assessment schedule can vary quite substantially across programs. Therefore, a window of acceptable due dates was set for each assessment checkpoint so that the resulting scores could be interpreted as representing a period of

approximately three months of growth and development between the checkpoints. Data recorded during September, October, and November was accepted for the fall checkpoint. Data recorded during December, January, and February was accepted for the winter checkpoint. Data recorded during March, April, May, and June was accepted for the spring checkpoint. In addition, the data for some individual children within programs that met these criteria were not complete for a variety of reasons. For example, a child may have joined late in the year, left the classroom before the end of the year, or had a large number of absences. These children were also excluded. Given all of these additional admissibility criteria, the resulting sub-population included ratings for a total of 69,743 children.

This sub-population did not represent the exact demographic distribution of children in the United States with respect to ethnicity and race according to the 2010 census. Therefore, a random sampling procedure was used to create a norm sample that reflected the most current estimates of the ethnic and racial diversity of the national population of children ages birth to five years of age. Table 1 contains the distribution of the norm sample across the seven commonly used racial and ethnic categories. Given that Hispanic refers to an ethnicity and not a racial designation, these categories are created by combining information about both the race and ethnicity of each child as reported by the teacher. The sampling procedure was successful in creating a norm sample that very closely approximated the national population. For example, the percentage of both African-American (13.6%) and Hispanic (25.5%) children matched the Census Bureau statistics. The four of the remaining five categories, White, Native-American, Pacific Islander, and Multiracial children, were all within .6 percentage points of the national statistics. Asian children were slightly under represented as they comprised 3.2% of the norm sample and 4.5% of the population.

Children were included from all regions of the United States, including 34 states, the District of Columbia, and Puerto Rico. The norm sample contains 51.3% boys and 48.7% girls. The primary language used in the homes of these children was English (77.5%), Spanish (17.7%), or other languages (4.8%). Children with an Individual Education Plan (IEP) or an Individual Family Service Plan (IFSP) comprise 13.1% of the sample. The total number of children included in the final norm sample was 54,504.

Ratings of Child Growth and Development by Three Month Age Band

The norm sample was divided into three month age bands based on the age of each child at the time of the fall assessment checkpoint. The children were placed into eighteen three month age bands from 3 through 5 months to 54 through 56 months. The Teaching Strategies GOLD assessment system is designed to be used with children from birth to six years of age. However, there were very few children younger than 3 months of age or older than 56 months of age at the time of the fall assessment in the sub-population that were eligible for inclusion in the study and therefore these categories were not included in the norm sample.

Tables 2 through 7 include the mean and standard deviation for both the scale scores and raw scores for each of the domains of development that are included in the Teaching Strategies GOLD assessment system. The raw scores are created by summing across the teacher ratings for all the items within each domain of development. Each item is rated using a 10 point scale and the range of possible raw scores is as follows: Social Emotional (0-81), Physical (0-45), Oral Language (0-72), Cognitive (0-90), Literacy (0-108), and Mathematics (0-63). The total number of possible raw score points varies by domain of development because a different number of items is included in each scale.

The scale scores for each domain of development are based on Item Response Theory. They are interval level scale scores that result from a transformation of the raw scores, are not dependent upon the number of items rated for each domain, and are calibrated to have a mean of 500 and a standard deviation of 100 across the entire age range. The mean of 500 is associated with children at 36 months of age as this is the middle of the intended age range for the measure. Expected scores are reported for the Social Emotional (Table 2), Physical (Table 3), Oral Language (Table 4), Cognitive (Table 5), Literacy (Table 6), and Mathematics (Table 7) domains of development.

These tables are useful for researchers and teachers interested in fine grained examination of expected growth by narrow age bands. These tables show an overall trend indicating that the expected amount of growth tends to increase with age. These tables also illustrate that the child scale scores, as expected, tend to become a little more spread out as the children get older. The standard deviations for any given scale score tend to become larger as children get older.

Reliability and Validity Evidence

A special case of the one parameter Item Response Theory model, the Rasch partial credit model, was used to examine the measurement properties of the item and scale scores for each of the developmental domains. These analyses were conducted to confirm, based on the current norm sample, the results of the Technical Manual for the Teaching Strategies GOLD Assessment System (Lambert, Kim, Taylor, & McGee, 2010). These analyses were also used to establish that the process used to calibrate the interval level scale scores for each developmental domain was applicable to the current norm sample. The first step in this process was to examine the model assumption of unidimensionality, that each scale score is measuring only one underlying construct. This assumption is considered tenable if the model accounts for the

majority of the variance in item scores and the first contrast does not account for more than 5% of the variance (Bond & Fox, 2007). The results of the principal components analysis of residuals indicated that the model accounted for over 75% of the variance in the item scores for each of the six scale scores (75.7% - 84.3%). The first contrast accounted for 5% or less of the variance for all scale scores except the Physical domain which was very close to the criterion (6.0%). These results taken together indicate that the assumption is tenable.

Next, fit statistics were examined to determine whether the item ratings fit the model. Infit (IMSE) and outfit (OMSE) mean square error statistics of .6 to 1.4 are considered acceptable (Bond & Fox, 2007). This criteria were met for every item on the Social Emotional (IMSE .84 – 1.31, OMSE .84 – 1.30), Physical (IMSE .90 – 1.14, OMSE .90 – 1.13), Oral Language (IMSE .83 – 1.30, OMSE .83 – 1.29), Cognitive (IMSE .86 – 1.15, OMSE .86 – 1.16), and Mathematics (IMSE .75 – 1.14, OMSE .75 – 1.12) scales. These criteria were met for all but one item on the Literacy scale (IMSE .76 – 1.52, OMSE .74 – 1.57). Therefore there is strong evidence that the data fits the model across all of the scales.

Item and person reliabilities and Cronbach's alpha reliabilities were examined for each scale score. Values greater than .80 are considered acceptable. Table 10 contains these coefficients, all of which are at or above .90. Item and person separation indexes were also examined and values greater than or equal to 3 are considered acceptable, and as shown in Table 8, all of these values met this criterion.

Kindergarten Entry Norms

A separate norm sample of kindergarten children was constructed. All children in the sample were at least 60 months old at the time of the fall assessment and were enrolled in a kindergarten classroom where the Teaching Strategies GOLD system was used as a fall

assessment. A total of 7,149 children met these criteria. This sub-population did not match the Census Bureau statistics for racial and ethnic composition. Therefore, a random sampling was used to match the national distribution as closely as possible. White children comprised 52.1% of the norm sample and 52.1% of young children nationally. African American children comprised 13.6% of the norm sample and 13.6% of young children nationally. Native American children were slightly overrepresented as they comprised 2.4% of the norm sample as compared to .9% of young children nationally. Hawaiian and Pacific Islander children comprise .3% of the norm sample and .2% nationally. Multi-racial children were overrepresented as they comprise 6.1% or the norm sample and 3.2% of young children nationally. Hispanic children comprise 25.5% of the norm sample and 25.5% of young children nationally. Therefore, the norm sample formed a relatively nationally representative sample with the exception of over representing multiracial children and not including any Asian children (4.5% nationally). The norm sample was 48.2% female and 51.6% male. Children with an IEP comprised 9.4% of the norm sample. English is the primary language spoken in the homes of 68.2% of the children as compared to Spanish (19.0%) and other languages (12.8%). A total of 4,155 were included in the final kindergarten norm sample.

Table 9 contains the means and standard deviations of each of the six scales for both the raw and scale scores. The expected scores for fall of the kindergarten year are generally higher than the winter assessments and lower than the spring scores in the norm tables for children who were 54-56 months of age at the time of the fall assessment. This makes sense as children who were 54-56 months of age at the time of their fall assessment in the four year old year would be 66-68 months of age during the fall assessment of their kindergarten year. This is a little older

than the children in this kindergarten sample as it is comprised of children who were generally 64-66 months of age at the time of the fall assessment.

Conclusion

This report can serve as a companion to the technical manual (Lambert, Kim, Taylor, & McGee, 2010). The results of this study demonstrate evidence for the reliability and validity of the scale scores created for each domain of development using the teacher ratings in this norm sample and confirm the results of the technical manual. These results also demonstrate that both the GOLD raw scores and scale scores for each domain of development are sensitive to the process of child growth and development. Teachers can use these results to understand how the scores of a particular child compare to a large, nationally representative norm sample. They can do so both at the beginning of the academic year, at kindergarten entry, and can compare the growth children are making across the academic year to the expected growth for children in the norm sample.

Table 1.

Norm Sample by Ethinc Subgroup.

Racial and Ethnic Subgroup	Census Bureau	Norm Sample	
		n	%
White, not Hispanic	52.1%	51.7%	28,194
African American, not Hispanic	13.6%	13.6%	7,430
Native American, not Hispanic	0.9%	1.5%	794
Asian, not Hispanic	4.5%	3.2%	1,764
Hawaiian or Pacific Islander, not Hispanic	0.2%	0.8%	458
Multirace, not Hispanic	3.2%	3.6%	1,964
Hispanic	25.5%	25.5%	13,900

Table 2.
Social Emotional Standard and Raw Scores by Three Month Age Band.

Age in Months		n	Standard Scores Mean	SD	Raw Scores Mean	SD	Age in Months		n	Standard Scores Mean	SD	Raw Scores Mean	SD
3-5	Fall	280	315.504	59.659	7.954	6.226	30-32	Fall	829	493.889	62.292	30.320	9.651
	Winter	280	360.957	57.010	12.054	7.043		Winter	830	527.340	60.455	35.786	9.600
	Spring	278	396.151	61.456	16.036	8.259		Spring	829	556.929	63.647	40.566	10.004
6-8	Fall	361	345.274	54.907	10.460	6.289	33-35	Fall	937	504.304	65.120	32.039	10.275
	Winter	361	385.729	58.096	14.751	7.630		Winter	939	540.339	61.201	37.896	9.941
	Spring	358	421.291	59.445	19.154	8.544		Spring	940	569.428	65.712	42.600	10.461
9-11	Fall	373	366.512	55.133	12.560	6.257	36-38	Fall	2495	497.815	69.092	31.158	10.581
	Winter	373	409.729	51.696	17.558	6.885		Winter	2495	543.313	62.994	38.434	10.053
	Spring	373	446.480	51.024	22.670	7.720		Spring	2493	577.936	64.613	44.022	10.273
12-14	Fall	451	399.284	54.799	16.268	7.343	39-41	Fall	5548	500.618	64.850	31.598	9.946
	Winter	454	439.949	53.316	21.722	7.936		Winter	5550	551.681	59.445	39.803	9.575
	Spring	453	465.746	55.221	25.620	8.598		Spring	5552	590.444	63.528	46.022	10.000
15-17	Fall	516	420.446	51.842	19.027	6.804	42-44	Fall	5996	512.209	65.175	33.431	10.196
	Winter	520	461.650	47.880	24.933	7.576		Winter	5998	561.466	60.180	41.389	9.640
	Spring	519	485.472	51.066	28.759	8.215		Spring	5998	599.764	62.842	47.523	9.858
18-20	Fall	564	438.741	54.082	21.610	7.771	45-47	Fall	7075	524.322	66.187	35.384	10.454
	Winter	565	475.965	51.931	27.227	8.295		Winter	7086	574.680	61.554	43.514	9.845
	Spring	565	501.611	56.369	31.416	9.156		Spring	7083	613.852	65.675	49.705	10.166
21-23	Fall	647	459.394	58.041	24.765	8.803	48-50	Fall	9716	546.344	68.149	38.953	10.804
	Winter	651	493.134	57.725	30.083	9.281		Winter	9723	598.263	64.618	47.257	10.189
	Spring	648	517.565	59.319	34.083	9.570		Spring	9718	641.280	69.381	53.893	10.489
24-26	Fall	734	467.907	55.071	26.064	8.565	51-53	Fall	13839	568.357	66.776	42.487	10.613
	Winter	734	504.337	55.640	31.890	8.996		Winter	13844	621.084	63.662	50.838	9.867
	Spring	734	527.034	60.923	35.674	9.792		Spring	13832	668.399	67.158	57.968	9.838
27-29	Fall	847	478.276	61.411	27.806	9.425	54-56	Fall	3120	575.153	70.063	43.608	10.996
	Winter	849	511.079	59.780	33.106	9.463		Winter	3120	627.457	64.748	51.836	9.998
	Spring	849	538.369	60.359	37.555	9.777		Spring	3118	674.931	67.920	58.919	9.892

Table 3.
Physcial Standard and Raw Scores by Three Month Age Band.

Age in Months		n	Standard Scores Mean	SD	Raw Scores Mean	SD	Age in Months		n	Standard Scores Mean	SD	Raw Scores Mean	SD
3-5	Fall	279	280.703	62.749	4.595	4.430	30-32	Fall	829	496.590	63.903	21.689	5.570
	Winter	278	331.158	63.292	7.827	4.997		Winter	827	526.975	61.591	24.380	5.410
	Spring	279	370.011	60.801	10.703	5.089		Spring	829	555.794	62.688	26.896	5.359
6-8	Fall	360	327.008	58.331	7.489	4.541	33-35	Fall	937	507.446	64.965	22.626	5.676
	Winter	361	367.413	60.753	10.490	5.025		Winter	939	539.847	60.525	25.505	5.238
	Spring	361	409.496	59.463	13.992	5.165		Spring	939	570.082	62.803	28.109	5.239
9-11	Fall	372	349.298	55.407	9.089	4.358	36-38	Fall	2481	499.486	65.363	21.956	5.720
	Winter	373	397.928	57.366	13.024	4.896		Winter	2492	538.749	60.330	25.421	5.227
	Spring	373	437.021	57.317	16.413	5.058		Spring	2494	570.550	62.146	28.172	5.262
12-14	Fall	454	389.209	59.009	12.284	5.002	39-41	Fall	5528	501.763	62.728	22.167	5.501
	Winter	455	428.556	58.093	15.679	5.027		Winter	5542	544.974	57.660	25.983	5.016
	Spring	454	457.278	60.167	18.198	5.242		Spring	5549	579.206	60.812	28.932	5.150
15-17	Fall	518	419.956	51.149	14.932	4.420	42-44	Fall	5988	511.177	62.874	22.994	5.529
	Winter	520	455.544	51.698	18.048	4.576		Winter	5996	553.312	58.342	26.706	5.060
	Spring	520	478.662	53.105	20.081	4.669		Spring	5997	588.275	60.374	29.707	5.103
18-20	Fall	567	434.767	49.995	16.206	4.387	45-47	Fall	7057	522.888	65.200	24.036	5.705
	Winter	566	467.719	52.708	19.127	4.650		Winter	7081	565.714	60.166	27.774	5.167
	Spring	567	497.273	56.207	21.716	4.894		Spring	7084	601.594	62.582	30.812	5.174
21-23	Fall	650	457.792	59.320	18.235	5.197	48-50	Fall	9684	543.147	64.554	25.812	5.618
	Winter	651	493.118	60.400	21.339	5.220		Winter	9717	588.390	61.932	29.712	5.244
	Spring	651	516.909	61.662	23.456	5.338		Spring	9720	627.891	66.010	32.953	5.265
24-26	Fall	733	467.718	59.245	19.126	5.176	51-53	Fall	13796	563.324	63.562	27.564	5.475
	Winter	734	501.059	59.240	22.064	5.134		Winter	13826	609.792	61.009	31.512	5.043
	Spring	736	526.788	62.602	24.326	5.362		Spring	13838	654.083	64.041	35.015	4.849
27-29	Fall	850	481.719	61.505	20.349	5.358	54-56	Fall	3116	569.418	64.712	28.093	5.529
	Winter	847	512.097	58.689	23.046	5.152		Winter	3116	615.548	61.332	31.994	5.025
	Spring	851	537.200	60.149	25.276	5.208		Spring	3119	659.199	63.445	35.431	4.763

Table 4.
Oral Language Standard and Raw Scores by Three Month Age Band.

Age in Months		n	Standard Scores Mean	SD	Raw Scores Mean	SD	Age in Months		n	Standard Scores Mean	SD	Raw Scores Mean	SD
3-5	Fall	279	324.789	52.780	5.358	5.962	30-32	Fall	828	494.714	59.394	29.150	9.010
	Winter	279	356.473	49.476	8.434	6.689		Winter	830	525.845	60.476	33.978	8.994
	Spring	280	382.089	51.145	11.518	7.212		Spring	827	555.492	66.218	38.300	9.327
6-8	Fall	361	348.266	50.733	7.521	6.516	33-35	Fall	931	504.021	64.786	30.576	9.798
	Winter	361	379.163	52.623	11.152	7.322		Winter	930	537.883	65.076	35.745	9.548
	Spring	361	407.116	56.053	14.978	8.025		Spring	929	568.350	72.093	39.968	9.757
9-11	Fall	373	358.276	43.676	8.630	5.207	36-38	Fall	2435	498.083	70.471	29.720	10.571
	Winter	373	394.528	42.593	13.206	5.996		Winter	2435	536.746	69.378	35.611	10.015
	Spring	372	424.691	43.273	17.581	6.569		Spring	2432	570.805	74.763	40.356	10.069
12-14	Fall	454	387.857	49.096	12.335	6.807	39-41	Fall	5473	500.526	65.260	30.155	9.910
	Winter	454	420.465	48.969	16.963	7.228		Winter	5471	543.484	63.687	36.649	9.287
	Spring	454	445.579	51.103	20.945	7.628		Spring	5470	580.611	70.797	41.695	9.467
15-17	Fall	518	406.886	42.940	15.062	5.985	42-44	Fall	5941	512.598	64.488	31.992	9.796
	Winter	519	439.952	40.923	20.110	6.429		Winter	5944	554.402	64.207	38.199	9.189
	Spring	517	466.783	44.366	24.468	7.002		Spring	5935	591.604	70.325	43.140	9.231
18-20	Fall	567	425.810	43.962	17.873	6.544	45-47	Fall	7020	525.214	66.759	33.886	9.951
	Winter	566	457.890	44.811	23.011	7.025		Winter	7025	569.563	66.879	40.276	9.222
	Spring	566	484.968	49.873	27.461	7.685		Spring	7014	608.481	73.374	45.236	9.305
21-23	Fall	648	446.378	46.747	21.222	7.374	48-50	Fall	9631	545.781	69.660	36.890	10.048
	Winter	647	477.467	48.875	26.263	7.780		Winter	9619	593.480	71.712	43.324	9.389
	Spring	649	506.757	56.306	30.968	8.529		Spring	9602	637.731	77.901	48.677	9.504
24-26	Fall	736	461.885	51.889	23.745	8.094	51-53	Fall	13744	565.949	68.915	39.764	9.612
	Winter	735	495.842	54.860	29.182	8.304		Winter	13741	616.193	70.898	46.178	8.894
	Spring	735	521.819	62.403	33.253	9.051		Spring	13718	666.840	75.651	52.073	8.922
27-29	Fall	851	475.449	56.884	26.093	8.773	54-56	Fall	3087	570.651	72.102	40.384	9.912
	Winter	850	506.695	57.469	31.032	8.850		Winter	3079	621.351	73.236	46.794	9.209
	Spring	847	534.590	62.444	35.238	9.055		Spring	3075	671.439	77.088	52.569	9.032

Table 5.
Cognitive Standard and Raw Scores by Three Month Age Band.

Age in Months		n	Standard Scores Mean	SD	Raw Scores Mean	SD	Age in Months		n	Standard Scores Mean	SD	Raw Scores Mean	SD
3-5	Fall	280	334.868	44.181	5.236	6.203	30-32	Fall	830	486.198	57.212	30.261	9.065
	Winter	280	366.989	43.722	9.400	7.224		Winter	830	521.608	60.105	35.857	9.181
	Spring	280	389.257	48.137	13.236	8.125		Spring	830	554.958	66.077	40.851	9.844
6-8	Fall	361	359.463	42.607	8.255	6.788	33-35	Fall	940	499.113	62.923	32.266	9.854
	Winter	361	383.479	48.758	12.247	8.045		Winter	940	538.506	63.995	38.381	9.624
	Spring	361	408.717	55.276	16.831	9.011		Spring	940	573.366	70.915	43.559	10.437
9-11	Fall	373	369.056	36.948	9.946	5.772	36-38	Fall	2498	497.117	63.924	31.912	10.160
	Winter	373	399.614	39.562	15.260	6.858		Winter	2498	543.725	65.859	39.119	9.970
	Spring	373	428.056	44.248	20.378	7.403		Spring	2498	583.271	70.007	45.046	10.413
12-14	Fall	455	392.196	44.499	13.859	7.510	39-41	Fall	5554	500.732	59.713	32.546	9.502
	Winter	455	423.316	48.356	19.497	8.049		Winter	5554	552.707	61.447	40.501	9.244
	Spring	455	445.127	54.601	23.334	8.761		Spring	5554	595.313	67.809	46.802	9.986
15-17	Fall	520	408.375	38.070	16.942	6.633	42-44	Fall	6000	511.798	61.892	34.269	9.720
	Winter	520	441.288	43.350	22.756	7.214		Winter	6000	562.964	62.185	42.027	9.310
	Spring	520	465.065	47.215	26.812	7.622		Spring	6000	606.330	67.231	48.407	9.876
18-20	Fall	567	424.439	40.998	19.765	7.070	45-47	Fall	7088	524.654	65.388	36.228	10.105
	Winter	567	455.570	46.831	25.192	7.695		Winter	7088	578.484	65.207	44.320	9.639
	Spring	567	484.556	57.018	29.977	8.886		Spring	7088	623.542	70.570	50.891	10.229
21-23	Fall	651	443.422	48.102	23.063	7.984	48-50	Fall	9725	547.240	68.657	39.636	10.437
	Winter	651	475.392	51.681	28.495	8.229		Winter	9725	604.455	69.201	48.123	10.147
	Spring	651	503.481	58.643	33.022	9.010		Spring	9725	653.918	76.291	55.219	11.043
24-26	Fall	736	455.327	49.941	25.135	8.167	51-53	Fall	13848	571.284	68.598	43.236	10.257
	Winter	736	490.594	54.272	31.033	8.537		Winter	13848	630.272	68.078	51.868	9.824
	Spring	736	518.678	63.842	35.435	9.759		Spring	13848	685.203	72.075	59.678	10.472
27-29	Fall	851	469.832	54.093	27.542	8.783	54-56	Fall	3122	579.122	71.305	44.373	10.628
	Winter	851	503.562	57.676	33.034	8.947		Winter	3122	638.492	69.104	53.025	9.936
	Spring	851	533.201	64.596	37.626	9.836		Spring	3122	692.758	72.236	60.744	10.567

Table 6.
Literacy Standard and Raw Scores by Three Month Age Band.

Age in Months		n	Standard Scores Mean	SD	Raw Scores Mean	SD	Age in Months		n	Standard Scores Mean	SD	Raw Scores Mean	SD
3-5	Fall	229	327.118	50.998	1.406	4.629	30-32	Fall	747	486.450	46.513	16.019	8.502
	Winter	240	351.283	57.856	2.504	6.607		Winter	761	512.469	47.031	21.062	9.616
	Spring	245	373.833	59.381	3.616	7.440		Spring	764	536.404	50.335	26.259	11.381
6-8	Fall	302	346.917	59.983	2.467	6.427	33-35	Fall	847	495.292	53.578	18.024	9.717
	Winter	313	371.089	64.306	3.802	8.635		Winter	873	527.931	52.237	24.520	11.158
	Spring	325	405.711	64.204	6.052	10.340		Spring	882	554.260	55.630	30.498	13.106
9-11	Fall	319	360.959	50.423	2.467	4.290	36-38	Fall	2306	498.011	56.351	18.699	10.120
	Winter	321	393.676	53.107	4.477	6.111		Winter	2351	538.021	56.299	26.934	11.884
	Spring	329	424.356	50.867	7.082	7.586		Spring	2371	569.615	59.616	34.365	13.801
12-14	Fall	383	387.044	53.246	4.042	6.539	39-41	Fall	5238	505.430	53.388	19.981	9.906
	Winter	399	418.446	51.453	6.496	7.852		Winter	5314	548.907	52.667	29.234	11.756
	Spring	416	437.952	50.928	8.596	8.995		Spring	5330	583.238	56.301	37.590	13.595
15-17	Fall	462	408.848	43.675	5.238	4.448	42-44	Fall	5678	516.199	53.563	22.143	10.547
	Winter	476	440.849	40.918	8.613	6.063		Winter	5773	559.538	51.390	31.679	11.862
	Spring	482	458.510	44.931	11.259	7.681		Spring	5808	594.322	54.929	40.355	13.571
18-20	Fall	490	425.706	48.745	7.178	6.736	45-47	Fall	6687	529.084	54.841	24.912	11.400
	Winter	491	455.175	48.534	10.945	8.105		Winter	6847	573.810	53.153	35.179	12.686
	Spring	512	476.609	54.035	14.553	10.489		Spring	6843	609.093	57.614	44.193	14.562
21-23	Fall	560	442.059	45.482	9.004	6.545	48-50	Fall	9169	548.479	56.771	29.300	12.607
	Winter	580	472.476	46.801	13.605	8.115		Winter	9337	596.006	57.134	40.826	14.205
	Spring	594	495.670	51.666	17.889	10.490		Spring	9362	635.152	62.540	51.084	16.167
24-26	Fall	647	457.887	46.591	11.250	7.759	51-53	Fall	13171	568.518	56.803	34.001	13.414
	Winter	654	486.985	47.722	16.092	9.465		Winter	13322	617.810	56.650	46.446	14.512
	Spring	669	509.031	52.567	20.475	11.326		Spring	13393	660.498	60.878	57.813	15.940
27-29	Fall	736	471.731	46.879	13.495	7.611	54-56	Fall	2930	574.078	59.491	35.467	13.925
	Winter	759	497.341	46.789	18.072	8.824		Winter	2972	622.038	58.680	47.631	14.807
	Spring	776	519.077	49.485	22.501	10.566		Spring	3000	663.869	62.721	58.781	16.222

Table 7.
Mathematics Standard and Raw Scores by Three Month Age Band.

Age in Months		n	Standard Scores Mean	SD	Raw Scores Mean	SD	Age in Months		n	Standard Scores Mean	SD	Raw Scores Mean	SD
3-5	Fall	225	340.613	35.899	0.640	2.740	30-32	Fall	747	490.837	48.109	12.582	6.024
	Winter	236	345.873	48.036	1.110	4.331		Winter	759	519.225	44.673	16.401	6.157
	Spring	233	354.893	56.790	1.639	5.312		Spring	769	541.956	47.664	19.766	6.898
6-8	Fall	295	345.278	48.118	1.092	4.389	33-35	Fall	850	499.138	52.245	13.827	6.471
	Winter	308	352.880	60.133	1.659	6.027		Winter	877	530.932	49.427	18.192	6.932
	Spring	319	385.273	69.130	3.339	6.787		Spring	898	559.396	52.243	22.416	7.753
9-11	Fall	305	345.439	38.534	0.803	2.857	36-38	Fall	2353	503.488	56.300	14.519	7.096
	Winter	313	376.486	54.196	2.364	4.274		Winter	2403	542.412	52.678	19.941	7.493
	Spring	324	413.914	57.454	4.765	5.199		Spring	2431	572.335	54.897	24.445	8.047
12-14	Fall	378	367.439	53.557	1.929	4.673	39-41	Fall	5294	509.813	52.890	15.281	6.885
	Winter	393	408.552	57.094	4.331	5.305		Winter	5390	552.639	50.392	21.432	7.346
	Spring	412	437.078	53.616	6.549	5.747		Spring	5437	584.993	53.647	26.351	7.983
15-17	Fall	457	394.201	52.151	3.265	3.820	42-44	Fall	5720	520.368	53.237	16.763	7.159
	Winter	471	434.679	47.739	6.231	4.429		Winter	5829	561.964	49.951	22.837	7.388
	Spring	476	461.271	44.548	8.868	5.031		Spring	5892	594.601	53.042	27.813	7.914
18-20	Fall	486	420.837	51.719	5.160	4.376	45-47	Fall	6739	532.163	53.666	18.457	7.477
	Winter	482	455.585	49.287	8.409	5.271		Winter	6906	575.563	50.703	24.905	7.596
	Spring	511	478.677	53.544	11.172	6.451		Spring	6940	609.470	55.099	30.054	8.185
21-23	Fall	555	439.989	49.803	6.825	4.734	48-50	Fall	9236	552.368	56.006	21.455	8.108
	Winter	583	473.021	47.247	10.348	5.509		Winter	9441	597.697	55.588	28.276	8.322
	Spring	588	498.980	49.374	13.636	6.531		Spring	9502	635.319	61.195	33.883	8.967
24-26	Fall	639	459.252	48.594	8.779	5.228	51-53	Fall	13230	571.517	55.686	24.315	8.280
	Winter	656	491.591	48.290	12.614	6.213		Winter	13428	618.369	55.296	31.390	8.243
	Spring	664	514.253	50.426	15.682	6.971		Spring	13576	661.314	60.138	37.676	8.682
27-29	Fall	736	473.402	47.529	10.420	5.382	54-56	Fall	2957	576.383	57.640	25.087	8.483
	Winter	760	502.878	44.934	14.118	5.888		Winter	3021	622.339	56.867	31.995	8.402
	Spring	774	525.776	47.232	17.373	6.691		Spring	3055	664.935	61.142	38.207	8.780

Table 8.
Reliability coefficients by scale score.

Sacle	Cronbach's Alpha	Person Reliability	Item Reliability	Person Separation Index	Item Separation Index
Social Emotional	.96	.95	.99	4.52	133.37
Physical	.94	.90	.99	3.04	71.87
Oral Language	.97	.96	.99	5.07	108.15
Cognitive	.97	.97	.99	5.36	89.07
Literacy	.96	.96	.99	4.84	135.58
Mathematics	.95	.94	.99	4.14	76.95

Table 9.
Kindergarten entry norms.

Scale		Mean	SD
Social Emotional	Raw Score	49.679	13.992
	Standard Score	614.662	91.612
Physical	Raw Score	32.777	5.198
	Standard Score	624.111	62.336
Oral Language	Raw Score	47.390	10.657
	Standard Score	628.905	84.863
Cognitive	Raw Score	51.102	13.922
	Standard Score	626.541	95.176
Literacy	Raw Score	51.692	17.980
	Standard Score	636.971	70.235
Mathematics	Raw Score	34.135	10.283
	Standard Score	637.176	70.620

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