

Teachers' Assessment of Preschoolers' Social and Emotional Competence: Does Sex of Children Matter in Developmental Outcomes?*

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Abstract – Behavioral and socio-emotional problems during early childhood have a lasting and profound impact on children's overall wellbeing and educational achievement and success. This study used the Wave 1 (2009) Early Development Instrument (EDI) data of 7938 kindergarten children in a Canadian province to examine gender-specific determinants of social competence and emotional maturity. The teachers' assessment of children's behavior on developmental areas, such as physical health and wellbeing, social competence, emotional maturity, language and cognitive skills, anxiety and fearfulness, communication skills, independence and attentiveness, and special skills were examined for both sexes, within a multivariate framework. The study revealed that boys scored consistently lower in all developmental areas than girls, after adjusting for age. When other variables were controlled, higher rates of independent and attentiveness predicted higher rates of social and emotional competence among boys and girls. Non-parental care before entry into kindergarten was predictive of lower levels of social and emotional development.

Keywords – Emotional maturity, Gender differences, Independence and attentiveness, Non-parental care, Social competence

I. INTRODUCTION

The early years of growth provide the foundation from which a child's later developmental trajectories can be predicted. Recognizing this, researchers have devoted a great deal of attention to the developmental assessment tools in order to understand patterns of children's behavioral and socio-emotional adjustments and well-being. Those children who enter kindergarten school with more internalizing problems, such as anxiety, depression, and withdrawal, and externalizing problems, such as hyperactivity and aggression, are hypothesized to experience particular challenges during and after their school years [1], [2]. Certain behavioral problems (e.g., impulsivity) might be considered typical of many children in their early years of development. While most children may either outgrow or learn to cope with such behaviors as they get older, but, some would continue to battle with problems compromising success in school and beyond [3]. Therefore, from both a theoretical and practical standpoint, it is important to understand and model early behavior patterns in developing and implementing appropriate strategies and support for children.

While there is no unanimous agreement among researchers about what factors contribute to varying developmental outcomes, one consistent finding is that early behavior problems can have long-lasting negative repercussions, especially in the areas of social competence and academic functioning [4], [5]. Gender disparities in student achievement have been the focus of developmental and clinical research, especially in the United States.¹ For instance, there is evidence to support the notion that externalizing behaviors (e.g., hyperactivity and aggression) are more common in boys than girls [6], with a sex ratio of approximately 10 boys for every one girl with externalizing behavior issues, particularly at school entry [1, p.464]. Another body of research has revealed gender differences in Attention Deficit Hyperactivity Disorder (ADHD). It has been reported that ADHD in the preschool and elementary school years are associated with low academic achievement, especially in the area of reading and mathematics [7]. Further, problems related to ADHD are more common in boys than girls, with a ratio of two-to-three boys for every girl in the population [8]. There are evidences of a strong inverse relationship between attention problems and expressive language development in boys in their preschool years [9]. Such differences in developmental trajectories suggest the need to consider sex of children as an important characteristic that may account for differential patterns of developmental outcomes. The insights thus obtained will help parents, educators, and policymakers in providing appropriate intervention and prevention efforts to close gender differentials in children's early years of life so that they can succeed in formal education and also strengthen their subsequent functioning.

Considering the long-term effects of children's behavioral problems on their overall health and wellbeing, the purpose of this study was to examine whether there are differences in young children's behavioral, socio-emotional and cognitive skills based on their sex. Data from a sample of 9641 Canadian children in kindergarten schools, collected by teachers in their classrooms, was studied for various aspects of development.

II. METHOD

A. Data

The Early Child Development Mapping Project (ECMap) Alberta, supported by the Ministry of Education, Alberta, Canada, is following a province-wide survey of preschoolers, which began in 2009. The data set for this study came from the Early Development Instrument (EDI), Wave 1 (2009), covering the developmental aspects of 9641 children in Alberta, Canada. The sample size was reduced to 7938 after the following restrictions were applied to the data: only those children who were in class more than one month, had no special needs, and had scores missing in no more than one domain were included. Questionnaires with no parental consent were excluded prior to applying these restrictions by the Offord Centre for Child Studies who did the initial cleaning of the data. The study includes five waves of data collection, the last being 2013. Therefore, Wave 1 data consisted of children who were disproportionately city dwellers (84 percent versus 16 percent). The reader is cautioned about this limitation in generalizing the findings from this study to other jurisdictions.

¹ In this paper, we use the terms 'sex' and 'gender' interchangeably acknowledging the fact that sex refers to biological differences and 'gender' to cultural differences. Our discussion is limited to only the variable sex in the data set, and not the socio-cultural relations or processes involved.

B. *The EDI*

One increasingly popular approach used to understand children's development during pre-school years involves the use of a rating system known globally as the EDI, developed at the Offord Centre of Child Studies, McMaster University in Canada [10]. It is based on an inventory of 103 questions that a teacher can use to rate a child's behavior in five domains of development: physical health and well-being, social competence, emotional maturity, language and cognitive development, and communication and general knowledge. As currently conceived by the EDI developers, the EDI is a multidimensional instrument composed of five quantitative domains,² used alone or in combination (as in the vulnerability measure). Two types of measures, interval and categorical, are derived from the EDI: (1) an interval-level measure for each domain, which varies from 0 (low skill/ability) to 10 (high skill/ability), treating the mean of the items contributing to each domain as a domain score; and (2) a categorical measure, the vulnerability score, which is calculated based on a comparison of children's scores with the lowest 10th percentile boundary for each domain. Thus, if a child's score falls below the lowest 10th percentile in one or more domains, a score of 1 (vulnerable) is given, otherwise, a score of 0 is given (not vulnerable).

For our purpose, children's developmental areas were assessed by kindergarten teachers' report on the EDI's 103 questions, characterized by seven dimensions based on two separate factor analyses, one involving 71 questions constituting five dimensions (physical health and wellbeing, social competence, emotional maturity, language and cognitive development, and anxiety and fearfulness) and another involving 18 questions constituting three dimensions (communication skills, independence and attentiveness, and physical strength).³ The items representing the physical developmental area from the two factor analyses were summed to produce one scale for our purpose here. Also included is a composite index of special skills, based on a total score on items, such as numeracy, literacy, visual arts, music, athletic/dance/drama, and problem solving.

C. *Variables*

The analyses presented here complement the work of Krishnan [11], [12], who studied at the factor structure of the EDI domains, keeping only those items that did not produce any cross-loadings or no-loadings, from a list of 103 questions administered to kindergarten teachers when children were attending kindergarten. Eight measures of development were included in the present analyses. The *physical health and wellbeing* area included 10 items that rate how children were dressed for school-related activities, whether or not they appear tired or sleepy, how well coordinated they are, and so on. The *social competence* domain included 23 items that rate how often they show cooperation, respect for property, responsibility, and the like. In general, the items in this scale measure children's ability to interact with others. The *emotional maturity* domain included 10 items that measure how children feel about themselves, others and the people around them (e.g., clean up mess and spontaneously helps). The *language and cognitive* scale included 24 items that show how eager they are to learn and identify sound and letters. The *anxiety and fearfulness* scale included eight items that rate how often they appear unhappy, sad, or depressed and shy. The *communication* scale included seven items that rate their interest in reading and writing, and their ability to articulate clearly. The *independence and attentiveness* scale included 7 items that rate their ability to play with children, work independently, neatly and carefully, and whether or not they exhibit temper tantrum. Finally, the *special skills* scale measured children's special or unique talents that are notable to others, that is, whether or not they demonstrated talents in numeracy, literacy, music, athletics/dance, or problem-solving in a creative way. Teachers were also given an opportunity to comment on other skill areas, but these were not coded and therefore were excluded from our analyses of special skills.

Also included were variables, age, sex, English/French first language, English/French second language, French immersion, aboriginal ancestry (North American Indian, First Nations, Métis, or Inuit), language delay, non-parental

² A different factor structure was found by Krishnan [11], [12], although not replicated by others.

³ When a Principal Components Analysis (PCA) of the 103 items was carried out on the EDI Alberta data, it yielded five areas of development from a total of 71 items: physical health and wellbeing, social competence, emotional maturity, language and cognitive development, and anxiety and fearfulness. Thirty two of the removed items that had either cross-loadings or no loadings were further analyzed within the framework of PCA. This analysis produced three components from a total of 18 items that may be labeled as: communication skills (7 items), independence and attentiveness (7 items), and physical readiness (4 items) [11], [12]. (The labels were based on Offord's classification of subdomains.)

care before entering kindergarten, repeating grade, and number of special problems⁴ that are likely to be associated with children's development. For example, early childhood experiences in center-based care may be associated with less favorable behavior outcomes, such as less self-control or more externalizing problems, in general [13].

III. RESULTS

D. Background Characteristics of the Children

Before conducting any multivariate analyses, preliminary analyses were performed including descriptive and One Way Analysis of Variance (ANOVA). To determine the relationship between gender and background variables and developmental measures, a correlation analysis was also performed. Table 1 summarizes the background characteristics of the children. The distributions of boys and girls are almost the same with 4029 boys and 3909 girls. The mean ages are 5.25 (SD=0.75) for boys and 5.27 (SD=0.55) for girls. While the children ranged in age from 3 years and 8 months to 7 years, more than 60 percent of both boys and girls were in the age range, 5 years 2 months to 5 years 4 months. Although the differences are not pronounced, slightly more girls were in French immersion than boys. The majority of boys and girls had their first language English/French 80.195 and 81.33%, respectively), with proportionately more boys than girls with their second language as English or French (13.98% and 12.67%, respectively). No noticeable gender differences were found in 'repeat grade or not', aboriginal ancestry, and non-parental care. Boys were reported to have more problems than girls that affected their ability to do school work (e.g., problems at home and speech impairment).

TABLE 1: BACKGROUND CHARACTERISTICS OF CHILDREN BY SEX

Characteristic	Boys		Girls	
	N	Percent	N	Percent
Age (years, month)				
<5 - 1	681	17.42	625	16.57
5-2 to 5-4	2383	60.96	2271	60.21
5-5 to 5-7	845	21.62	876	23.22
French immersion				
Yes	420	10.43	473	12.10
English/French first language				
Yes				
English/French second language	3092	80.19	3024	81.33
Yes	563	13.98	495	12.67
Aboriginal ancestry				
Yes	228	5.66	245	6.27
Language delay				
Yes	284	7.05	162	4.14
Repeating grade				
Yes	156	3.87	136	3.48
Non-parental care				
Yes	3646	90.49	3528	90.25
No. of special problems				
One problem	506	59.11	350	40.89
Two or more problems	222	68.94	100	31.06

⁴ Adopting a coding system that has been in place in the province of Alberta, children may be designated as having exceptional/special needs. These children were excluded from our sample. Teachers were also given an opportunity to report any special problem that can limit a child's ability to do school work in a regular class room, regardless of whether or not they faced other challenges or problems (e.g., physical, hearing and speech impairment) and the variable, *special problems* is derived from responses to such questions.

E. Areas of Development

Table 2 presents the means for the scores of the developmental areas and special skills. In all eight areas, scores for boys were consistently lower than that for girls; boys were, on average, were reported to be less socially competent, emotionally mature, and independent and attentive than girls. Although small in magnitude, gender differences in mean scores for anxiety and fearfulness and special skills were statistically significant ($p \leq 0.025$ and $p \leq 0.01$, respectively).

We calculated the summary scores for all the measures in Table 2 after they were standardized on the same scale using age as a standardized variable; all measures were standardized using the same means and standard deviations from age 5.27. Table 3 presents the means and standard deviations for the measures by gender and age. The mean scores increased from age 5.28 and up for both boys and girls. Across sexes, the pattern was similar, with particularly large changes observed among girls in their emotional maturity and communication skills. However, with this kind of exercises, we will know little about how different areas of development are associated with one another, and if any of these measures or children's background differentially influences the two sexes.

TABLE 2: MEANS AND STANDARD DEVIATIONS OF AREAS OF DEVELOPMENT BY CHILD SEX

Areas of Development	Boys				Girls			
	Mean	SD	SE	95% CI for mean	Mean	SD	SE	95% CI for mean
Physical health and wellbeing	8.12	1.85	0.029	(8.06, 8.18)	8.47	1.68	0.027	(8.41, 8.52)
Social competence	8.29	1.92	0.030	(8.23, 8.35)	9.12	1.36	0.022	(9.08, 9.16)
Emotional maturity	5.81	2.63	0.043	(5.72, 5.89)	6.87	2.50	0.041	(6.79, 6.96)
Language and cognition	8.47	1.93	0.031	(8.40, 8.53)	8.85	1.66	0.027	(8.79, 8.90)
Anxiety and fearfulness	8.86	1.55	0.025	(8.81, 8.91)	8.94	1.48	0.024	(8.89, 8.98)
Communication skills	7.01	2.92	0.046	(6.92, 7.10)	7.69	2.65	0.043	(7.61, 7.77)
Independence and attentiveness	7.73	2.23	0.035	(7.65, 7.80)	8.65	1.75	0.028	(8.60, 8.71)
Special skills	0.05	0.12	0.002	(0.05, 0.05)	0.06	0.15	0.002	(0.05, 0.06)

TABLE 3: MEANS AND STANDARD DEVIATIONS OF AREAS OF DEVELOPMENT BY SEX WITH AGE AS A STANDARDIZED VARIABLE

Areas of Development	Boys		Girls	
	Mean	SD	Mean	SD
Physical health and wellbeing				
<5.27 years	-0.100	0.656	0.052	0.568
≥ 5.28 years	0.002	1.034	0.230	0.904
Social competence				
<5.27 years	-0.187	0.808	0.165	0.551
≥ 5.28 years	-0.156	1.049	0.277	0.742
Emotional maturity				
<5.27 years	-0.160	0.759	0.099	0.733
≥ 5.28 years	-0.123	1.016	0.308	0.952
Language and cognition				
<5.27 years	-0.079	0.639	0.039	0.527
≥ 5.28 years	-0.044	1.032	0.152	0.864
Anxiety and fearfulness				
<5.27 years	-0.001	0.056	0.020	0.625
≥ 5.28 years	-0.068	1.044	0.027	0.997
Communication skills				
<5.27 years	-0.130	0.903	0.066	0.826
≥ 5.28 years	0.018	0.998	0.267	0.903
Independence and attentiveness				
<5.27 years	-0.176	0.811	0.149	0.620
≥ 5.28 years	-0.132	1.042	0.278	0.829
Special skills				
<5.27 years	-0.023	0.513	0.002	0.616
≥ 5.28 years	-0.002	1.003	0.087	1.199

F. Predicting Children's Social Competence and Emotional Maturity

To address the question of whether children's background characteristics and their areas of skills and development were related to their social and emotional development, we conducted four regression analyses. We excluded English/French first language, English/French second language, French immersion, aboriginal ancestry, and language delay from further analyses because of insufficient number of cases or lack of significant correlations between the independent and dependent variables. Table 4 presents the results from the regression analyses predicting social competence of boys and girls.

Both regression analyses predicting social competence were significant: $F(11, 2951) = 462.65, p \leq .000$ with a variance of 63.2% for boys and $F(11, 2850) = 451.11, p \leq .000$ with a variance of 63.4% for girls. In both regression equations, independence and attentiveness accounted for a significant amount of the variance in both the boys' and girls' social competence. The significant positive beta coefficient for independence and attentiveness indicated that the more independent and responsible children are as reported by their teachers, the more likely that they depict behaviors, such as cooperation and self-control that lead to social competence. The significant negative beta coefficient for language and cognitive skills indicated that the more children show interest in reading and writing, the less likely they appear socially competent. As one would expect, children who had been in non-parental care on a regular basis prior to kindergarten entry will likely limit their ability to interact and relate appropriately to their peers or react to unexpected

contexts. Neither the physical health and wellbeing aspect of children (measured with such indicators as coordination and level of energy) nor age added significantly to the explanation of social competence among boys.

Non-parental care, after controlling for other factors, did add significantly to the model predicting girls' social competence. Girls who had been in non-parental care on a regular basis are likely to be at a greater disadvantage in social competence than their counterparts who had not been in such care settings. Unlike in boys, physical health and wellbeing and age predicted social competence among girls, after controlling for other factors.

In the regression analyses predicting emotional maturity, both regression analyses were significant: $F(11, 2951) = 102.24, p \leq .000$ with an explained variance of 27.3% for boys and $F(11, 2850) = 118.22, p \leq .000$ with an explained variance of 31.1% for girls (Table 5). Non-parental care and repeated grade or not did not add significantly to the emotional maturity of neither boys nor girls. Whereas physical health and wellbeing did not contribute to the emotional maturity of girls, age did not contribute to the emotional maturity of boys, probably due to the fact that differences between the age groups are not large enough to show any significant impact. The strongest of all variables contributing to emotional maturity (as well as social competence) was independent and attentiveness, controlling other developmental aspects and background characteristics.

TABLE 4: REGRESSION ANALYSIS PREDICTING SOCIAL COMPETENCE BY GENDER

Variables in the model	Beta	t	Sig.
Boys			
Physical health and wellbeing	-.016	-1.096	.273
Emotional maturity	.056	4.323	.000
Language and cognition	-.090	-5.998	.000
Anxiety and fearfulness	.029	2.359	.018
Communication skills	-.064	-4.314	.000
Independence and attentiveness	.798	48.962	.000
Special skills	-.022	-1.927	.054
Non-parental care	-.045	-3.969	.000
Age	.014	1.259	.208
Repeated grade or not	-.022	-1.975	.048
No. of special problems	-.095	-7.480	.000
Constant (B= -.386)		-1.182	.237
Girls			
Physical health and wellbeing	.039	2.617	.009
Emotional maturity	.027	1.969	.049
Language and cognition	-.061	-4.074	.000
Anxiety and fearfulness	.058	4.611	.000
Communication skills	-.093	-5.994	.000
Independence and attentiveness	.787	49.702	.000
Special skills	-.026	-2.226	.026
Non-parental care	-.066	-5.808	.000
Age	.028	2.427	.015
Repeated grade or not	-.021	-1.860	.063
No. of special problems	-.058	-4.667	.000
Constant (B= -.504)		-1.947	.052

TABLE 5: REGRESSION ANALYSIS PREDICTING EMOTIONAL MATURITY BY SEX

Variables in the model	Beta	t	Sig.
Boys			
Physical health and wellbeing	-.054	-2.605	.009
Social competence	.111	4.323	.000
Language and cognition	.043	2.012	.044
Anxiety and fearfulness	.119	6.866	.000
Communication skills	.153	7.378	.000
Independence and attentiveness	.302	9.944	.000
Special skills	.060	3.738	.000
Non-parental care	.004	.240	.810
Age	-.009	-.562	.574
Repeated grade or not	.010	.602	.547
No. of special problems	.052	2.906	.004
Constant (B= 0.151)		.334	.738
Girls			
Physical health and wellbeing	-.029	-1.391	.164
Social competence	.051	1.969	.049
Language and cognition	.070	3.428	.001
Anxiety and fearfulness	.147	8.591	.000
Communication skills	.184	8.728	.000
Independence and attentiveness	.295	10.135	.000
Special skills	.093	5.874	.000
Non-parental care	-.019	-1.218	.223
Age	.046	2.904	.004
Repeated grade or not	.013	.857	.392
No. of special problems	.059	3.432	.001
Constant (B= -1.302)		-2.793	.005

IV. CONCLUSIONS AND DISCUSSION

Past research on developmental trajectories of preschoolers has demonstrated different patterns of behavior, especially in terms of externalizing behaviors. There are indications that social and emotional competencies in early years, if predictable, can better support children in their formal schooling and even in later years of life. While sex differences in academic achievement have been widely studied, much less attention has been directed toward examining whether social and emotional behavior and adjustment varies across the two sexes among preschoolers. The basic aim of this study was to address this issue. In this study, we found gender differences in all areas of development, after controlling for age. When all the five established domains of early development were considered, language and cognitive development emerged as the most important predictor of children's social competence. Among girls, however, the most important contributing factor of social competence was communication skills. It is notable that the independent and attentive scale emerged as the strongest of all predictors in both social competence and emotional maturity.

The statistically significant negative influences of non-parental home and social competence in both boys and girls warrant further exploration, particularly in light of recent increases in publically supported care centers and also female labor force participation rates. Exposure to larger peer groups in center-based care systems may enhance preschoolers' language and cognitive development. However, they may encounter other challenges that could interfere with their socio-emotional well-being, especially when they are cared for in centers with large child-staff ratios; children in care settings with a small group size and child-adult ratio may benefit from having more attention and resources available to them, affecting their social and emotional behaviors, positively. Additional research is needed to determine the

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mechanisms underlying the relationships between such variables as child-adult ratio and formal vs. informal care type and socio-emotional development.

In line with previous research (e.g., Prior et al., 1993), this study has found gender differences in social and emotional competencies, demonstrating that boys tend to manifest higher rates of externalizing problems than girls. Since externalizing problems, and thereby the social competence scale includes aggressive behaviors (e.g., gets into fights, bullies or being mean, kicks, and takes things), it is important to include questions relating to other forms of aggressive behavior. Girls may exhibit aggressive behaviors other than bullying or kicking, but cannot be thought of as free from aggressive behaviors. Future research must consider different forms of aggression and also examine the cultural context to which the differences occur (Jun-Li Chen, 2010), if any, in order to fully understand the externalizing problems in boys and girls.

There are conceptual and methodological limitations associated with this study, primarily because it is based on behaviors observed by teachers. Teacher reports, if supplemented with parental reports would have produced useful information on behaviors that are covert. On the methodological level, the cross-sectional nature of the data limits our ability to establish cause-and-effect relationships. Further, the sample is urban-based, making it difficult, among other things, to examine the association between child care arrangements and socio-emotional behaviors by urban-rural residence. Finally, we were limited in our examination of explanatory variables, such as ethnicity, socioeconomic status, and family status (e.g., lone vs. two-parent family) that may impact developmental outcomes.

With all these limitations, the findings of this study have important implications for early childhood educators. To a greater extent, children model their behavior from their teachers; classrooms become an important setting where they learn appropriate communication strategies and mannerisms. Educators need to be aware of this fact as well as the differential nature of maturation, adaptive skills, and the coping mechanisms of boys and girls so that they can provide gender-specific strategies to minimize behavioral problems in children. A better understanding of children's socio-emotional well-being will help educators, parents, and policymakers in providing assistance and support to those in need so that children can overcome their developmental and academic challenges.

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REFERENCES

- [1] Jun-Li Chen, J. "Gender differences in externalizing problems among preschool children: Implications for early childhood educators". *Early Child Development and Care*, 180 (4), 463-474, 2010.
- [2] Turney, K. & Kao, G. "Pre-kindergarten child care and behavioral outcomes among children of immigrants." *Early Childhood Research Quarterly*, 24, 432-444, 2009.
- [3] Campbell, S. B., Shaw, D. S., & Gilliom, M. "Early externalizing problems: Toddlers and preschoolers at risk for later maladjustment." *Development and Psychopathology*, 12, 467-488, 2000.
- [4] Campbell, S. B. *Behavior Problems in Preschool Children: Clinical and Developmental Issues*. New York: Guilford Press, 2002.
- [5] Moffitt, T. E. The neuropsychology of conduct disorder. *Development and Psychopathology*, 5, 135-151, 1993.
- [6] Prior, M., Smart, M. A., Sanson, A., & Oberklaid, F. "Sex differences in psychological adjustment from infancy to 8 years." *Journal of the American Academy of Child & Adolescent Psychiatry*, 32(2), 291-304, 1993.
- [7] Frazier, T. W., Youngstrom, E. A., Glutting, J. J., & Watkins, M. W. "ADHD and achievement: Meta-analysis of the child, adolescent and adult literatures and a concomitant study with college students." *Journal of Learning Disabilities*, 40, 49-65, 2007.
- [8] Graaetz, B. W., Sawyer, M. G., & Baghurst, P. "Gender differences among children with DSM-IV ADHD in Australia." *Journal of the American Academy of Child and Adolescent Psychiatry*, 44, 159-168, 2005.
- [9] Zevenbergen, A. A. & Ryan, M. M. "Gender differences in the relationship between attention problems and expressive language and emerging academic skills in preschool aged children." *Early Child Development and Care*, 180 (10), 1337-1348, 2010.
- [10] Janus, M. & Offord, D. "Development and psychometric properties of the Early Development Inventory (EDI): A measure of children's school readiness." *Canadian Journal of Behavioral Science*, 39(1), 1-22, 2007.
- [11] Krishnan, V. A comparison of Principal Components Analysis and Factor Analysis for Uncovering the Early Development Instrument (EDI) domains (unpublished manuscript), Early Child Development Mapping Project (ECMap), Faculty of Extension, University of Alberta, Edmonton, Alberta, 2011.
- [12] Krishnan, V. Introducing a School Preparedness Index for a Canadian Sample of Preschoolers Without Special Needs (unpublished manuscript), Early Child Development Mapping Project (ECMap), Faculty of Extension, University of Alberta, Edmonton, Alberta, 2011.
- [13] Loeb, S., Bridges, M., Bassok, D., Fuller, B., & Rumberger, R. W. "How much is too much? The influence of preschool centers on children's social and cognitive development." *Economics of Education Review*, 26, 52-66, 2007.