

# Chapter 8

## Constructing a Multidimensional Socioeconomic Index and the Validation of It with Early Child Developmental Outcomes

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### **ABSTRACT**

*The chapter focuses on the development of a socioeconomic index (SEI) using a Principal Components Analysis (PCA) of 26 variables at the Dissemination Area (DA) level for Alberta. First, the importance of socioeconomic factors in understanding child development outcomes is discussed, addressing the micro-macro level influences. Second, a description of the framework is provided along with the statistical procedures. Third, the results are presented, followed by a discussion of the benefits of having a summary measure in understanding kindergartners' developmental outcomes. The five components of SEI explained 56 per cent of the total variation in the overall index. The SEI patterns across Alberta were examined and the index was validated for its associations to the five domains of early child developmental outcomes, physical, social, emotional, language and cognitive skills, and communication and general knowledge. The index emerged as a strong correlate of all five domains with the strength of relationships varying across developmental domains and geography. A major strength of the procedure presented in the study is that it can be applied to different levels of geography and provides meaningful information to developmental research.*

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## INTRODUCTION

A decade or two ago, child development researchers focused on a child's biological characteristics in describing his or her development (Krishnan, 2011). However, in recent years, interest has shifted into a different direction by exploring children's developmental outcomes using a holistic approach. Thus, socioeconomic and cultural factors are incorporated into the research designs along with biological factors as predictors (Evans & Wachs, 2010; Lustig, 2010; Perreia & Smith, 2007; Program Effectiveness Data Analysis Coordinators of Eastern Ontario, 2009). Consequently, there is a growing theoretical and empirical literature making reference to several indicators and application of more sophisticated statistical procedures (e.g., Lee, 2014; Hoff, Laursen, & Bridges, 2012; Moore, Murphy, Bandy, & Lawner, 2014). In contrast, much of the early literature in the early 2000s made use of a composite involving few indicators or a single indicator as a proxy for defining socioeconomic status. In this context, the best-known are the Hollingshead four-factor index of social status (based on householder education and occupation) and the socioeconomic index of occupations (a measure of occupational prestige utilizing education and income data).<sup>1</sup> Researchers have argued that socioeconomic disadvantages (e.g., poverty) of communities and neighborhoods in which children live can be inversely related to such developmental outcomes as school readiness and educational performance (Crosnoe, 2007; Liu & Lu, 2008). Unfortunately however, based on studies of children and youth that appeared in three major journals over the period 1991-2000, researchers found the use of aggregate measures of socioeconomic status as a rare thing (Ensminger & Fothergill, 2003; see also, Hoff et al., 2012). In general, the literature lacks a contextually-based socioeconomic index in order to fully understand inequalities in early child developmental outcomes and a model that links it to the developmental outcome of interest.

This study fills the gap by developing a measure that summarizes multi-dimensional aspects of the socioeconomic conditions in a Canadian province at the Census Dissemination Area (DA) level as it allows for the possibility of comparing developmental outcomes across smaller as well as larger geographic areas in relation to the contexts in which children live. This exercise represents a significant departure from current strategies and the evidence might change the long-standing paradigm that a composite index will do it all; there may be situations where a particular component may be a better correlate of a certain domain of child development than others, and its relationship to development may vary across domains of development and at different geographic levels. Generally speaking, the approach used here in developing the index cannot be thought of as a radical departure from existing methodologies in index construction. However, it is anticipated that the index will add more value, especially when it becomes a generally acceptable yardstick to assess patterns and trends and also to monitor the relative position of communities and/or neighborhoods in developmental outcomes. The index would make it easier for tracking progress over time by developing a new and revised measure, with data collected through Censuses in the future, if necessary.

The chapter is organized as follows: First, the importance of socioeconomic factors in understanding child development outcomes is discussed. Second, the micro-macro level influences of socioeconomic factors on developmental health are outlined. This exercise is intended to make a case for adopting a macro approach in index construction. Third, a brief description of the framework for constructing the index is provided. This will help in rationalizing the use of a Principal Components Analysis (PCA) in order to construct the index. This is followed by a discussion of the computational procedures of the composite index utilizing the PCA approach. Then the results are discussed, both in terms of geographic distribution of the index and its component parts and their relationships to early child development outcome

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