Neighbourhood Socioeconomic Status and Early Childhood Development

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Introduction

Background
Evidence shows that census-based socioeconomic indices are reliable neighbourhood-level correlates of Canadians’ mental and physical health. Less is known about the extent to which these indices are associated with child development.

Objectives
This study examines the relationship between four frequently used Canadian indices of socioeconomic status (SES) and early child development.

Methods
We replicated the derivation of four established Canadian SES indices. Association of each index with early child development was examined using developmental health data from the Early Development Instrument (EDI). The strength of association was analyzed by comparing adjusted R² values of regressions using the indices as the independent variables and the EDI as the dependent variable (Tables 1 and 2). Effect sizes are also examined using the beta coefficients from these same regressions (Table 3).

SES Indices
Canadian Deprivation (CanDep) Index (Pampalon et al. 2009)
- Six variables from Canadian Census
- Two components - Material and Social

Socioeconomic Factor Index (SEFI) (Chateau et al. 2012)
- Four variables from Canadian Census
- One number index

Canadian Marginalization (CanMarg) Index (Matheson et al. 2012)
- 18 variables from Canadian Census
- Four components – residential instability, material deprivation, dependency, ethnic concentration

Early Childhood Mapping Project (ECMap) Index (Krishnan 2010)
- 26 variables from Canadian Census
- Five components – material, social and cultural systems and two unnamed ones.

Early Development Instrument

A 103 item teacher-rating questionnaire developed in Canada to measure developmental health of children in 5 domains physical health & wellbeing, social competence, emotional maturity, language & cognitive development, and communication & general knowledge (Janus & Offord, 2007)

 Defines children as vulnerable if they fall below the 10th percentile of Canadian children on any of the five EDI domains in the EDI. Summary measure used is overall vulnerability defined as being vulnerable on one or more EDI domains

Data aggregated to custom defined geographic neighbourhood-level for 2038 areas across Canada (from 12 out of the 13 provinces)

Discussion/Conclusions

Neighbourhood SES and its impact on early childhood development
The different amounts of variation explained between provinces indicate that 1) a clearer social gradient exists in some provinces than others, and 2) the degree of the association between SES and child development varies among jurisdictions. Nevertheless, the indices explained substantial amounts of variation in some domains. The patterns of differences between the strengths of association between material and social index components and specific EDI domains may point towards promising areas for improvement to decrease inequalities in early childhood outcomes. Further research refining the SES index will help to identify specific pathways and mechanisms through which the SES of a neighbourhood impacts aspects of child development.

Which attributes of SES make them better suited to analyze developmental outcomes?
There is a trade-off between explanatory power over the EDI and the simplicity/interpretability of the index. We also found that material, social and cultural (language/immigration) constructs were all necessary to include in an SES index because these three types of constructs all affect the domains of the EDI in different, but significant ways.

Future Research
Results from this study are informing ongoing work to construct a new SES index, specifically designed to analyze neighbourhood EDI vulnerability. The new SES index will be used to examine the mechanisms behind the differences in gradients observed between the provinces and domains. The new index will also be used in the analyses of changing gradients over time as well as differences in gradients between sub-populations in Canada.

References


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Table 1: Adjusted R-squared values of regressions on the overall percent vulnerability on the EDI in a neighbourhood for the four largest provinces and for Canada overall (N=2038)

<table>
<thead>
<tr>
<th>Province</th>
<th>CanDep</th>
<th>SEFI</th>
<th>CanMarg</th>
<th>ECMap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontario</td>
<td>0.31</td>
<td>0.31</td>
<td>0.30</td>
<td>0.33</td>
</tr>
<tr>
<td>Alberta</td>
<td>0.40</td>
<td>0.41</td>
<td>0.46</td>
<td>0.48</td>
</tr>
<tr>
<td>British Columbia</td>
<td>0.28</td>
<td>0.30</td>
<td>0.35</td>
<td>0.38</td>
</tr>
<tr>
<td>Quebec</td>
<td>0.17</td>
<td>0.14</td>
<td>0.15</td>
<td>0.17</td>
</tr>
<tr>
<td>Canada</td>
<td>0.17</td>
<td>0.16</td>
<td>0.17</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Note: Regressions included all components of a respective index as regressors, separate from each other.

Table 2: Adjusted R² values for regressions using in the five EDI domains and overall vulnerability as dependent variables and the components of the four indices as independent variables (each domain/index combination was a separate regression).

<table>
<thead>
<tr>
<th>EDI Indices</th>
<th>Physical Health and Well-Being</th>
<th>Social Competence</th>
<th>Emotional Maturity</th>
<th>Language and Cognitive Development</th>
<th>Communication Skills and General Knowledge</th>
<th>One or More Domains</th>
</tr>
</thead>
<tbody>
<tr>
<td>CanDep</td>
<td>0.12</td>
<td>0.10</td>
<td>0.15</td>
<td>0.19</td>
<td>0.07</td>
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<td>SEFI</td>
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<td>0.09</td>
<td>0.10</td>
<td>0.19</td>
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<td>0.16</td>
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<tr>
<td>CanMarg</td>
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<td>0.09</td>
<td>0.13</td>
<td>0.18</td>
<td>0.20</td>
<td>0.17</td>
</tr>
<tr>
<td>ECMap</td>
<td>0.24</td>
<td>0.13</td>
<td>0.17</td>
<td>0.25</td>
<td>0.27</td>
<td>0.25</td>
</tr>
</tbody>
</table>