

**Background**

Poor socioeconomic circumstances and gender disproportionately affect educational trajectories and outcomes such as high school completion and enrollment in post-secondary education in males over females [1]. There is currently a lack of information/research about how early in the life course these gaps develop, and if the effects of gender and socioeconomic status (SES) interact with each other. Specifically, we investigate whether males are disproportionately affected by gradients in SES in early childhood in all Canadian provinces and territories.

**Early Development Instrument (EDI)**

The EDI is an internationally-validated teacher-completed instrument measuring the developmental status of kindergarten-aged children on five domains: Physical Health and Well-being, Social Competence, Emotional Maturity, Language and Cognitive Development, and Communication Skills and General Knowledge [2].



**Data**

The study combines the EDI at the individual level with data from the Canadian Census and Taxfiler databases at the neighbourhood level [3]. The EDI data used are from one time point in all Canadian provinces and territories (N=316,086). A neighbourhood SES index was created using 10 socioeconomic variables from the Census and Taxfiler databases.

**Methods**

As shown in Fig. 1 and 2, domain scores are consistently higher for females than males, and for children from higher SES neighbourhoods. We therefore use a regression model to estimate the effects of gender and SES on each of the five domains, allowing for interaction between these two variables. The regressions use a multilevel structure, allowing for intercepts and effects to vary between neighbourhoods (Table 1). We use the Language and Cognitive Development domain as an example in this poster. Gender-SES interaction coefficients are shown for all domains in Table 2.

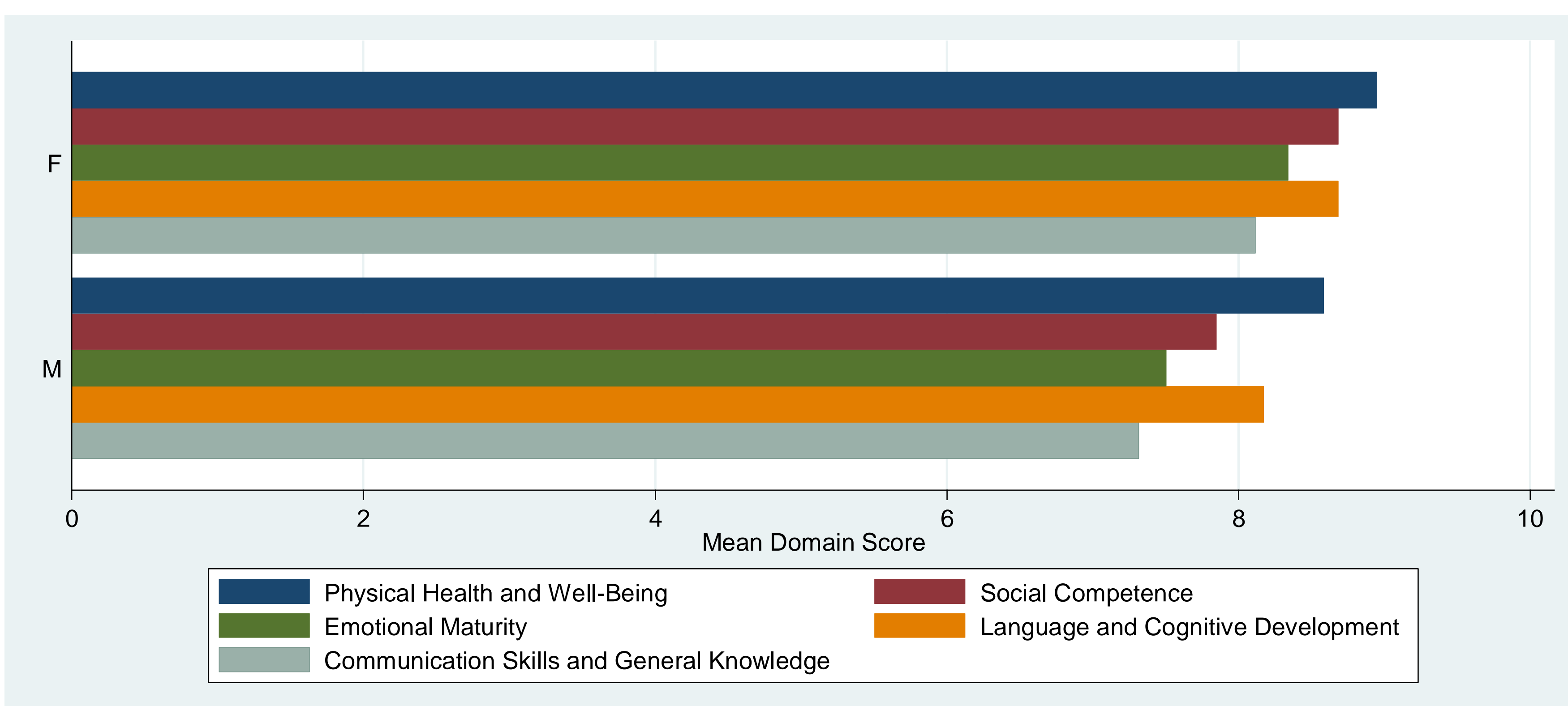


Figure 1: Mean EDI domain scores by gender

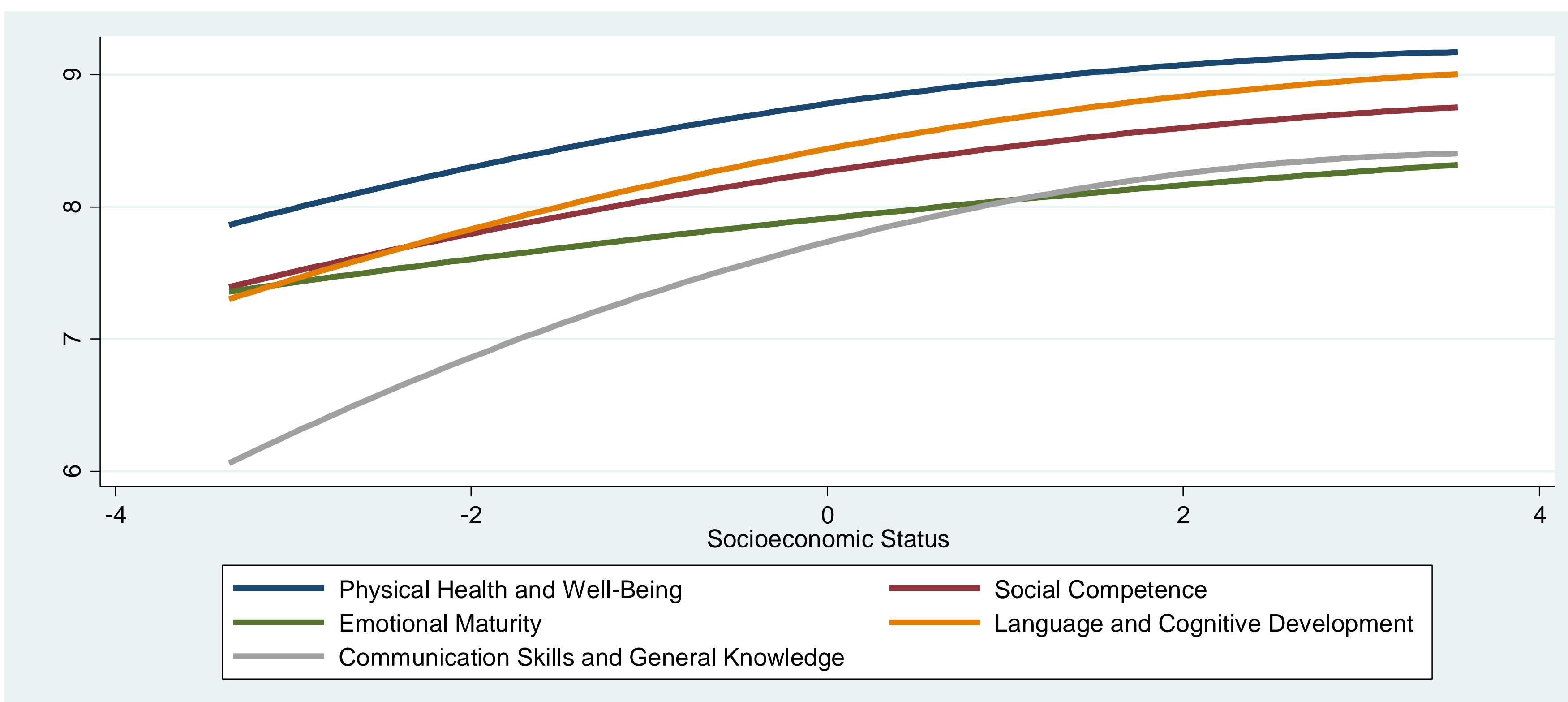


Figure 2: Mean EDI domain scores by neighbourhood socioeconomic status

**Results**

Table 1: Multi-level regressions. Dependent variable: Language and Cognitive Development domain scores (model 5 allows for random coefficients within neighbourhoods)<sup>1</sup>

	(1)	(2)	(3)	(4)	(5)
SES	0.240*** (0.00934)	0.244*** (0.00946)	0.213*** (0.00997)	0.200*** (0.0107)	0.199*** (0.0106)
SES Squared		-0.0197** (0.00678)	-0.0177* (0.00715)	-0.0123 (0.00769)	-0.0128 (0.00760)
Male			-0.516*** (0.00785)	-0.524*** (0.00778)	-0.528*** (0.00889)
Male x SES			0.0609*** (0.00634)	0.0617*** (0.00628)	0.0622*** (0.00720)
age at completion				0.738*** (0.0102)	0.737*** (0.0102)
Log-Likelihood	-630076.5	-630072.3	-626676.0	-624086.8	-624050.2

Standard errors in parentheses  
 \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

<sup>1</sup>A constant and Male x SES squared term were included in regressions but omitted from this table

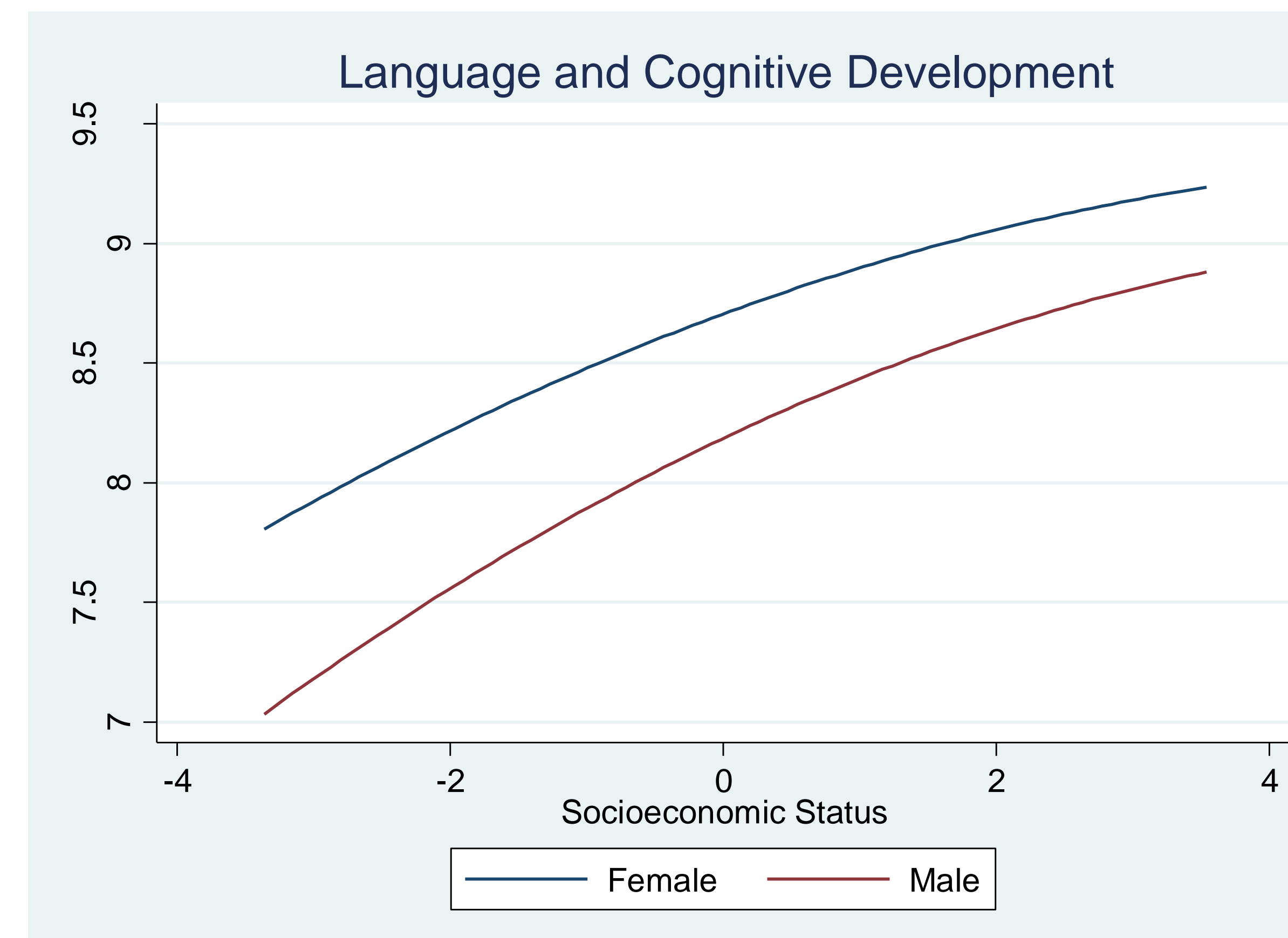


Figure 3: Model of the relationship between the Language and Cognitive Development domain of the EDI and Socioeconomic status by gender (uses model 5 above)

Table 1 shows that scores on the Language and Development domain are increasing at a decreasing rate over SES. Domain scores are significantly lower for males. The gender-SES interaction term is statistically significant, and remains so after controlling for children's age. Model 5 was the best fit, shown graphically in Fig 3.

The findings regarding the models' structures were similar for all five domains. Table 2 shows the gender-SES interaction coefficients for model 5 in each domain. The coefficient was statistically significant in all domains, but the magnitude of this term was largest in the Language and Cognitive Development domain.

Table 2: Values of beta coefficients for the gender-SES interaction term in each respective domain

Domain	Gender-SES Interaction Term
Physical Health and Well Being	0.02***
Social Competence	0.04***
Emotional Maturity	0.02**
Language and Cognitive Development	0.06***
Communication Skills and General Knowledge	0.04***

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

**Discussion/Conclusion**

Canadian children's kindergarten-age development follows a socioeconomic gradient, which is steeper for males than for females. Over the life course these gaps in development are likely amplified and put a strain on the educational, health, economic and judicial systems. Our results contribute to the evidence indicating that focusing policy on the known weaknesses in children from low SES neighbourhoods, and particularly males, could have immense benefits for the country as a whole.

**References**

- [1] Buchmann, C., DiPrete, T. A., & McDaniel, A. (2008). Gender inequalities in education. *Annu. Rev. Sociol.*, 34, 319-337. DOI: 10.1146/annurev.soc.34.040507.134719
- [2] Janus, M., & Reid-Westoby, C. (2016). Monitoring the development of all children: the Early Development Instrument. *Early Childhood Matters*, 40-5.
- [3] Guhn, M., Janus, M., Enns, J., Brownell, M., Forer, B., Duku, E., . . . Raos, R. (2016). Examining the social determinants of children's developmental health: protocol for building a pan-Canadian population-based monitoring system for early childhood development. *BMJ Open*, 6(4). doi:10.1136/bmjopen-2016-012020