Overview of select measures of occupational segregation used in our research papers

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Formula for the Index of Dissimilarity

We calculate the index of dissimilarity (DI) of gender occupational segregation as:

$$S = 0.5 \times \Sigma_i |q_i - p_i|$$

where

p_i = the proportion of women in occupation *i*,

q_i = the proportion of men in occupation *i*.

This formula indicates the proportion of women in occupation *i* (p_i) who would have to change occupations for the occupational distribution of women and men to be the same. A DI value of 0 means complete equality, whereas a value of 1 indicates complete segregation (Duncan & Duncan, 1955; Fox & Fox, 1987).

Decomposition of Changes in Indices of Dissimilarity Over Time

The index of dissimilarity (DI) builds on two aspects of the occupational distributions of two groups: 1) the extent of segregation within an occupation; and 2) the extent of the labour force in highly segregated occupations (Fox & Fox, 1987). Relatedly, the temporal changes in DI of gender occupational segregation can be decomposed into three components: 1) changes due to changing gender composition within an occupation (COMP); 2) changes due to changes in general occupation structure (mix) of the economy (MIX); and 3) the interaction between COMP and MIX (COMP * MIX) (Blau & Hendricks, 1979; Cotter et al., 1995; Fox & Fox, 1987).

Using mathematical notations, we calculate the COMP and MIX as follows:

$$COMP = \frac{1}{2}\left[\sum_i \left|\frac{q_{i2}T_{i1}}{\sum_i q_{i2}T_{i1}} - \frac{p_{i2}T_{i1}}{\sum_i p_{i2}T_{i1}}\right| - \sum_i \left|\frac{q_{i1}T_{i1}}{\sum_i q_{i1}T_{i1}} - \frac{p_{i1}T_{i1}}{\sum_i p_{i1}T_{i1}}\right|\right]$$

$$MIX = \frac{1}{2}\left[\sum_i \left|\frac{q_{i1}T_{i2}}{\sum_i q_{i1}T_{i2}} - \frac{p_{i1}T_{i2}}{\sum_i p_{i1}T_{i2}}\right| - \sum_i \left|\frac{q_{i1}T_{i1}}{\sum_i q_{i1}T_{i1}} - \frac{p_{i1}T_{i1}}{\sum_i p_{i1}T_{i1}}\right|\right]$$

where

T_{it} = total individuals employed in occupation i in year t

p_{it} = proportion of women in occupation i in year t

q_{it} = proportion of men in occupation i in year t

t = 1 the earlier time point

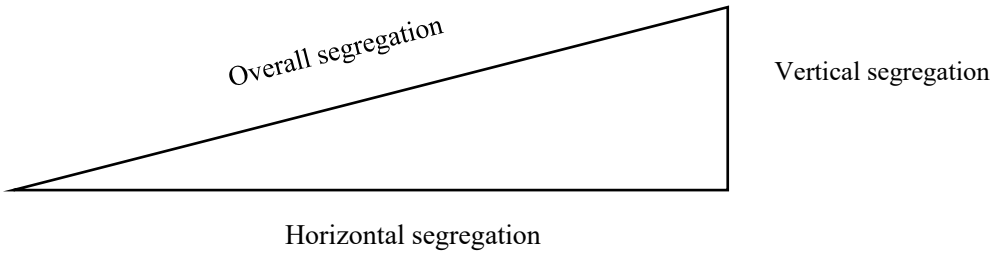
t = 2 the later time point

The formula for COMP shows changes in the DI from time 1 to 2 “that would have occurred if the size of each occupation had remained fixed” at time 1 (Blau & Hendricks 1979). This enables

us to capture the source of variation in DI between time 1 and time 2 that is due to changes in the gender composition within occupations. In turn, the formula for MIX displays changes in the DI from time 1 to 2 that would have occurred if the gender composition within each occupation had remained the same as time 1. This allows us to identify the source of changes in the change in DI between time 1 and 2 due to changes in the size of occupational categories (Blau & Hendricks, 1979). Finally, the interaction between COMP and MIX is the residual of the two: $(DI_{t2}-DI_{t1})$-(COMP+MIX).

Overall, Vertical and Horizontal Segregation (derived from Blackburn et al, 2001)

The relationship among overall, vertical, and horizontal segregation is visually demonstrated as follows:



Overall segregation in this variation of measurement is equivalent to the Gini index, which can be calculated as:

$$G = \sum_{i=2} \left[\sum_{1}^{i-1} \frac{F_t}{F} \times \sum_{1}^{i} \frac{M_t}{M} - \sum_{1}^{i} \frac{F_t}{F} \times \sum_{1}^{i-1} \frac{M_t}{M} \right]$$

where

n = total number of occupations

i = *i*th occupations in one's data

t = occupations included in the cumulative total (of occupations)

Ft = number of women in the occupation *t*

Mt = number of men in the occupation *t*

F = total number of women in the labour force

M = total number of men in the labour force

Vertical segregation: Somers'd, indicating indicates the strength and association between two ordinal variables (i.e., gender and occupations).

Horizontal segregation= $=\sqrt{(overall\ segregation)^2 - (vertical\ segregation)^2}$

(Blackburn et al., 2001).