Problem Set #[1]

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Problem 1

Part (a).find a model

According to Mads Meier Jger and Richard Breens publication A Dynamic Model of Cultural Reproduction in American Journal of Sociology, I find a simple version of statistical model describing the intergenerational transmission of cultural capital.

Part (b).give a citation

Mads Meier Jger and Richard Breen, "A Dynamic Model of Cultural Reproduction," American Journal of Sociology 121, no. 4 (January 2016): 1079-1115. DOI: 10.1086/684012

Part (c).write down the model

$$\mathrm{C}_c = \beta_1\theta_p + \beta_2\mathrm{S}_p + \beta_3\mathrm{X}_p + \beta_4\mathrm{A}_c + \mathrm{L}_c$$

This model only considers the condition that one family only has one child. C represent the childs cultural capital and subscripts c AND p, respectively, the child and parents. Cultural reproduction theory believes that parents possess a stock of cultural capital and they would transmit some of this to their child by parents actively investing and child passively acquiring. So S p denote parents total stock of cultural capital and Theta p denote parents actively investing into their childs cultural capital. Beta1 and Beta2 is the passive rate of transfer of cultural capital from parents to child. Moreover, the childs cultural capital also depends on parents socioeconomic resources Xp, and the childs academic ability Ac, which could be assume to be constant. Lc is the luck. Beta3 and Beta4, which represent certain size of Xp and Ac respectively, are constant greater than zero. These elements form a basic model of intergenerational transmission of cultural capital.

Part (d).list variable

From the model, we could know that Cc is the endogenous variables, which denotes childs cultural capital, and it is the output of the whole model. Theta p (parents actively investment), Sp(parents total stock of cultural capital), Xp(parents socioeconomic resources), Ac(childs academic ability) and Lc(luck) are exogenous variable, which are input and determines outside the model.

Part (e).classify the model

This model is a linear model because it describes a continuous response variable as a function of one predictor variable. This model is not state at a specific time instant so it not a static model. It used to represent interaction between parents and child and the dynamic cultural transmission process. The beta1 and beta2 are not constants and they would change in different stages of child. So this model is a dynamic

model. In addition, this model is also a deterministic model, other than stochastic model. The output, childs cultural capital of the model is fully determined by the parameter values and the initial conditions. The same set of exogenous parameter value will lead to same outputs.

Part (f).

However, this model has some flows. It can only apply to the condition that the child is stay at home for most of time. Sometimes, the child goes to boarding school. The time he/she spends with his/her family is really short. Parents socioeconomic resources and total stock of cultural capital will not be that affective to child. So we can add a variable of feature, average time the child stay with his/her family Tc into the model, and multiply it by Beta5, a certain rate

Problem 2

Part (a).write down model

$$\begin{aligned}\text{lifespan}_i = \beta_0 + \beta_1 \text{gender}_i + \beta_2 \text{income}_i + \beta_3 \text{healthindex}_i + \beta_4 \text{smoke}_i + \beta_5 \text{genre}_i \\ + \beta_6 \text{numberofworks}_i + \beta_7 \text{environment}_i + \epsilon_i\end{aligned}$$

Part (b).

The lifespan of popular musicians is mainly decided by three aspects. The aspect is musicians' population characteristics, such as the gender, income, smoke or not, healthy or have diseases. The second aspect is his music characteristics, for instance, his music genre, his number of works being published. The last aspect of variables is the outside characteristics, such as the access to water and air polluation.

Part (d-e).key factors

The exogenous factor that can influence this outcome is

- Gender(G): the life expectancy of different gender is different.
- Music Genre(GR): different music genre will represent different emotion of musicians and attitude towards life of musicians. For example, Death Metal sometimes can deliver musicians desperation of life. And the emotion of musician can influence their life expectancy.
- Number of works he/she published (N): Sometimes, the more the number of works they release, the more workload they have. So they will spend short time with family and friend to relax themselves. And as a result, they would have shorter life-span.
- Health index(H): from their health report every year, we can extract a health index to represent their health condition. Their health condition can make big difference to their life-span.

- Income(I): Income can be different every year and various income can affect the life expectancy of musician.
- Environment Pollution(E): It include air pollution and water pollution in certain time. Serious pollution can cause shorter life expectancy.
- Smoke(S): Some personal habit, such as smoke can also has bad impact on musicians' health, and as a result, make their lifespan shorter.

Part (f).how to test

To test my key variables in my model, I will do two steps. The first step is gathering data from Internet. I will randomly select a group of musicians and get all the variables I need from the Internet. Because my model is a linear model, so the second step is to use these data conducting regression analysis by RStudio. After I do that, I can see the significant of each factor. Then I will try stepwise selection select the predictors of my model. Then, to make sure no simultaneous influence of two variables on a third, I will add interaction term to test it.