Problem Set #1

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Problem 1

Part (a). Find a theoretical or statistical model.

The article I found is Parenthood and Happiness: Effects of Work-Family Reconciliation Policies in 22 OECD Countries.

Part (b). Give a detailed citation.

Glass, Jennifer, Simon, Robin W., and Andersson, Matthew A. *Parenthood and Happiness: Effects of Work-Family Reconciliation Policies in 22 OECD Countries.* American Journal of Sociology 122, no. 3 (2016): 886-929.

Part (c). One of the models from the paper is:

$$Y_{ij} = \beta_{0j} + \beta_{1j} X_{1ij} + \beta_{2j} Z_{ij} + E_{ij}$$

This is the fixed-effects procedure that models country-level differences in the effect of parenthood on happiness, net of sociodemographic variables. In this model, Y_{ij} is the happiness of individual i in country j, X_{1ij} is the parental status (1 if parent), and Z_{ij} is the vector of individual attributes (age, gender, education, income decile, marital and employment status, etc.).

Part (d). List which variables are exogenous, which variables are endogenous.

Exogenous variables of this model are X_{1ij} and Z_{ij}, which are inputs to the model. Endogenous variable of this model is Y_{ij}, which is the output of the model.

Part (e). Classify the model.

The model is static because it does not have time-dependent changes.
The model is linear because it's in the linear format.
The model is stochastic because it has an error term E_{ij}.

Part (f). List a variable or feature that you think the model is missing that might be valuable.

I think it would be helpful to include a personality test and we can code the personality of each respondent into an exogenous variable. From my perspective, a person's inherent personality type plays an important role in determining the level of happiness and the ability to cope with stress.

Problem 2 Part (a) (b) (c). Write down a model of whether someone decides to get married

$$y^* = \alpha + \beta_1 Family + \beta_2 Age + \beta_3 Relationshipstatus + \beta_4 Income + \beta_5 Partnergender + \beta_6 Gender + \beta_7 Race + \epsilon_i$$

$$y_i = \begin{cases} 1 & if \ \ y_i^* > \gamma \text{ (Decides to get married)} \\ 0 & if \ \ y_i^* \leq \gamma \text{ (Decides not to get married)} \end{cases}$$

where γ is the threshold

I used the latent variable approach to build this model, and y^* is the underlying latent propensity that $y = 1$. In this model, *Family* is a dummy variable, and it stands for whether parents divorced or not. *Age* is the age of the respondent. *Relationshipstatus* indicates whether the respondent is currently in a relationship or not. *Income* is the average income per year. *Partnergender* is a dummy variable, and it is 0 if the respondent's gender is the same as his or her partner and 1 if the respondent's gender is different from his or her partner. *Gender* is a dummy variable. 0 is female and 1 is male. *Race* stands for the respondent's race.

Part (d) (e). What are the key factors and why?
I think *Family*, *Age*, *Relationshipstatus*, *Partnergender* and *Income* are the key factors in this model.

- *Family*: I think *Family* is one of the most important factors in this model. Here *Family* is specified as whether parents are divorced or not. The influence of parents' marital relationship quality will shape children's attitude toward marriage and divorce, so from the perspective of social learning theory in psychology, parents' marital status and marital relationship quality will impact whether a person decides to get married or not.

- *Age*: People may get married at various age, but a slightly higher percentage of people tend to get married within certain age range such as 25-35. Also, the percentage of people who get married younger than 20 years old or older than 40 years old is much lower than those typical ages.

- *Relationshipstatus*: Whether someone is in a relationship and whether the relationship status is steady also play important roles in determining whether someone will be more likely to get married.

- *Partnergender*: Same-sex marriages still face challenges such as incomplete legislation and isolation nowadays, so the percentage of heterosexual couples who decide to marry may be much higher than that of homosexual couples.

- *Income*: Getting married means more responsibility so a steady financial status and whether someone's income will be able to afford daily expenses are also taken into account when someone decides whether to marry or not.

Part (f). How to test?

I plan to design a survey and recruit participants from Amazon MTurk to test my model. Participants will be asked to fill out a survey about they age, race, gender, parental marriage status, average income per year, and current relationship status. After these background questions, participants will be asked if they decide to get married in the near future. Then I will run a multiple linear regression analysis on the survey data to see whether the predictor variables are significant.