SPSS Example Analysis

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Research Question

How has cost of preschool child care increased in Virginia from 2008 - 2018?

National Database of Childcare Prices: https://www.dol.gov/agencies/wb/topics/featured-childcare

The National Database of Childcare Prices (NDCP) offers childcare price data by childcare provider type, age of children, and county characteristics. Data are available from 2008 to 2018.

Our data has one row per Virginia county per year from 2008 to 2018.

Import data

1. File…Import Data…Excel…
2. Select "va_childcare_prices.xlsx" and click Open
3. In the Read Excel File preview, ensure first row of data is used for variable names.
4. Click OK
5. Save data as SPSS data file (.sav). File…Save As…, enter a file name such as "va_child_care" and click Save.

Inspect Data

Add Variable labels and ensure variable have appropriate Measure type.

1. In the Data Editor, go to the Variable View tab
2. Add Variable labels in Label column
    - Add label "Median Price of Center-Based Care – Preschool" for variable "MCPreschool"
    - Add label "Year" for variable "StudyYear"

3. Ensure variable County_FIPS_Code has Measure type "Nominal"

The MCPreschool variable reports "Aggregated weekly, full-time median price charged for Center-based Care for preschoolers (i.e. aged 36 through 54 months)"

Summarize and visualize

Calculate mean cost of Preschool by Year

1. Analyze…Compare Means…Means…
2. Add MCPreschool to Dependent List, add StudyYear to Independent List
3. Click OK.

Cost appears to be rising about $3 per year.

Visualize Preschool cost by county over time

1. Go to Graphs…Chart Builder…
2. In the Gallery select Line, and drag the Multiple Line icon to the palette.
3. Drag StudyYear to "X-Axis?" box
4. Drag MCPreschool to "Y-Axis?" box
5. Drag County_Name to "Set color?" box
6. Click OK

The resulting spaghetti plot is a little messy, but overall we see preschool cost increasing for all counties over time. In addition the trajectory of increase looks similar for all counties, though there is a great deal of variation in cost between the counties.

Model preschool cost as a function of year with county as a random effect

This is an example of a multilevel model, or a random-intercept mixed-effect model.

1. Go to Analyze…Mixed Models…Linear…
2. In the "Specify Subjects and Repeated" dialog, add County_Name to the Subjects Field and click Continue
3. In the "Linear Mixed Models" dialog
    - add MCPreschool to the Dependent variable field
    - add StudyYear to Covariate field
4. Click the Fixed… button
    - Click StudyYear and click Add.. Then click Continue.

5. Click the Random… button
    - in the Subject Groupings section at bottom, click County_Name and then click the arrow to add to Combinations.
    - check the box Include Intercept
    - click Continue
6. Click the Statistics… button and check the boxes for "Parameter estimates for fixed effects" and "Covariances of random effects". Click Continue
7. Click OK

Interpretation

In the output under Estimates of Fixed Effects, we see a StudyYear coefficient of 3.020 and a 95% confidence interval of [2.859, 3.180]. This estimates the cost of Preschool increasing by about $3 per week each year from 2008 - 2018.

In the output under Estimates of Covariance parameters, we see two estimates for variance:

1. Residual: this is the variability *within* each county.
2. Intercept/County_Name: this is the variability *between* each county.

Clearly there is much more variability between counties than within counties.

Some researchers and journals like to report Intraclass Correlation Coefficients (ICC). This is the Intercept/Group variance divided by the total variance.

$$\text{ICC} = \frac{1973.786}{1973.786 + 73.151} = 0.964$$

About 96% of the variability in pre-school cost is due to County, or location.

Save Viewer file

We can save our analysis results for later review or to share with colleagues.

In the Viewer window, click File…Save As…, type a name such as "analysis_results" and click Save. This saves an SPV file that requires SPSS to view.

To create a PDF file that anyone can view:

1. right click in the Viewer window,
2. click Export,
3. in the Objects to Export, select "All visible"
4. under "Type:" make sure PDF is selected,
5. Click Browse… to choose where to save the PDF file, give it a name, and click Save

6. Click OK