PSYC 575 Multilevel Modeling: Prospectus
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Our project, culminating in a final paper, will investigate whether participating in various extracurricular activities predicts changes in empathy scores in children over time. The data is taken from a longitudinal study at the Brain and Creativity Institute investigating the effects of music training on various cognitive, social, and motor abilities in children. There is debate over the impacts music training has on non-musical skills, such as social and emotional capabilities, though several studies suggest increased empathy in children after a variety of group music-making activities (Kirschner & Tomasello, 2009; Laurence, 2008; Rabinowitch et al., 2012). Children in the present study participated in either a Music, Sports, or Control group. The Music group (n = 26) was comprised of children who participated in after- school music training 4-5 days per week. The Sports group (n = 28) participated in after-school soccer and swimming programs 3-5 days per week. The Control group (n = 29) did not participate in a systematic after-school program for the duration of the study. While participants took part in a wide range of assessments, assessment of empathy was chosen as the factor of interest for this project.

The dataset we are using is longitudinal panel data, where all study participants were administered three empathy tests yearly for 5-6 years. Tests used were Bryant's Index of Empathy for children, measuring emotional empathy and has a maximum of 22 total points (Bryant, 1982); The Video Emotion Test (Goldstein and Winner, 2012), evaluating understanding of others' emotional states (Goldstein and Winner, 2012); and RMET (reading the mind in the eyes), measuring understanding of others' emotional states based on facial expression only around their eyes (Baron-Cohen et al., 2001). Previous work on this data set shows no differences at baseline in empathy skills between the three groups of children, providing an excellent baseline for longitudinal studies of music training and sports programming on empathy in children (Habibi et al., 2014).

We will use a multi-level analysis with time as the Level-1 variable and subject as the Level-2 variable. We will use group (Music, Sports, and Control; Figure 1) as a time-invariant (Level-2) predictor to assess the interaction between group and time; that is, whether changes in empathy within individuals over time can be predicted by whether they participated in the music, sports, or control group. We will analyze each of the three empathy outcome measures separately. First, we will perform an attrition analysis to investigate whether those who dropped out of the study differ on any of the variables from those who remained in the study. We will also test for group differences in baseline age and gender to determine whether they should be included as time-invariant covariates in the model, as age and gender have previously been shown to influence cognitive empathy (Schwenck et al., 2014). We are primarily interested in differences in the trends of the empathy measures between the three groups while holding constant other variables which may influence empathy scores. We will model within-subject growth curves (random slopes) for empathy scores across time, and include a measure of verbal ability (time-varying and time-invariant) from the WASI test as covariates of no interest. The data analytic scripts and supplemental materials for this project will be available at https://github.com/eherschel/Music_Sports_Empathy.

References

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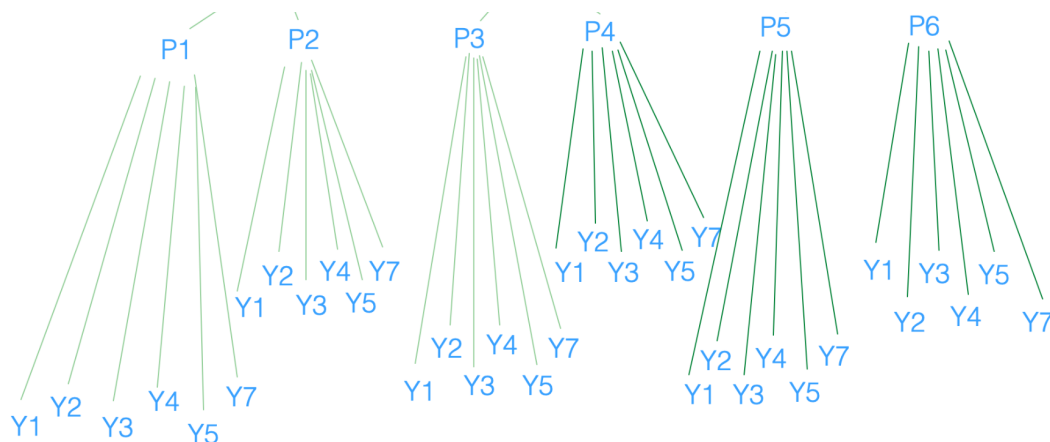
Supplemental Materials

Figure 1: Network Graph of Data Structure.