**PSQF 6271 Longitudinal MLM Formative Assessment #3: Lesa’s Answer Key**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Parameters:** | **Otherwise known as (list synonyms):** |  | **GLM:** |  | **For Multilevel Models: Time = 0,1,2,3** |
|  | Regression Empty Model |  | Empty Means, Random Intercept Model | Fixed Linear Time, Random Intercept Model | Random Linear Time Model |
|  |   |  |   |   |   |
|  | $y\_{i}=β\_{0}+e\_{i}$  |  | $$ y\_{ti}=β\_{0i}+e\_{ti}$$ |  $y\_{ti}=β\_{0i}+β\_{1i}(Time\_{ti})+e\_{ti}$ |  $y\_{ti}=β\_{0i}+β\_{1i}(Time\_{ti})+e\_{ti}$ |
|  |   |  | $$ β\_{0i}=γ\_{00}+U\_{0i}$$ | $$ β\_{0i}=γ\_{00}+U\_{0i}$$ | $$ β\_{0i}=γ\_{00}+U\_{0i}$$ |
|  |   |  |   | $$ β\_{1i}=γ\_{10}$$ | $$ β\_{1i}=γ\_{10}+U\_{1i}$$ |
|  |   |  |   |   |   |
| Terms that are Fixed Effects(and their interpretations in that model) | Model for the Means; Structural Model; constant part everybody gets to build their predicted outcome |  | $β\_{0}$ = fixed intercept = grand mean |  | $γ\_{00}$ = fixed intercept = grand mean of person means | $γ\_{00}$ = fixed intercept = predicted mean *at time 0*$γ\_{10}$ = fixed time slope = average change in $y\_{ti}$per unit time | $γ\_{00}$ = fixed intercept = predicted mean at time 0$γ\_{10}$ = fixed time slope = average change in $y\_{ti}$per unit time; *now average slope of person slopes* |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
| Terms that will haveLevel-2 variances(and their interpretations in that model) | Between-Person; inter-individual, time-invariant, random effects, G matrix |  | $e\_{i}$ = person-specific residual; total deviation from sample mean for person *i* |  | $U\_{0i}$ = random intercept = deviation of person mean from grand mean of person means | $U\_{0i}$ = random intercept = deviation of person mean from grand mean of person means | $U\_{0i}$ = random intercept = deviation of person mean from grand mean of person means *at time 0*$U\_{1i}$ = random time slope = deviation of person slope from grand mean of person slopes |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
| Terms that will have Level-1 variances(and their interpretations in that model) | Within-Person, intra-individual, time-varying, residual, R matrix |  | ($e\_{i}$ could also go here, in the sense that it is a single-level model, although $e\_{i}$ does not go with WP in this model) |  | $e\_{ti}$ = residual = time-specific deviation from person mean for person *i* | $e\_{ti}$ = residual = time-specific deviation from level-2 predicted outcome for person *i* | $e\_{ti}$ = residual = time-specific deviation from level-2 predicted outcome for person *i* |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |