* 1. Aggregation of data to macro level units runs the risk of the ecological fallacy, as you cannot infer that a macro association translates into the same micro effect.   
     *- Correct, aggregation of data to macro unit can run the risk of the ecological fallacy. For example, there is a group level correlation between the proportion of Hispanic voters in US states and the republican vote percentage. This does not imply that Hispanic voters vote republican.*
  2. Disaggregation of data to micro level units runs the risk of the ecological fallacy, as you cannot infer that a macro association translates into the same micro effect.   
     *- Incorrect*
  3. Aggregation of data to macro level units runs the risk of the ecological fallacy, as you cannot infer that a micro association translates into the same macro effect.   
     *- Incorrect*
  4. Disaggregation of data to micro level units runs the risk of the ecological fallacy, as you cannot infer that a micro association translates into the same macro effect   
     *- Incorrect*

1. In a random effects ANOVA, Yij = γ00 + u0j + εij
   1. γ00 is the fixed intercept term, u0j a residual at the individual level, and εij a random effect at the group level   
      *- Incorrect*
   2. γ00 is the random intercept term, u0j a residual at the individual level, and εij a random effect at the group level   
      *- Incorrect*
   3. γ00 is the random intercept term, u0j a random effect at the group level, and εij a residual at the individual level   
      *- Incorrect*
   4. γ00 is the fixed intercept term, u0j a random effect at the group level, and εij a residual at the individual level   
      *- Correct*
2. Random effects ANOVAs (i.e., Yij = γ00 + u0j + εij) do not assume that
   1. u0j is normally distributed with a mean of 0 and variance   
      *- Incorrect, this is an assumption of the random effects ANOVA*
   2. εij is normally distributed with a mean of 0 and variance   
      *- Incorrect, this is an assumption of the random effects ANOVA*
   3. Residuals are normally distributed with a mean of 0 and variance   
      *- Incorrect, this is an assumption of the random effects ANOVA*
   4. Yij is normally distributed with a mean of 0 and variance   
      *- Correct, there are no assumptions about the normality of the distribution of the outcome variable, just about the distribution of residuals.*
3. For a random effects ANOVA, the intra class correlation is:
   1. the proportion of variance explained by the group   
      *- True, but incorrect response*
   2. the correlation between two randomly drawn individuals in one randomly drawn group   
      *- True, but incorrect response*
   3. the variance of the intercept as a proportion of total variance   
      *- True, but incorrect response*
   4. All of the above  
      *- Correct response*
4. For this random intercept multilevel model, Yij = γ00 + γ10 Xij + u0j + εij
   1. There are two fixed and two random/residual effects   
      *- Correct, there are two fixed effects (*γ00 + γ10 Xij *) and two random effects (*u0j + εij)
   2. There are three fixed and one random/residual effect   
      *- Incorrect*
   3. There are one fixed and three random/residual effects   
      *- Incorrect*
   4. There are four fixed effects.   
      *- Incorrect*
5. Looking at Yij = γ00 + γ10Xij + u0j + εij
   1. If we removed or set γ00 to equal 0, we would have a random effects ANOVA   
      *- Incorrect*
   2. If we removed or set γ10 to equal 0, we would have a random effects ANOVA   
      *- Correct, the random effects ANOVA is the same as a multilevel model in which there are no predictors, just random effects for group, and error term, and an intercept parameter*
   3. If we removed or set u0 to equal 0, we would have a random effects ANOVA   
      *- Incorrect*
   4. If we removed or set εij to equal 0, we would have a random effects ANOVA   
      *- Incorrect*
6. Is Yij = γ00 + u0j + εij
   1. Simple regression   
      *- Incorrect*
   2. A random effects ANOVA   
      *- Correct*
   3. A random intercepts model   
      *- Incorrect*
   4. A random slopes and random intercepts model   
      *- Incorrect*
7. Is Yi = β1 + ei
   1. Simple regression   
      *- Correct*
   2. A random effects ANOVA   
      *- Incorrect*
   3. A random intercepts model   
      *- Incorrect*
   4. A random slopes and random intercepts model   
      *- Incorrect*
8. Is Yij = γ00 + γ10 Xij + u0j + u1j Xij + εij
   1. Simple regression   
      *- Incorrect*
   2. A random effects ANOVA   
      *- Incorrect*
   3. A random intercepts model   
      *- Incorrect*
   4. A random slopes and random intercepts model   
      *- Correct*
9. Is Yij = γ00 + γ10 Xij + u0j + εij
   1. Simple regression   
      *- Incorrect*
   2. A random effects ANOVA   
      *- Incorrect*
   3. A random intercepts model   
      *- Correct*
   4. A random slopes and random intercepts model   
      *- Incorrect*

The following output was obtained for a random intercept MLM:

Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest']

Formula: HOSTILE ~ TSIG + (1 | COMPID)

Data: lq2002

REML criterion at convergence: 5671.1

Scaled residuals:

Min 1Q Median 3Q Max

-1.9626 -0.7132 -0.2692 0.4721 3.4835

Random effects:

Groups Name Variance Std.Dev.

COMPID (Intercept) 6.73567 2.5953

Residual 38.9866 6.2439

Fixed effects:

Estimate Std. Error df t value Pr(>|t|)

(Intercept) 1.96414 0.07599 548.78434 25.85 <2e-16 \*\*\*

TSIG 2.33149 0.12147 1994.85949 -15.44 <2e-16 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:

(Intr)

TSIG -0.892

* 1. The ICC = .17 (i.e., 6.73567 / 38.9866)   
     *- Incorrect*
  2. The ICC = .85 (i.e., 38.9866 / (6.73567 + 38.9866))   
     *- Incorrect*
  3. The ICC = .15 (i.e., 6.73567 / (6.73567 + 38.9866))   
     *- Correct, the ICC is equal to the variance attributable to the group as a proportion of the total variance*
  4. The ICC = 5.78 (i.e., 38.9866 / 6.73567)   
     *- Incorrect*

1. 1. There is a positive association between “HOSTILE” and “TSIG”   
      *- Correct, there is a positive association between these variables*
   2. There is a positive association between intercept and ses.   
      *- Incorrect, there is no modelled association between intercept and SES*
   3. The groups’ slopes vary around a mean value of 2.33149   
      *- Incorrect, the group slopes do not vary in this model*
   4. None of the above  
      *- Incorrect*