

Running Head: MIDTERM

Finding the answer behind Indonesian Student's High Level of Confidence Level in Mathematics

[ Student Name Removed ]

ORLA 6641.001 Adv Topics in Research Methods and Design

Teachers College

[ Date ]

**Abstract:** This secondary analysis research aimed to examine the effects of students' characteristics such as gender and socio-economics status, their achievement and their level of engagement in mathematics; classroom' characteristics such as location, class size, teacher's gender and teacher's years of experience can affect his/her students' confidence level in mathematics. The dataset is used for this analysis was taken from TIMSS 2011, which contained in the total of 5,828 8th grade students in Indonesia. The results show that, on average Indonesian student's confidence level in mathematics is quite high. This confidence level is most affected by the gender of the student, the student's socio-economic background, their engagement in mathematics, the class size and also their classmate's socioeconomic status. Student's achievement also has a small, significant effect on confidence level of student in mathematics.

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## Introduction

Self-perception in mathematics is the perception of a student about his or her level of mathematics skill, or how confident they are in solving and tackling math problem. A good number of researches in the literature have shown a tight relationship between self-perception in mathematics and math performance and achievement (Marsh, 1990; Yoshino, 2012). In other words, students who believe that they are good at mathematics tend to excel in it. As educators, it's essential to know what factors would affect a student self-perception and more specifically, among those factors which are controlled by the student's characteristic and which are controlled by external factors, like the environment or interaction with others.

This paper examines the difference between students' confidence level in mathematics in Indonesia using TIMSS 2011 results. The reason behind choosing Indonesia is because even though Indonesia was in the bottom 5 in terms of both 8<sup>th</sup> grade achievements in mathematics 4<sup>th</sup>

grade in Reading, the attitude toward learning those subjects, the confidence level, and the enjoyment of being in school are among the top countries that participated in TIMSS and PIRLS, 2011. This study would allow educators to unpack the Indonesia's paradox and understand which factors contribute to the high level of confidence in mathematics of Indonesian students.

### **Literature Review**

Since there is a lack in the literature regarding to Indonesia education, most of this literature reviews are based on researches in developed countries such as United States, Australia and taken for granted that there are potentially some crucial different between Indonesia education system and others. To address this issue, we need to conduct a HLM model taken variables at the country level. However, there have been very limited researches in HLM cross-country analysis regarding specifically to student's confidence in mathematics. The study by Marsh and Hau in 2004 is one of those few. Using fifteen-year-olds in 26 countries, they found the correlation between reading achievement and math self-concept are negatively correlated even though there is a strong correlation between math and verbal achievement. Marsh and Hau also confirmed the internal/external model that academic self-concept can be explained by internal (the student's characteristics) and external (the environment), by other words, self-concept is "multidimensional".

The first factor that greatly influences a student perception in mathematics in the western literature is gender. Many researches have produced statistical evidences of higher self-perception in math in male student than their female counterparts (Brown and Josephs, 1999; Randhawa et al., 1993). The literature suggested that even though gender may not be the source of self-perception, the end result of female being suffered from disadvantage in math self-efficacy (and therefore math performance) should be carefully considered by educators and

policy makers. In addition, many other factors are based on gender as input for their outcomes such as social-expectation from their parent (Bleeker and Jacob, 2004). Ma and Kishor research in 1997, in contrast, concluded that gender differences did not influence the relationship between mathematics achievement and mathematics self-concept, the perception of family support and the perception of mathematics as a male domain. They pointed out that there were age differences, and the time spent at junior high school was particularly important for the relationship between self-concept and achievement. In addition, the study by Kurtz-Coste et al. showed the favored group (boys) is significantly impacted by parent stereotype than the less favored group (girls). Other than parents, the next important figure who influences student's confidence is teacher. Teachers tend to give more attentions and open encouragement to male students (Einarsson and Granstrom, 2002).

In the literature, the most frequently mentioned aspect that affects self-efficacy and student's confidence in external dimension is location of the school. Two-way ANOVA was conducted on a research that shows a higher level of self-efficacy on urban children than rural children in Basak & Ghosh, 2014. Jesse L. M. Wilkins' (2004) study also differentiated self-concept by the individual and by geographic region. He found that countries which showed markedly higher self-concepts had lower achievement and vice versa. Wilkins pointed out that Asian and East European students tended to have a lower self-concept than students in Middle Eastern, Western European, North and South American and Australasian countries. Wilkins's findings showed that mathematics and science self-concepts were embedded in culture, and academic achievement was not necessarily associated with the level of self-concept.

## Research Questions

**Comment [AJB1]:** Lit review could be longer, to really flesh out the research, literature and theory in the field.

(1) To what extent do students' characteristics such as gender and socio-economics status, their achievements, their level of engagement in mathematics, their perception about their teacher's expectation to do well in mathematics is associated with confidence level in Mathematics.

(2) To what extent are classroom characteristics such as location, class size, teacher's gender and teacher's years of experience associated with student confidence level in mathematics.

## METHODS

### Conceptual Framework and Methodology

In the last decades, multilevel modelling (HLM) has become a popular ways to analyze data. It is often used to avoid inappropriate conclusions from the regular OLS regression with unadjusted standard errors when analyzing nested data because HLM accounts for statistical dependency by assigning each level its own statistical model that included intercept, regression coefficients and error terms (O'Dwyer and Parker, C. E, 2014). In particular, this study looks at the effects of both students' characteristics and also the classroom' characteristics after controlling for student-level factors, thus, an appropriate procedure for doing this analysis is the hierarchical linear model or HLM (Mertler and Vannatta, 2012; Heck, Thomas and Tabata, 2013).

The equation for each level of analysis is listed below:

(1) Student-Level (Level 1) :  $Y_{ij}$  (Individual Student's Mathematics Confidence) =  $\beta_0j$  (Classroom's mean Mathematics Confidence) +  $\beta_1j$  (female) +  $\beta_2j$  (Student's SES (amount of books)) +  $\beta_3j$  (Teacher's Expectation) +  $\beta_4j$  (Student's achievement) +  $\beta_5j$  (Student's engagement in mathematics) +  $+ r_{ij}$  (Variations in Student's Confidence in Mathematics)

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Comment [AJB3]: Please start with the data, dataset and sample size used in the study.

Comment [AJB4]: The analysis section (please see APA structure and formatting) goes after the data and variables section.

Comment [AJB5]: There are multiple English phrasing problems throughout the paper such as this. Please make sure to use a grammar checker as well as other writing resources to ensure that there are no grammar issues with all future submissions for the course.

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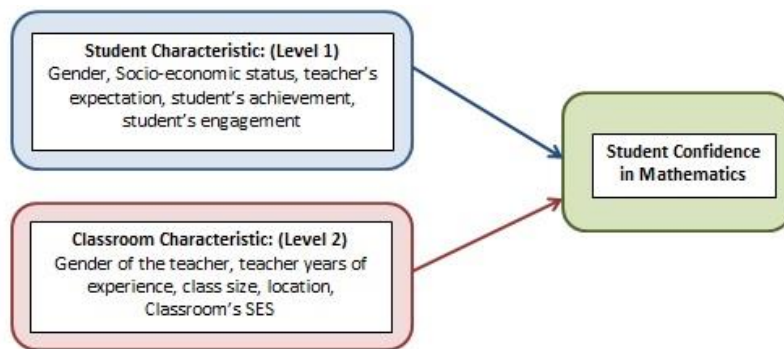
Comment [AJB6]: Please use Word's equation editor. If you need assistance with the equation editor, there are many tutorials on youtube.

(2) Classroom/School-Level (Level 2):  $\beta_0j$  (Classroom's mean Mathematics Confidence) =  $\gamma_{00} + \gamma_{01}(\text{Gender of the teacher}) + \gamma_{02}(\text{Teachers' year of experience}) + \gamma_{03}(\text{Class size}) + \gamma_{04}(\text{Location}) + \gamma_{05}(\text{Classroom's SES (average amount of books per classroom)}) + u_{0j}(\text{Variations in Classroom's Confidence in Mathematics})$

**Comment [AJB7]:** Which is it? Classroom or school? Level 2 is not clear. Please be very specific in stating what the dependent variable is, what is at each level and what are the variables of interest.

**Comment [AJB8]:** As demonstrated in the examples provided in the class, please discuss in your narrative here each term in the equation, telling your reader what each one means in the narrative. The way you have it now, with explanations in ( ) it is confusing, as the equations appear to be misstated as there are no X's, only betas (slopes). Please follow the nomenclature put forward by Heck et al and R&B 2002.

Figure 1: Conceptual Framework Model.



## Data

First administered in 1995, the Trends in International Mathematics and Science Study (TIMSS) is an international assessment of the mathematics and science knowledge of 4th and 8th grader students around the world. International Association for the Evaluation of Education Achievement (IEA), the conductor of the study is an independent international cooperative of research centers with headquarters in Amsterdam. Its mission is the “conduct of comparative studies focusing on educational policies and practices in order to enhance learning with and across systems of educations.” TIMSS 2011 is the fifth in IEA’s series of international assessments of student achievement dedicated to improving teaching and learning in mathematics and science, which over 60 countries participated in. Similar to other edition of

**Comment [AJB9]:** Please cite the dataset and the manual somewhere in this paragraph.

TIMSS, it consists of an assessment of mathematics and science, as well as student, teacher, and school questionnaires.

The dataset given by TIMSS 2011 was useful in examination of the research questions because the dataset were collected internationally from a large sampling population and publically available. Second, with all 60 countries participated, TIMSS designed a two-stage stratified probability sampling to select schools and students, and the process of random sampling were carefully conducted in each country (Wilkins, 2004). Thus, TIMSS data is a nested dataset that can be used for HLM research method in this paper (Heck, Thomas and Tabata, 2013). Last but not least, TIMSS 2011 asked the students, teachers and the school principal questions that strongly related to this study, thus the dataset contained the appropriate set of variables.

The original dataset for this study consists of 5,828 8th grade students in Indonesia. This original dataset is the result after the merge between TIMSS student's background dataset for 8th grader and the school's background dataset and the teacher's background dataset for Indonesia. All the omitted and invalid as well as system-missing was then carefully recoded. After running the listwise deletion method using SPSS 22, the final dataset used for analysis consists of 5,484 students, which is about 94% of the original dataset. According to Strayhorn, secondary analysis is often complicated based on the amount of missing data (Strayhorn, 2009). Since the missing cases for each variable is far less than 5% and the total of missing cases in the whole dataset is only 6%, listwise deletion method would not be a problem for this study (Roth, 1994).

The description of all the dependent and independent variables for both level of analysis is recorded in the table below.

**Comment [AJB10]:** In the literature review, please provide a paragraph on why Indonesia is an important context to consider given the purpose of the study.

**Comment [AJB11]:** How many schools are included? Please state this.

Table 1. Description of Variables (N= 5,485)

| Variable Name                             | Definition and metrics  | Mean   | Std. Dev | Min   | Max    |
|---|---|--------|----------|-------|--------|
| <b>Dependent Variable</b>                 |   |        |          |       |        |
| Confidence Level in Mathematics           | Taking the “student’s confidence with mathematics” variable from TIMSS 2011.  | 9.56   | 1.01     | 3.18  | 15.82  |
| <b>Level-1 Independent Variables</b>      |   |        |          |       |        |
| Student’s Gender (Female)                 | Male =0, Female =1  | .51    | .50      | 0     | 1      |
| Students’ home literature                 | Substitute measure of Social-Economic class (SES). Students were asked about the amount of books they have at home, with the following categories:<br>1= having none or fewer than a bookshelf (0-10 books)<br>2= having one bookshelf (11-25 books)<br>3= having one bookcase (26-100 books)<br>4= having two bookcases (101-200 books)<br>5= having three or more bookcases (200+books) | 2.03   | .81      | 1     | 5      |
| Teacher Expectation                       | The student was asked to agree or disagree with the following statement “Teacher expects me to do well in Mathematics”<br>0=Disagree a lot<br>1=Disagree a little<br>2=Agree a little<br>3=Agree a lot  | 2.16   | .57      | 0     | 3      |
| Student’s achievement in Mathematics      | Taking the first plausible value for mathematics achievement from TIMSS 2011.   | 401.82 | 82.63    | 99.31 | 689.64 |
| Student’s engagement level in Mathematics | Scale of engagement with science lesson based on 7 items, taken from TIMSS 2011.  | 9.94   | 1.19     | 3.27  | 14.34  |
| <b>Level-2 Independent Variables</b>      |   |        |          |       |        |

**Comment [AJB12]:** Please make sure to follow the format in the examples provided for the class. Please list the dataset variable labels for each variable.

**Comment [AJB13]:** Is this a single variable? How is it scaled? What were the options for the student to respond to?

**Comment [AJB16]:** As discussed in class this needs to be rescaled from 0 to 4 so that 0 is interpretable.

**Comment [AJB14]:** How you have this table formatted is confusing, as (200+books) is on the same line as Teacher here. Where does it belong?

**Comment [AJB15]:** As you’re using this as a predictor variable, I recommend that you z-score it (standardize) to make 0 interpretable. Or, it needs to be grand mean centered which you would state below.

**Comment [AJB17]:** First, it’s not clear what this information applies to. It’s in the middle of the description of something else on the left. Second, why does it not go to zero? How was it measured? These issues are not clear.



|                               |  |       |      |      |      |
|-------------------------------|--|-------|------|------|------|
| Teacher's Gender (Female)     | Male=0, Female=1   | .57   | .50  | 0    | 1    |
| Teacher's years of experience | The teachers were asked to report how many years they have been working as teacher:<br>1= Less than 5 years<br>2=At least 5 but less than 10<br>3=At least 10 but less than 20<br>4=20 years or more | 2.77  | 1.06 | 1    | 4    |
| Class size                    | The teachers were asked to report their class size   | 36.89 | 7.38 | 6    | 67   |
| Location                      | The location of the school (dummies)   | 0.07  | 0.26 | 0    | 1    |
|                               | 1= Urban   | 0.56  | 0.50 | 0    | 1    |
|                               | 2= Suburban  | 0.12  | 0.32 | 0    | 1    |
|                               | 3= Medium size city  | 0.21  | 0.40 | 0    | 1    |
|                               | 4= Small town  | 0.04  | 0.19 | 0    | 1    |
|                               | 5= Remote Rural  |       |      |      |      |
| School's home literature      | The average of the variable home-literature in each school, which substitute to measure the SES of each school   | 2.03  | 0.26 | 1.29 | 2.70 |

**Comment [AJB18]:** Same issues as above.

**Comment [AJB19]:** Level 2 is not clear at all. Is it classroom or school?

**Comment [AJB20]:** Is this grand mean centered below?

**Comment [AJB21]:** Which is used as the reference group?

**Comment [AJB22]:** Does this come from the survey or did you calculate this variable? It needs to come from the survey as you most likely do not have all of the students in the classroom/school.

**Comment [AJB23]:** This needs to be in the table as well.

The dependent variable for this study is the variable **BSBGSCM** (Student's confidence with mathematics) from TIMSS 2011 dataset. This variable is the scale combinations of multiple variables related to student level of confidence in mathematic using Rasch Modelling method (Foy and Olson, 2013). The higher the score the more confident each student feels toward Mathematics (M=9.56, SD=1.01).

For level-1 variables, the first independent variable as suggested by the literature review was the student's achievement in TIMSS 2011. According to TIMSS 2011 User Guide and previous studies, the best way to measure students' achievement is the first plausible value, BSMMAT01 (Foy and Olson, 2008, Yoshino, 2012). The scale of plausible value for TIMSS was 0-1000. Indonesia ranked in the lowest quadrant among all the country participated in TIMSS in 2011. , this this particular dataset, the range is around 99 points to 690 points, with

mean equals to 401.82 points and standard deviation is 82.63 points, which is around 100 points lower than the average.

Gender variable, ITSEX was recoded so that female students are represented as 1 and male are represented 0. There are 51% of students in the dataset is female ( $SD=0.50$ ). The socio-economics background of each student is multidimensional. It can consist of parents' education, occupation, income and home possessions (Yang, 2003). However, as previous literature suggested, number of books at home was used in this study as the proxy for the student's socio-economics background since they are highly correlated with the student's socio-economic background (Yoshino, 2012; Chiu and Klassen, 2010). Note that the number of books does not increase equally as the code increases in TIMSS. As stated in table 1 above, for example, a student who had up to 10 books was coded as 1, a student who had 11-25 books was coded as 2, and the student who had 26-100 books was coded as 3. However, the larger the numeric number can indicate that a student had more books in his or her home. Similarly, the student was also asked if he or she thinks his or her teacher expected that they will do well in Mathematics. This variable was recoded so that 0 means the strongly disagree with the statement (which means, the student doesn't think his/her teachers expected them to do well in mathematics) and 4 if they strongly agree. Last but not least, the engagement level variable, similar to the confidence level in math is a scale generated by TIMSS using 7 variables related to student's engagement level, like how much the student spends time doing homework per day.

For level-2 variables, similar to student's gender, the mathematics teacher's gender was recoded so that 0 represents male teacher and 1 represents female teacher. Overall, 57% of the all math teachers in this dataset are female. TIMSS dataset also contains a categorical variable, where the teachers reported how many years of teaching experience they have had. This variable

is recoded so that 1 represents that the teacher taught less than 5 years and 4 represents that they have been teaching more than 20 years. The class size is also recorded in TIMSS and was used as one of the independent variable for level 2 as suggested by the literature. On average, there are also 37 students in one classroom, the biggest classroom is 67 and the smallest classroom was 6. In addition, the location of the schools was recoded as dummies variables since there is no linear correlation between them. The suburban was used as the control group to compare with other locations. Finally, the average number of books at home for each class room was computed as the proxy for the average SES in each classroom.

## Result and Discussion

The first model- the unconditional random effect or null model, using ML estimation gave the intercept of 9.61 for student's confidence level. This represents the average confidence level of math for all classrooms and all students. The Wald Z for classroom level in the null model was significant (Wald  $Z = 7.29$ ,  $p < .001$ ). In addition, the Intraclass Correlation Coefficient (ICC) was 0.16, which indicates that 16% of the total variance in Indonesia student's level of confidence in mathematics can be explained by variance between the classrooms. We expect this variance to be reduced by adding other level 1 and level 2 variables into the model, as introduced in model 2 (Level-1 Variables) and model 3 (Level-2 Variables).

Model 2 was introduced to answer research question 1 about the effect of students' characteristics to their science achievement. The result showed that if the student is male, have the average number of books at home, the average achievement in Mathematics, the average level of engagement in math, strongly disagree that the teacher expected them to do well in math, then the student would be expected to have the level of confidence in mathematics as 9.89. If the student is male, we expect to see .11 point of confidence drop. For each increase level of books

**Comment [AJB24]:** How were the normality assumptions checked? Were any variables transformed? What about grand mean centering?

**Comment [AJB25]:** Results is a different section from discussion.

**Comment [AJB26]:** Please provide an introduction paragraph for the results.

**Comment [AJB27]:** To avoid confusion, it's usually good practice to use models A, B, and C, rather than 1, 2, and 3.

**Comment [AJB28]:** Excellent. Well stated.

**Comment [AJB29]:** This is good to do, but you haven't grand mean centered the continuous predictor variables. Please see above.

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at home, the student is expected to be .02 points increased in their confidence. The same level of confidence, 0.02 increase for every increase of 100 points they achieve in TIMSS, this perhaps

Table 2: HLM Table Result

|  | Null Model (1)    | Random Intercept<br>Level 1- Variables<br>Model (2) | Random Intercept<br>Level 2- Variable<br>Model (3) |
|--|-------------------|---|--|
| <b>Intercept</b>   | 9.61***<br>(0.04) | 9.89***<br>(.07)                                    | 10.84***<br>(.30)                                  |
| <b>Level-1 Independent Variables</b>                                 |                   |   |  |
| Female   |                   | -.11***<br>(.03)                                    | -.11***<br>(.03)                                   |
| Student's SES<br>(grandcent_books)                                   |                   | .02***<br>(.01)                                     | .02***<br>(.01)                                    |
| Teacher's Expectation  |                   | -.16***<br>(.03)                                    | -.16***<br>(.03)                                   |
| TIMSS Achievement in<br>Mathematics (per<br>100pts)(grandcent_score) |                   | .02***<br>(.00)                                     | .02***<br>(.00)                                    |
| Student's Engagement in<br>Mathematics<br>(grandcent_engage)         |                   | .43***<br>(.13)                                     | .43***<br>(.13)                                    |
| <b>Level-2 Independent Variables</b>                                 |                   |   |  |
| Gender of Teacher  |                   |   | -.04<br>(.05)                                      |
| Teacher's Years of<br>Experience                                     |                   |   | -.05<br>(.03)                                      |
| Class size   |                   |   | -.01*<br>(.00)                                     |
| Urban  |                   |   | .14<br>(.12)                                       |
| Medium Size City   |                   |   | .01<br>(.11)                                       |
| Small Town   |                   |   | .08<br>(.08)                                       |
| Remote Areas   |                   |   | .17<br>(.15)                                       |
| School-SES   |                   |   | -.27*<br>(.12)                                     |
| Intraclass Correlation   | .16               |   |  |
| % of Level-1 Variance<br>explained by the Model                      | 21%               |   |  |
| % of Level-2 Variance<br>explained by the Model                      | 40%               |   |  |

**Comment [AJB30]:** Be careful about inserting tables in the middle of a sentence. You usually want to do it between paragraphs.

**Comment [AJB31]:** Please provide standardized regression coefficients along with the unstandardized, following the calculations from Hox provided in class.

**Comment [AJB32]:** As school SES goes up confidence goes down? Really? I'm worried about this result unless you have research to support it or maybe I'm not understanding how you coded the variable.

**Comment [AJB33]:** Which model do these refer to? Please make sure to report these for models 2 and 3.

Note:  $p < 0.001$  \*\*\*  $p < 0.05$  \*

**Comment [AJB34]:** No variables were transformed or grand mean centered?

Also, please provide a note as to what the numbers in the ( ) are. Following APA format they should be standard errors.

consistent with the paradox pattern that we have been seeing regarding to achievement and confidence level in Indonesia. This finding suggests that even though the achievement in TIMSS, perhaps in this case significantly contributes to the student's confidence level, however only by little.

In addition, for every increase level of engagement in mathematics, the student will increase their confidence level about .43 point. One surprising finding was that if the student thinks that the teacher expected them to do well in mathematics then they will actually be less confidence about mathematics. All of these findings are significant at  $p < .001$  level.

Model 3 added all the level 2 variables to the model 2. The intercept showed that if the student is male, has the average number of books at home, the average achievement in Mathematics, the average level of engagement in math, strongly disagree that the teacher expected them to do well in math, furthermore the student's classroom is located in suburban, his mathematics teacher is also male, have close to 0 year of teaching experience, and the class size is close to 0 and all other students in his class have 0 books at home, then the student would be expected to have the level of confidence in mathematics as 10.84.

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**Comment [AJB35]:** Same problem as with above.

The only two predictors in Level-2 that were significant at  $p < .005$  level in this model were class size and the classroom socio-economic status, as measured by the average of number of books at home from all the students in the class. For each additional student in the classroom, the confidence level in mathematics of student drop .01 and for each additional level of increase in classroom socio-economic status, the confidence level drop .27 point. This could be indicating

**Comment [AJB36]:** I'm still worried about where this variable came from. Plus it's negative in this equation, which is odd.

that students from more affluent classroom, where they attend class with other affluent classmates are less confident than who attends classroom where other students in the class have lower socio-economic background.

In total, all the level two variances explained 21% of the total variance in Level-1 and 40% of the total variance in Level 2. The Wald Z test suggests that even after controlling for all the student's level independent variables, a statistically significant amount of variation in outcomes still remains both within and between classrooms. This would suggest us to find other predictors within and between classrooms/schools that beyond what have been found in the literature.

### Limitation

Multilevel modeling is an extension of multilevel regression; thus the assumptions underlying multiple regressions (e.g., normality of residuals, lack of multicollinearity, and outliers) are applied to multilevel modelling (Raudenbush & Bryk, 2002). For example, the correlation between level of engagement in mathematics and the teacher's expectation was larger than .5 and is significant. This could contribute to opposite effect for teacher's expectation that was seen in the result for model 2 (See Appendix). In addition, even if multicollinearity was not an issue in level-1 but instead is suspected in level-2 variable (since the correlation method cannot measure level-2 variables between schools).

Thought the purpose of this study is to find factors in individual-level and school-level that can explain variance in Indonesian student's confidence level in mathematics, the study does not seem to fulfill its own mission. Student-level variables included in this study mostly do not significantly affect the students' confidence; furthermore there are still 60% of the between-school variances in classroom-level and 80% of student-level variance that have not been explained. It

**Comment [AJB37]:** Before limitations, please provide a discussion section. Please place the results and findings within the broader conversation in the literature on this topic, citing the literature and walking your reader through how to interpret these results.

These two books may help with the types of language and discussion I'm looking for:

Miller, J. E. (2013) *The Chicago Guide to Writing about Multivariate Analysis*, Second Edition. University Of Chicago Press: Chicago.  
<http://www.amazon.com/Chicago-Writing-Multivariate-Analysis-Publishing/dp/0226527875>

Hancock & Mueller (2010) *The Reviewer's Guide to Quantitative Methods in the Social Sciences*.  
<http://www.amazon.com/Reviewers-Quantitative-Methods-Social-Sciences/dp/041596508X>

would be also very important to find and understand the standardized coefficient for each variable to find among all the predictors what can do the best job predicting student's confidence level in mathematics.

As with any modelling approach, cross-validation and replication are required. Further examination of affective and attitudinal factors with different measures and new sample of data is likely to provide better understanding of school learning, students' achievement and also student's level of confidence. As mention in the previous section, since there is a lack in literature about Indonesia education system, perhaps the predictors was not the most influential predictors in Indonesia education context. It would be also interesting to compare to other country datasets to see whether what have been suggested in American/western literature also can hold true in other education systems.

## Bibliography

- Antonio, A. L. (2004). The Influence of Friendship Groups on Intellectual Self-Confidence and Educational Aspirations in College. *The Journal of Higher Education*, 75(4), 446-471.
- Brookhart, S., Andolina, M., Zuza, M., & Furman, R. (2004). Minute math: An action research study of student self-assessment. *Educational Studies in Mathematics*, 57(2), 213-227. doi: 10.1023/B:EDUC.0000049293.55249.d4
- Cates, G., Skinner, C., Watkins, C., Rhymer, K., McNeill, S., & McCurdy, M. (1999). Effects of Interspersing Additional Brief Math Problems on Student Performance and Perception of Math Assignments: Getting Students to Prefer to Do More Work. *Journal of Behavioral Education*, 9(3-4), 177-192. doi: 10.1023/A:1022135514692
- Chiu, M. M & Klassen, R.M (2010) Relations of mathematics self-concept and its calibration with mathematics achievement: Cultural differences among fifteen years old in 34 countries. *Learning and Instruction*, 20(1), 2-17.
- Foy, P., & Olson, J. F. (2013). TIMSS 2011 user guide for the international database. Chestnut Hill, MA: International Study Center, Boston College.
- Hendy, H. M., Schorschinsky, N., & Wade, B. (2014). Measurement of math beliefs and their associations with math behaviors in college students. *Psychological Assessment*, 26(4), 1225-1234. doi: 10.1037/a0037688
- Kalchman, M. (2011). Using the math in everyday life to improve student learning: The Math in Everyday Life homework assignment builds student confidence and competence in mathematics. *Middle School Journal*, 43(1), 24-31. doi: 10.2307/23047641
- Legg, A. M., & Locker, L., Jr. (2009). Math Performance and Its Relationship to Math Anxiety and Metacognition. *North American Journal of Psychology*, 11(3), 471-485.

**Comment [AJB38]:** This is a very good start on the Midterm. However, there are multiple issues that I encourage you to address in a rewrite.

- 1) Please provide a more detailed literature review to justify the study following the structure of the example journal articles provided in class.
- 2) Please ensure that you are following APA 6<sup>th</sup> edition formatting and structuring throughout.
- 3) Please note the comments throughout the methods section. There are issues throughout that make it difficult to understand exactly what you're referring to.
- 4) Throughout, please make sure to refrain from using passive sentence construction. Feel free to use "I", and write all sentences from an active sentence construction stance, in which a human is taking action in just about every sentence.
- 5) There are multiple issues throughout the results that detract from the findings. Please see the comments throughout on this.
- 6) Please provide a detailed discussion as noted in the comments.
- 7) Please make sure to check for all grammar issues and correct them before any future submissions.

Currently this paper is a B- (80%). However, through a rewrite in which you substantively address each of the issues in the assignment, I believe that this paper could become an A, or an A+. Please return a rewrite by email anytime on or before April 20.

**Comment [AJB39]:** This is a reference section. Please see APA format.

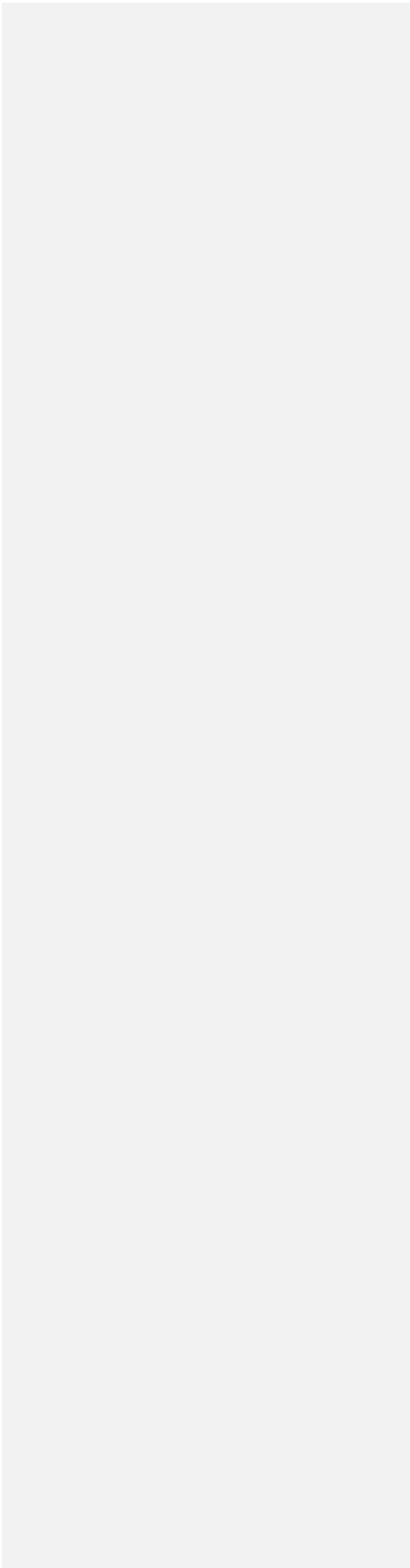
- Ma, X., & Kishor, N. (1997). Attitude toward self, social factors, and achievement in mathematics: A meta-analytic review. *Educational Psychology Review*, 9(2), 89–120.
- Marsh, H. W. (1990). A multidimensional, hierarchical model of self-concept: Theoretical and empirical justification. *Educational Psychology Review*, 2, 77–172.
- Marsh, H. W., & Hau, K. (2004). Explaining paradoxical relations between academic self-concepts and achievements: Cross-cultural generalizability of the internal/external frame of reference predictions across 26 countries. *Journal of Educational Psychology*, 96(1), 56–67.
- Merlter & Vannatta (2013) *Advanced and Multivariate Statistical Methods: Practical Application and Interpretation*. Chapters 1, 2, 3 (p.1-66) & 7 (p.159-190).
- Molly M. Jameson, B. R. F. (2014). Math Anxiety, Math Self-Concept, and Math Self-Efficacy in Adult Learners Compared to Traditional Undergraduate Students. *Adult Education Quarterly*, 64(4), 306-322. doi: 10.1177/0741713614541461
- O'Dwyer, L. M., & Parker, C. E. (2014). A primer for analyzing nested data: multilevel modeling in SPSS using an example from a REL study. Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Northeast & Islands.
- Strayhorn, T. L. (2009). Accessing and analyzing national databases. In T. J. Kowalski & T. J. Lasley (Eds.), *Handbook of data-based decision making in education* (pp. 105-122). New York, NY: Routledge.
- Roth, P. L. (1994). "Missing data: A conceptual review for applied psychologists". *Personnel Psychology* 47 (3): 537–559. doi:10.1111/j.1744-6570.1994.tb01736.x
- Rumberger, R. W., & Palardy, G. J. (2005). Test Scores, Dropout Rates, and Transfer Rates as Alternative Indicators of High School Performance. *American Educational Research Journal*, 42(1), 3-42. doi: 10.2307/3699454
- Yang, D.-C., Lai, M.-L., Yao, R.-F., & Huang, Y.-C. (2014). Effects of Remedial Instruction on Low-SES & Low-Math Students' Mathematics Competence, Interest and Confidence. *Journal of Education and Learning*, 3(1), 1-15.
- Yoshino, A. (2012). The relationship between self-concept and achievement in TIMSS 2007: A comparison between American and Japanese students. *International Review of Education*, 58(2), 199-219. doi: 10.1007/s11159-012-9283-7
- Yang, Y. (2003). Dimensions of socio-economic status and their relationship to mathematics and science achievement at individual and collective level. *Scandinavian Journal of Educational Research*, 47(1), 220-41
- Wilkins, J. L. M. (2004). Mathematics and science self-concept: An international investigation. *The Journal of Experimental Education*, 72(4), 331–346.

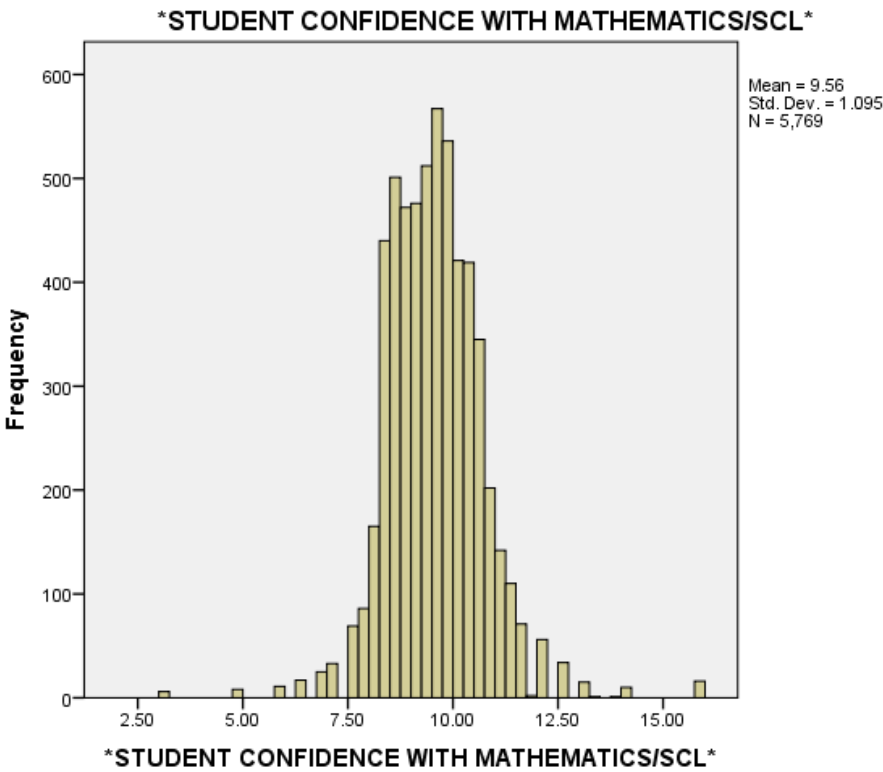


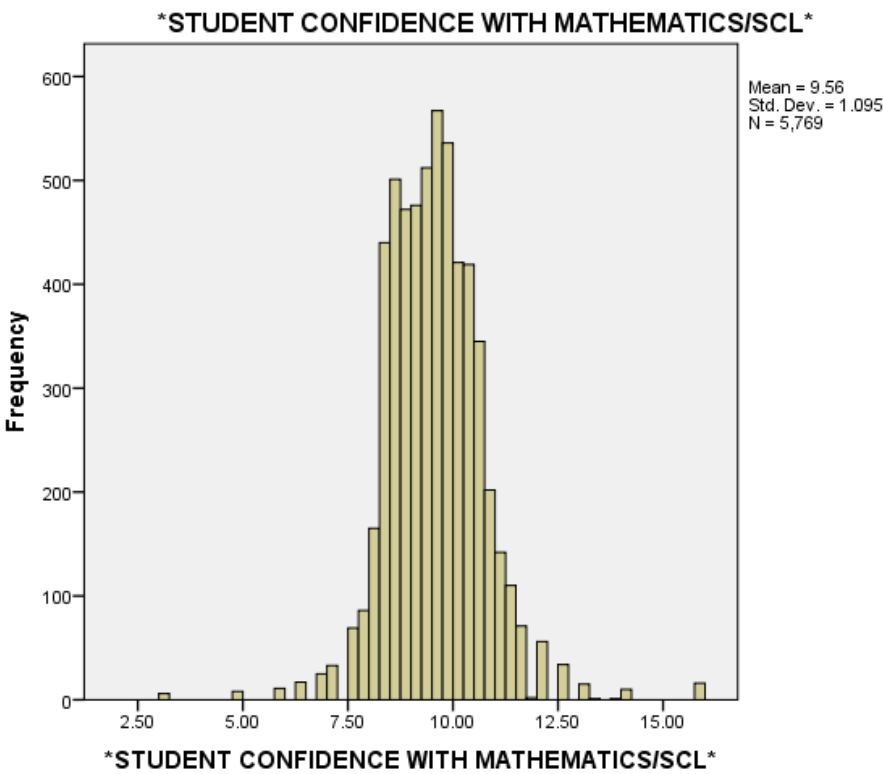
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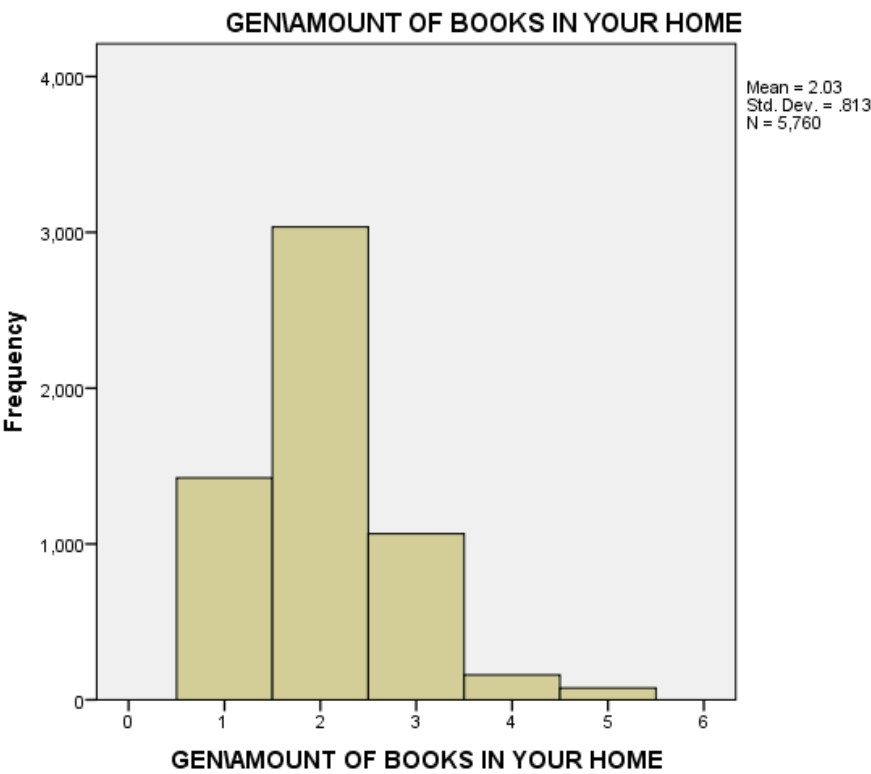
## DESCRIPTIVE STATISTICS WITHOUT LISTWISE DELETION

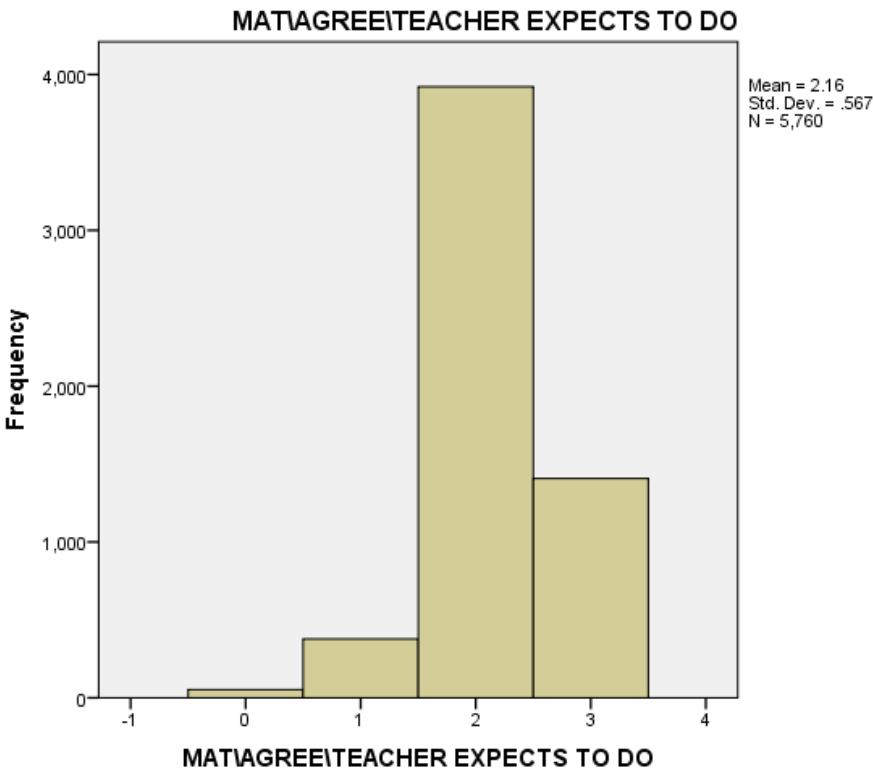
| Statistics             |   |                             |  |   |  |  |                              |  |  |                  |  |
|------------------------|---|-----------------------------|--|---|--|--|------------------------------|--|--|------------------|--|
|                        | *STUDENT<br>CONFIDENCE WITH<br>MATHEMATICS/SCL* | *SEX<br>OF<br>STUDENTS<br>* | GENA<br>MOUNT<br>OF<br>BOOKS IN<br>YOUR HOME | MATAGRE<br>ETEACHER<br>EXPECTS<br>TO DO | *1ST<br>PLAUSIBLE<br>VALUE<br>MATHEMATICS<br>* | *STUDENTS<br>ENGAGED IN<br>MATHEMATICS<br>LESSONS/SCL<br>* | GEN<br>\SEX<br>OF<br>TEACHER | GENIM<br>MEDIATE AREA<br>OF SCHOOL<br>LOCATION | GENN<br>UMBER OF<br>STUDENTS<br>IN THE CLASS | school<br>_books | *TEACHERS<br>YEAR<br>S OF<br>EXPERIENCE* |
| N Valid                | 5769  | 5828                        | 5760   | 5760                                    | 5828   | 5761   | 5788                         | 5788   | 5788   | 5828             | 5679                                     |
| Missing                | 59  | 0                           | 68   | 68                                      | 0  | 67   | 40                           | 40   | 40   | 0                | 149                                      |
| Mean                   | 9.5608  | .51                         | 2.03   | 2.16                                    | 401.3503                                       | 9.9432   | 1.48                         | 2.12   | 36.93  | 2.0329           | 2.77                                     |
| Median                 | 9.6194  | 1.00                        | 2.00   | 2.00                                    | 400.0059                                       | 9.6346   | 1.00                         | 1.00   | 37.00  | 2.0000           | 3.00                                     |
| Skewness               | .452  | -.051                       | .840   | -.294                                   | -.050  | 1.230  | 5.712                        | .667   | -.194  | .241             | -.364                                    |
| Std. Error of Skewness | .032  | .032                        | .032   | .032                                    | .032   | .032   | .032                         | .032   | .032   | .032             | .032                                     |
| Minimum                | 3.18  | 0                           | 1  | 0                                       | 99.31  | 3.27   | 1                            | 1  | 6  | 1.29             | 1  |
| Maximum                | 15.82   | 1                           | 5  | 3                                       | 689.64   | 14.34  | 9                            | 5  | 67   | 2.70             | 4  |

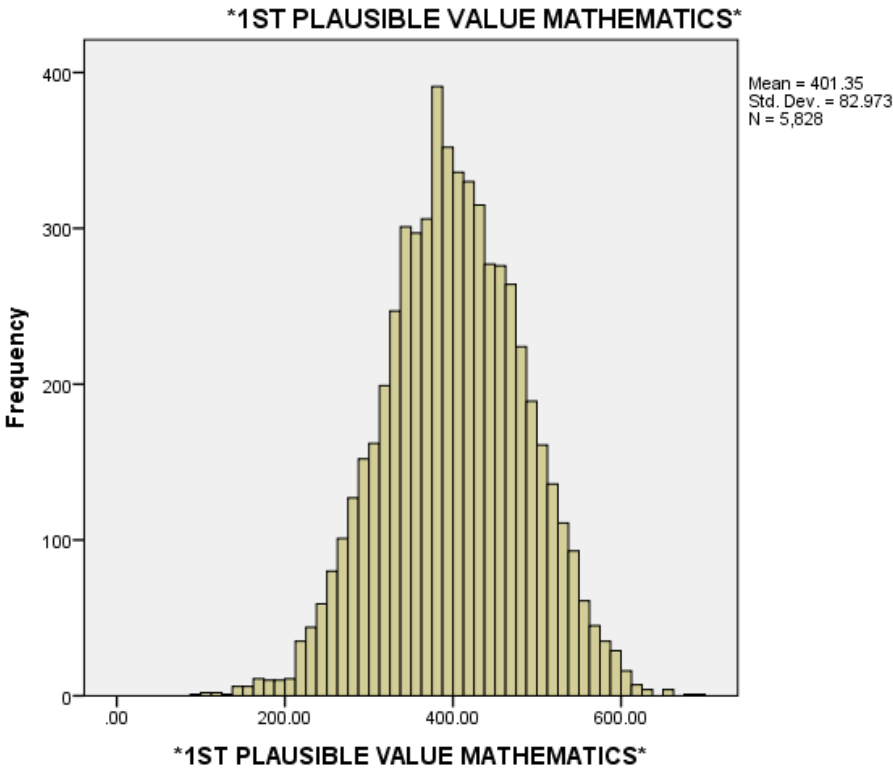


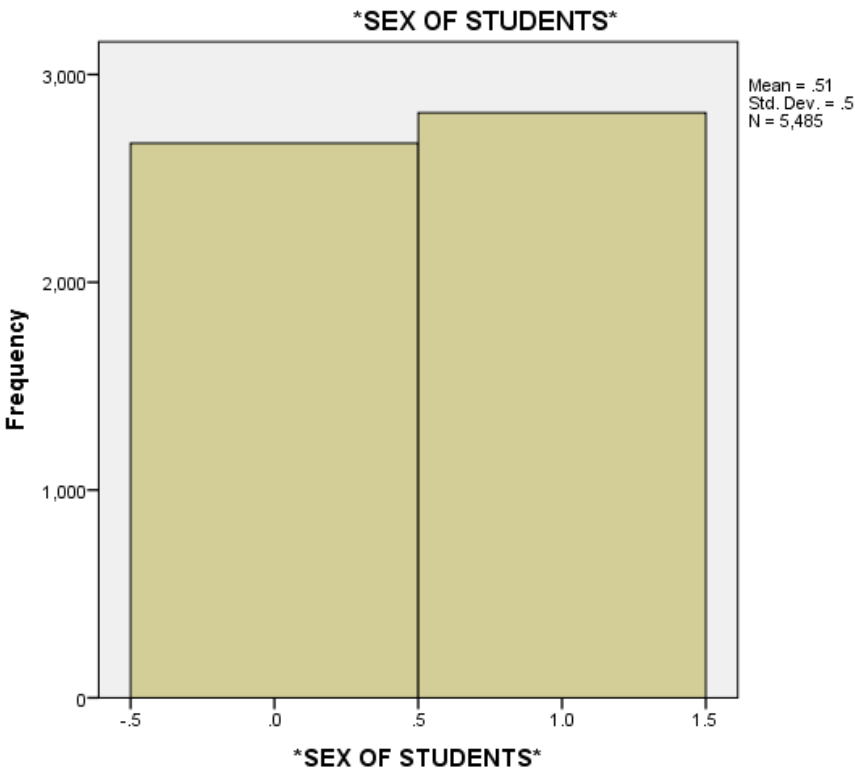






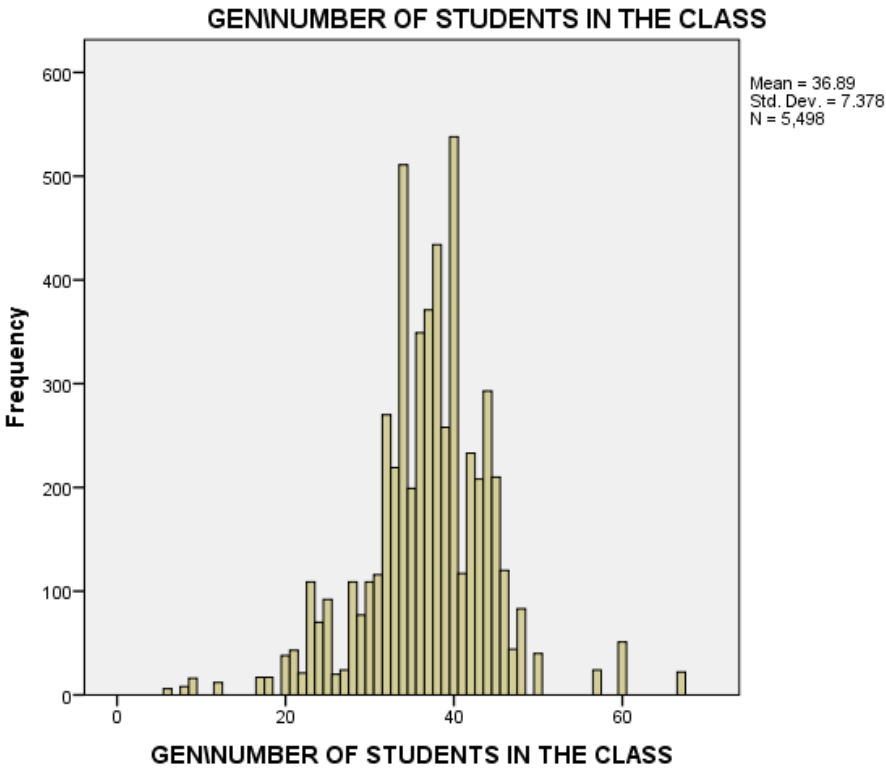


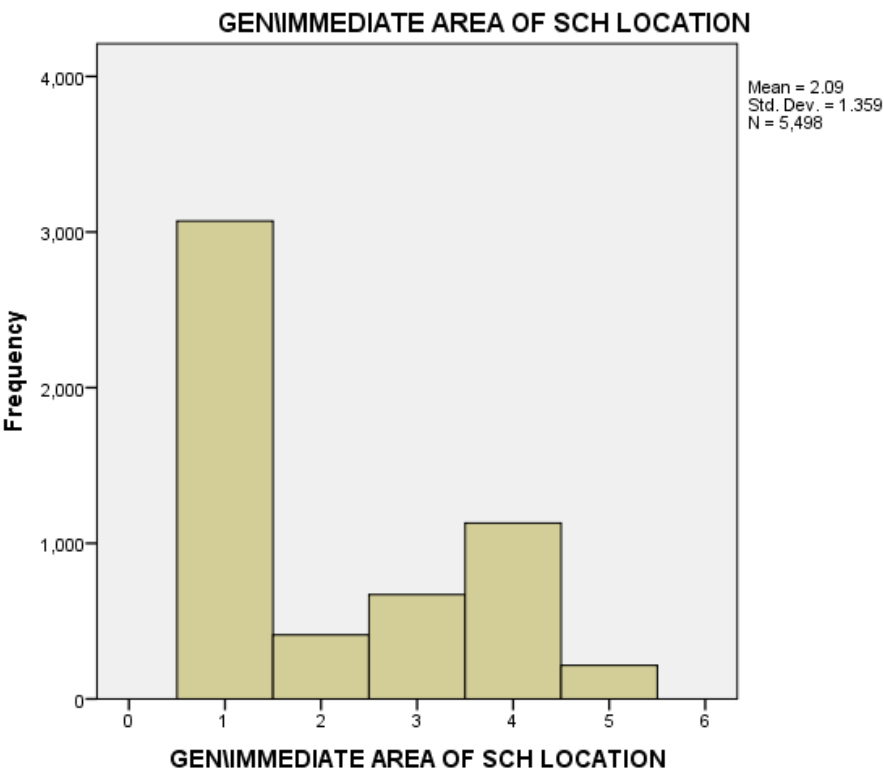


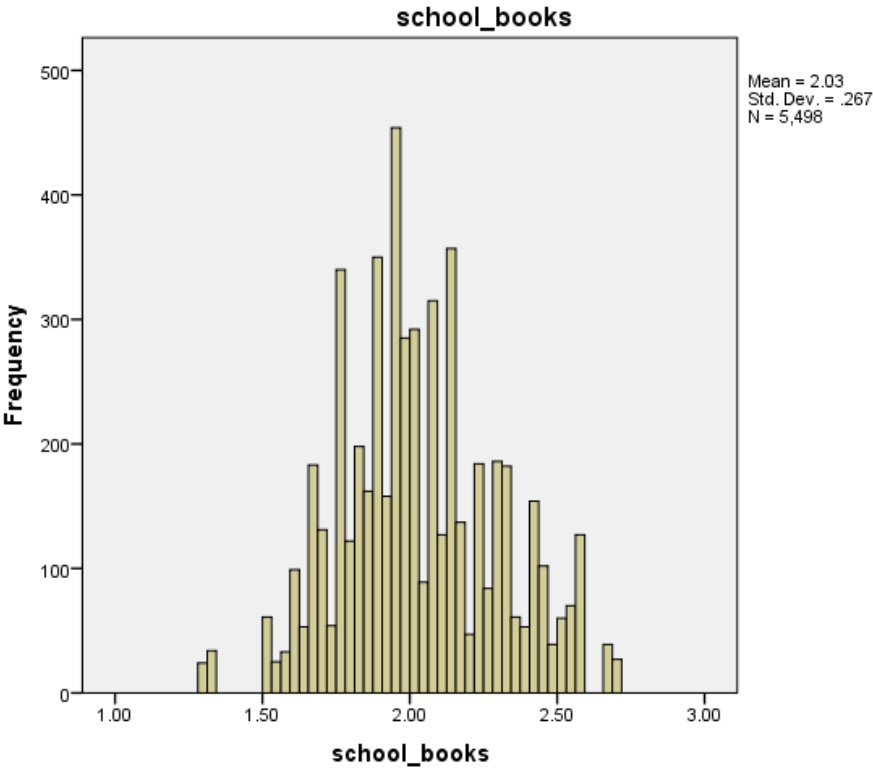






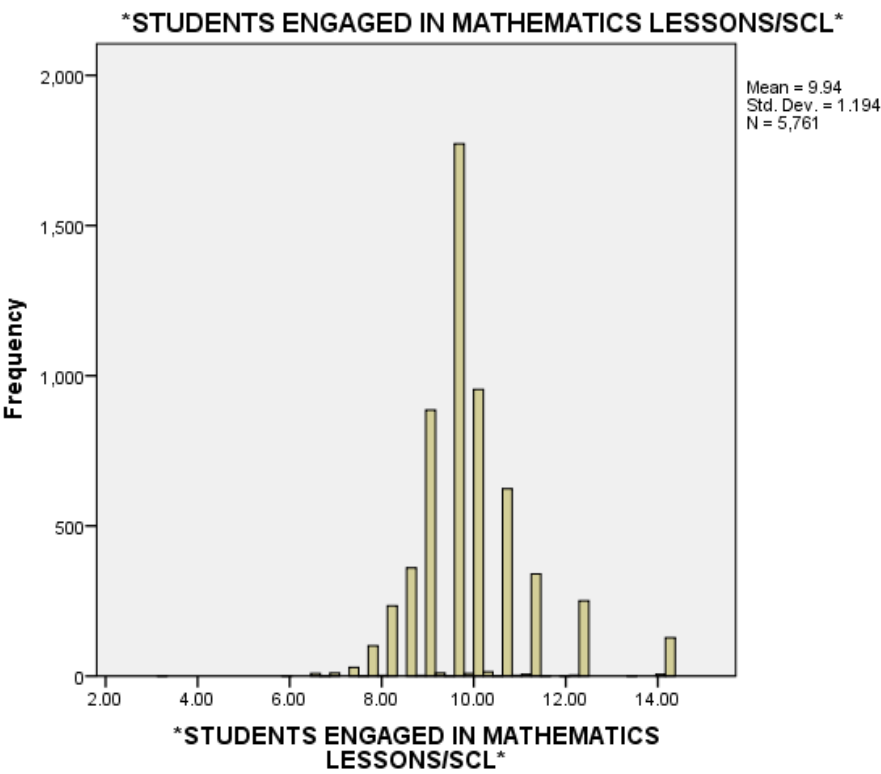


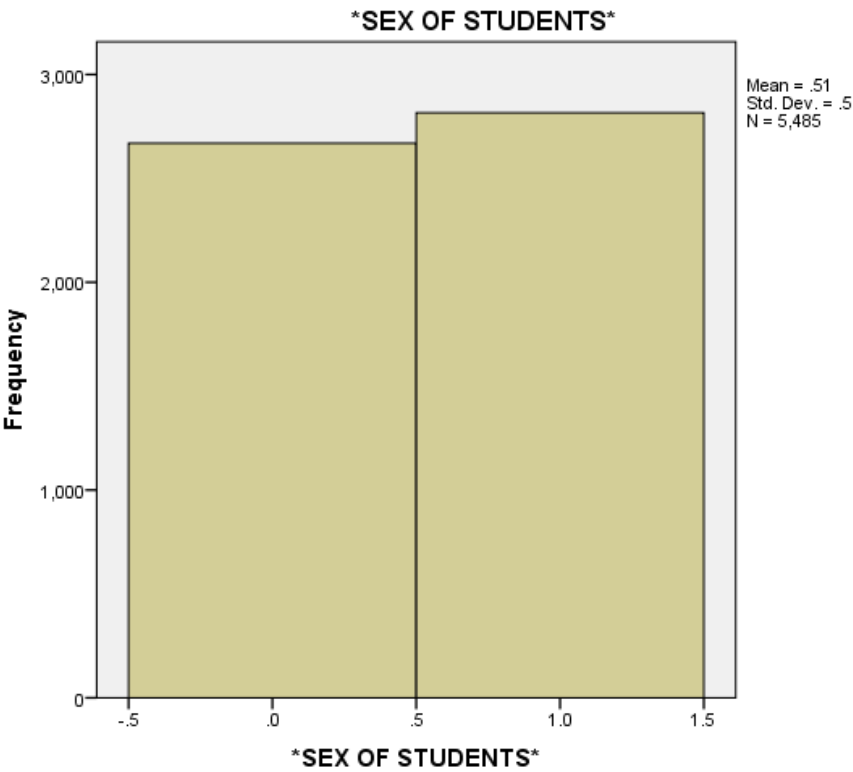


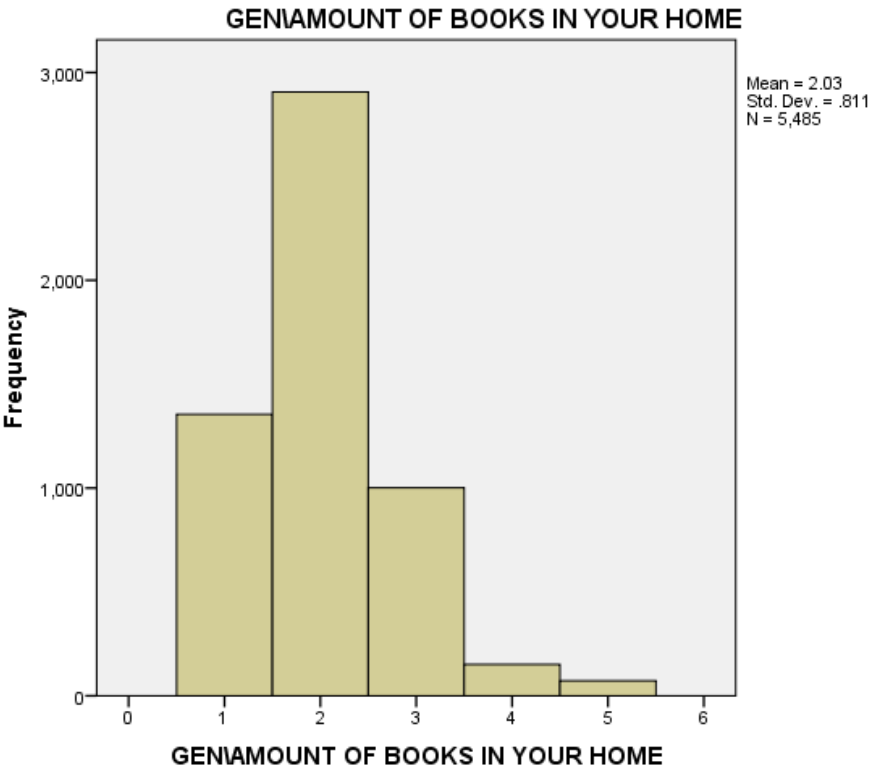


DESCRIPTIVE STATISTICS W/ LISTWISE DELETION

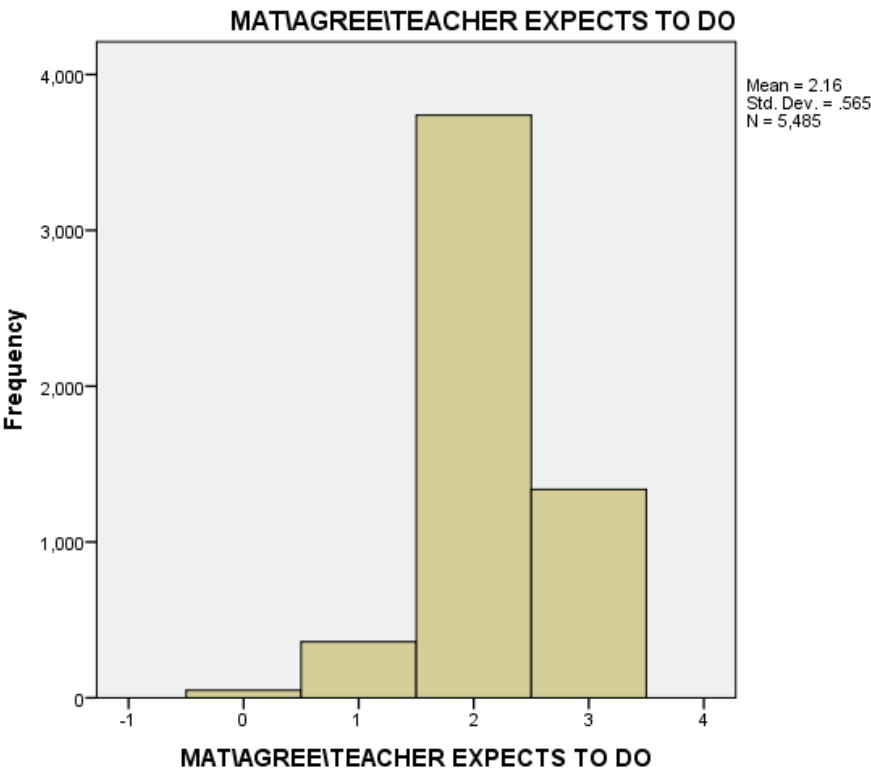
| Statistics     |         |  |                      |  |  |   |  |                       |
|----------------|---------|--|----------------------|--|--|---|--|-----------------------|
|                |         | *STUDENT<br>CONFIDENCE<br>WITH<br>MATHEMATICS/S<br>CL* | *SEX OF<br>STUDENTS* | GEN\AMOUNT OF<br>BOOKS IN YOUR<br>HOME | MAT\AGREE\TEA<br>CHER EXPECTS<br>TO DO | *1ST PLAUSIBLE<br>VALUE<br>MATHEMATICS* | *STUDENTS<br>ENGAGED IN<br>MATHEMATICS<br>LESSONS/SCL* | GEN\SEX OF<br>TEACHER |
| N              | Valid   | 5485   | 5485                 | 5485                                   | 5485                                   | 5485                                    | 5485   | 5485                  |
|                | Missing | 0  | 0                    | 0                                      | 0                                      | 0                                       | 0  | 0                     |
| Mean           |         | 9.5578   | .51                  | 2.03                                   | 2.16                                   | 402.8284                                | 9.9414   | .57                   |
| Std. Deviation |         | 1.10107  | .500                 | .811                                   | .565                                   | 82.62516                                | 1.19498  | .496                  |
| Minimum        |         | 3.18   | 0                    | 1                                      | 0                                      | 99.31                                   | 3.27   | 0                     |
| Maximum        |         | 15.82  | 1                    | 5                                      | 3                                      | 689.64                                  | 14.34  | 1                     |

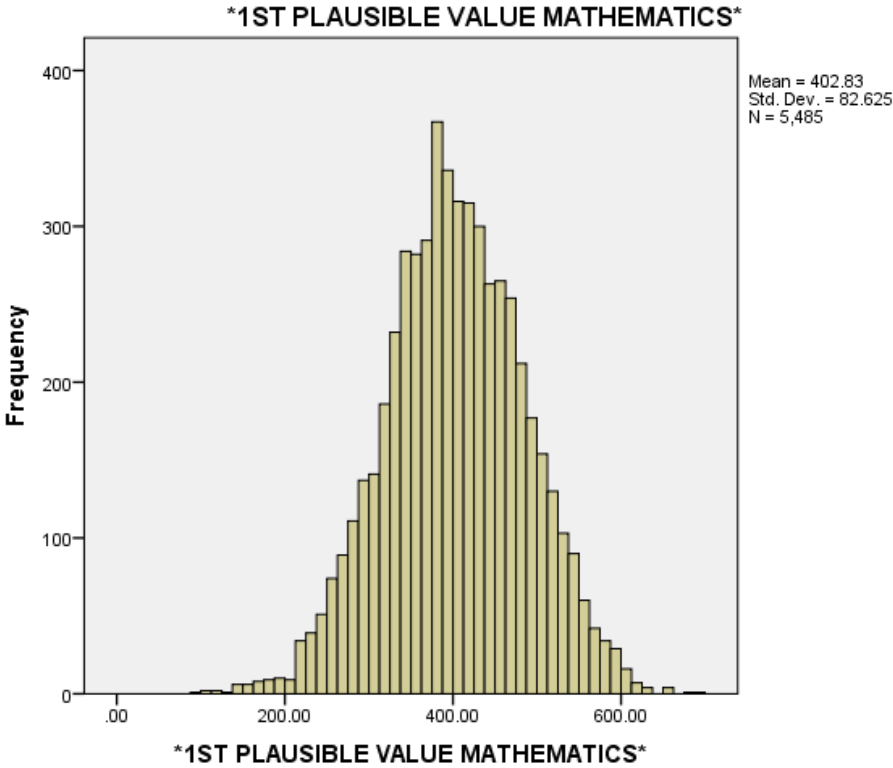


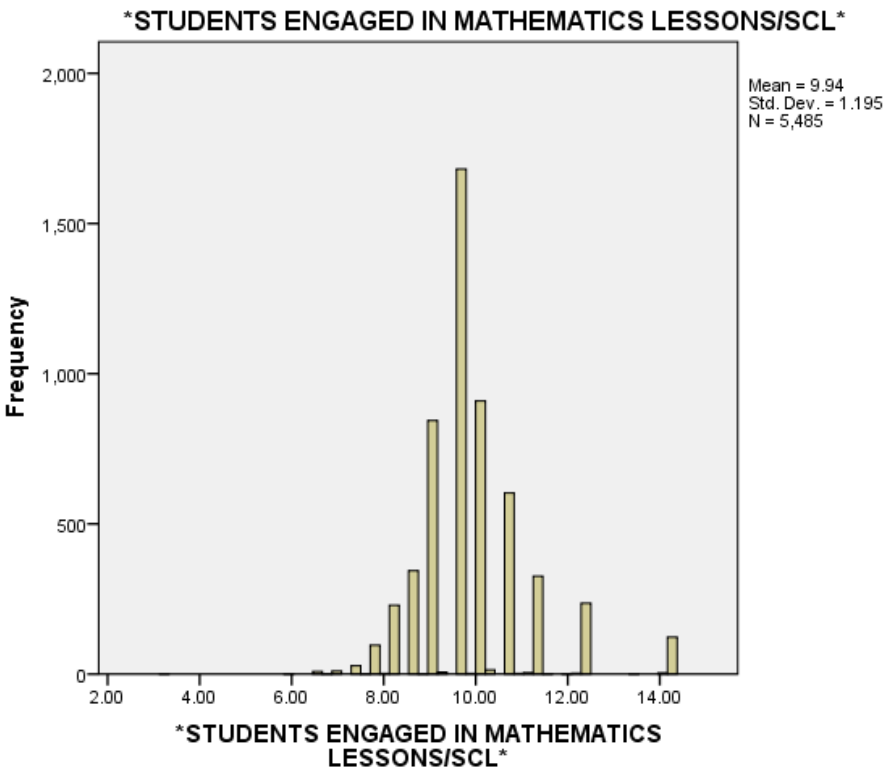


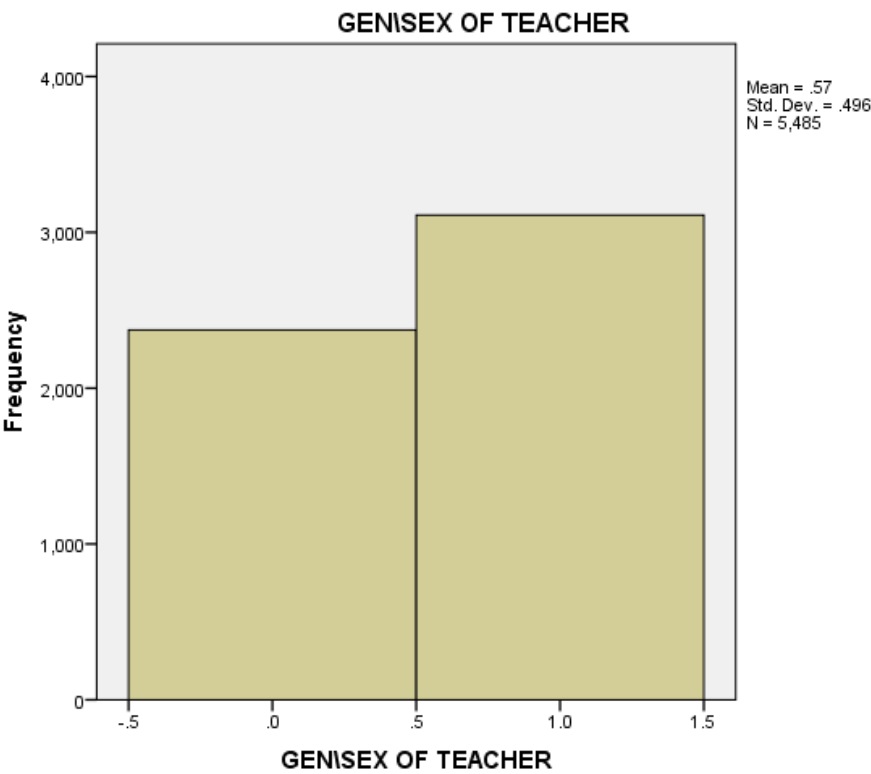


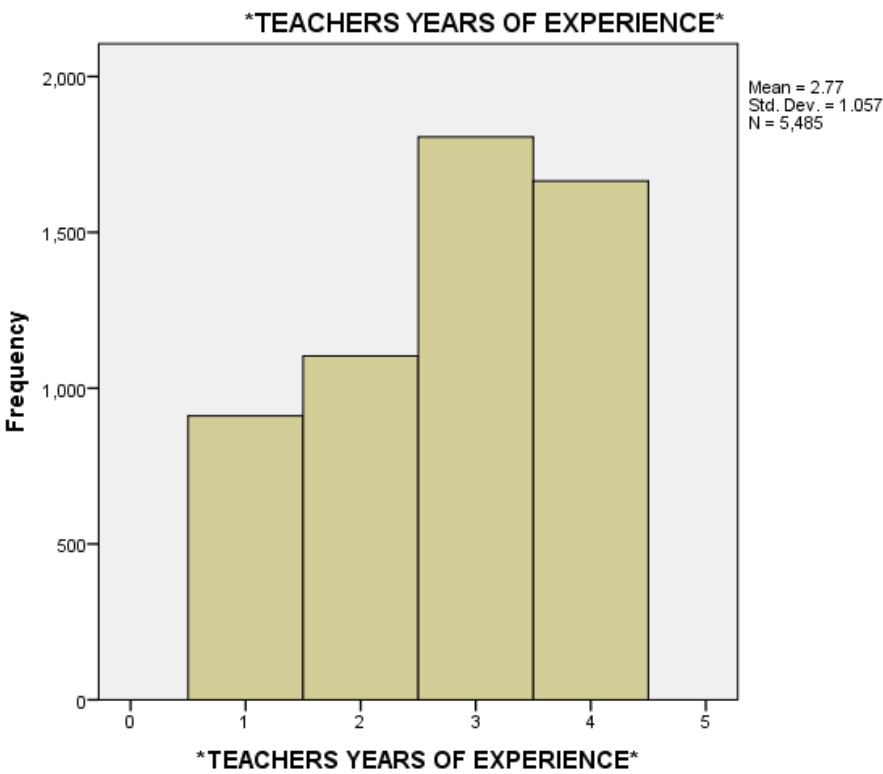


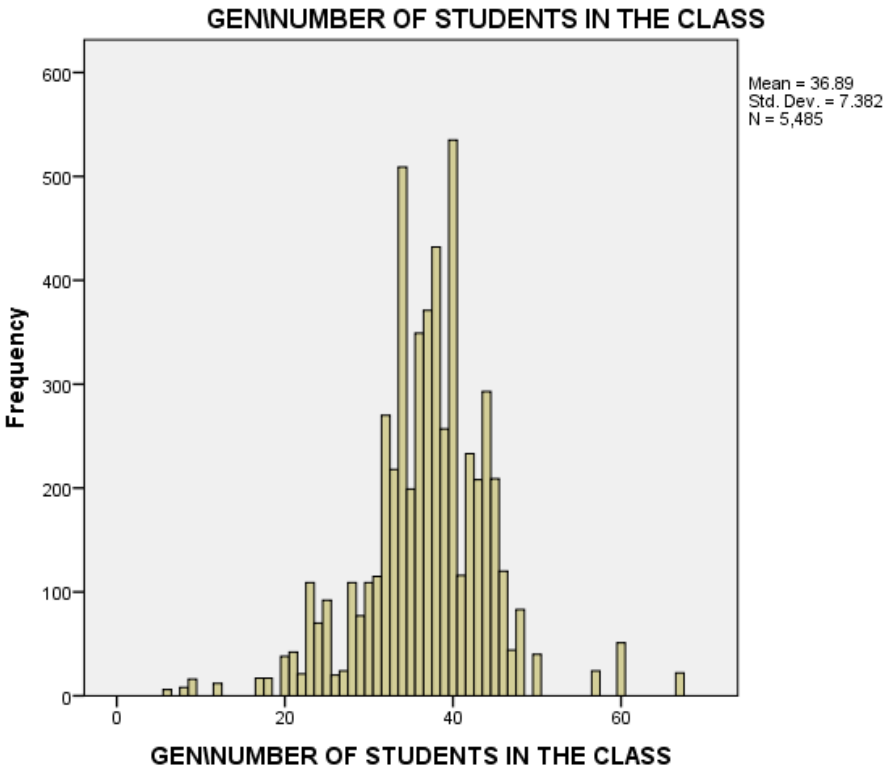


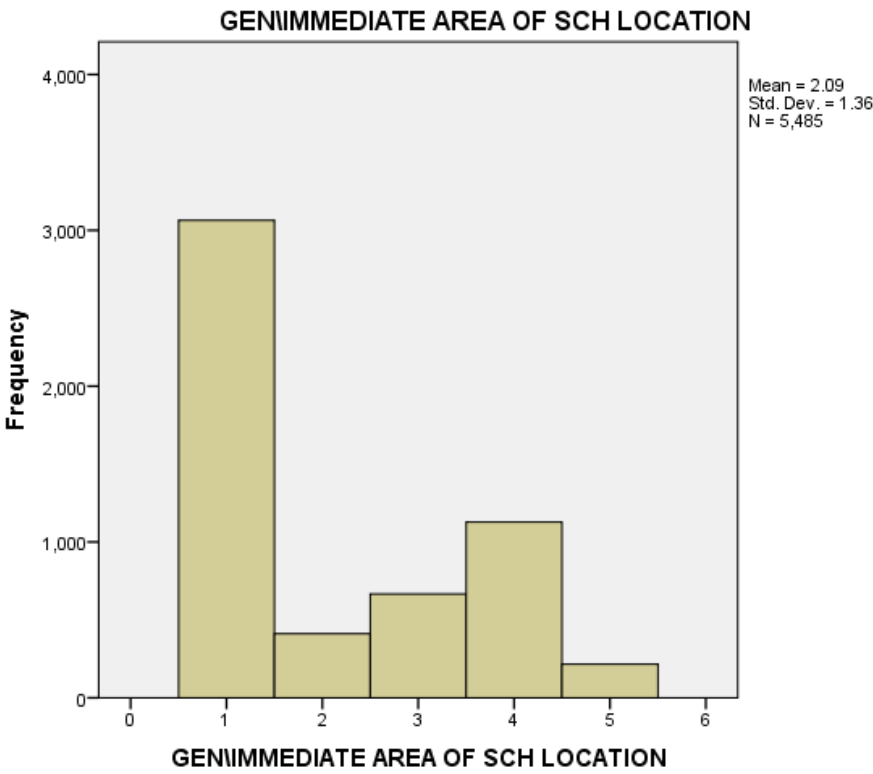


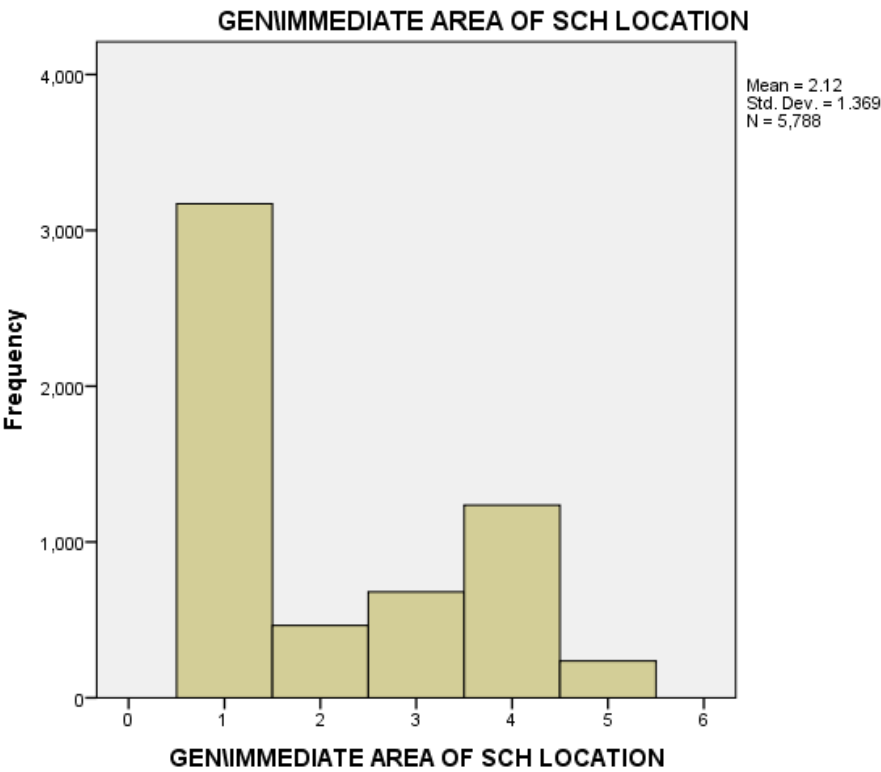




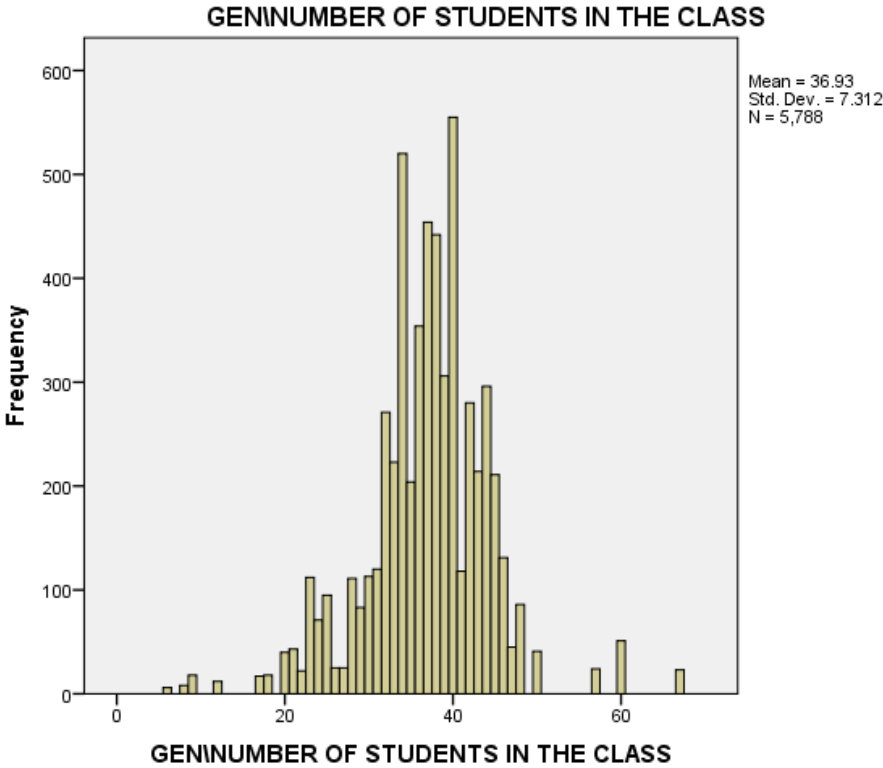




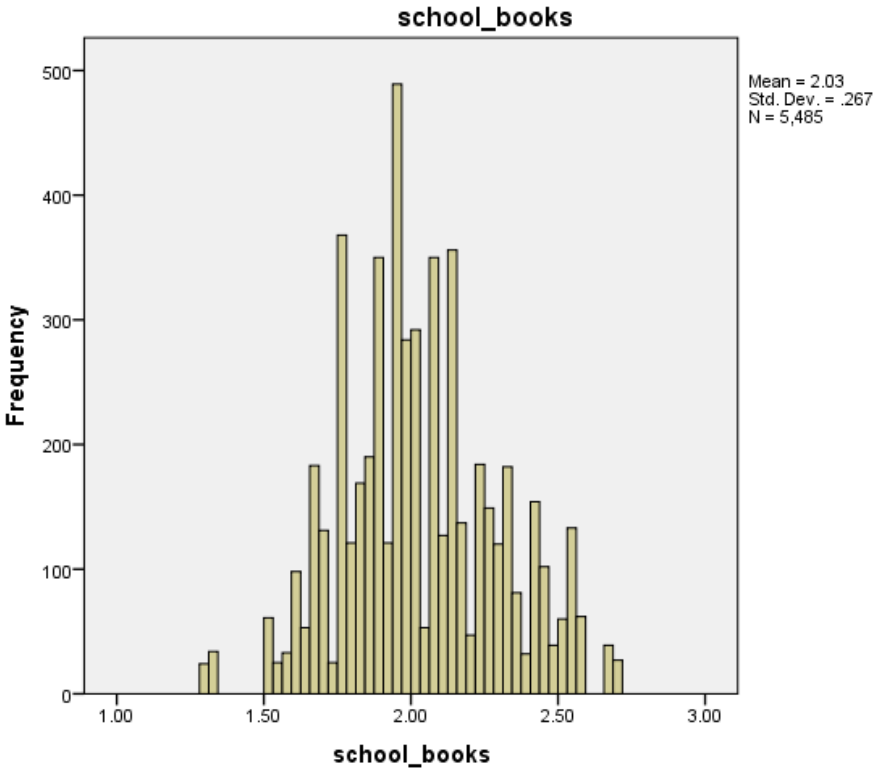










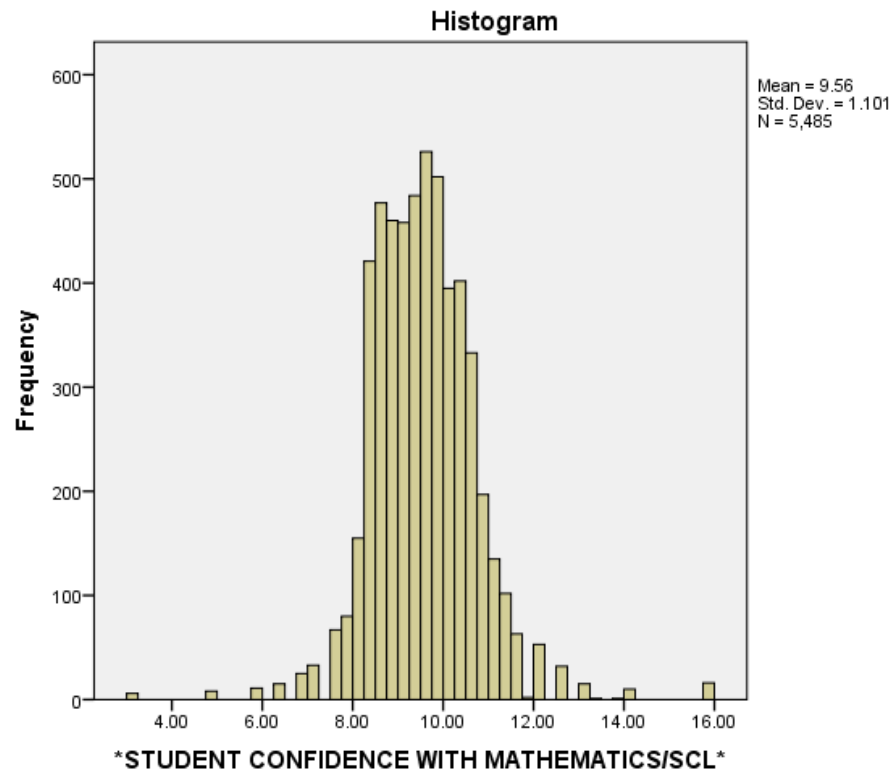


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TRANSFORMATION

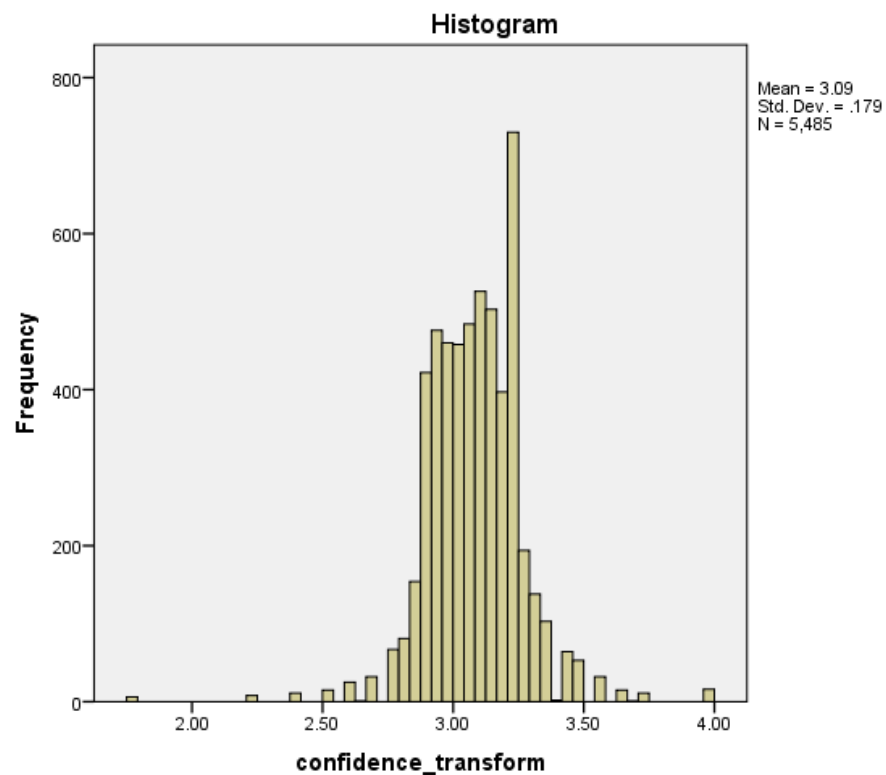
Original:

| Descriptives                                 |                                  |             | Statistic | Std. Error |
|--|----------------------------------|-------------|-----------|------------|
| *STUDENT CONFIDENCE<br>WITH MATHEMATICS/SCL* | Mean                             |             | 9.5578    | .01487     |
|  | 95% Confidence Interval for Mean | Lower Bound | 9.5287    |            |
|  |                                  | Upper Bound | 9.5870    |            |
|  | 5% Trimmed Mean                  |             | 9.5357    |            |
|  | Median                           |             | 9.6194    |            |
|  | Variance                         |             | 1.212     |            |
|  | Std. Deviation                   |             | 1.10107   |            |
|  | Minimum                          |             | 3.18      |            |
|  | Maximum                          |             | 15.82     |            |
|  | Range                            |             | 12.64     |            |
|  | Interquartile Range              |             | 1.20      |            |
|  | Skewness                         |             | .462      | .033       |
|  | Kurtosis                         |             | 4.858     | .066       |



Using sqrt:

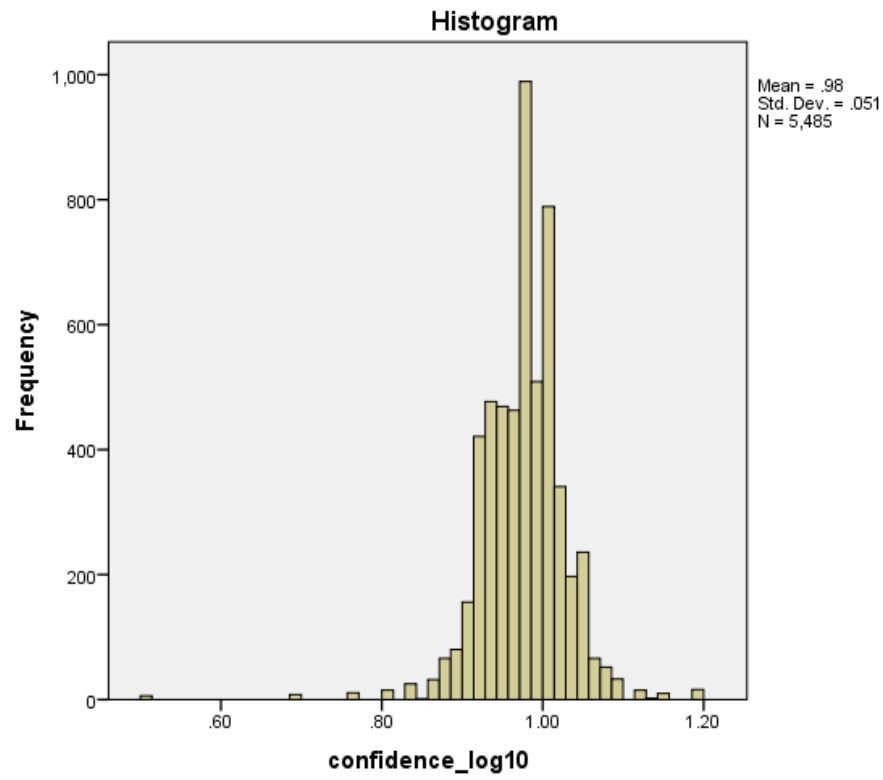
**Descriptives**



|                      |   | Statistic | Std. Error |
|----------------------|---|-----------|------------|
| confidence_transform | Mean                                    | 3.0864    | .00241     |
|                      | 95% Confidence Interval for Lower Bound | 3.0817    |            |
|                      | Mean Upper Bound                        | 3.0911    |            |
|                      | 5% Trimmed Mean                         | 3.0856    |            |
|                      | Median                                  | 3.1015    |            |
|                      | Variance                                | .032      |            |
|                      | Std. Deviation                          | .17869    |            |
|                      | Minimum                                 | 1.78      |            |
|                      | Maximum                                 | 3.98      |            |
|                      | Range                                   | 2.19      |            |
|                      | Interquartile Range                     | .20       |            |
|                      | Skewness                                | -.172     | .033       |
|                      | Kurtosis                                | 5.715     | .066       |

Using log 10

| Descriptives     |                                  |             | Statistic | Std. Error |
|------------------|----------------------------------|-------------|-----------|------------|
| confidence_log10 | Mean                             |             | .9774     | .00069     |
|                  | 95% Confidence Interval for Mean | Lower Bound | .9761     |            |
|                  |                                  | Upper Bound | .9788     |            |
|                  | 5% Trimmed Mean                  |             | .9780     |            |
|                  | Median                           |             | .9831     |            |
|                  | Variance                         |             | .003      |            |
|                  | Std. Deviation                   |             | .05132    |            |
|                  | Minimum                          |             | .50       |            |
|                  | Maximum                          |             | 1.20      |            |
|                  | Range                            |             | .70       |            |
|                  | Interquartile Range              |             | .05       |            |
|                  | Skewness                         |             | -1.010    | .033       |
|                  | Kurtosis                         |             | 10.389    | .066       |



CORRELATION TEST



## Correlations

|   |                     | *SEX OF STUDENTS* | GENAMOUNT OF BOOKS IN YOUR HOME | MATAGREE\TEACHER EXPECTS TO DO | *1ST PLAUSIBLE VALUE MATHEMATICS* | *STUDENTS ENGAGED IN MATHEMATICS LESSONS/SCL* |
|---|---------------------|-------------------|---------------------------------|--------------------------------|-----------------------------------|---|
| *SEX OF STUDENTS*                             | Pearson Correlation | 1                 | .028*                           | .025                           | .063**                            | .057**  |
|   | Sig. (2-tailed)     |                   | .036                            | .064                           | .000                              | .000  |
|   | N                   | 5485              | 5485                            | 5485                           | 5485                              | 5485  |
| GENAMOUNT OF BOOKS IN YOUR HOME               | Pearson Correlation | .028*             | 1                               | .041**                         | .110**                            | .042**  |
|   | Sig. (2-tailed)     | .036              |                                 | .002                           | .000                              | .002  |
|   | N                   | 5485              | 5485                            | 5485                           | 5485                              | 5485  |
| MATAGREE\TEACHER EXPECTS TO DO                | Pearson Correlation | .025              | .041**                          | 1                              | -.064**                           | .541**  |
|   | Sig. (2-tailed)     | .064              | .002                            |                                | .000                              | .000  |
|   | N                   | 5485              | 5485                            | 5485                           | 5485                              | 5485  |
| *1ST PLAUSIBLE VALUE MATHEMATICS*             | Pearson Correlation | .063**            | .110**                          | -.064**                        | 1                                 | -.083**                                       |
|   | Sig. (2-tailed)     | .000              | .000                            | .000                           |                                   | .000  |
|   | N                   | 5485              | 5485                            | 5485                           | 5485                              | 5485  |
| *STUDENTS ENGAGED IN MATHEMATICS LESSONS/SCL* | Pearson Correlation | .057**            | .042**                          | .541**                         | -.083**                           | 1   |
|   | Sig. (2-tailed)     | .000              | .002                            | .000                           | .000                              |   |
|   | N                   | 5485              | 5485                            | 5485                           | 5485                              | 5485  |
| GEN\SEX OF TEACHER                            | Pearson Correlation | -.001             | .044**                          | -.001                          | .013                              | -.017   |
|   | Sig. (2-tailed)     | .948              | .001                            | .935                           | .345                              | .207  |
|   | N                   | 5485              | 5485                            | 5485                           | 5485                              | 5485  |
| *TEACHERS YEARS OF EXPERIENCE*                | Pearson Correlation | .010              | .029*                           | -.012                          | .224**                            | -.064**                                       |
|   | Sig. (2-tailed)     | .445              | .030                            | .358                           | .000                              | .000  |
|   | N                   | 5485              | 5485                            | 5485                           | 5485                              | 5485  |
| GEN\NUMBER OF STUDENTS IN THE CLASS           | Pearson Correlation | .034*             | .004                            | -.033*                         | .099**                            | -.072**                                       |
|   | Sig. (2-tailed)     | .012              | .747                            | .016                           | .000                              | .000  |
|   | N                   | 5485              | 5485                            | 5485                           | 5485                              | 5485  |
| GEN\IMMEDIATE AREA OF SCH LOCATION            | Pearson Correlation | -.005             | -.027*                          | -.018                          | -.129**                           | .022  |
|   | Sig. (2-tailed)     | .687              | .046                            | .175                           | .000                              | .111  |
|   | N                   | 5485              | 5485                            | 5485                           | 5485                              | 5485  |

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

Running Head: MIDTERM

### NULL MODEL

Estimates of Fixed Effects<sup>a</sup>

| Parameter | Estimate | Std. Error | df      | t       | Sig. | 95% Confidence Interval |             |
|-----------|----------|------------|---------|---------|------|-------------------------|-------------|
|           |          |            |         |         |      | Lower Bound             | Upper Bound |
| Intercept | 9.608120 | .038794    | 144.171 | 247.671 | .000 | 9.531442                | 9.684799    |

a. Dependent Variable: \*STUDENT CONFIDENCE WITH MATHEMATICS/SCL\*.

Estimates of Covariance Parameters<sup>a</sup>

| Parameter                         | Estimate            | Std. Error | Wald Z | Sig. | 95% Confidence Interval |             |
|-----------------------------------|---------------------|------------|--------|------|-------------------------|-------------|
|                                   |                     |            |        |      | Lower Bound             | Upper Bound |
| Residual                          | 1.039393            | .020128    | 51.640 | .000 | 1.000683                | 1.079601    |
| Intercept [subject =<br>IDSCHOOL] | Variance<br>.191480 | .026310    | 7.278  | .000 | .146273                 | .250659     |

a. Dependent Variable: \*STUDENT CONFIDENCE WITH MATHEMATICS/SCL\*.

### LEVEL-1 RANDOM INTERCEPT MODEL (W/O GRAND CENTERING)

Estimates of Fixed Effects<sup>a</sup>

| Parameter       | Estimate | Std. Error | df       | t      | Sig. | 95% Confidence Interval |             |
|-----------------|----------|------------|----------|--------|------|-------------------------|-------------|
|                 |          |            |          |        |      | Lower Bound             | Upper Bound |
| Intercept       | 4.746798 | .138307    | 4796.839 | 34.321 | .000 | 4.475653                | 5.017943    |
| female          | -.109328 | .025248    | 5415.356 | -4.330 | .000 | -.158824                | -.059833    |
| books           | .061497  | .015919    | 5452.111 | 3.863  | .000 | .030290                 | .092704     |
| teacher_expect  | -.162660 | .026373    | 5402.754 | -6.168 | .000 | -.214363                | -.110957    |
| score_math      | .002047  | .000188    | 4449.211 | 10.871 | .000 | .001678                 | .002416     |
| engagement_math | .434329  | .013043    | 5478.973 | 33.299 | .000 | .408759                 | .459900     |

a. Dependent Variable: \*STUDENT CONFIDENCE WITH MATHEMATICS/SCL\*.

Estimates of Covariance Parameters<sup>a</sup>

| Parameter                         | Estimate            | Std. Error | Wald Z | Sig. | 95% Confidence Interval |             |
|-----------------------------------|---------------------|------------|--------|------|-------------------------|-------------|
|                                   |                     |            |        |      | Lower Bound             | Upper Bound |
| Residual                          | .823667             | .015980    | 51.544 | .000 | .792935                 | .855590     |
| Intercept [subject =<br>IDSCHOOL] | Variance<br>.130656 | .019279    | 6.777  | .000 | .097842                 | .174474     |

a. Dependent Variable: \*STUDENT CONFIDENCE WITH MATHEMATICS/SCL\*.

Running Head: MIDTERM

LEVEL-1 RANDOM INTERCEPT MODEL (WITH GRAND CENTERING)

Estimates of Fixed Effects<sup>a</sup>

| Parameter        | Estimate | Std. Error | df       | t       | Sig. | 95% Confidence Interval |             |
|------------------|----------|------------|----------|---------|------|-------------------------|-------------|
|                  |          |            |          |         |      | Lower Bound             | Upper Bound |
| Intercept        | 9.889100 | .073507    | 2345.966 | 134.533 | .000 | 9.744954                | 10.033245   |
| female           | -.109328 | .025248    | 5415.356 | -4.330  | .000 | -.158824                | -.059833    |
| books            | .061497  | .015919    | 5452.111 | 3.863   | .000 | .030290                 | .092704     |
| teacher_expect   | -.162660 | .026373    | 5402.754 | -6.168  | .000 | -.214363                | -.110957    |
| grandcent_score  | .002047  | .000188    | 4449.211 | 10.871  | .000 | .001678                 | .002416     |
| grandcent_engage | .434329  | .013043    | 5478.973 | 33.299  | .000 | .408759                 | .459900     |

a. Dependent Variable: "STUDENT CONFIDENCE WITH MATHEMATICS/SCL".

Estimates of Covariance Parameters<sup>a</sup>

| Parameter                                  | Estimate | Std. Error | Wald Z | Sig. | 95% Confidence Interval |             |
|--|----------|------------|--------|------|-------------------------|-------------|
|  |          |            |        |      | Lower Bound             | Upper Bound |
| Residual                                   | .823667  | .015980    | 51.544 | .000 | .792935                 | .855590     |
| Intercept [subject =<br>IDSCHOOL] Variance | .130656  | .019279    | 6.777  | .000 | .097842                 | .174474     |

a. Dependent Variable: "STUDENT CONFIDENCE WITH MATHEMATICS/SCL".

Running Head: MIDTERM

## LEVEL-2 RANDOM INTERCEPT MODEL

**Estimates of Fixed Effects<sup>a</sup>**

| Parameter              | Estimate  | Std. Error | df       | t      | Sig. | 95% Confidence Interval |             |
|------------------------|-----------|------------|----------|--------|------|-------------------------|-------------|
|                        |           |            |          |        |      | Lower Bound             | Upper Bound |
| Intercept              | 10.849318 | .301808    | 150.290  | 35.948 | .000 | 10.252984               | 11.445652   |
| female                 | -.108462  | .025247    | 5421.992 | -4.296 | .000 | -.157956                | -.058967    |
| books                  | .067536   | .016055    | 5318.050 | 4.206  | .000 | .036061                 | .099010     |
| teacher_expect         | -.161341  | .026381    | 5404.282 | -6.116 | .000 | -.213058                | -.109624    |
| grandcent_score        | .002138   | .000190    | 4711.363 | 11.258 | .000 | .001765                 | .002510     |
| grandcent_engage       | .433074   | .013049    | 5470.956 | 33.188 | .000 | .407492                 | .458655     |
| teacher_female         | -.041987  | .051951    | 346.783  | -.808  | .420 | -.144167                | .060192     |
| teacher_yrs_experience | -.045538  | .027231    | 185.197  | -1.672 | .096 | -.099261                | .008186     |
| classsize              | -.008473  | .003605    | 184.725  | -2.350 | .020 | -.015585                | -.001360    |
| urban                  | -.144843  | .124411    | 121.228  | -1.164 | .247 | -.391141                | .101456     |
| medium_size_city       | .008019   | .105923    | 122.040  | .076   | .940 | -.201665                | .217703     |
| small_town             | .083288   | .079752    | 130.854  | 1.044  | .298 | -.074482                | .241059     |
| remote_rural           | .169933   | .148057    | 132.126  | 1.148  | .253 | -.122936                | .462801     |
| school_books           | -.272181  | .124602    | 133.495  | -2.184 | .031 | -.518630                | -.025731    |

a. Dependent Variable: \*STUDENT CONFIDENCE WITH MATHEMATICS/SCL\*.

**Estimates of Covariance Parameters<sup>a</sup>**

| Parameter                         | Estimate | Std. Error | Wald Z | Sig. | 95% Confidence Interval |             |
|-----------------------------------|----------|------------|--------|------|-------------------------|-------------|
|                                   |          |            |        |      | Lower Bound             | Upper Bound |
| Residual                          | .824182  | .015985    | 51.558 | .000 | .793439                 | .856116     |
| Intercept [subject =<br>IDSCHOOL] | .114549  | .017504    | 6.544  | .000 | .084902                 | .154548     |

a. Dependent Variable: \*STUDENT CONFIDENCE WITH MATHEMATICS/SCL\*.

