

# Differential Gender Performance on the Major Field Test—Business

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## Abstract

The Major Field Test in Business (MFT-B), a standardized assessment test of business knowledge among undergraduate business seniors, is widely used to measure student achievement. Many previous studies analyzing the scores on the MFT-B report gender differences on the exam even after controlling for student's aptitude, general intellectual ability, and motivation. Our results point to two reasons behind this phenomenon. First, it is important to control for critical thinking abilities while explaining variation in the MFT-B scores. Second, motivations to perform well on the test vary between genders and high and low performing students.

## Introduction

The Major Field Achievement Test in Business (MFT-B) is a widely used learning assessment instrument intended for use with graduating seniors in post-secondary undergraduate business programs. The primary motivations for administering the assessment is related to general assessment of learning and curriculum development efforts and to offer external accrediting bodies, such as the Association to Advance Collegiate Schools of Business (AACSB), evidence that a program is fulfilling or making progress toward its stated mission. Martell (2007) [1] reported that in 2006, 46% of business schools used the MFT-B test in their assessment of students' learning. The Educational Testing Service (ETS), the publisher of the instrument, reported that 132,647 individuals at 618 different institutions completed the MFT-B between 2005 and 2011 (Educational Testing Service, 2009 [2]). The ETS describes the instrument as designed to measure a student's knowledge and ability to apply significant facts, concepts, theories, and analytical methods related to business. The questions represent a wide range of difficulty, and the assessment attempts to cover both depth and breadth in assessing students' levels of achievement (Educational Testing Service, 2010 [3]). The MFT-B has attracted the attention of researchers seeking to identify the determinants of student performance on this widely used assessment. Standardized test scores (ACT/SAT), grade point average (GPA), majors field of study, and gender have been consistently cited as determinative covariates. Our study extends this research stream by further and specifically examining the size and heretofore, unexamined nature of reported MFT-B performance differentials attributed to gender.

Gender, specifically male advantage, has been reported in several studies of performance on the MFT-B. Bielinska-Kwapisz, Brown & Semenik (2011) [4] reported that men perform

better than women by 4.33 points after controlling for ACT scores, GPA, and an offer of extra credit for performance. Mason et al. (2011) [5] reported a 4.9 point male advantage on the MFT-B while controlling for GPA, SAT, age, transfer, race, and major; while Bagamery, Lasik, and Nixon (2005) [6] reported male scores on the MFT-B were 8 points higher than those from women when controlling for essentially the same stock of covariates. Black and Duhon (2003) [7] reported a 3.79 point male advantage, while Bean and Bernardi (2002) [8] report a 3.64 point male advantage. Contreras, Badua, Chen, and Adrian (2011) [9] and Mirchandani, Lynch, and Hamilton (2001) [10] also found that males significantly outperformed females while controlling for standard co-variants and dispositional factors. Terry, Mills, Rosa, and Sollosy (2009) [11], in a study of the MFT-B performance of on-line students, did not find gender to be a significant predictor of MFT-B scores when they controlled for ACT scores, GPA, transfer, internationalism, and participation in online business education; however, in their study group, students' percentage score on the MFT-B assessment counted for either 10% or 20% of the course grade in the business capstone course. They reported that a 10% application to capstone course grade resulted in a 12.91% increase in the MFT-B percentile score and a 20% application to course grade resulted in an 18.1% score increase. These results were consistent with results those of Bycio and Allen (2007) [12] who, using a self-reported motivation scale had previously reported that student motivation is an important determinant of performance on the MFT-B. While the overwhelming majority of studies of performance on the MFT-B report gender differences and male over-performance, the nature and determinants of those differences have neither been explained or speculated upon. Our study's objective is to attempt to fill the gap in the understanding of the determinants of MFT-B scores. The possibility of a male advantage in the MFT-B raises the specter of a threat to the validity of this widely used measure of academic achievement among undergraduate business students, an issue which needs to be fully examined and understood.

Our study seeks to contribute an understanding of these observed differences in gender performance in two ways. First, a measure of critical thinking ability will be introduced into the explanatory scheme in an effort to more completely examine the impact of gender differences on MFT-B performance. The other main approach in our study, informed by results reported by Terry et al. (2009) [11] and Bycio and Allen (2007) [12], is to examine the impact of motivation on performance and the possibility of differential gender reactivity to the offer of extra or course credit incentives linked to MFT-B performance. The study begins with a description of the setting and data used to consider these heretofore unexamined relationships. MFT-B score distributions are provided along with an examination of the determinants and inter-correlations of the MFT-B and critical thinking scores. Analysis of gender differences in MFT-B scores when extra credit is offered is provided, along with an examination of gender performance on the MFT-B across different academic majors.

## **Method**

The setting for the current study is an undergraduate college of business at a Carnegie Research I, Land Grant University, which has held continuous AACSB accreditation for over 25 years. Students at the focal institution are predominantly Caucasian with a small population of international and ethnic students. As part of an assessment of learning process, the MFT-B has been administered to every graduating senior from the summer semester of 2005 to spring 2009.

Background data identified in the study was obtained from student records. The total number of students in the study population was 885. Full data, most notably MFT-B and ACT scores, was available for 692 students, primarily attributable to the fact that transfer students were not required to submit ACT scores. In addition, for each of the 692 students in the core study, the data includes university grade point average measured at graduation, gender, and major area of study (accounting, finance, management, or marketing). Starting in the spring semester of 2008, students received extra credit points in their capstone business course to incent their best efforts on the MFT-B (5 points for a 50th percentile score, 7.5 points for 75th percentile, and so on). Critical thinking skills are generally defined as the ability to evaluate sources of information, challenge assumptions, understand context, analyze arguments, and use metacognition (Brookfield, 1987 [13]; King & Kitchener, 1994 [14]; Kurfiss, 1988 [15]). In this study critical thinking was measured with the California Critical Thinking Skills Test (CCTST) (Facione & Facione, 1994 [16]). Published by the California Academic Press, the CCTST is an educational assessment tool specifically designed to assess selected, core critical thinking skills (Facione, 1990 [17]). The test consists of 34 multiple-choice items yielding an overall measure of critical thinking skills and sub-scales measuring: analysis, evaluation, inference, deductive reasoning, and inductive reasoning (Jacobs, 1995 [18]). The CCTST has been demonstrated to have acceptable reliability and validity when used to assess critical thinking skills in college students (Facione & Facione, 1994 [16]; Facione, Giancarlo, Facione, & Gainen, 1995 [19]). As a part of the institutional assessment of learning agenda, the CCTST was administered to every graduating senior from the spring semester 2006 to spring 2007, a total of 327 students. Table 1 reports the full list of variables, their definitions, and descriptive statistics.

TABLE 1 *Definitions and Descriptive Statistics*

Variable	Description	Mean	Std Dev.	Min.	Max.	N
MFT-B	MFT-B score on a scale 120 to 200	161.49	12.28	128	194	885
ACT	ACT score on a scale 1 to 36	23.39	3.46	14	34	692
GPA	GPA measured at the time of graduation	3.13	0.40	1.99	4	880
CTTOT	Total Critical Thinking score on a scale of 0 to 34	20.39	4.44	8	31	327
CTANAL	CT Analysis	4.84	1.19	1	7	327
CTINF	CT Inference	10.10	2.41	2	15	327
CTEVAL	CT Evaluation	5.45	2.08	0	11	327
CTDED	CT Deductive	9.24	2.76	2	16	327
CTIND	CT Inductive	11.15	2.30	4	16	327
Male	1 if male; 0 if female	0.54	–	0	1	885
ExCredit	1 if extra credit was offered	0.41	–	0	1	885
FIN	1 if finance major	0.17	–	0	1	885
ACCT	1 if accounting major	0.22	–	0	1	885
MGMT	1 if management major	0.33	–	0	1	885
MKTG	1 if marketing major	0.27	–	0	1	885

### Analysis

Differences in means and variances between male and female students' characteristics for the whole sample and for sub-samples of observations, when CCTST and extra credit were given

were calculated. The only statistically significant observed differences between sample means are those between male and female MFT-B scores and GPA. Interestingly, males outperformed females on the MFT-B, while females' GPAs were higher. Study results suggest that female students had higher GPAs even after controlling for the variation in their ACT scores. Similar results were reported in other settings (e.g. Siebert et al., 2006 [20]; Stater, 2009 [21]) and were attributed to the greater academic motivation among females. The Levene test for the equality of variances was performed and the only statistically significant differences observed were between male and female variances of their MFT-B scores (female variance = 135.2 vs. male variance = 162.5) and their CCTST sub-scores for inductive reasoning (female variance = 4.63 vs. male variance = 5.87). On average, male students had higher MFT-B scores, but larger variance in those scores.

### **Determinants of Critical Thinking Scores**

Numerous studies have reported that critical thinking abilities are influenced by specific instructional variables. However, in our study the focus was on the identification of institutional data that helps to explain the variation in critical thinking scores. There is no clear consensus in the academic literature on the influence of GPA, ACT, or gender on critical thinking ability or CCTST scores. In the context of our study, ACT scores were used as a proxy for general cognitive capability (Koenig, Frey, & Detterman, 2008 [22]), GPA as a measure of time input and effort, along with students' major field of study (accounting, finance, marketing, or management). The specific learning function used in this study was a fixed effects model with the CCTST score or its sub-scales as a dependent variable and ACT, GPA, Male as independent variables with majors as fixed effect. The accounting major was dropped to avoid perfect multicollinearity. The ordinary least squares regression was used to estimate the model. Informed by previously cited research, we hypothesized that ACT and GPA would have a positive effect on the critical thinking measures, but the effect of gender had to be determined empirically. All correlations between the sub-scales of the CCTST were significant at 1% level. The largest correlation was between CCTST total scores and CCTST deductive and inference scores. In addition, CCTST deductive and inference scores were the most strongly correlated ( $r = 0.86$ ). The main model containing CCTST total scores explained about 42% of the variation in MFT-B scores. As expected, ACT scores were a good predictor for CCTST scores and explained the most of the variation in the CCTST scores in all models. The GPA scores were significantly correlated with the CCTST total, evaluation, and deductive models. It is likely that courses students take tend to increase the evaluation and deductive subscales of the CCTST, but not inference, analysis, and induction subscales. Students' majors were not significant factors in the models after controlling for all other characteristics. Study results suggest that males outperformed females on inference and deductive critical thinking. This may explain conflicting reports on this variable in previous literature: specifically, the effect may depend on the type of the critical thinking test used.

### **Determinants of MFT-B Scores**

A number of studies have examined the effect of students' characteristics on performance on the MFT (e.g. Allen & Bycio, 1997 [23]; Bagamery et al., 2005 [6]; Bean & Bernardi, 2002 [8]; Black & Duhon, 2003 [7]; Bielinska-Kwapisz, Brown & Semenik, in press a [24], in press b [25]; Bielinska-Kwapisz & Brown, 2011 [4]; Bycio & Allen, 2007 [12]; Contreras et al., 2011 [9]; Mason et al., 2011 [5]; Mirchandani et al., 2001 [10]; Stoloff & Feeney, 2002 [26]; Terry et

al., 2009 [11]; Zeis, Waronska, & Fuller, 2009 [27].) Most of the above studies included standardized test scores (ACT/SAT), grade point average (GPA), majors, and gender as independent variables. However, none of the previous literature analyzing MFT-B scores controlled for students' critical thinking abilities and only a few studies analyzed the effect of critical thinking on the performance on class exams. Jenkins (1998) [28] results suggest that students with higher measures of critical thinking skills (measured by the Watson Glaser Critical Thinking Appraisal test) and past academic performance outperformed other students on a class exam and a comprehensive final examination in an upper-division auditing course. Roberts and Dyer (2005) [29] used the Engagement, Maturity, and Innovativeness Critical Thinking Disposition Inventory and showed that motivation, self-efficacy, and critical thinking disposition accounted for 8.8% of the variance in a linear combination of attitudes and post-test achievement.

### **Gender, Critical Thinking, and the MFT-B**

To examine the effect of gender and critical thinking on the variation in MFT-B scores we used the model with MFT-B scores as dependent variable; ACT, GPA, Male, ExCredit, and the CCTST score or sub-scales score as independent variables; and majors' fixed effects. Several variations of the model were estimated and the results are presented in Table 2. During the period in which the CCTST test scores were obtained, extra credit for MFT-B performance was not offered to students. Therefore, Model 1 ( $n = 692$ ) in Table 2 uses all data, but the rest of the models employ only data collected during the time period when the CCTST test was administered ( $n = 238$ ). The best explanatory model is Model 5, which includes the inference subscale of the CCTST, and explains about 54% of variation in the MFT-B scores. This model suggests that the GPA was the most important predictor in explaining MFT-B results. A 10% increase in GPA increases MFT-B by 1.6%. The impact of ACT was similar: a 10% increase in ACT scores increased MFT-B by 1.46%. The impact of the critical thinking score was smaller: a 10% increase in the critical thinking inference score increased the MFT-B by only 0.1%. In comparison with Model 3, which uses the same data, but also the CCTST total score, a 10% increase in the total critical thinking score increased the MFT-B by 0.7%. As reported in previous literature, management and marketing students achieved lower scores on the MFT-B exam as compared to accounting students. Of particular interest in our study is the coefficient of the Male variable. In Model 5, after controlling for the critical thinking inference scores, the coefficient on Male variable was insignificant. Therefore, critical thinking inference scores may explain the difference between male and female scores on the MFT-B. Compared to Model 2, which used the same sample of observations, but did not control for critical thinking, the coefficient was smaller by 33% (and insignificant). These results suggest that differences in critical thinking inference scores may be responsible for the difference between male and female scores on the MFT-B reported in previous studies.

TABLE 2 *Dependent Variable = MFT-B Scores (t-statistics are in parentheses)*

Model	1	2	3	4	5	6	7	8
Variables	All data	Data limited to CCTST	CT Total	CT ANAL	CT INF	CT EVAL	CT IND	CT DED
Constant	99.32 (30.2)	99.05 (19.28)	99.52 (19.8)	97.93 (18.50)	100.11 (20.22)	100.39 (5.18)	95.86 (5.14)	101.96 (19.89)
ACT	1.50 (13.5)	1.47 (8.43)	1.04 (5.07)	1.43 (8.00)	1.01 (5.08)	1.33 (6.70)	1.25 (6.60)	1.14 (5.73)
GPA	8.50 (8.5)	9.10 (5.62)	8.27 (5.19)	9.04 (5.57)	8.44 (5.39)	8.71 (5.35)	8.75 (5.45)	8.40 (5.23)
Male	4.33 (6.2)	2.77 (2.44)	2.35 (2.12)	2.73 (2.40)	1.86 (1.68)	2.85 (2.52)	2.82 (2.52)	2.19 (1.94)
Finance	1.67 (1.5)	2.43 (1.28)	3.02 (1.66)	2.65 (1.90)	2.82 (1.54)	2.52 (1.90)	2.79 (1.48)	2.80 (1.94)
Management	-3.63 (3.8)	-3.29 (1.99)	-3.14 (1.96)	-3.22 (1.95)	-3.18 (2.00)	-3.29 (2.00)	-3.21 (1.97)	-3.19 (1.97)
Marketing	-5.82 (5.9)	-5.37 (3.12)	-5.05 (3.01)	-5.28 (3.06)	-5.30 (3.20)	-5.21 (3.04)	-5.02 (2.94)	-5.33 (3.16)
EXCRED	1.29 (1.9)	NA	NA	NA	NA	NA	NA	NA
CT measure	NA	NA	0.59 (3.69)	0.43 (0.09)	1.21 (4.40)	0.53 (1.66)	0.72 (2.62)	0.76 (3.15)
R-squared	0.5013	0.5119	0.539	0.514	0.550	0.518	0.526	0.532
Adj R-squared	0.4962	0.4992	0.525	0.499	0.536	0.503	0.512	0.518
N	692	238	238	238	238	238	238	238

### Gender, Extra Credit, and the MFT-B

To further analyze genders differences on the MFT-B, the impact of an offer of extra credit tied to performance was examined. GPA is frequently used as a measure of student's effort and, as previously noted, female subjects have overall significantly higher GPA scores than males. Therefore, it is hypothesized that the extra credit offered for good performance on the MFT-B exam should impact female scores less than male scores since female students may already be performing at peak levels and would not need or be benefited by an incentive to increase effort. Therefore, the estimation was performed separately by gender. Most of the coefficients were quite similar to one another. As before, the most important variables in explaining the variation of the MFT-B scores were ACT and GPA; however, most interestingly there were significant differences between male and female students' reactions to the extra credit offer. Our study results suggest that males who were offered extra credit for performance on the MFT-B, on average had MFT-B scores 2.48 points higher than male scores received in years that extra credit was not offered. The extra credit coefficient for females was not significant and actually had a sign in an unanticipated direction. As previously noted, the extra credit offer was not in place during the period when the CCTST data was collected, so that relationship cannot be directly examined. However, it is possible to divide the sample into periods when extra credit was or was not offered and to examine the impact of the CCTST variable during the period when the extra credit was not offered. As expected, when data were split into with and without extra credit conditions and after controlling for all other variables except critical thinking, male mark-up was significant in both regressions. However, the mark-up for males was 3.20 points when extra credit was not offered and 5.76 when extra credit was offered: an 80% increase. The difference of 2.6 points matches the result of 2.5 extra points for males who received an extra

credit offer. As expected, this coefficient went down from 3.2 to 1.86 and became insignificant while controlling for the critical thinking inference scores.

To further analyze the reaction of males to an extra credit offer, the differences throughout the MFT-B distribution were examined using quantile regression. Quantile regression makes use of the entire sample and is not equivalent to utilizing the dependent variable series of sub-samples and applying OLS to those sub-samples. We estimated coefficients at the 5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup>, and 95<sup>th</sup> percentiles of the overall MFT-B male score distribution. The results suggest that ACT and GPA scores were significant determinants of male MFT-B scores along the whole distribution. However, the effect of the extra credit was not uniform throughout the male MFT-B scores distribution. On average (OLS estimation), extra credit offers increased overall male scores by 2.48 points. However, it started with almost no effect for the lowest 5<sup>th</sup> percentile (0.56;  $p = 0.75$ ) and remained insignificant at 25<sup>th</sup> percentile (1.49;  $p = 0.29$ ). The extra credit became significant at the median (2.35;  $p = 0.025$ ) and increased to 2.92 at 75<sup>th</sup> percentile ( $p = 0.04$ ). It peaked at 3.62 for top 5<sup>th</sup> percentile of male MFT-B scores ( $p = 0.006$ ). Similar quantile regression was performed for females. In that instance an extra credit offer was not significant and had an unexpected negative sign for the OLS and for all quantiles except for 95% quantile when the sign became positive, although the coefficient remained insignificant (2.38;  $p = 0.15$ ). Therefore, the extra credit incentive was not significant for any females in the study and up to the median for the male distribution. The only population that reacted to the extra credit incentive was the top 50<sup>th</sup> percentile of males.

### **Analysis by Major**

The above analysis shows significant differences in MFT-B scores by major. Similar differences were found in previously cited studies where in general it was reported that marketing and management students have performed on the MFT-B inferior to finance and accounting students after controlling for standard variables (ACT, GPA, gender). However, the previous literature is silent in regard to the impact of gender differences by major. We estimated the impact of ACT, GPA, Extra Credit, and Male on MFT-B scores using OLS and quantile regressions by major. The results from the OLS regression show that, on average, males outperformed females on the MFT-B with score 3.53 points in marketing, 3.70 points in management, 4.37 in finance, and 6.38 in accounting. However, the results from the quantile regression show large differences across quantiles. Overall, the biggest differences were in accounting (all quantile coefficients were above all quantiles in management and marketing and all but 80<sup>th</sup> percentile in finance). In management and accounting, the differences between quantiles were not very large; however, at the 80<sup>th</sup> percentile on MFT-B scores in finance, the difference was 8.59 points, but was not significant at the lowest percentile. However, the same analysis was performed controlling for the critical thinking inference scores and none of the coefficients were significant (similar results were obtained when critical thinking total scores were used).

### **Summary, Conclusions, Implications, and Limitations**

The MFT-B is intended to measure mastery of business knowledge by senior students in undergraduate business programs. It has been estimated that almost half of all colleges of business utilize the MFT-B as a part of their assessment of learning process and to support

external accreditation by the AACSB. The MFT-B has attracted attention from researchers who have primarily focused on the covariates and determinants of performance on the assessment. Among other identified explanatory variables, previous studies have consistently reported a gender effect with male advantage. In the cited studies males' MFT-B scores were higher, in a range from 3.6 to 8.4 points, than females' scores, significant even after controlling for general ability with ACT/SAT scores and effort with GPA. Using a large multi-year sample, our study examined the nature of this gender effect. In the focal study sample ( $n = 692$ ), male MFT-B scores were 4.33 points higher than women, significant when controlling for ACT and GPA. The results of our study suggest that it is very likely that male advantage on the MFT-B emanates from two sources. First, and perhaps most importantly, is a gender-based difference in critical thinking skills. In our study, critical thinking was measured with the CCTST and even though no significant bivariate gender differences on the CCTST were observed, when control for ACT scores was introduced into the analysis, a significant male advantage appeared. A further examination of the impact of critical thinking on gender differences in MFT-B scores suggests that the inference subscale of the CCTST was the source for most of the explained differences. Our study results indicate that 44% of variation in the CCTST total scores was explained by variation in ACT and GPA scores. Males significantly outperformed females on both the inference and deductive subscales; however, these two measures were strongly correlated and half of the questionnaire items which contributed to the deductive reasoning subscale also contributed to the inference subscale. MFT-B gender differences by major were also analyzed. The largest gender differences were found in the top decile of finance majors, a difference which is explained by the differential CCTST scores. Additionally, our study results indicate that part of the gender differences on the MFT-B can also be explained by any performance incentives given to students to encourage best efforts when taking MFT-B. Significant gender differences in reactivity to those incentives were observed. In this study sample there was no female reactivity to an offer of extra course credit tied to performance on the MFT-B. But results do indicate that the top 50<sup>th</sup> percentile of males in the MFT-B distribution reacted significantly to the same extra credit offer. Results of our study are reassuring in regard to the possibility of gender bias in the MFT-B itself. However; since most of the difference between males and females on the MFT-B exam can be explained by the differences in the critical thinking-inference abilities, it is important to include some measure of critical thinking while explaining or attempting to fully understand local variation in MFT-B scores. The use of extra credit to incent best efforts when taking the MFT is more complex. Our study's results indicate that incentives tied to MFT-B performance will yield higher institutional scores, but almost all of that increase emanates from males in the top half of the MFT-B distribution. The argument in favor of an extra credit offer is that it may yield not just higher, but more accurate MFT-B scores, reflecting the full nature of business knowledge amongst the cohort completing the assessment. The argument against an extra credit offer is that extra credit may unfairly benefit males for doing something (making a best effort on the MFT-B) they should be doing anyway. However, females, inclined to give their best effort absent an extra credit offer, are disadvantaged in the course or other setting where the extra credit is applied. The focal performance metric in this study is the MFT-B. ETS, publishers of the MFT-B, describe using subject matter experts to produce the assessment tools (Educational Testing Service, 2009 [2]), but provide no definitive evidence regarding validity—a factor that has attracted concerned attention (Allen & Bycio, 1997 [23]; Parmenter, 2007 [30]). The value of the performance findings, albeit not necessarily the potential value of the methodology, is of course limited by the validity of that measure. The contribution of our study

lies in the illumination of not just the size, but the nature and determinants of the gender differences, which have been observed in numerous studies of the MFT-B. Previous research on the determinants of MFT-B scores estimated coefficients at the mean. However, as our study demonstrates, it is both interesting and helpful to see the determinants of the MFT-B scores examined at different points of the distribution. The use of quartile regression, which examines relationships at various locations on the distribution curve, may yield substantially different results from the impact at the top or a bottom of the distribution. Quartile regression would seem to substantially improve the accuracy of the assessment of learning and contribute to a better understanding of the contribution of dispositional factors, such as gender, which impact academic achievement as compared to estimates of the coefficients on sample means obtained by the use of OLS. The relatively large multi-year data set used in this study has permitted an examination of differential gender performance comparisons within and between different cohorts at the same institution. Generalization of the findings regarding the size, nature, and determinants of these gender differentials will be enhanced by replications in other institutional settings and studies across different institutions. Most importantly, our results suggest that gender differences on the MFT-B exam disappear after controlling for students critical thinking skills. The result is an important step in an assurance that the MFT-B test is not gender biased. Moreover, we show that males and females react differently to extra credit offered on the good performance on the MFT-B. These differences in behavior are also found between low and high performing students. We used separate regressions by gender and a quantile regression to uncover these phenomena. The results may be very important for departments in their decision whether to offer an extra credit for a good performance on the MFT-B exam. Our study sheds a light on gender differences in self-motivation. Additionally, we contribute to the literature by estimating factors explaining the variation on the California Critical Thinking Skills Test (CCTST) and its subscales. We document differences between genders in the distributions of MFT-B, ACT, GPA, and CCTST. We also show that differences in gender may differ in different business majors.

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