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GENDER DIFFERENCES IN STATISTICS ANXIETY AMONG GRADUATE STUDENTS LEARNING ENGLISH AS A FOREIGN LANGUAGE

TSUNG-YUAN HSIAO AND STEVE CHIANG
National Taiwan Ocean University, Keelung, Taiwan, ROC

Learning a foreign language arouses anxiety (Horwitz, Horwitz, & Cope, 1986). Lalonde and Gardner (1993) contend that learning statistics is similar to learning a foreign language. It is, therefore, not surprising that students enrolled in statistics courses often experience statistics anxiety. Because the study of statistics, as an essential component of the graduate curriculum, can lead to students' anxiety, helping students manage their statistics anxiety has been a concern of teachers. Alleviation of anxiety first requires an understanding of its causes, one of which has been identified as gender. However, empirical investigations have generated mixed results about the effects of gender on statistics anxiety. DeCesare (2007) reported that females experience greater statistics anxiety than do males; Baloğlu (2003) did not find such a difference; and Zeidner (1991) found that gender differences vary according to type of statistics anxiety.

Although empirical research has accumulated much evidence on the effect of gender on statistics anxiety, no study has been devoted to examining this with students learning English as a foreign language and statistics (as a subject) in that language. We therefore hypothesized that statistics anxiety would be higher for females than for males for students learning English as a foreign language and studying statistics in that language. Participants were 77 students in graduate programs of applied English in Taiwan. Ages ranged from 22 to 59 years (M =

Tsung-yuan Hsiao, PhD, Professor and Director, and Steve Chiang, PhD, Assistant Professor, Institute of Applied English, National Taiwan Ocean University, Keelung, Taiwan, ROC.
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Please address correspondence and reprint requests to: Tsung-yuan Hsiao, Institute of Applied English, National Taiwan Ocean University, 2 Pei-Ning Road, Keelung 202, Taiwan, ROC. Phone: +886-2-24622192 ext. 2003; Fax: +886-2-24631205; Email:**tyhsiao@ntou.edu.tw** or **hsiao.tsungyuan@gmail.com**

27.56, *SD* = 7.31). Females (81%) outnumbered males (19%), which is reflective of the gender make-up in a typical graduate language program in Taiwan. More participants had an undergraduate major in social sciences and humanities (84%) than in science or engineering (16%). A chi-square test for independence did not show significant gender differences in academic majors, $\chi^2(1, N = 77) = 0.38$, $p = .539$. Participants completed the 51-item Statistical Anxiety Rating Scale (Cruise & Wilkins, 1980) using 5-point Likert scales. Cronbach's coefficient alphas for reliability were .94 for the entire scale and .94, .87, .81, .84, .79, and .58 for the six subscales, respectively.

Results from an independent-samples *t* test for overall statistics anxiety failed to yield a significant difference between males ($M = 150.80$, $SD = 31.00$) and females ($M = 146.89$, $SD = 27.46$), $t(75) = -0.48$; $p = .631$. To test the gender effects on the six subscales ($M_{\text{males}} = 41.80, 36.27, 28.33, 18.53, 12.53$, and 13.33; $M_{\text{females}} = 36.71, 36.05, 31.05, 18.92, 11.55$, and 12.61), a one-way between-group MANOVA was conducted and revealed a significant difference, Wilks' Lambda = .80, $F(6, 70) = 2.88$; $p < .05$. However, a subsequent univariate ANOVA did not produce any significant effect, and thus our hypothesis was not supported. There are three possible explanations for the nonsignificant results in this study, including gender identity. Perhaps the minority of males who join the foreign language profession dominated by females are those who identify with the majority female groups. This identification may increase males' anxiety, thus neutralizing the gender effects. Furthermore, the humanities and social sciences undergraduate background shared by the majority of students of both genders in the group may also explain the lack of gender differences. Another explanation is that females' greater proficiency in English as a foreign language serves to counteract their otherwise higher levels of anxiety about statistics as another foreign language. These possibilities could be investigated in future.

Keywords: statistics anxiety, Statistical Anxiety Rating Scale, foreign language learning, gender.

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