## Results

### Statistical Assumption Tests

The dependent variable (i.e., productivity) was continuous. The visual inspection of the productivity boxplot showed that there were two extreme scores, which were subsequently removed. The Shapiro-Wilk statistic was non-significant which indicated that the productivity scores were normally distributed, $p$[1] $= .253$[2]. The inspection of skewness and kurtosis $z$-scores of the productivity distribution also showed that the assumption of normality was met, $z_s = .52$ and $z_k = .89$[3].

Further, the Levene's test of equality of variance revealed that the assumption of homogeneity was violated, $p = .007$. However, given the moderate and approximately equal sample size in each group, ANOVA is thus considered robust for this degree of violation.[4]

### Main Effect Analyses

A 3 (Workplace Recreation: Physical Activity, Non-physical Activity, Absence) x 2 (Gender: Male, Female) between-participant factorial ANOVA was conducted on productivity.[5]

Findings revealed a significant main effect of workplace recreational activities on work productivity, $F(2, 419) = 25.11$, $p < .001$, $\eta^2 = .56$. However, there was no significant main effect of gender emerged, $F(1, 419) = 1.82$, $p = .586$, $\eta^2 = .07$. This indicated that overall male ($M = 5.8$, $SD = 1.1$) and female employees did not differ in productivity ($M = 5.2$, $SD = 1.3$).

### Main Effect Comparisons

To follow up the main effect of workplace recreation[6], three pairwise $t$-tests were conducted to compare the main effect of workplace recreation, each evaluated at $\alpha = .05$. Results revealed that employees who did not participate in any recreational activity ($M = 3.9$, $SD = 1.2$) displayed significantly lower productivity than those who participated in the non-

**Commented [KC1]:** 1. *Italicise* English letters.

2. Report exact $p$-values up to 3 decimal points. Except when output says "$p = .000$", report it as "$p < .001$", or "$p = 1.000$" then report it as "$p > .999$".

**Commented [KC2]:** 3. Normal *zs* & *zk* must fall within the range of ±1.96.

**Commented [KC3]:** 4. Justify why you continued to use ANOVA to analyse the heterogeneous data.

**Commented [KC4]:** 5. Mention the analysis design.

**Commented [KC5]:** 6. Do follow-up analysis (pairwise comparison) only for (a) the **significant** main effect and (b) the IV with more than 2 levels (i.e., here, physical activity vs. non-physical activity vs. absence).

physical recreational activity ($M$ = 5.5, $SD$ = 0.9), $t(419) = -16.67$[7], $p$ = .001, 95% CI [-18.98, -11.16][8], or in the physical recreational activity ($M$ = 6.4, $SD$ = 0.7), $t(419) = -6.87$, $p < .001$, 95% CI [-7.72, -5.44]. Likewise, employees who participated in the non-physical recreational activity showed significantly lower productivity than those who participated in the physical recreational activity, $t(419) = -5.13$, $p$ = .002, 95% CI [-7.75, -2.50]. In addition, results revealed a significant interaction effect between workplace recreation and gender, $F(2, 419) = 5.11$, $p$ = .011, $\eta^2 = .22$.

**Simple Effect Analyses**[9]

This was followed up by performing simple effect analyses of workplace recreation at each level of gender.[10] Findings revealed a significant simple effect of workplace recreation for males, $F(2, 419) = 28.56$, $p < .001$, $\eta^2 = .48$, but not for females, $F(2, 419) = 0.70$, $p$ = .456, $\eta^2 = .03$. Therefore, female employees in the physical recreational activity ($M$ = 5.9, $SD$ = 0.8), the non-physical recreational activity ($M$ = 5.7, $SD$ = 1.1), and the absence ($M$ = 5.3, $SD$ = 0.8) conditions did not differ in work productivity.

**Simple Comparisons**

To follow up the simple effect of workplace recreation among male employees[11], three simple comparison analyses (planned pairwise $t$-tests) were performed, each evaluated at $\alpha = .05$. Males who attended the physical recreational activity displayed significantly higher average productivity ($M$ = 6.6, $SD$ = 1.3) than males who attended the non-physical recreational activity ($M$ = 5.4, $SD$ = 0.9), $t(419) = 8.01$, $p$ = .008, 95% CI [6.01, 9.71][12], and males who did not attend any recreational activity ($M$ = 5.1, $SD$ = 1.4), $t(419) = 2.38$, $p$ = .001, 95% CI [1.43, 3.87]. However, there was no significant productivity difference in males who attended the non-physical recreational activity and males who did not attend any recreational activity, $t(419) = 0.37$, $p$ = .135, 95% CI [-1.25, 2.77].

**Commented [KC6]:** 7. Hand calculate $t$-values by

$t = \frac{\text{Mean Difference}}{\text{Std.Error}}$ , $df = df_{\text{Error}}$

**Commented [KC7]:** 8. Again, SPSS does NOT provide CIs for $t$-values. Hand calculation can be done using the "Multiple Comparisons" table (in SPSS output) by

$LL = \frac{\text{Lower Bound of Mean Difference}}{\text{Std.Error}}$

$UL = \frac{\text{Upper Bound of Mean Difference}}{\text{Std.Error}}$

**Commented [KC8]:** 9. Follow up effect of the focal IV ***at each level*** of the other factor. Do Simple Effect Analysis only if the interaction effect is **significant**.

**Commented [KC9]:** 10. Always check your Testing Hypothesis (H1) to identify the focal IV (in this example, the focal IV is Workplace Recreation — not Gender).

**Commented [KC10]:** 11.Conduct follow-up analysis (pairwise comparison) only if (a) the simple effect is **significant**, and (b) there are more than 2 levels to compare (i.e., physical activity vs. non-physical activity vs. absence). *Note*: Do NOT follow up *non*-significant simple effect!

**Commented [KC11]:** 12. Look at the **Main Effect Comparisons** for how to hand calculate $t$-values and their CIs in page 2.