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## **The Effects of Gender and Competition on Performance**

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### **Abstract**

Male and female young adults were asked to construct a simple two dimensional red sol-cup pyramid (four layers with four cups on the bottom layer), under timed conditions, either by themselves or alongside a competing participant of the same biological sex. Participants' scores (time) were compared to look for evidence of an interaction between gender and competition on performance. It was found that there was no significant effect of the gender and competition interaction on performance,  $F(1, 17) = 2.045$ ,  $p > 0.05$  partial  $\eta^2 = 0.136$ . These findings suggest that gender and competition do not work together to influence performance in a simple task under timed conditions. Neither gender,  $F(1, 17) = 0.118$ ,  $p > 0.05$  partial  $\eta^2 = 0.09$ , nor competition,  $F(1, 17) = 0.325$ ,  $p > 0.05$  partial  $\eta^2 = 0.024$  have a significant main effect on performance.

Keywords: Gender, competition, performance, biological sex, timed conditions.

There are many factors that influence human being's performance in a given task.

Psychological factors like motivation, rewards, curiosity and need for achievement all play a pivotal role in deciding how well people perform. Fear, for example, is known to affect the human body by producing adrenaline and increasing blood flow, this increasing performance in certain tasks. Many studies have examined a variety of these factors extensively. Studied related to the effects of mind-altering drugs, for example, are common. Hall (1994) published a meta-analysis which examines the physical effects of cannabis consumption; "The most immediate effect of smoking cannabis is to increase the heart rate by 20% to 50% within a few minutes (9–11) to a quarter of an hour of smoking cannabis. Changes in blood pressure also occur". (Hall, 60). Research like Hall's demonstrates how outside environmental stimuli can affect bodily performance on tasks. Changes in blood pressure and heart rate, in this case, would most obviously affect performance in specific tasks. A large amount of other research has been

devoted to studying performance as a result of other such factors, even variables such as two factors of particular interest: gender, and competition. A demonstration of this is a study conducted by Buxton (2010), a Huron University College student, which examined the effects of competition and reward on intrinsic motivation in males. The problem is, however, that typically the effects of either gender or competition are examined separately or in combination with other variables, and usually not simultaneously. In Buxton's example, only one gender (males) was used in the study, as was the case in many other studies in the Huron University College Journal of Learning and Motivation. An interaction between gender and competition on performance has not been studied in detail. Based on research such as Samantha Buxton's and Wayne Hall's, it can be hypothesized that a combination of gender and competition could have a reasonable effect of performance in a task. Evolutionarily, it would make sense that males would respond differently to competition than females. In the animal kingdom, with a few rare exceptions such as the polygynous crowned lemur, *E. coronatus*, (Marolf, 2007) it has been observed that typically males are the ones who must compete in the tribe/herd for the right to mate, and not the females of the species. Females play an active role in selecting potential mates, while the males must compete for the females' attention. Male on male competition may transfer into all aspect of life, not just mating. If this assumption is correct, human males would naturally respond more strongly to competition as a whole compared to females. In the current experiment, participants completed a simple task in which they stacked a series of red solo-cups in a two-dimensional pyramid fashion under timed conditions. The scores of participants were analysed to look for a main effect of gender and completion on performance. If one biological sex reacted significantly more or less to competition than the other, it would serve as evidence that gender (biological sex) plays a role alongside competition in affecting performance.

## **Method**

### **Participants**

The participants were young adults, primarily Huron University College first year Psychology 1100E students, who were recruited via the SONA research participation credit system. The remaining participants were either close friends or relatives of the experimenter. A total of 17 participants were chosen for the study. The Psychology 1100E students were compensated for their participation by earning a credit on the SONA system, an opportunity to earn credits in their program. The remaining participants were volunteers and were not directly compensated.

### **Materials**

The cups used in the experiment to construct the two-dimensional pyramid were plastic red solo-cups available at most corner stores in London, Ontario. A total of 10 cups (all approximately 9cm x 9cm x 12cm in dimension) were used. A simple Microsoft Office Word (2010) document was created with a table to record participants' scores, genders, and status (competition or no competition). The table can be found in appendix A.

### **Procedure**

Each trial consisted of the experimenter briefly introducing the participants to the concept behind the task, and demonstrating the task to familiarize participants with the researcher's expectations. For the experiment, the solo-cups were stacked in a simple two-dimensional pyramid fashion: four cups as the bottom 'layer' or 'row', three cups to make up the next layer, two cups as the next layer, and finally one cup at the very top. Following this introduction,

participants all had the opportunity to practice the task until they felt confident. Participants performed the task twice, both attempts being timed. The better of the two timings was used in the statistical analysis. Every participant completed the task successfully. Sessions, on average, took no longer than 5-10 minutes per participant. The experiment, was concluded by debriefing participants formally and thanking them for their participation. All Psychology 1100E students who participated were given their SONA system credits where appropriate.

### **Results**

The experimental hypothesis was that there would be a significant effect of the gender and competition interaction on performance. There should be significant differences in performance among participants in varying conditions and of different genders. The results of the experiment can be found in Figure 1.

A 2 X 2 between-subjects analysis of variance (ANOVA) was conducted to look for a significant effect of the interaction between gender and competition on performance measured in mean time per seconds. The results indicate that there is no significant main effect of either gender,  $F(1, 17) = 0.118, p > 0.05$  partial  $\eta^2 = 0.09$ , or competition,  $F(1, 17) = 0.325, p > 0.05$  partial  $\eta^2 = 0.024$ , on mean performance. There is no significant effect of gender-competition interaction on mean performance measured in seconds,  $F(1, 17) = 2.045, p > 0.05$  partial  $\eta^2 = 0.136$ .

### **Discussion**

The results provided no basis to reject the null hypothesis. There seems to be no obvious effects of gender or status on mean time, nor is there a clear interaction between the two independent variables on mean time. The null hypothesis must continue to be accepted.

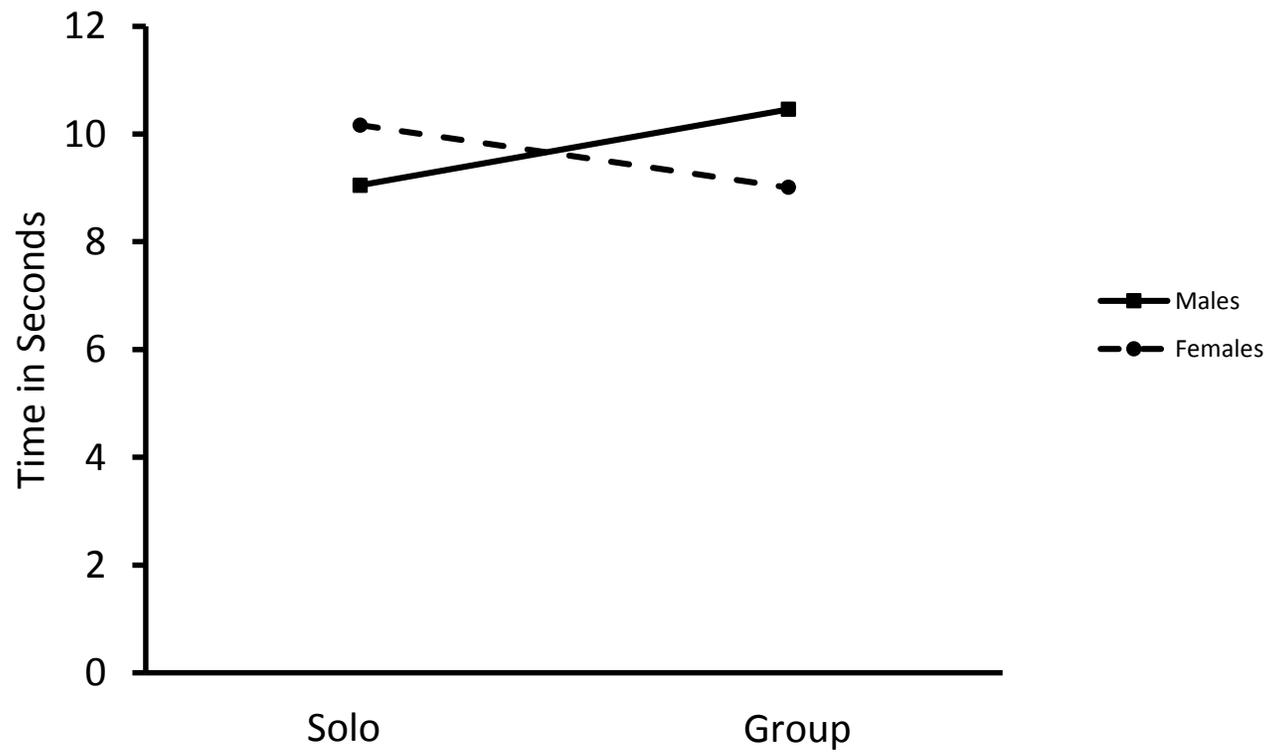


Figure 1. The interaction between competition (solo or group) and gender (male or female) on mean performance measured in seconds. There appears to be no significant main effect of status and gender on mean performance. There is no interaction between the variables. The results provide no basis to reject the null hypothe

There are a number of reasons why the results turned out the way they did. One very important thing to note is that it was not a truly accurate measurement of competition, since in both the 'solo' and the 'group' conditions in the experiment, the experimenter was always present. It is entirely possible that the presence of the experimenter could have skewed the results in a way that caused participants to perform better or worse than they otherwise would. In a more ideal experiment, the researcher could take more precautions to ensure 'true' competition conditions.

Another issue with the study is that, while all participants had the opportunity to practice the task before being tested, not all participants practiced the same amount or grasped the idea of task equally well. The extra practice that participants could have had, in or outside the experiment, could greatly have affected results. It is possible that some participants, especially, could have completed similar tasks in their personal lives, as a game or some sort of challenge.

The most obvious limitation of the study was the lack of participants. There were only 17 participants in total (7 male, 10 female), with an unequal amount of participants in the various conditions (7 'solo', 10 'group'). In a more ideal study, there would have been more participants in total, with more equality in 'spread' of participants across conditions. There were also a few outliers; participants who performed unreasonably well or poorly. Removal of such outliers by setting a range of acceptable scores, for example, could be a solution.

Another major limitation of the study was that the experimenter could not control a number of important outside variables (hidden variables) that could very easily have affected the participants' performance. Factors such as the participant's food consumption on the day of testing, levels of sleep, number of practices, previous experience, light conditions, and so forth,

could easily have had major effects on performance, yet the researcher had no control over these variables. In a more perfect study, these variables would be better controlled for.

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