

The Effects of Cats and Music on Happiness

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Abstract

Significant research has been conducted on finding interactions between external variables and happiness levels of an individual. Using the Oxford Happiness Questionnaire, we randomly assigned 40 Dordt college students to one of four groups: having a cat present, music being played, both of these variables, or none. We blocked on gender and extracurricular involvement. For each group, they took the survey under their specific conditions and their survey score was recorded, which was measured on a scale of 1 (not happy) to 6 (very happy). R Studio was used to analyze the results and a few significant interactions were found. First, having music being played increased the happiness score by 0.4. Second, having a cat present and being a male decreased their happiness score by 0.53. Lastly, being involved in extracurricular activities increased happiness levels by 7.3%. Because random assignment occurred, cause and effect can be concluded. The results from this experiment can be used for further investigation into what type of music best improves happiness scores of an individual, and modern day therapy for depression, like counselling, can then possibly be replaced by musical therapy.

Background and Significance

Happiness has been studied and researched significantly over the past few decades. Since depression is on the rise, researchers have focused on finding what external variables help improve the happiness levels of human beings. Music is one method that has proven to increase the happiness level of an individual. Neurological studies show that humans react emotionally to a piece of music, even at an early age.¹ More research has proven that music improves the immune systems of patients after surgery, lowers blood pressure of cardiac patients, and decreases stress in pregnant women.⁵ Scientists have also confirmed that music provokes memories – good or bad – which will affect the mood of an individual.⁵ These abilities of music lead to the possibility of music being a useful treatment for depression. Music therapy can then replace other forms of counselling for patients diagnosed with depression.³ Another method to help improve the happiness level of an individual is the presence of animals. Studies have shown that dog owners are less prone to being depressed, being stressed out, and are more prone to being calm and relaxed.⁷ In a study with 217 people, which consisted of pet owners and non-pet owners, it was found that pet owners were happier, healthier, and better adjusted. Allen R. McConnell concluded with the statement, “Specifically, pet owners had greater self-esteem, were more physically fit, tended to be less lonely, were more conscientious, were more extraverted, tended to be less fearful and tended to be less preoccupied than non-owners”.² The question remains of whether or not happiness can be measured. The “Oxford Happiness Questionnaire” attempts to do that, which was created by Michael Argyle and Peter Hills of Oxford Brookes University.⁴ This survey was published in 2002, and has been used in scientific experiments and studies to find associations between happiness and another explanatory variable. One of these studies occurred in 2013. The experiment attempted to explain the relationship between personality traits and happiness. A positive and significant relationship was found between happiness and eccentric personalities.⁶

The goal of the experiment is to find significant evidence that happiness scores for college students change based on the external variables around them. To achieve this, we will block on the variables gender and extracurricular involvement so that we can explain unwanted variation. We expect that music will have a positive effect on the happiness scores, but the presence of a cat will not have a significant change on the overall scores of students.

Methods

Data

The data we recorded included the happiness scores for each individual. The survey used measured happiness on a scale of 1-6, where a 6 was extremely happy and a 1 was not happy. The survey used self-reflection statements (e.g. I feel that life is very rewarding), and responded by saying “strongly disagree”, “strongly agree”, or four other options in between. We recorded each subject’s gender, class status (upper/lowerclassmen), and extracurricular involvement (music and/or athletics). Once we had everything except for the happiness scores, we blocked the groups as best we could to avoid unwanted variation. The sample size was 40, which was smaller than originally desired, but it nonetheless provided sufficient diversity for our blocking to efficiently take place.

Variables

The list of variables for this experiment was fairly small. The only two variables were the presence of music in the background and the presence of a cat. As a result, there were four total groups in the experiment. One group was a control and neither of the two variables were present. Another group took the survey with a cat in the room, the third group took the survey while Christian contemporary music was being played in the background over the speakers in the room, and the fourth group had the combination of the two variables while they took the survey. We also attempted to block certain confounding variables such as gender, class status (upper/lower classmen), and extra-curricular participation (music and athletics). There were probably more confounding variables we could have blocked, but these seemed like the ones that would have the greatest impact on the survey scores of participant happiness.

Procedure

R Studio was used to perform computations and analysis on the data. We looked at individual relationships to get an idea of which variables might be most correlated to the happiness scores. We then made a model that checked for all of the two-way interactions. We then modified this model to account for only the significant interactions. Next, we modified our significance level and found our model that we used to predict the the happiness score (although only half of the variables had significance). After the ideal model was created, we were able to interpret the results and discuss what they may mean for the way people’s happiness is affected, based on the external factors around them while taking the test.

Results

The overall mean score was 4.55 with a standard deviation of 0.49. Our experiment only had a few variables so we tried to find every single significant variable or interaction possible. The following table shows our GLM model in the upper half which depicted the best fit for predicting future happiness scores. The lower half of the table shows our ANOVA summary for the model. There was only one interaction that was found to be significant when analyzing the data.

```
Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)    4.18481    0.18913  22.126 < 2e-16 ***
happy$CatYes   0.27835    0.21216   1.312  0.19830
happy$GenderMale 0.07471    0.19931   0.375  0.71011
happy$ExtraCurricularYes 0.30389    0.14111   2.154  0.03845 *
happy$MusicYes 0.39649    0.14170   2.798  0.00841 **
happy$CatYes:happy$GenderMale -0.52658    0.28004  -1.880  0.06865 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 0.1900011)

Null deviance: 9.3187  on 39  degrees of freedom
Residual deviance: 6.4600  on 34  degrees of freedom
AIC: 54.585

Number of Fisher scoring iterations: 2

> summary(aov(mode19))
              Df Sum Sq Mean Sq F value Pr(>F)
happy$Cat      1  0.002  0.0022   0.012 0.9140
happy$Gender    1  0.357  0.3567   1.878 0.1796
happy$ExtraCurricular  1  0.449  0.4487   2.362 0.1336
happy$Music     1  1.379  1.3792   7.259 0.0109 *
happy$Cat:happy$Gender  1  0.672  0.6718   3.536 0.0686 .
Residuals     34  6.460  0.1900
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
> |
```

We were able to find that being in extra-curriculars was significant when looking at happiness scores, which showed there was a good reason to block on that variable, which was done during the study. Next, we found that playing music in the background also had a positive significance on happiness scores. **Figure 1** shows the happiness scores for each room assuming the subject was a female and was not involved in extracurriculars (if they were in either of these groups, it would just shift all of the scores an equal amount). Also, **Figure 2** shows the increase in happiness scores due to involvement in extracurricular activities. It was found that there was a 7.3% increase in happiness scores with involvement in such activities. Our significance level throughout the study was 0.15 in order to try to find more significance throughout the test (of course, this approach has its own limitations).

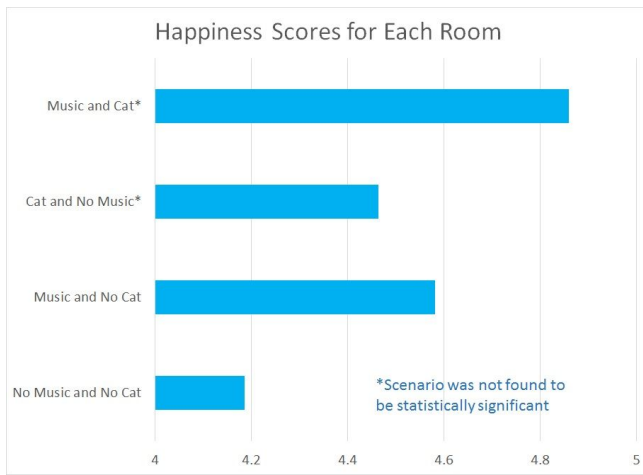


Figure 1

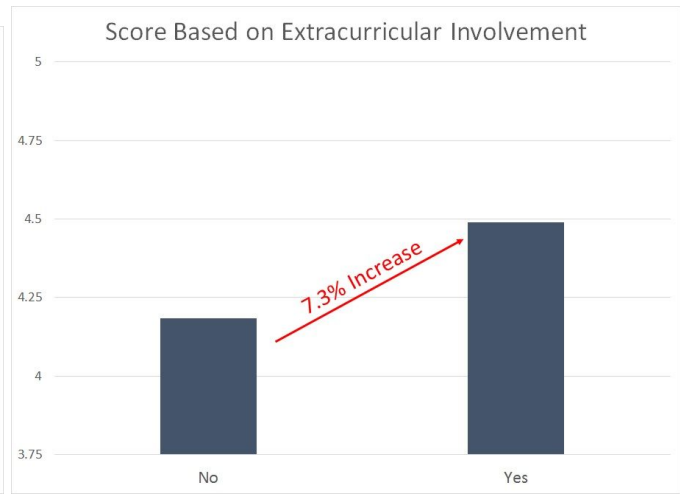


Figure 2

Finally, our lone interaction is shown in **Figure 3**. A significant interaction was found between males and the presence of a cat in the room. This graph clearly shows that the presence of a cat decreased male scores while it increased female scores, while they were nearly equal with no presence of a cat.

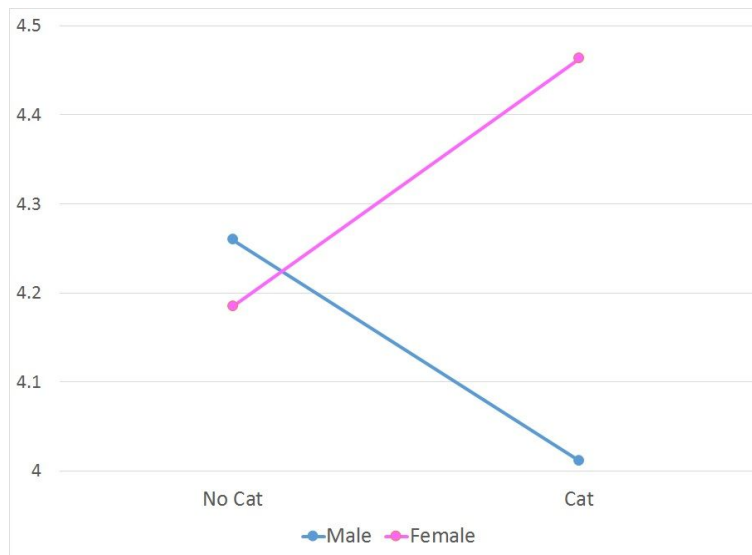


Figure 3

Although the interaction found involved the cat, the variable itself was not found to be significant. Also, gender was not significant on its own either, but it shows that the combination of the two may drastically change the happiness score for an individual.

Conclusion and Discussion

We have found music playing in the background to be influential while participants took the happiness survey. However, we only played one type of music, Christian contemporary. Perhaps other types of music would change the scores more positively, or even in a negative direction, if it is a genre that the subject is not a fan of. Regardless, it was found to make a difference in the experiment as was predicted in our hypothesis.

Even though the presence of the cat was not significant, it played a crucial role in our experiment by being a part of an interaction with males. This may suggest that males do not get along with cats as well as females do. But this could also be due to someone being allergic to cats or others that happen to like dogs substantially more (we thought about having both together, but decided that would be a bad idea). We do not want to rely too heavily on this study because it only had 40 participants, but that makes it a little bit more stunning that we were still able to find significant data when analyzing.

Finally, we are left the question of whether happiness can really be measured, at least on a quantitative scale. We all express our emotions in different ways, and there are definitely people who become less happy as soon as they take a survey. We also wonder if the cat really impacted the surveys of some people. The music may have naturally affected the results to the questions, but unless the participant directly interacted with the cat, it may be tough to say it really made a difference on how they felt at the time or filled out the survey. The opportunities are endless, and this experiment only scratches the surface.

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