

Does Heavy Metal Music, Energy Drink or Both Stimulate a Person's Mood?

Who you are: You are the **Statistical Consultants** that need to finalize the study design for the Investigator group.

Their Study: They want to investigate whether listening to heavy metal music, consuming an energy drink or both (listening and drinking) affects a person's mood.

Generic Study Description:

The Investigators didn't tell you much over the phone, so you do not have much to Prepare for the meeting. They have had a statistics course in the past, so they know just enough statistics to be D A N G E R O U S.... !!

You Open the meeting by being warm and inviting. You are ready to listen and ask questions to understand.

Since you do not have much to go on, you have your Work cut out for you.

Here is what you need to achieve during the consulting meeting:

You need to obtain a clear understanding of what the researchers-

- want to do
- how they plan to do it
- does the study design make sense and follow good experimental principles?
- What do the investigators need from you?

How do you plan to End the meeting and follow-up?

Finally, Reflect on what went well, not so well and what they could do better.

Does Heavy Metal Music, Energy Drink or Both Stimulate a Person's Mood?

Who you are: You are the **Investigator group** that needs to design a study. You contacted the statistical consultants to help you finalize the study design.

Your Study: You want to investigate whether listening to heavy metal music, consuming an energy drink or both (listening and drinking) affects a person's mood.

Generic Study Description:

You got an A in your statistics class in the past, so you have some idea of how to design a study. All you really need to get from the statisticians is a sample size. Really, how hard could this be??

There are three treatment groups you are considering [DO NOT CONVEY THIS INFORMATION UNLESS ASKED]. There are:

- exposure to heavy metal music,
- drinking an energy drink and
- both listening and drinking.

The measured response is a person's mood, which is evaluated by taking a Mood Test Assessment. The score can range from 0 (bad mood) to 100 (great- on top of the world).

There are three aspects of the design to discuss. You may talk about as many as time permits or you can discuss a different topic of your choice.

- You just need a sample size. You think 10 measurements on each person assigned to treatment is adequate, but you seek confirmation from the statisticians. This will give you 30 measurements to analyze. [NOTE – THIS IS A BAD DESIGN since you should have 10 people per group instead of taking 10 measurements on one person. HOWEVER YOU THINK YOU ARE RIGHT ABOUT THE DESIGN - DO NOT CHANGE THIS FEATURE ABOUT THE DESIGN UNLESS ADVISED BY THE CONSULTANTS].
- You recall a placebo (control group) was discussed in your last statistics class and you need to ask the statistical consultants whether you should add a fourth group to the study. You have enough resources to add a fourth group. What would the statisticians recommend and why?
- You need to ask the statistical consultants when to administer the Mood Test. That is, should you only assess a person's mood after the treatment or assess mood both before and after the treatment. What would the statisticians recommend and why?

Does Temperature Affect the Survival of Nematodes?

Who you are: You are the **Statistical Consultants** that need to finalize the study design for the Investigator group.

Their Study: They want to investigate temperature conditions effect on nematodes because they help ensure plant survival.

Generic Study Description:

The Investigators didn't tell you much over the phone, so you do not have much to Prepare for the meeting. They have had a statistics course in the past, so they know just enough statistics to be D A N G E R O U S.... !!

You Open the meeting by being warm and inviting. You are ready to listen and ask questions to understand.

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- want to do
- how they plan to do it
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How do you plan to End the meeting and follow-up?

Finally, Reflect on what went well, not so well and what they could do better.

Does Temperature Affect the Survival of Nematodes?

Who you are: You are an **Investigator group** in the University of Minnesota Plant Pathology department. You contacted the statistical consultants to help you analyze a study you conducted.

Your Study: You are trying to find optimal conditions for nematodes because they help ensure plant survival. NOTE- DO NOT EXPLAIN WHAT A NEMATODE IS UNLESS ASKED. A nematode is a worm.

Generic Study Description:

You are measuring how nematodes react to different temperatures in the field. Based on your introductory statistics class (outside of the statistics department), you believe ANOVA is an appropriate technique to analyze the data.

There are 7 different temperature treatments for nematode: -80°C , -20°C , 4°C (control), 40°C , 45°C , 50°C , 55°C . Each treatment was replicated four times (DON'T EXPLAIN FURTHER WHAT THIS MEANS UNLESS ASKED)-replication in this case means that there were 4 nematodes in each treatment.

The experimental unit (DON'T USE THE WORDS EXPERIMENTAL UNIT) is an individual nematode. You assigned each nematode to a group randomly. You are measuring if each nematode is alive or dead after 12 hours in the temperature condition. The experiment is run in a lab simultaneously for all temperature conditions. Make up other information as necessary.

There are three aspects of the analysis to discuss. You may talk about as many as time permits or you can discuss a different topic of your choice.

- You should ask the consultants this question: *There was 0 nematode alive after treatments - 80°C , 50°C and 55°C . Should I include the 0 when I do the ANOVA analysis? I'm worried about normality.* What would the statisticians recommend and why?
- You want to compare cold (-80 , -20) and warm ($40,45,50,55$) to the control (4). What would the statisticians recommend and why?
- You are using this as a pilot study for another study. Is there anything the statistician recommend as changes for a future study?