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Which better reduces anxiety: Having someone try to cheer you up, or trying to cheer someone else up?

Goal and Summary of Methods

In this experiment, we will study whether individuals who score highly on a screening tool for General Anxiety Disorder (GAD) find relief from either of two treatments:

- 1) Having a real (but anonymous) person sending them a personalized text message each day featuring a joke, inspirational quote, or just a personal message, or
- 2) Sending such messages daily to someone who they are told scored higher (meaning that person is experiencing more anxiety) on the screening tool.

Communication with test subjects will all happen via text message through a Twilio app that will handle the anonymization of users, while still delivering and storing text messages as needed.

We hypothesize that while perceiving one's self as the recipient of treatment may have a small effect on relieving anxiety, being infused with a sense of agency and responsibility for another, and for whom one might feel compassion, will provide a greater sense of anxiety relief.

Experimental Design

Gathering Test Subjects

We will gather 160 subjects by soliciting participants online in various anxiety, mental health, self-data, or other relevant subreddits or forums online. We will let each subject know that they are signing up for a lightweight psychological study about empathy and anxiety. 40 subjects will be assigned to our control group, as well as 40 to each of our three control groups.

Measuring Anxiety

After we have signed up enough participants, the study will take place over the course of a week. On the first day of the study, we will ask participants to complete a questionnaire that is accepted

as a valid initial screening tool for those who might have General Anxiety Disorder. This well-established, seven-question diagnostic tool is known as the GAD-7.¹ Here it is in its entirety:

Over the last 2 weeks, how often have you been bothered by the following problems?	Not at all sure	Several days	Over half the days	Nearly every day
1. Feeling nervous, anxious, or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it's hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3
<i>Add the score for each column</i>	+	+	+	
Total Score (add your column scores) =				

This could be easily administered via a web form, in which we ask for no personal data other than a subject's mobile phone number. And scoring the GAD-7 is simple, as each answer's value is added up and compared to the following scale: 0-5 suggesting mild anxiety, 6-10 suggesting moderate anxiety, 11-15 suggesting moderately severe anxiety, and 15-21 suggesting severe anxiety. If we encountered potential subjects in the top category, we would not consider them eligible for our study, but would provide recommendations for them for professional help in their area.

Blocking on anxiety level and gender and assigning treatment vs control

After we have tabulated our subjects' scores on the initial screener, we would block based on the range categories described in the GAD-7 scoring above, to make sure we have an equal distribution of each category of anxiety sufferers.

We would also block on gender, as some past research has suggested that there may be differences in how different genders relate to empathy².

¹ <https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/410326>

² <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1963313/>

Blocking on appropriate variables, we would endeavor to assign 40 subjects to control, and 40 to each of our three treatment groups.

The experiment

Over the course of the week, each participant would receive one text message each day, between the hours of 1pm and 2pm in their time zone. Each group would receive a different sort of message, as described in the following table:

Control Group	The control group subjects would receive a neutral fact about the world each day, such as, “The largest of the whale species is the blue whale which can grow to an average length of 70 – 90 ft. and weigh an average of 100 – 150 tons, however in some cases the blue whale has measured in at over 100 ft. in length and weighed more than 180 tons.” This is meant to control for the experience of receiving a novel text message, but not one that is intended to carry emotional weight.
Treatment Group 1	This group would receive a different text message each day with a prompt to provide an inspiring or amusing text which would be delivered to someone else who suffers from more extreme anxiety. An example message might be: “Provide some cheer for your study buddy today by responding to this text with a joke, which will be passed along to a member of the study tested to have a higher anxiety level than you.”
Treatment Group 2	This group would receive positive, encouraging, and inspiring texts prepared in advance by the research team.
Treatment Group 3	This group would receive both positive, encouraging content like Treatment Group 2, as well as the request to provide content like Treatment Group 1.

We will need to seek advice on how to treat subjects in Treatment Group 1 who do not comply and fulfill the writing prompts requested of them.

At the end of the week, each subject would be asked to take the GAD-7 again. The value of their new GAD-7 score minus their original GAD-7 score will be the individual’s outcome variable used in our analysis.

The analysis

Once we have collected the data, we would conduct hypothesis tests to determine whether there is a statistically significant difference in outcomes between each treatment group and the outcomes in the control group, as well as whether there is a difference in outcomes between the three treatment groups, to see whether taking a more active role in dealing with anxiety helps the actor more than simply being a recipient of help.

Risks and Pitfalls

I do see the possibility for several pitfalls in this experiment.

First, there are obvious ethical and perhaps legal questions related to conducting a test that is at all related to mental health. I would need to do further research and seek the guidance of professors to make sure we are not crossing any ethical or legal boundaries here.

If we are in the ethical and legal clear, it may be difficult enough to get 160 people to be willing to take our initial screening at all. And it's possible that all those surveyed would test as low-anxiety, and thus we might not see enough anxiety amidst our population in the first place to see any significant reduction from any methods.

Another risk is that subjects assigned to Treatment Group 1, which would be the group tasked with creating positive content each day, might not adhere to the requested schedule of content creation. We have not yet learned how to handle non-compliance, so we would need to seek further guidance there.

There are of course also privacy concerns that we would need to address, and our disclaimers and procedures would need to be sufficient to reassure potential subjects that we would indeed protect their privacy.

A potential pilot

A potential pilot program could help us gauge the rate at which we might see sign-ups, potentially even in each separate researcher's social network, to see which one might be the most promising for recruiting the entire cadre of subjects.

Additionally, a pilot program might provide some early insight into the variance of GAD-7 scores we would see in the initial screening, to see if we are finding scores that demonstrate enough anxiety to potentially result in a statistically significant decrease.