PE = psychedelic experience

H1: We expect that presence of meaning in one’s life will increase after the psychedelic experience, while the urge to search for meaning in one’s life will decrease.

H2: We expect that changes in presence of meaning in one’s life before and after 2 and 4 weeks the psychedelic experience will be predicted by ASC, MEQ, CEQ,EBI, EDI.

Exploratory from paper:

We expect that the more frequent psychedelic drug is taken, the more meaningful respondent’s life is, therefore less space for improvement.

Intentions, how seasoned psychedeller are they (the more, the happier, the less space for improvement, at least in the WEMWBS), psychedelic dose, one’s confidence in the positive effect of psych, drug type

**Data**

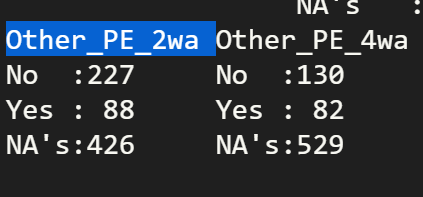
* **MLQ** = meaning in life questionnaire (10-item), **2 dimensions**
* **MEQ** = mystical experience questionnaire (30-item), **4 dimensions**
* **EDI** = ego dissolution inventory questionnaire (a new 8-item with the pearpuse of measuring ego dissolution (**1 dimension)**
* **EBI** = emotional breakthrough inventory (6-item, new), **1 dimension**
* **CEQ** = challenging experience questionnaire( 30-item leading to a total score and seven subscales scores (i.e., fear, grief, physical distress, insanity, isolation, death, and paranoia) **7 dimensions**
* **ASC** = altered states of consciousness questionnaire (**7 dimensions**)

Line questions

1. How to analyse multidimensional questionnaries?
2. When modelling for demographic aspect, all the significant predictors must be included in the further analysis?

In the psychedelic survey, 741 respondents started to filling their preliminary results, this process finished only 654 respondents. The follow-up questionnaire in 2 weeks 315 (other PE 313, in 4 weeks 212(other PE212).

|  |  |  |  |
| --- | --- | --- | --- |
| Model | variable | estimate | ER |
| other | other | -0f.23 | 8.58 |
| Other+ placebo | Other|placebo | -0.22|0.16 | 7.55|29.3 |
| Other|placebo|mental heatlh | Other|placebo|menal health | -0.2| 0.16| .33 | 6.43| 30 | 36 |
| Other|placebo|mental heatlh| psych naive | Other|placebo|mental heatlh| psych naive | -0.19 | 0.18 | 0.35 | 0.41 | 5.7 | 80 |24 | 10.24 |



Methods notes

Reference to the awesome paper – how psychological data are wrongly ctreated as continuous, but they are ordinal in fact!! -> ordinal regression!

Introduction

* “abstract”
* Motivation, importance
* Describe the aim of the experiment (thank you for the data)
* Hypothesis (back them up)

Analysis/Design

* Explain necessary data collection,(esxlusion), questionnaries (along with references??)
* How I am gonna test my hypothesis (be specific), why I chose EV and Cis over loo (or here I can use all??)
  + The importance of ordinal regression, function (probit, the outcome scale)
  + What factors did I control for (Other\_PE)
  + PCA and tetrachloric correlations
* Latent variable interpretation

Results

Hypotheiss 1

Hypothesis 2

Discussion

Introduction

The aim of this paper is to investigate effects of psychedelic experiences on perceived meaning in one’s life. Since 2006 (ref), after many years of artificial suppression, a psychedelic research is in its full resurgence. These powerful compounds, such as psilocybin, ketamine, LSD, and DMT, have been tested as potential treatment for addictions, major-depressive disorder, obsessive-compulsive disorder. Clinical results are without any exaggeration impressive but the mechanism underneath needs further exploration.

Psychedelic experiences have been repetitively linked to an increase in well-beings (ref). Following this thought of line along with the teachings of Frankl’s logotherapy (ref), which says that human beings are purpose-seeking/driven beings, I investigated the links between meaning in one’s life and taking psychedelics.

Data collection

Before I introduce my hypothesis, data collection process must be described. The data was obtained through a resourceful initiative of The Center for Psychedelic Research at Imperial College London[[1]](#footnote-1) called Psychedelic Survey[[2]](#footnote-2). It is a website where people who intend to take a psychedelic drug can participate in a research by completing several questionnaires about the experience. I would like to thank for the generosity of a research team, particularly Hannes Kettner[[3]](#footnote-3) for sharing the data with me.

Data collection occurred at 5 different days. First, a week before psychedelic experience, respondents provided their demographical information along with signed contest. Second, a day before MLQ (meaning in life questionnaire, ref) was filled. Third, a day after the psychedelic experience, 5 other questionnaires were completed, namely: ASC (altered states of consciousness), CEQ (challenging experience questionnaire), EBI (emotional breakthrough inventory), EDI (ego dissolution inventory), and MEQ (mystical experience questionnaire). Third, two weeks after the psychedelic experience MLQ (meaning in life questionnaire) was taken again. Lastly, four weeks after the psychedelic experience MLQ was taken again.

On the one hand, web-based data collection is very inexpensive possibility how to access data from natural, daily setting. On the other hand, the convenience comes at cost, mainly manifested at the impossibility to control for confounds which would be easily eradicated in the lab setting. Moreover, in some countries, the psychedelic substances are still illegal which forces respondents to procure substances from unreliable sources where dosage nor cleanliness cannot be traced with certainty. Therefore, the survey data should be viewed as a supplementary material which can point in the right direction for proper double-blinded, placebo-controlled experiments.

The 10-item MLQ questionnaire has two dimensions. First, investigates how much meaning is in one’s life in the present moment, while the other dimension tackles one’s urge, need, desire to search for a meaning. While higher scores in former are connected with love, life satisfaction, joy, agreeableness, intrinsic religion, the higher scores in latter are associated with fear, sadness, depression.

Hence, I hypothesize that

H1a: scores in the first dimension of MLQ, “present meaning” is going to be higher two and four weeks after the psychedelic experience, compared to a baseline taken a day before.

H1b: On the contrary, the second dimension of MLQ, “search for meaning” shall lower two and four weeks after the psychedelic experience, compared to a baseline.

H2: The expected positive change in perceived presence of meaning in one’s life will be predicted by the 5 questionnaires: ASC, CEQ, EBI, EDI, MEQ.

Participants

The first round of questionnaires was filled out by 654 participants. However, questionnaires administrated two and four weeks after the psychedelic experience, were completed by 279 and 165 responds, respectively. Note that the table () is an overview of demographical data of 279 participants. Some of the participants stated that during the 5 week survey period, they had also other psychedelic experiences besides the one they signed up for.

Analysis

Type of data, appropriate type of regression, mention why I chose it (why is it superior to modelling it as discrete variables). Data transformation, describe models for each Hypothesis, prior selection process plus type of prior, methods employed at model evaluation

The MLQ questionnaire consists of 10 questions with 7 possible answers, ranging from “absolutely agree” to “absolutely disagree”. It is a variable with natural order also known as ordinal variable. Unfortunately, especially in psychology, it is commonplace to analyse them as if they were metric (ANOVA, t-test). As a consequence, one can expect “low correct detection rates, distorted effect size estimates, inflated false alarm (type-I-error) rates, and even inversions of differences between groups.”(pp.2) A main cause can be found in the violation of metric model’s assumption called equidistant, meaning that the distance between “absolutely disagree” to “moderately disagree” might not be the same as between “moderately disagree” and “disagree”.

Following the line, the only possibly analysis of MLQ is to employ a ordinal regression, specifically, cumulative model which assumes that the outcome ordinal variable (Y) is a reflection of a latent variable Y. In other words, our inner scale of agreeing and disagreeing is continuous. As the ordinal cumulative model requires non-linear parametrization, a probit link function, which utilizes normal distribution, was chosen over the brm’s default option logit, which employes logistic distribution. Both distributions were fitted to the data using package fitdistrplus and the goodness of fit was more or less the same. As the probit turned out to be multiple times more efficient, all models utilized the probit link function whose estimates tell us how many are we away from mean.

To analyse H1a and H1b, the data must were transformed into long format in order to have 5 questions of first dimension taken before the psychedelic experience and 5 questions of first dimension taken either 2 or 4 weeks after the psychedelic experience in one column. Afterwards, another two corresponding columns describing a number of question and taken time of the MLQ score. In this format, we we can predict the MLQ score from whether the score was take before or after the psychedelic experience (further as MLQ\_type) while accounting for random intercepts of participants and question numbers. One could argue that a random slope for question number could have been employed, nevertheless, due to high computational demands this option was abandoned. The same format was used for the second dimension of MLQ as well. Moreover, a variable accouting for multiple psychedelic experinces (e.g., during ceremonies) was added to ensure it does not counfound the results. The general formula goes:

MLQ score ~ MLQ type + Multiple psychedelic experiences + (1|Participant) + (1|Question number)

The reason behind analyzing the MLQ score before vs 2 weeks after, and before vs 4 weeks after separately, as it could be modelled in a single model, is that it would lead to a loss of 115 respondents in the former comparison. To keep the data, I split the analysis.

In terms of setting priors, without any a priori knowledge from literature, I expected the effect sizes to be centered at zero, keeping them at reasonably plausible interval from -2 to 2 by a standard deviation of 1. This approach has several benefits. First, it is a fast and easy (compared to others) optimization of a model which spare us many pitfalls. Second, with an informed prior, one has to be very careful with the usage of evidence ratio, nonetheless, with a conservative one does not have to be concerned.

1. <https://www.imperial.ac.uk/psychedelic-research-centre/> [↑](#footnote-ref-1)
2. <https://www.psychedelicsurvey.com/> [↑](#footnote-ref-2)
3. Psychedelic Research Group, Neuropsychopharmacology Unit, Centre for Psychiatry, Division of Brain Sciences,Department of Medicine, Imperial College London, London, United Kingdom [↑](#footnote-ref-3)