

Ingredients for a Good Meme



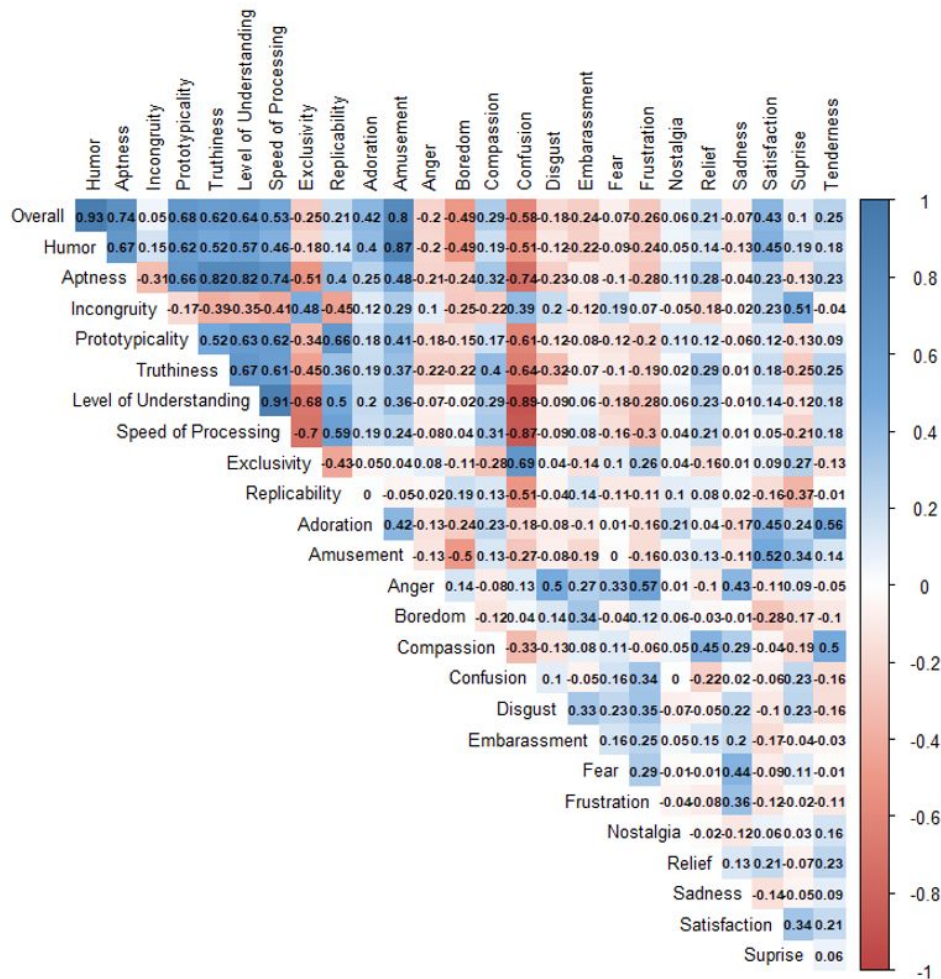
Supplementary Results

Data and Code Can Be Found Here (Anonymous)

https://osf.io/zy59j/?view_only=110fa6b45bf142b5887de0f908149369

Correlation Results

- Pearson's R Correlations for 299 internet memes (one meme is missing emotional data)
- Overall rating had the strongest positive correlations with humor, aptness, and amusement.
- Humor had a very strong correlation with amusement and moderately strong correlations with aptness, level of understanding, speed of processing, prototypicality, and truthiness.
- Replicability had a weak correlation with overall rating but a positive correlation with prototypicality, level of understanding, and the speed of processing.
- Exclusivity and confusion had a positive correlation with incongruity and a strong negative correlation with level of understanding and speed of processing.

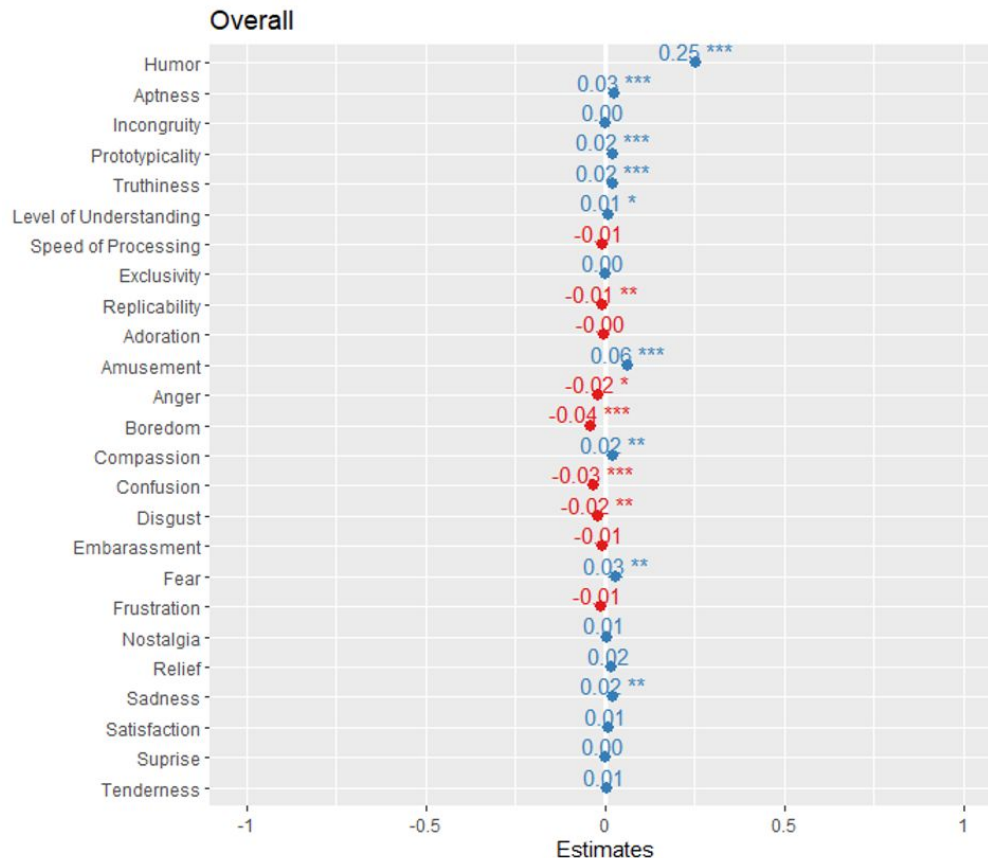


Pre-Registered Linear Mixed Effects Models

- To understand the influence of each ingredient in predicting overall rating, we ran a pre-registered linear mixed effects model using the *lmer4* package in R. The model used the each variable as a fixed effects, and the stimuli and participants as random effects, and overall ratings as the dependent variable.
 - $H1 <- \text{Overall_Rating} \sim \text{Humor} + \text{Aptness} + \text{Incongruity} + \text{Prototypicality} + \text{Truthiness} + \text{Level_Of_Understanding} + \text{Speed_Of_Processing} + \text{Exclusivity} + \text{Replicability} + \text{Adoration} + \text{Anger} + \text{Boredom} + \text{Compassion} + \text{Confusion} + \text{Disgust} + \text{Embarrassment} + \text{Fear} + \text{Frustration} + \text{Nostalgia} + \text{Relief} + \text{Sadness} + \text{Satisfaction} + \text{Surprise} + \text{Tenderness} + (1 \mid \text{stimuli}) + (1 \mid \text{participant})$
- We also ran a second pre-registered linear mixed effects analysis to determine which ingredients contribute to humor ratings. The model used humor as the dependent variable, the measured continuous variables as fixed effects, and the stimuli and participants as random effects
 - $H2 <- \text{Humor} \sim \text{Aptness} + \text{Incongruity} + \text{Prototypicality} + \text{Truthiness} + \text{Level_Of_Understanding} + \text{Speed_Of_Processing} + \text{Exclusivity} + \text{Replicability} + \text{Adoration} + \text{Anger} + \text{Boredom} + \text{Compassion} + \text{Confusion} + \text{Disgust} + \text{Embarrassment} + \text{Fear} + \text{Frustration} + \text{Nostalgia} + \text{Relief} + \text{Sadness} + \text{Satisfaction} + \text{Surprise} + \text{Tenderness} + (1 \mid \text{stimuli}) + (1 \mid \text{participant})$

Hypothesis 1 Results

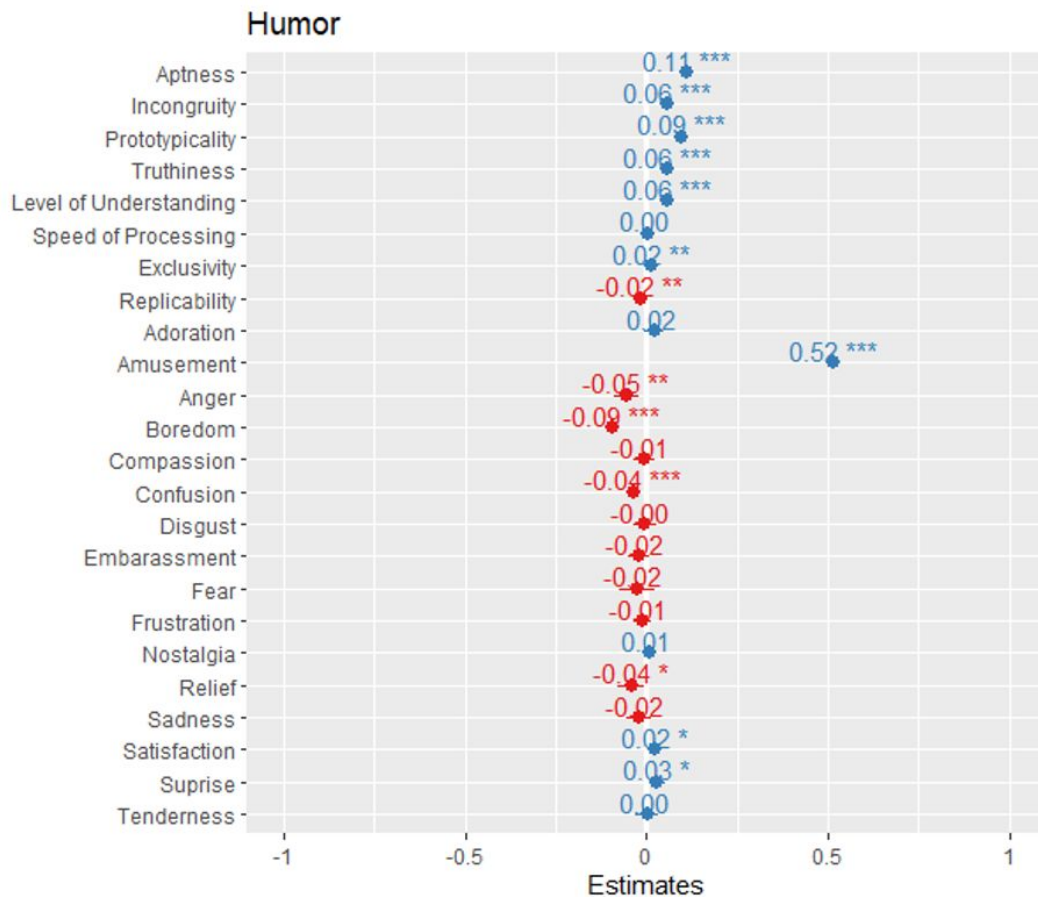
- As predicted in our pre-registration of H1, we found that humor, aptness, prototypicality, truthiness, level of understanding, and speed of processing had significant positive effects on overall rating.
- In addition, negatively valenced emotions like anger and confusion, had negative effects on overall rating
- Due to high correlations in the raw data, we found unexpected results in our models as well. Specifically, we found that fear and sadness have a significant positive effect in overall rating, even though they had a weak negative correlation.
- Therefore, we believe that the pre-registered models suffer from confounding and/or suppressing latent variables.



Pre-registered H1 linear mixed effect forest plot of estimates for predicting overall rating. Note: * denotes $p < 0.05$, ** denotes $p < 0.01$, *** denotes $p < 0.001$

Hypothesis 2

- As predicted by our second pre-registered hypothesis, aptness, incongruity, surprise, level of understanding, and speed of processing had significant positive effects on humor ratings.
- We also correctly predicted confusion to have a negative effect on humor ratings.
- We also found amusement was the strongest predictor of humor ratings while prototypicality, truthiness and exclusivity had significant positive effects.
- Other negative emotions seem like boredom and anger seemed to significantly decrease humor ratings.



*Pre-registered H2 linear mixed effect forest plot of estimates for predicting humor ratings. Note: * denotes $p < 0.05$, ** denotes $p < 0.01$, *** denotes $p < 0.001$*

Factor Loading Correlations

- To check for multicollinearity in our exploratory factor data, we calculated the correlations and VIF between all of the five factors
- We only found a strong correlation between factor 2 (humor) and overall liking
- We found that all five factors are under the minimum threshold of 5 VIF score for multicollinearity

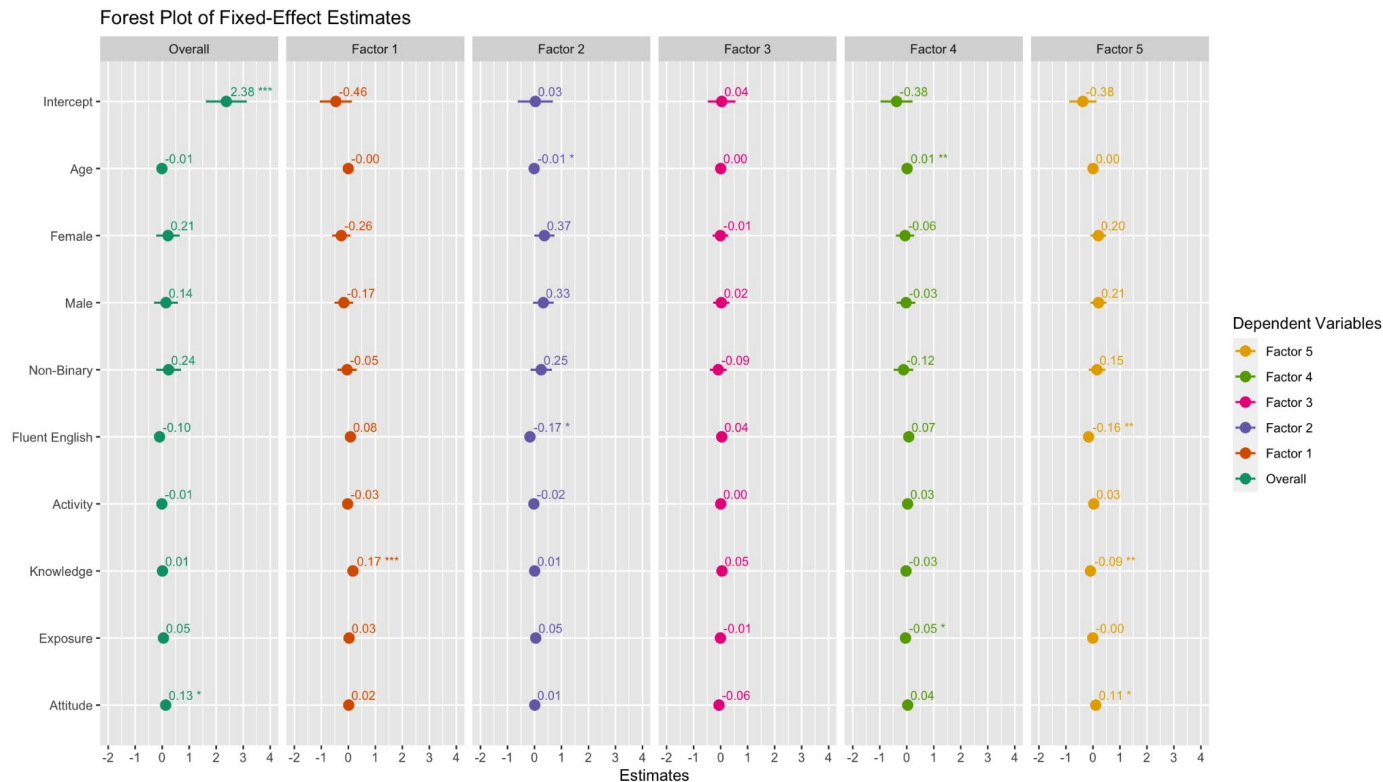
Variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
VIF	1.27355	1.36803	1.17864	1.28581	1.15347



Demographic Effects of Ratings and Factor Loadings

- N = 326 participants were included in the analysis
- Participants filled out a demographic questionnaire and asked to indicate the following:
 - Age: selecting their year of birth
 - Gender: Female/Male/Non-Binary/Prefer Not to Say
 - Fluent English Speaker: Yes/No
 - Social Media Activity: from 1: Not Active at All to 5: Extremely Active
 - Knowledge of Internet memes from 1: Not Knowledgeable at All to 5: Extremely Knowledgeable
 - Attitude Towards Memes from 1: Dislike a Great Deal to 5: Like a Great Deal
- To understand the effect of demographic variables on overall ratings and factor loadings, we ran six linear mixed effects models using demographic variables as fixed effects and overall ratings and factor scores as dependent variables
 - E.g. Overall $\sim$ Age + Female + Male + Non-Binary + Fluent English + Social Media Activity + Meme Knowledgeability + Attitude Towards Memes

Demographic Effects Results



*Linear mixed effects forest plot of demographic effects estimates including confidence intervals and p-values. Note: * denotes $p < 0.05$, ** denotes $p < 0.01$, *** denotes $p < 0.001$*

Demographic Effects Results

- The results of the linear mixed effect model showed that demographic variables did not have a significant effect on the overall ratings of internet memes. Only attitude towards internet memes had a marginally significant positive effect on meme appreciation ($b = 0.13, p < 0.05$).
- In factor 1, knowledge of internet meme culture had a significant positive effect ($b = 0.17, p < 0.00$). People well-versed in meme culture processed the internet memes more fluently.
- Age ($b = -0.01, p < 0.05$) and native English fluency ($b = -0.17, p < 0.05$) had marginally significant negative effects on the loadings of factor 2. People who were older and were native English speakers were less likely to feel the amusement and perceive the humor of the internet memes.
- While demographics did not have any significant effects on factor 3 loadings, age ($b = -0.01, p < 0.01$) had a marginally significant positive effect on factor 4 loadings and exposure to internet memes ($b = -0.05, p < 0.01$) had a significant negative effect.
- Finally, native English fluency ($b = -0.16, p < 0.01$) and knowledge of meme culture ($b = -0.09, p < 0.01$) had significant negative effects on factor 5 loadings but attitude towards memes ($b = 0.11, p < 0.05$) had a marginally positive effect.