Supplemental Material

In the supplemental material, we describe the data and the Generalized Linear Mixed Models (GLMMs) in more detail. First, we plot the two dependent measures (number of ideas generated and average novelty of ideas) and calculate the index of dispersion for each. Second, we specify the distributions used in the GLMMs and tables for models not shown in detail in the paper.

1) Data Graphs and Dispersion

The number of ideas generated was positively skewed although truncated with a minimum of two ideas, Figure A1. Note the high concentration of data points around 10 ideas.

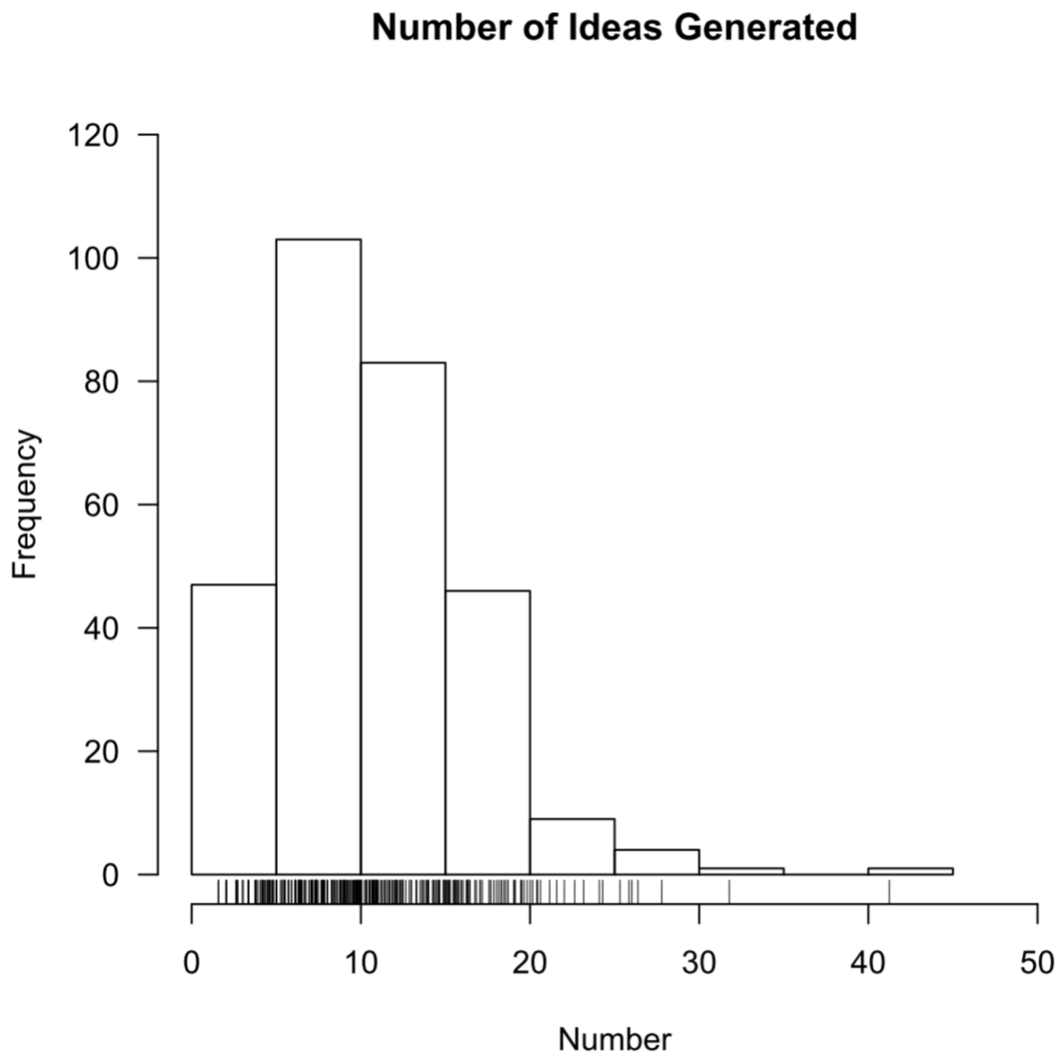

Figure A1. Histogram of the number of ideas generated. The x-axis is the number of ideas and y-axis is the frequency. Tickmarks indicate the number of ideas for each specific values.

The novelty of ideas was also positively skewed, but with values spread-out through most of the rating scale (Figure A2).

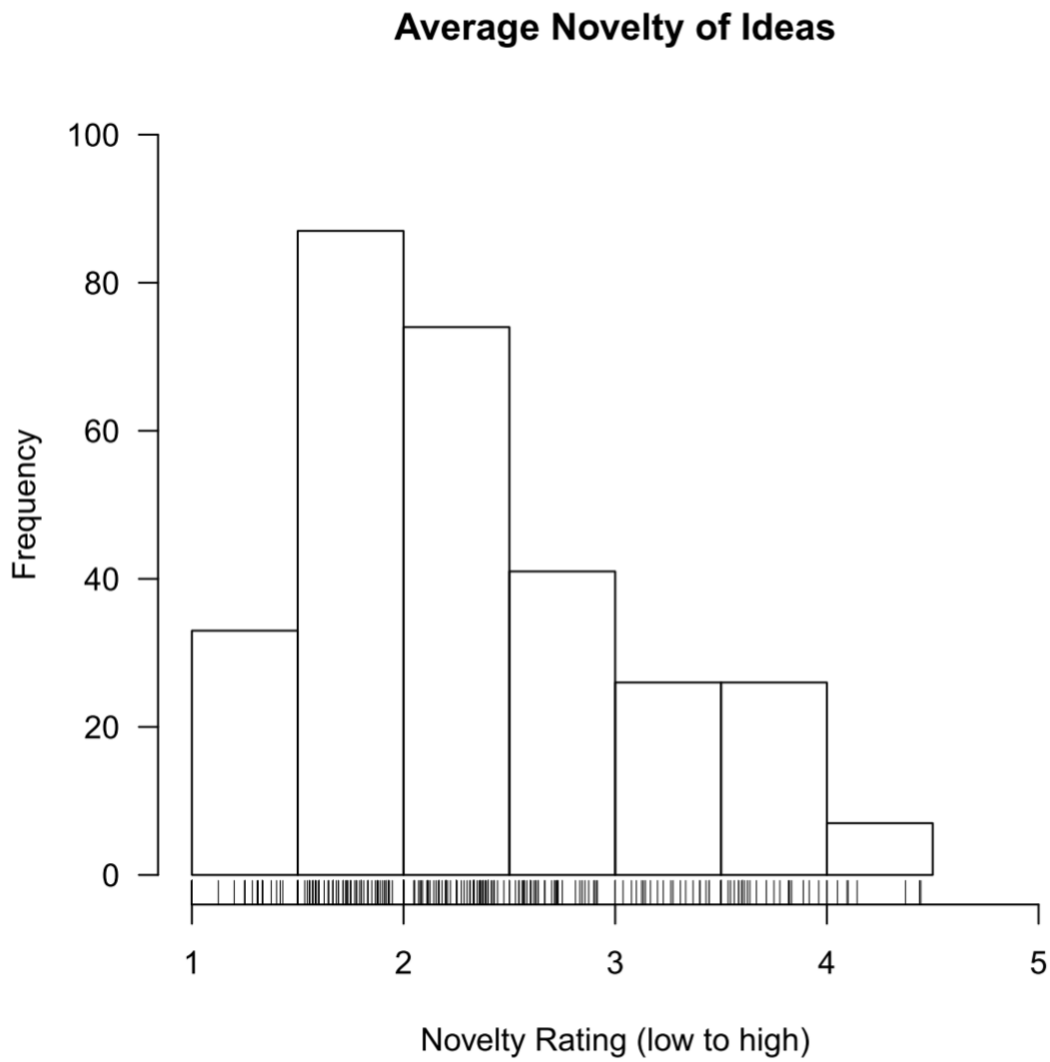

Figure A2. Average novelty of ideas generated. The x-axis is the novelty rating (1 = low to 5 = high) and y-axis is the frequency. Tickmarks indicate the specific average novelty rating for ideas.

To help determine the distribution of the data, we used the index of dispersion (Puig & Valero, 2006):

$I = \frac{S^2}{M}$, where

$I = index\ of\ dispersion,$

$S^2 = variance,$

$M = mean$

$I < 1$ indicates under-dispersion, data are more spread-out than a Poisson distribution suggesting a binomial distribution or similar distribution.

$I = 1$ indicates the variance and mean are equal, suggesting a Poisson distribution which has a single free parameter to represent both the variance and the mean simultaneously.

$I > 1$ indicates over-dispersion, data clump together more than a Poisson distribution and suggesting a negative binomial or similar distribution

As the above graphs suggest, the number of ideas generated was over-dispersed (I = 2.94) and the average novelty rating was under-dispersed (I = 0.26).

2) GLMMs: Distributions and Models not described in Detail in the Paper

Multilevel models for counts were fit using the Generalized Linear Mixed Models (GLMMs) with the glmmTMB package in R (Brooks et al., 2017; R Core Team, 2019). For number of ideas generated, we used a zero-truncated Poisson distribution in the GLMMs. These models would not converge with a negative binomial distribution. This is likely because values of 0 and 1 never occurred. For average novel of ideas, we used Conway-Maxwell-Poisson distribution which can model under-dispersion as well as fractional numbers (Brooks et al., 2017). Last, we describe two models that were not detailed in the paper: Base models for predicting number of ideas and average novelty of ideas.

Number of Ideas

The base model for predicting number of ideas during the group phase included five Level 2 predictors (all assessed at the individual level, rather than the observation level). These were:

1) Fluency score
2) Need for cognition score
3) Openness to experience score
4) Extraversion score
5) Average number of ideas generated in dyad phase

Each of these predictors substantially reduced the AIC of the model when included, suggesting a more likely model. See Table A1 for the estimates of fixed effects for each of these predictors.

Table A1. Estimates of fixed effects for base model for predicting number of ideas

Predictor	Estimate (IRR)	95% CI (IRR)	Estimate (Linear, at Mean)	95% CI (Linear, at Mean)
Fluency	1.02	[1.01, 1.04]	0.25	[0.07, 0.44]

Need for Cognition	1.00	[1.00, 1.00]	0.00	[-0.05, 0.05]
Openness to Experience	0.07	[-0.06, 0.19]	0.77	[-0.60, 2.33]
Extraversion	0.96	[0.90, 1.03]	-0.40	[-1.09, 0.34]
Dyad Performance	1.14	[1.11, 1.17]	1.24	[1.26, 1.92]

Average Novelty

The base model for predicting average novelty of ideas during the group phase also included four Level 2 predictors (all assessed at the individual level, rather than the observation level). These were:

1) Fluency score
2) Need for cognition score
3) Openness to experience score
4) Extraversion score

The average novelty of ideas generated in the dyad phase was tested as an additional predictor for the base model, but its inclusion actually increased the AIC of the model. As a result, it was not included as a predictor going forward. All of the other variables substantially reduced the AIC upon their inclusion. See Table A2 for the estimates of fixed effects for each of the four included predictors.

Table A2. Estimates of fixed effects for base model for predicting number of ideas

Predictor	Estimate (IRR)	95% CI (IRR)	Estimate (Linear, at Mean)	95% CI (Linear, at Mean)
Fluency	1.01	[1.00, 1.02]	0.15	[0.04, 0.26]
Need for Cognition	1.00	[1.00, 1.00]	0.00	[-0.03, 0.03]
Openness to Experience	1.04	[0.96, 1.13]	0.49	[-0.46, 1.52]
Extraversion	0.99	[0.90, 1.03]	-0.16	[-0.67, 0.37]

Supplemental Reference

Puig, P., & Valero, J. (2006). Count data distributions: Some characterizations with applications. *Journal of the American Statistical Association*, *101*(473), 332–340.