

Pre-Registration report for Experimental Psychology Lab Study 2019

Research questions

When looking at other people, humans are able to process perceived faces and encode those information in order to form an opinion, or assumption, about the other's personality. Basically, there could be two different forms of processing faces: *featural processing* and *configural processing*.

Featural processing takes only the facial features (e.g. mouth, nose, eyes) into account, while configural processing takes the configuration of those features into account as well (e.g. eyes over nose over mouth).

We want to replicate the study described in the paper “Configural processing and social judgments: Face inversion particularly disrupts inferences of human-relevant traits“ by John Paul Wilson, Steven G. Young, Nicholas O. Rule and Kurt Hugenberg from 2018. Our goal is to disrupt the possible configural processing of faces by turning them upside down and see if this has an effect on the perception of different character traits.

All our data and code can be found in our github repository:
<https://github.com/annassommer/XPLabFinal>

Hypotheses

1. We predict that “trustworthiness” as a character trait is more often appointed to humans than dominance, which is more often appointed to humans as well as to non-humans. On the other hand, we predict that our participants perceive dominance as a character trait that can be applied to both humans and non-humans. This hypothesis is based on the findings of Wilson et al. (2018) in Study 4a of their paper.
2. We hypothesize that character traits perceived as being exclusively human rely primarily on the configural processing of faces. Character traits appointed to both humans and non-humans are processed featurally.

If hypothesis (1) is true, we predict that the perception of “trustworthiness” of faces differs more significantly between upside down faces and upright faces than the perception of “dominance”. Upright faces are perceived as more trustworthy than inverted faces because turning a face around disrupts possible *configural processing*. On the other hand, the perception of “dominance” should not vary much between upright and inverted faces, as the featural processing of faces is maintained across both conditions. This hypothesis is based on the findings of Wilson et al. (2018) in Study 1. of their paper.

Study plan

The study is going to be a web-based experiment which participants can do wherever they choose and without supervision. It is divided into two parts: In the first part, we want to take a look at how a certain character trait is classified as being specifically human rather than being equally attributable to humans and non-humans. In the second part, we explore the effect inversion has on the judgment of faces regarding the two character traits.

Participant recruitment

We are going to start recruiting participants as soon as we finish the pre-registration. The
By: Anna Sophia Sommer, Daniel Pietschke, Esther Chevalier, Fabienne Kock, Sarah Greb

recruitment will take place via social media (Facebook, WhatsApp and Telegram) and the bulletin board on the University of Osnabrück platform StudIP. The experiment will be available for 14 days.

The study will be conducted in German because most of the people that we are going to reach are German native speakers. Therefore, the only restriction for participants will be to be able to speak German on a B2 level or better.

Data set

We are using the first 36 black and 36 white male face images from the Chicago face database (version 2.0.3) as material plus the two above-mentioned character traits with some more as fillers for the first part of the study. We resized the pictures to 450×316 pixels.

The face database is freely available here: <https://chicagofaces.org/default/>

Study design

The first part of our study will contain 10 character traits. Participants will see one trait at a time and are asked to rate them on a scale from 1 to 9 to be exclusive to humans (9) or humans and non-humans alike (1) with labeled end points. The exact wording will be “Wie bewerten Sie das folgende Merkmal?” (“How do you rate the following character trait?”) with “Trifft gleichermaßen auf Menschen und Tiere zu” (1) (“Equally applicable on humans and animals”) and “Trifft nur auf Menschen zu” (9) (“Only applicable on humans”) as the end points on the scales.

In the second part, participants will see 72 upright male faces one after another and are asked how strong they would attribute either trustworthiness or dominance to each face on a scale from 1 to 7 (1 = not trustworthy/dominant, 7 = very trustworthy/dominant) with labeled end points. Whether „trustworthiness“ or „dominance“ will be rated is chosen at random. The same will be done for the 72 inverted male faces. The blocks are counterbalanced, it is decided by coin flip if a participant gets first the upright faces block and then the inverted faces block or the other way around.

The exact wording in German will be “Wie dominant/vertrauenswürdig ist dieses Gesicht?” and for the scales “Gar nicht dominant/vertrauenswürdig” (1) and “Sehr dominant/vertrauenswürdig” (7).

There is no waiting time between trials in both parts of the experiment. An information screen telling participants what is about to follow and what they are supposed to do is shown before each part of the experiment.

The following text will be displayed before the beginning of the first part:

“In diesem Teil des Experiments sehen Sie ein Persönlichkeitsmerkmal.

Es ist Ihre Aufgabe auf einer Skala von 1 bis 9 zu bewerten, inwieweit das Merkmal nur auf Menschen oder gleichermaßen auf Menschen und Tiere zutrifft. 1 steht hier für 'Trifft gleichermaßen auf Menschen und Tiere zu' und 9 steht hier für 'Trifft nur auf Menschen zu'.

Wenn Sie bereit sind, drücken Sie bitte auf Start:”

After completion of the first part, the following text will be displayed:

“In diesem Teil des Experiments werden Ihnen Fotos von Gesichtern gezeigt.

Es ist Ihre Aufgabe auf einer Skala von 1-7 zu bewerten, inwieweit das Persönlichkeitsmerkmal “Dominanz” (or if applicable “Vertrauenswürdigkeit”) auf das Gesicht zutrifft.

1 steht hier für 'Gar nicht dominant (or if applicable vertrauenswürdig)',

7 steht für 'Sehr dominant (or if applicable vertrauenswürdig)'.

Sie sehen zunächst auf den Kopf gestellte Fotos, und dann aufrechte. /

Sie sehen zunächst aufrechte Fotos, und dann auf den Kopf gestellte.

(It is decided by coin flip which sentence is displayed. Pictures appear as announced, either turned around and then upright (First version of the sentence) or upright and then turned around (second version of the sentence))

Wenn Sie bereit sind, drücken Sie bitte auf Start:”

Measured variables

We are going to keep track of the reaction time for every stimulus, the ratings of the character traits in the first half as well as the ratings of the faces in the second part of the study. Furthermore we are going to collect the age and gender of all participants.

The response time will be treated as an interval scale in milliseconds, ratings as an ordinal scale, age as an interval scale and gender as a nominal scale.

Exclusion criteria

We are going to exclude data from participants who always give the same answer to every trial and data from participants who answer in a pattern (1, 2, 3, 4, 5, 6, 7) for at least 3 times. As for reaction times, we are going to exclude data from participants if their reaction times are outside the mean reaction time \pm 3 times the standard deviation interval.

Statistical analysis

We are going to use R for statistical analysis with the packages tidyverse, effsize, readR, brms, desktools and Rmisc.

For the first part of the study, we are going to firstly filter out the necessary data (which is the rating of dominance and trustworthiness). After that, we will visualize the data and calculate the median and standard deviation before performing an paired sample t-test and calculating Cohen's d.

For the second part, we will create 6 different regression models.

The first one will be modelling the responses against the categories.

The second will be the responses against the categories and the picture format (inverted and upright).

For the third one, we will model the responses against the categories and the category per picture format (category|pictureFormat).

The fourth model will contain the responses modeled against the categories per participant (category + (1|participant_id)).

The fifth model will unify the second and fourth model.

The sixth model will be the unification of the third and fourth model.

Once we have all six models, we will use the loo and loo_compare function of R to determine the best of the models.

To judge if our hypothesis 1 was correct, we need the paired sampled t-test to exceed statistical significance as well as Cohen's d for to be labeled as “large”.

To judge for acceptance or rejection of hypothesis 2, we take a look at the best model determined by loo_compare. In our pilot, this is model 6. Then, we check in the table named “Population-Level Effects” if the difference of the columns named “l-95% CI” and “u-95% CI” for the row “category” contains the 0. If that is the case, we reject the hypothesis.