

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, in comparison with animals, than dominance. This hypothesis is based on the findings of Wilson et al. (2018) in Study 4a of their paper.
2. We hypothesize that character traits, which are perceived as being exclusively human, namely “trustworthiness”, according to hypothesis 1, rely primarily on the configural processing of faces. Character traits appointed to both humans and animals, namely “dominance”, according to hypothesis 1, are processed featurally.

Under the assumption that trustworthiness is attributed stronger to humans (higher ratings in part one of the experiment), we predict that the perception of the “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. Specifically we look at the ratings of trustworthiness (“Vertrauenswürdigkeit”) and dominance (“Dominanz”). To mitigate the ratings influencing each other we ask for ratings of several more traits i.e. confidence, aggressiveness, patience, conscientiousness, friendliness, extroversion, politeness, sensibility (“Selbstsicherheit”, “Aggressivität”, “Geduld”, “Gewissenhaftigkeit”, “Freundlichkeit”, “Extrovertiertheit”, “Höflichkeit”, “Sensibilität”). This part is going to require a within-subject analysis.

In the second part, we explore the effect inversion has on the judgment of faces regarding two character traits: trustworthiness and dominance. This part is going to require a between-subject analysis

Participant recruitment

We are going to start recruiting participants as soon as we finish the pre-registration. The 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 7 days.

The study will be conducted in German because most of the people that we are going to reach are German native speakers.

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 character traits “trustworthiness” and “dominance” with some more as fillers for the first part of the study. We resized the pictures to 450 × 316 pixels. We use only male faces because the original study only used male faces as well, in order to avoid social bias playing a role in the participants' judgement.

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

Study design

The experiment consists of two parts.

The first part starts with an introduction slide, that informs the participants about their upcoming task. The explanatory text reads as follows:

“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:”

in English: In this part of the experiment you will see one personality trait. Your task is to rate this trait on a scale from 1 to 9 regarding its assignment to humans exclusively or humans and animals equally. 1 stands for “exclusively human” and 9 stands for “equally human and animal”. Press the “start” button once you're ready.

After the introduction slide the actual test phase starts. The participants view randomly one out of ten character traits (“Selbstsicherheit”, “Aggressivität”, “Geduld”, “Gewissenhaftigkeit”, “Freundlichkeit”, “Extrovertiertheit”, “Höflichkeit”, “Sensibilität”, “Vertrauenswürdigkeit”, “Dominanz”) at a time. All ten character traits will be shown to all participants. Each character trait

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shall be rated by the participant on a 9-point rating scale with labeled end points ranging from 1 (“Trifft gleichermaßen auf Menschen und Tiere zu” – “Equally applicable on humans and animals”) to 9 (“Trifft nur auf Menschen zu” – “Only applicable on humans”).

The second part of the experiment starts again with an introduction slide, that informs the participants about their upcoming task. This explanation text of the second part reads as follows:

“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.

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

In English: In this part of the experiment you will see pictures of faces. Your task is to rate them for “Trustworthiness” (or “Dominance”, which trait is to be rated is decided by coin flip) on a scale from 1 to 7. 1 stands for “Not trustworthy” (“not dominant” respectively), 7 stands for “very trustworthy” (“very dominant” respectively).

You will firstly see faces which have been turned upside down and upright faces after that. / You will firstly see upright faces and faces which have been turned upside down after that.

(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))

The test phase of the second part consists of two blocks (counterbalanced). In the first block participants see 72 upright or inverted facial stimuli one after another, that have to be rated on “dominance” or “trustworthiness” (decided by coin flip beforehand and does not change during experiment). The rating takes place on a 7-point rating scale ranging from 1 (“not trustworthy/dominant”) to 7 (“very trustworthy/dominant”) with labeled end points. The second block is identical to the first besides that the facial stimuli are shown in an inverted (or upright depending on the first block) manner.

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

In both parts of the experiment, the next trial starts immediately after participants selected their answer.

After the second part is finished, participants will be asked to give their age, gender and mother tongue and are offered the chance to leave some further comments. The experiment ends with a screen saying “Vielen Dank, dass sie an dem Experiment teilgenommen haben.” (in English: “Thank you for participating in this experiment.”).

Measured variables

For the first part we collect the ratings of the traits. The independent variable would be the different character traits and the dependent variable the rating of the given trait. The character traits are scaled nominal and their ratings are of an ordinal scale.

In the second part we collect the ratings of character traits being ascribed to either upright or inverted pictures. Here the independent variables would be the currently rated character trait (either trustworthiness or dominance) the photos and the condition of the photos (either upright or inverted). The dependent variable would be again the rating. The independent variables are of nominal scale and the dependent variable of an ordinal scale.

Moreover we are going to keep track of the reaction time for every stimulus, meaning the ratings of the character traits in the first part 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, 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 using boxplots and build a regression model which models the responses of participants against the two character traits per participant. We need to represent a participant dependency because it is a within subject design.

To judge if our hypothesis 1, that trustworthiness is a more humanlike trait and dominance a trait equal to humans and animals, was correct, we need the 95% confidence interval for the not baseline trait to not contain 0. If we have dominance as a baseline we need a positive estimate for trustworthiness and if trustworthiness is the baseline a negative estimate for dominance to represent that trustworthiness is a more humanlike trait. If that is the case, we accept the hypothesis.

For the second part, we will create 3 different regression models. We have no participant dependence for it is a between participant design.

The models are :

- Model 1 will be modeling the responses against the categories dominance and trustworthiness
- Model 2 will be the responses against the categories and the picture format (inverted and upright)
- Model 3 will model the responses against the categories and the category per picture format (category|pictureFormat)

Once we have all three models, we will use the loo and loo_compare function of R to determine the model fitting the data best.

To judge for acceptance or rejection of the hypothesis 2 based on the model, we take a look at the best model determined by loo_compare. Then, we check the 95% confidence interval for

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“category”. For the hypothesis to be accepted the confidence interval must not contain 0.