Preregistration – Moral foundations and vaccination against Covid-19[1]

[1] Following the PRP-Quant template (Preregistration Task Force, 2020).

Title

T1 Title

Moral values related to attitudes and decisions about vaccinating against Covid-19

T2 Contributors

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Using the CRediT Contributer Role Taxonomy (https://casrai.org/credit/).

T3 Date of Preregistration

Will be assigned upon submission.

T4 Versioning information

This is the first version.

T5 Identifier

T6 Estimated duration of project

January 2021 – October 2021

T7 IRB Status

The ethics committee of the Catholic University Eichstätt-Ingolstadt approved the present study (ID: 056 – 2021).

T8 Conflict of Interest Statement

The contributors to the study declare not to have conflicts of interest.

T9 Keywords

Moral foundations, vaccination hestitancy, vaccination, Covid-19, Moral Foundations Theory, Liberty, Purity, Pandemic

T10 Data accessibility statement and planned repository

Data will be accessible via download (Open Science Foundation repository) and can be used for all purposes.

T11 Code availability

Reproducible code and material will be publicly available.

Abstract

A1 Background

The moral dimensions of liberty, purity, authority, and possibly harm have been found to correlate with vaccination hesitancy measured as parents' and caregivers' attitudes and intentions towards vaccination against child's diseases.

A2 Objectives and Research questions

The present study investigates the relationship between moral dimensions and the intention/decision to vaccinate against Covid-19 in adults, rather than specifically parents. The decision to vaccinate against Covid-19 concerns the deciders themselves rather than another person – their wards.

A3 Participants

German adults recruited from social media groups with vaccination, health, and Covid related topics (such assupporting or rejecting vaccination in general or against Covid-19 specifically) will be investigated.

A4 Study method

Participants are asked to complete an online survey using the moral foundations questionnaire (J. Graham et al., 2011), general vaccination hestitancy (Rossen et al., 2019), attitudes towards vaccination against Covid-19, and political orientation on a left-right spectrum as well as political party association. Bayesian multiple linear and multinomial logistic regressions as well as data-driven clustering methods will be used to model groups of attitudes and their relationship to the endorsement of moral domains.

Introduction

I1 Theoretical background

The Covid-19 pandemic and climate change are two relevant challenges for humanity. Both topics are part of political and social controversies between what seems like opposing camps, where one group argues that there is a severe problem which requires drastic human interventions and the another group argues that the problem is less severe and even if does not justify drastic political or social interventions.

Moral values have been demonstrated to correlate with stances on climate change (Dickinson et al., 2016; Jansson & Dorrepaal, 2015; Milfont et al., 2019; Vainio & Mäkiniemi, 2016; Welsch, 2020), vaccination in general (Amin et al., 2017; Rossen et al., 2019) or acceptance of pandemic protection measures (A. Graham et al., 2020). Moral values are also well replicated to predict political affiliation on the liberal-conservative or left-right spectrum (Di Battista et al., 2018; J. Graham et al., 2011; Kivikangas et al., 2021; Yılmaz et al., 2016).

Vaccine hestitancy exists and has been primarily observed in the realm of child's diseases (Gilkey et al., 2014; Oladejo et al., 2016; Opel et al., 2011, 2013). Amin et al. and Rossen et al. investigated parent populations and consistently found that vaccine hesitancy is predicted by the moral foundations of purity and liberty, and less consistently found the harm and authority foundations as predictors. Greater endorsement of the moral dimensions of harm, purity, and liberty went along with greater vaccine hesitancy.

For child's diseases parents are the decision makers for their children and do not affect themselves but their wards. In the Covid-19 pandemic, each individual has to decide whether to vaccinate against Covid-19 or not which provides a singular opportunity to investigate the relationship between personal values and vaccination decisions regarding the own person.

I2 Objectives and research questions

The present study investigates the relationship between personal moral values on the one hand and vaccination in general and against Covid-19 specifically. In a certain sense it is a conceptual replication of the findings that moral foundations correlate in a specific pattern with decisions to vaccinate. Instead of focussing on parents only (Amin et al.; Rossen et al.), in the present study the focus is on adults. Instead of focussing on the decision to vaccinate against child's diseases, the present study focusses on vaccination against Covid-19. Further, instead of samples from the USA or Australia, a German sample will be investigated.

I3 Hypotheses

H_{dec} Decision aspect

Propensity of outcome k (Covid vaccination decision supporter, rejecter, or fencesitter) in a multinomial logistic regression with the six moral foundations as predictors:

- Null model $Model_0$: $\lambda_k = \beta_{0,k}$
- $Model_1$: $\lambda_k = \beta_{0,k} + \beta_{pur,k} + \beta_{lib,k}$
- $Model_2$: $\lambda_k = \beta_{0,k} + \beta_{harm,k} + \beta_{pur,k} + \beta_{auth,k} + \beta_{lib,k}$
- Full model $Model_{full}$: $\lambda_k = \beta_{0,k} + \beta_{harm,k} + \beta_{fair,k} + \beta_{loy,k} + \beta_{auth,k} + \beta_{pur,k} + \beta_{lib,k}$

H_{att} Attitudes aspect

Vaccine hestitancy predicted by the six moral foundations. VCI is modelled to be normally distributed, $vci_{sum} \sim normal(\mu, \sigma)$, with mean:

- Null model $Model_0$: $\mu_{vci} = \beta_0$
- $Model_1$: $\mu_{vci} = \beta_0 + \beta_{auth} + \beta_{pur} + \beta_{lib}$

- Model$_2$: $\mu_{vci} = \beta_0 + \beta_{harm} + \beta_{auth} + \beta_{pur} + \beta_{lib}$
- Full model Model$_{full}$: $\mu_{vci} = \beta_0 + \beta_{harm} + \beta_{fair} + \beta_{loy} + \beta_{auth} + \beta_{pur} + \beta_{lib}$

H_{clust} Clusters of attitudes

Clusters of attitudes are generated using the mclust package and selected by BIC. The number of clusters is yet unknown. Propensity of outcome k (participant belongs to attitude group k) in a multinomial logistic regression is modelled with the six moral foundations as predictors:

- Null model Model$_0$: $\lambda_k = \beta_{0,k}$
- Model$_1$: $\lambda_k = \beta_{0,k} + \beta_{pur,k} + \beta_{lib,k}$
- Model$_2$: $\lambda_k = \beta_{0,k} + \beta_{harm,k} + \beta_{pur,k} + \beta_{lib,k}$
- Full model Model$_{full}$: $\lambda_k = \beta_{0,k} + \beta_{harm,k} + \beta_{fair,k} + \beta_{loy,k} + \beta_{auth,k} + \beta_{pur,k} + \beta_{lib,k}$

$H_{parents}$ Attitudes aspect for parent subpopulation

All three previous analyses will be repeated with the subset of parents (and caregivers) in order to replicate the findings of Rossen et al., and Amin et al. (variable PARENT == 1).

I4 Exploratory research questions

E1: Decision aspect

How do moral foundations, political orientation and party association, as well as specific vaccination related attitudes differ depending on the decision to vaccinate against Covid-19 estimating the coefficients of a Bayesian ANOVA of the respective dependent variable with factor vaccination decision and levels supporter, fence-sitter, and rejector. This analysis is carried out for descriptive purposes to illustrate mean differences in dependent variables based on decision types.

E2: Political orientation and political party association

Party association (nominal)

Party association is a nominal variable which will be predicted by the six moral foundations in a multinomial logistic regression with co-variates gender, age, and education.

- Null model Model$_0$: $\lambda_k = \beta_{0,k} + \beta_{gend,k} + \beta_{age,k} + \beta_{edu,k}$
- Model$_1$: $\lambda_k = \beta_{0,k} + \beta_{gend,k} + \beta_{age,k} + \beta_{edu,k} + \beta_{pur,k} + \beta_{lib,k}$
- Model$_2$: $\lambda_k = \beta_{0,k} + \beta_{gend,k} + \beta_{age,k} + \beta_{edu,k} + \beta_{harm,k} + \beta_{auth,k} + \beta_{pur,k} + \beta_{lib,k}$
- Full model Model$_{full}$: $\lambda_k = \beta_{0,k} + \beta_{gend,k} + \beta_{age,k} + \beta_{edu,k} + \beta_{harm,k} + \beta_{fair,k} + \beta_{loy,k} + \beta_{auth,k} + \beta_{pur,k} + \beta_{lib,k}$

The same model specifications as in the previous multinomial logistic regressions will be used.

Political orientation (metric)

Analysis 1: Zero-order correlation between political orientation and endorsement of the binding and individualizing moral foundations, respectively. The prediction based on previous data is a positive relationship between binding foundations and political orientation (to the right) and a negative relationship between individualizing foundations and political orientation (to the right).

Analysis 2: Multiple linear regression with predicted variable political orientation, the six foundations as predictors and gender, age, and education as co-variates. The four models specified for the analysis of party association will be tested the only difference being that the predicted variable will not be propensity of associating with party k but political orientation $\mu_{ori.}$

The same model specifications as in the previous multiple linear regressions will be used.

Method

M1 Time point of registration

Registration prior to analysis of the data. Data are already collected at the time of the registration.

M2 Use of pre-existing data

None.

M3 Sample size, power, and precision

Sample size was determined based on resource constraints, heuristics, and no further justification (Lakens, 2021). The present study is partly a conceptual replication of Rossen et al. (2019) Amin et al. (2017) with N=296 and N=1007, respectively. The larger of both was used as a heuristic for the present study. No further justification was used for determining sample size. After two bouts of recruiting ca. 1600 participants completed the study. Recruiting was stopped but the survey was kept open until submission of the preregistration.

M4 Participant recruitment, selection, and compensation

(a) Methods of recruitment

The link to the survey was posted on social media platforms (Facebook, Telegram Groups) and advertised on the University homepage. Social media groups with topics of Covid, vaccination in general (both pro and contra), vaccination against Covid specifically (both pro and contra), and general health topics were selected. For private groups, the group owners were contacted and asked to make the survey invitation available to the group members. Further, vaccine skeptical mailing list owners were contacted and asked whether they would inform their subscribers about the present study. The survey was also advertised to psychology students at the Catholic University of Eichstätt-Ingolstadt.

(b) Exclusion criteria

The exclusion criteria are detailed in section AP1

(c) details of any stratification sampling used

None.

(d) Planned participant characteristics

As vaccination sceptics comprise a proportion of 12 % in the German population (Schmid-Küpke & COVIMO Studiengruppe, 2021), the focus of recruiting was more vaccination sceptical social media groups in order to have vaccination sceptics present in the sample adequate for statistical power not representative for the German population.

(e) Compensation for participation

Psychology students from the Catholic University of Eichstätt-Ingolstadt could claim course credit for participation.

M5 Handeling of participant drop-out

Participants who did not complete the survey will be excluded from analysis.

M6 Masking of participants and researchers

Data are anonymized and allow no conclusion as to the identity of a participant. IP addresses are never stored at any point in time.

M7 Data cleaning and screening

See section AP1.

M8 Treatment of missing data

Cases with missing data will be excluded from analysis.

M10 Type of study and study design

The study is an observational design. Relevant factors are:

- Moral Foundations (care, fairness, loyalty, authority, purity, and liberty)
- Vaccination Confidence Inventory with 18 items
- Political ideology (self association with the left vs. right political spectrum)
- Party association (self association with parties of the German party system)
- Vaccine behaviour intentions for 11 child diseases
- Attitudes towards vaccination against Covid-19 (23 items)
- Vaccine preference for 5 vaccines against Covid-19
- Cluster of vaccination attitudes (number of levels determined in a data-driven fashion using clustering methods)

M11 Randomization

NA

M12 Measured variables, manipulated variables, covariates

See Codebook.

M13 Study Materials

See Codebook.

M14 Study Procedures

The questionnaire is administered via online assessment.

Analysis plan

The subsequent analyses are considered to be confirmatory, as the analysis plan is preregistered (Wagenmakers et al., 2012).

AP1 Criteria for post-data collection exclusion of participants

Participants will be excluded if

- they didn't complete the survey
- if they failed the "It is better to do good than to do bad" attention check
    - MFQ2_GOOD_7 < 4
- if they took less than 2:40 min to complete the survey
- Response variability
    - the "standard deviation of responses across a set of consecutive item responses for an individual" (Dunn et al., 2018, S. 108) is calculated with the irv function from the careless package (Yentes & Wilhelm, 2021) for all items of each scale (MFC, VCI, CoVCI)
    - response variability of zero is used as a cut-off to identify careless response behaviour and such participants will be excluded from analysis
- Person fit
    - following the procedure of Israel et al. (2021), person-fit statistics using the mirt and personfit function from the mirt package (Chalmers, 2012) are calculated per item in the MFC, VCI, CoVCI, BAS, and vaccine preference
    - the zh person-fit statistic is used to identify participants with incongruent response patterns
    - based on the recommendation of Felt et al. (2017) participants with an item with zhs < |2| are excluded from the analysis
- All metrics (attention check, response duration, response variability, and person-fit zhs) are provided in the data set together with the inclusion decision (true/false)

AP2 Criteria for post-data collection exclusions on trial level

NA

AP3 Data preprocessing

Decision to vaccinate against Covid-19

Currently, many people around the world have to decide whether to get vaccinated against Covid-19. They either have already formed their intention and possibly put their decision into action or are still evaluating

Thus, the data will be segmented into three decision groups

1. Covid-19 vaccination supporters: already vaccinated or have the intention to do so
2. Covid-19 vaccination rejectors: already rejected an offer to vaccinate or have no intention to do so
3. Covid-19 vaccination fence-sitters: have no clear intention

```
supporters: vaccinated == TRUE | (intention == 5 | intention == 4)
rejectors: rejected == TRUE | (intention == 1 | intention == 2)
fence-sitters: intention > 2 & intention < 4
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CoVCI items for Yes and No

Most items in the CoVCI scale are equivalent for those already inoculated with at least one dose and those not yet having received at least one shot. The difference is in tense (past tense vs. intention for future action). For instance items:
COVCI_YES_PROTECTOTHERS_43 („Ich *habe mich* gegen Covid-19 *impfen lassen*, um andere Personen zu schützen.“ „I *vaccinated* against Covid-19 in order to protect others“) and COVCI_NO_PROTECTOTHERS_16 („Ich möchte mich gegen Covid-19 impfen lassen, um andere Personen zu schützen.“, “I *want to vaccinate* against Covid-19 in order to protect others.”). These items will be recoded into one single variable COVCI_PROTECTOTHERS.

Subscale scores

MFQ subscale scores for the subscales harm, fairness, loyalty (ingroup), authority, purity and liberty are calculated by averaging relevant items as indicated in the codebook. The subscales binding and individualizing dimensions will be calculated by averaging subscales authority, purity, and loyalty or harm and fairness, respectively.
For Rossen et al.’s VCI scale, also the average score is calculated: VCI. The coding of VCI_PROTECTALL_15, VCI_COMPULSORY_10, and VCI_PROTECTOTHERS_4 is reversed (data$V <- 4 – data$V).

Z-transformation

MFQ_HARM, MFQ_FAIR, MFQ_LOY, MFQ_AUTH, MFQ_PUR, MFQ_LIB, MFQ_BIND, MFQ_INDIV and VCI are z-transformed. Variable names for z-transformed values end with “_z”. All items used in the cluster analysis will also be z-transformed.

AP4 Reliability analysis

Internal consistency is quantified as omega (McDonald, 1999) as proposed by Dunn, Baguley, and Brunsden (2014) using the omega function in the psych package (Revelle, 2021).
The research question does not focus on the questionnaires as measurement instruments but in their relationship to the Moral Foundations. It is known, that reliability of measurement instruments frequently are suboptimal. Thus, no consequences in handling of items or data are drawn from low fits in confirmatory factor analyses. Results of an explanatory factor analysis (for VCI and CoVCI) as well as confirmatory analyses (for VCI, MFQ, and CoVCI) will be reported in the supplement. The EFA will be performed on randomly selected 600 participants, the CFA for VCI and CoVCI on the rest of participants and for MFQ on all participants. The proportion of the decision groups (rejectors, fence-sitters, and supporters) will be equally represented in both subsamples. For comparability with previous studies using the MFQ, CFAs will be reported for

a) a two factor solution of individualizing (harm and fairness items) and binding dimensions (items for loyalty, authority, and purity),
b) a five factor model for harm, fairness, loyalty, authority, and purity,
c) a six factor model with harm, fairness, loyalty, authority, purity, and liberty
d) a hierarchical model with superordinate factors individualizing and binding and subordinate factors harm and fairness for the individualizing factor and purity, authority, and loyalty for the binding factor
e) a hierarchical model as in (d) with an additional superordinate factor liberty with subfactors lifestyle liberty and economic liberty

Models a, b, and d are equivalently defined as in Graham et al. (2011), and model e as defined in Iyer et al. (2012).

AP5 Descriptive statistics

Dependent variables will be reported with mean, sd, number of observations, and the 95% credible interval. For Bayesian model fits, the model averaged posterior for estimated variables will be reported with mean, sd, and the 95% credible interval.

The sample of the present study is not representative. Deviation of demographic variables including political orientation and party association from the German national proportions will be reported.

AP6 Statistical models

H_{dec} Decision aspect

Bayesian multinomial logistic regression[2] with the nominal predicted variable decision group (3 levels) and metric predictors moral foundations. The multinomial logistic regression is calculated according to Kruschke (2015, p. 650).

The linear propensity of outcome k is

$\lambda_k = \beta_{0,k} + \sum_{i=1}^{6} \beta_{i,k}$

That is

$\lambda_{supp} = \beta_{0,supp} + \sum_{i=1}^{6} \beta_{i,supp}$

$\lambda_{fence} = \beta_{0,fence} + \sum_{i=1}^{6} \beta_{i,fence}$

$\lambda_{rej} = \beta_{0,rej} + \sum_{i=1}^{6} \beta_{i,rej}$

and $\sum_{i=1}^{7} \beta_{i,k} = \beta_{harm,k} + \beta_{fair,k} + \beta_{loy,k} + \beta_{auth,k} + \beta_{pur,k} + \beta_{lib,k}$

The probability of outcome k is given by a softmax function

$$\Phi_k = \text{softmax}_{vacc_{type}}(\{\lambda_k\}) = \frac{\exp(\lambda_k)}{\exp(\lambda_{supp}) + \exp(\lambda_{fence}) + \exp(\lambda_{rej})}$$

The basline slopes for dec_type=supp will be set to zero.

Log odds will be calculated according to equation 22.4 in Kruschke:

$$\begin{aligned} \log\left(\frac{\phi_k}{\phi_r}\right) &= \log\left(\frac{\exp(\beta_{0,k} + \beta_{1,k}x)}{\exp(\beta_{0,r} + \beta_{1,r}x)}\right) \\ &= \log\left(\frac{\exp(\beta_{0,k} + \beta_{1,k}x)}{\exp(0 + 0x)}\right) \\ &= \beta_{0,k} + \beta_{1,k}x \end{aligned} \qquad (22.4)$$

Figure 1. Interpretation of the regression coefficients (Kruschke, 2015).

Model parameters will be estimated via a Markov Chain Monte Carlo (MCMC) procedure according to the generative model depicted in Figure 4:

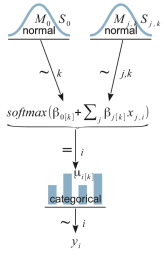


Figure 2. Generative model for the multinomial regression ((Kruschke, 2015).

The model will be implemented in JAGS using the model code from Kruschke (2015, pp. 660) with standardized predictor and predicted variables which are then back transformed to the original scale. Sampling parameters will initially include 3 chains, 2000 adaptation steps, 10000 steps per chain, and 5000 burn-in steps. In case processing time is too long (several days), the number of

2

steps will be gradually reduced. Initial values will be randomly drawn from the respective prior distribution.

If the process does not converge (convergence criterion $\hat{R} < 1.1$), auto-correlation is too high (effective sample size < 5000), or computation duration is infeasible, the number of burn-in steps, adaptation, thinning and/or the overall number of steps will be increased. In case of PC memory problems, thinning will be increased. In case of further non-convergence different initial values will be used. The coda samples will be provided with the open data. Complete convergence diagnostics will be calculated using the superdiag package (Le Bao et al., 2020) and made available in the supplement.

Posterior parameter estimates will be reported with mode and the 95% credible interval.

Several models will be fitted:

1. a null model $Model_0$,
2. the full model $Model_{full}$,
3. a model including only the significant factors of Amin et al. ($Model_1$),
4. and a model including only the significant factors Rossen et al. ($Model_2$)

Based on the results of Amin et al. Model 1 will include the purity, authority and liberty dimensions. Model 2 will include the purity, liberty, authority, and additionally harm dimensions. The models will be compared using the Deviance Information Criterion (DIC, Plummer, 2008; Spiegelhalter et al., 2002).

If the sample size for the different decision types for all three types is > 100. If one type is below that N, the group is excluded from the analysis and the regression reduces to a dichotomous regression. Priors are vague with $\mathcal{N}(0;20)$.

Bayesian ANOVA[3]

For descriptive purposes the relationship between the moral foundations and dec_type will be calculated as foundation ~ dec _type. This is symmetrical to the multinomial approach, where dec _type ~ foundations which also accounts for possible correlations between the moral foundations. 6 separate Bayesian ANOVAs with dependent variables harm, fairness, loyalty, authority, purity, liberty, and vaccine hestitancy will be conducted with the predictor dec_type (supporters, fence sitters, rejecters) using the BayesFactor package (Morey & Rouder, 2018; Rouder & Morey, 2012):

- r scale for fixed effects: 0.5
- pairwise comparisons based on posterior odds with correction for multiple testing (Westfall, Johnson, & Utts, 1997)
- 95% credibility interval for the the dependent variable

Post Hoc Comparisons

		Prior Odds	Posterior Odds	$BF_{10, U}$	error %
(14.9,34.3]	(34.3,53.7]	0.587	0.450	0.767	4.078e −6
	(53.7,73.1]	0.587	1.034e +7	1.760e +7	2.957e −15
(34.3,53.7]	(53.7,73.1]	0.587	286.936	488.484	7.253e −9

Note. The posterior odds have been corrected for multiple testing by fixing to 0.5 the prior probability that the null hypothesis holds across all comparisons (Westfall, Johnson, & Utts, 1997). Individual comparisons are based on the default t-test with a Cauchy (0, r = 1/sqrt(2)) prior. The "U" in the Bayes factor denotes that it is uncorrected.

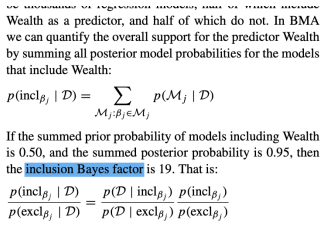
Figure 3. Dummy output for post hoc comparisons in JAGS.

[3] Results will be reported along the following template "First, we discuss the results for hypothesis testing. The null hypothesis postulates that there is no difference in log fuse time between the groups and therefore H0 : δ = 0. The one-sided alter- native hypothesis states that only positive values of δ are possible, and assigns more prior mass to values closer to 0 than extreme val- ues. Specifically, δ was assigned a Cauchy prior distribution with r = 1/√2, truncated to allow only positive effect size values. Figure 6a shows that the Bayes factor indicates evidence for H+; specifically, BF+0 = 4.567, which means that the data are approximately 4.5 times more likely to occur under H+ than under H0. This result indicates moderate evidence in favor of H+. The error percentage is < 0.001%, which indicates great stability of the numerical algorithm. (van Doorn et al., 2021)

H_{att} Attitudes aspect

Bayesian multiple linear regression with predicted variable VCI and predictors moral foundations.

- Regression function from the BAS R package (Clyde, 2020) following the implementation in JASP (Bergh et al., 2021; JASP Team, 2020)
- JZS prior with default value r scale = 1/8, corresponding to the choice in other software (e.g., BayesFactor, Morey & Rouder, 2018)
- model prior beta binomial with a=1 and b=1
- The 95% credible intervals for coefficients will be reported
- Models null, 1, 2, and full will be fitted
- Inclusion Bayes Factors (Bergh et al., 2021)will be reported


Wealth as a predictor, and half of which do not. In BMA we can quantify the overall support for the predictor Wealth by summing all posterior model probabilities for the models that include Wealth:

$$p(\text{incl}_{\beta_j} \mid \mathcal{D}) = \sum_{\mathcal{M}_j : \beta_j \in \mathcal{M}_j} p(\mathcal{M}_j \mid \mathcal{D})$$

If the summed prior probability of models including Wealth is 0.50, and the summed posterior probability is 0.95, then the inclusion Bayes factor is 19. That is:

$$\frac{p(\text{incl}_{\beta_j} \mid \mathcal{D})}{p(\text{excl}_{\beta_j} \mid \mathcal{D})} = \frac{p(\mathcal{D} \mid \text{incl}_{\beta_j})}{p(\mathcal{D} \mid \text{excl}_{\beta_j})} \frac{p(\text{incl}_{\beta_j})}{p(\text{excl}_{\beta_j})}$$

Figure 4. Screenshot from van den Bergh et al. (2021) of how the inclusion Bayes factor is calculated.

H_{clust} Clusters of attitudes

Determination of clusters

Attitudes towards vaccination will be clustered using a Gaussian finite mixture model fitted by the Expectation-Maximization (EM) algorithm using the mclust-5 R package (Scrucca et al., 2016).

- The z-transformed items to be clustered are:
    - all items of the VCI
    - all items of the CoVCI
    - attitudes towards all 11 child diseases
- The best fitting model will be selected based on the Bayesian Information Criterion (BIC)
- BIC differences for the best 5 models will be reported
- a BIC plot for model variants will be provided
- The clustering structure will be visualized using the MClustDR function with uncertainty boundaries

Clusters with less than 15 persons will be omitted.

Semantic analysis of clusters

A purely data driven classification itself provides no semantic or psychological interpretation of the clusters. Therefore, the clustering will be used as a grouping variable for the variables:

- action to vaccinate
- decision to vaccinate
- vaccination attitudes
    - average score
    - and for individual items (as in Rossen et al., 2017)
- Covid specific attitudes
    - average score
    - and for individual items
- moral foundations
    - for harm, fairness, loyalty, etc. separately
- political orientation and party affiliation

Rossen et al. found three clusters of

- vaccination supporters
- vaccination rejectors
- vaccination fence-sitters

It is possible that, in case of more than 3 clusters, additional clusters describe subgroups of these three prototypical groups. Indicators for the groups are “decision to inoculate” (high, medium, low) and overall vaccination hesitancy. Potential subgroups might differ in the aspects, where vaccine hesitancy occurs (e.g., in the realm of safety concerns or conspiracy).
Differences or equivalence in indicators between clusters will be quantified with independent Bayesian T-Tests (two-sided Student independent sample T-Test with a Cauchy prior of scale 0.707).
Relevant semantic markers are:

- equivalence between groups
- ordering relative to hesitancy and vaccination decision

Tested models
The clustering results in the variable ATTITUDE_GROUP with k levels. For inference, a multinomial logistic regression with predictors harm, fairness, loyalty, authority, purity, and liberty will be performed as for H_{dec} only that the predicted variable has k levels. For descriptive purposes, one Bayesian ANOVA with predictor attitude group and predicted variable endorsement will be performed for each of the six moral dimensions, with the same specification as for H_{dec}.

$H_{parents}$ Attitudes aspect for parent subpopulation
All three previous analyses (decision aspect, attitude aspect, and attitude clusters) will performed on the subgroup of parents/caregivers with the same model specifications in a replication attempt of Amin et al. and Rossen et al..

E1: Decision aspect in all other measured dependent variables
For descriptive purposes, a set Bayesian ANOVAs will be performed on all items and subscales will be performed with predictor variable decision group and a second set with predictor attitude group in order to describe mean differences. The same model specifications as for H_{dec} and H_{clust} will be used. These analyses will be reported completely in the supplement.

E2: Political orientation and political party association
Political party association
Party association is a nominal variable with levels AfD, CDU/CSU, FDP, Bündnis90/Die Grünen, SPD, Die Linke, and other. A multinomial logistic regression will be performed with predicted variable party association and predictors the six moral foundations. Co-variate variables are gender, age, and education. In case the model fails to converge, the co-variates will be removed step by step until convergence. The model is specified as for H_{dec} and H_{clust}. For descriptive purposes each moral foundation will be analysed as predicted variable in a Bayesian ANOVA with the nominal predictor party association with the same model specification as for H_{dec} and H_{clust}.

Political orientation: Replication of Klein et al. (2018)
Two Bayesian correlations will be performed with binding foundations ~ political orientation (left/right) and individualizing ~ political orientation with

- Pearson’s rho correlation coefficient
- alternative hypothesis one-sided (the more endorsement of the binding foundation the more right; the more endorsement of the individualizing foundations, the more left)
- stretched beta prior with width 1
- 95% credible interval of Pearson’s r will be reported

Additionally, the same correlation analyses will be reported for each of the six moral dimensions.

Political orientation: Multiple linear regression

In order to account for co-variates and correlations among predictors, a Bayesian linear regression with predicted variable political orientation and predictors of the six moral foundations with co-variates of age group, gender, and education will be performed:

- Regression function from the BAS R package (Clyde, 2020) following the implementation in JASP (Bergh et al., 2021; JASP Team, 2020)
- JZS prior with default value r scale = 1/8, corresponding to the choice in other software (e.g., BayesFactor, Morey & Rouder, 2018)
- model prior beta binomial with a=1 and b=1
- The 95% credible intervals for coefficients will be reported

AP7 Inference criteria

Bayes Factors

Bayes Factors have a continuous scale but frequently are summarized in discrete categories of how strong evidence is for the null- (or for the alternative) hypothesis. In the present study, the set following set of labelswill be used (Lee & Wagenmakers, 2013). Bayes Factors BF_{10} (or BF_{01}) between 1-3 will be interpreted as as anecdotal evidence for H_1 (or H_0), 3-10 as moderate, 10-30 as strong, 30 -100 as very strong and greater than 100 as extreme.

Credible intervals

For each estimated parameter, mean, mode, sd, and the 95% credible interval of the model averaged posterior will be used for inference.

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Codebook

Code	Item text (German)[1]	Item text (English)[2]	Reverse coded	Possible responses	Scale	Sub-scale
Instruktion Demografische Daten	Herzlich Willkommen zur Studie! Vielen Dank, dass Sie sich für eine Teilnahme entschieden haben. Geben Sie bitte zunächst ihr Alter, Geschlecht und ihren Schulabschluss an.	Welcome. Thank you that you decided to participate in the present study. Please first indicate your age, gender, and education.				
PRIVACYINFO	Für weitere Informationen zum Umgang mit personenbezogenen Daten wählen Sie "Anzeigen"	For further information how your personal data will be handled, please click “show”.		1 = Anzeigen		
CONSENT	Hiermit bestätige ich, dass ich die Teilnahmeinformationen gelesen und verstanden habe. …	I confirm that I have read and understood the participant information.		1 = Ja, ich möchte an der Umfrage teilnehmen 2 = Nein, ich möchte nicht an der Umfrage teilnehmen		
AGE	Wie alt sind Sie?	How old are you?		2 = 12 bis 15 3 = 16 bis 17 4 = 18 bis 29 5 = 30 bis 39 6 = 40 bis 49 7 = 50 bis 59 8 = über 60	Demographic Data	
GENDER[3]	Geschlecht:	Gender		1 = männlich 2 = weiblich 3 = divers	Demographic Data	
EDUCATION	Welchen Schulabschluss haben Sie?	What is your highest educational qualification?		1 = Abitur, Fachhochschulreife oder gleichwertigen Abschluss 2 = Mittere Reife, Realschulabschluss, Abschluss der Polytechnischen Oberschule (10. Klasse) oder gleichwertigen Abschluss 3 = Hauptschulabschluss oder gleichwertigen Abschluss 4 = keinen Schulabschluss	Demographic Data	
PARENT	Sind Sie momentan erziehungsberechtigt für mindestens ein Kind oder erwarten Sie aktuell ein eigenes Kind?	Are you caregiver for at least one child or do you currently expect a child?		1 = ja 2 = nein	Demographic Data	
POLITICS_PARTY	Wenn am nächsten Sonntag Bundestagswahl wäre, welche Partei würden Sie wählen?	If there were general elections next Sunday, what party would you vote for?		1 = AFD 2 = CDU/CSU 3 = FDP 4 = Bündnis90/Die Grünen 5 = SDP	Demographic Data	

[1] Formulierung exakt wie im Fragebogen.
[2] Formulierung des Originalitems oder grobe Übersetzung aus dem Deutschen.
[3] Konvention: Abkürzung in Großbuchstaben, die den Variableninhalt anzeigen. Für Skalen, Subskalen, Items mit Unterstrich getrennt: z.B. MFQ_HARM_CRUEL oder VCI_CONSPI_PHARM (für item 8).

				6 = Die Linke 7 = Sonstige		
POLITICS_LEFTRIGHT	In der Politik wird oft von "rechts" und "links"gesprochen. Ordnen Sie sich in diesem Sinne auf der unten gegebenen Skala ein.	In politics frequently the distinction between left and right is mentioned. Please self assign to that scale.		1 = links 2 3 4 5 6 7 8 9 10 = rechts	Demographic Data	
MFQ Teil 1 Instruktion	In diesem ersten Teil der Studie beantworten Sie Fragen zu ihren persönlichen Werten. Inwieweit sind folgende Überlegungen für Sie relevant, wenn Sie entscheiden, ob etwas richtig oder falsch ist? Bitte bewerten Sie jede Aussage anhand dieser Skala. "Überhaupt nicht relevant" bedeutet "diese Überlegung hat rein gar nichts mit meinem Urteil, ob etwas richtig oder falsch ist zu tun". "Extrem relevant" bedeutet, "dies ist eine der wichtigsten Grundlagen, wenn ich entscheide, ob etwas richtig oder falsch ist." Mit den Angaben dazwischen können Sie ihre Meinung abstufen.	In the first part of this study, you will be asked for your personal values. When you decide whether something is right or wrong, to what extent are the following considerations relevant to your thinking? Please rate each statement using this scale: [0] = not at all relevant (This consideration has nothing to do with my judgments of right and wrong) [1] = not very relevant [2] = slightly relevant [3] = somewhat relevant [4] = very relevant [5] = extremely relevant (This is one of the most important factors when I judge right and wrong)			MFQ	
MFQ1_HARM_EMOTIONALLY_1	Ob die Gefühle von jemandem verletzt werden	Whether or not someone suffered emotionally		Likert 6 relevance[4]	MFQ	HARM
MFQ1_FAIRNESS_TREATED_2	Ob einige Menschen anders behandelt werden als andere	Whether or not some people were treated differently from others		Likert 6 relevance	MFQ	FAIRNESS
MFQ1_INGROUP_LOVECOUNTRY_3	**O**b Handlungen aus Vaterlandsliebe geschehen	Whether or not someone's action showed love for his or her country		Likert 6 relevance	MFQ	INGROUP

[4] Likert 5 agreement: Fünfstufige Likert Skala für Zustimmung: 0 = Stimme nicht zu; 1 = Stimme eher nicht zu; 2 = weder noch; 3 = stimme eher zu 4 = Stimme voll und ganz zu
Likert 6 agreement: Sechstufige Likert Skala für Zustimmung: 0 = Stimme überhaupt nicht zu; 1 = Stimme nicht zu; 2 = Stimme eher nicht zu; 3 = Stimme eher zu; 4 = Stimme zu; 5 = Stimme voll und ganz zu
Likert 6 relevanve: Sechstufige Likert Skala der Relevanz: 0 = überhaupt nicht relevant; 1 = nicht sehr relevant; 2 = ein wenig relevant; 3 = etwas relevant; 4 = sehr relevant; 5 = extrem relevant
Likert 6 probability: Sechstufige Likert Skala der Wahrscheinlichkeit: 0 = vollkommen ausgeschlossen; 1 = eher unwahrscheinlich; 2 = etwas unwahrscheinlich; 3 = etwas wahrscheinlich; 4 = Eher wahrscheinlich; 5 = Sehr wahrscheinlich

MFQ1_AUTHORITY_RESPECT_4	Ob jemand einen Mangel an Respekt vor Autoritäten gezeigt hat	Whether or not someone showed a lack of respect for authority		Likert 6 relevance	MFQ	AUTHORITY
MFQ1_PURITY_DECENCY_5	Ob jemand gegen Anstand und Reinheit verstoßen hat	Whether or not someone violated standards of purity and decency		Likert 6 relevance	MFQ	PURITY
MFQ1_LIBERTYECO_PROPERTY_6	Ob jemandes Privateigentum respektiert wurde.	Whether or not private Property was respected.		Likert 6 relevance	MFQ	ECONOMIC LIBERTY
MFQ1_MATH_7[5]	Ob jemand in Mathematik gute Leistungen zeigt	Whether or not someone was good at math		Likert 6 relevance	MFQ	
MFQ1_HARM_WEAK_8	Ob sich jemand für eine andere verletzbare und schwache Person einsetzt	Whether or not someone cared for someone weak or vulnerable		Likert 6 relevance	MFQ	HARM
MFQ1_FAIRNESS_UNFAIRLY_9	**O**b jemand ungerecht handelt	Whether or not someone acted unfairly		Likert 6 relevance	MFQ	FAIRNESS
MFQ1_INGROUP_BETRAY_10	**O**b jemand etwas getan hat, um seine oder ihre Gruppe zu hintergehen und sie zu betrügen	Whether or not someone did something to betray his or her group		Likert 6 relevance	MFQ	INGROUP
MFQ1_LIBERTYLIFE_FREE_11	**Ob alle Beteiligten frei waren zu tun, was sie wollen**	Whether or not everyone was free to do as they wanted		Likert 6 relevance	MFQ	LIFESTYLE LIBERTY
MFQ1_AUTHORITY_TRADITIONS_12	Ob jemand sich an die Traditionen der Gesellschaft gehalten hat	Whether or not someone conformed to the traditions of society		Likert 6 relevance	MFQ	AUTHORITY
MFQ1_PURITY_DISGUSTING_13	O**b** jemand etwas Ekelhaftes getan hat	Whether or not someone did something disgusting		Likert 6 relevance	MFQ	PURITY
MFQ1_HARM_CRUEL_14	Ob jemand grausam war	Whether or not someone was cruel		Likert 6 relevance	MFQ	HARM
MFQ1_FAIRNESS_RIGHTS_15	Ob jemande**m** seine oder ihre Rechte verweigert wurden	Whether or not someone was denied his or her rights		Likert 6 relevance	MFQ	FAIRNESS
MFQ1_INGROUP_LOYALTY_16	Ob jemand ein Mangel an Loyalität zeigt	Whether or not someone showed a lack of loyalty		Likert 6 relevance	MFQ	INGROUP
MFQ1_AUTHORITY_CHAOS_17	O**b** jemandes Handlungen Chaos und Unordnung verursacht haben	Whether or not an action caused chaos or disorder		Likert 6 relevance	MFQ	AUTHORITY
MFQ1_PURITY_GOD_18	Ob jemand so gehandelt hat, dass Gott es in dieser Weise befürworten würde	Whether or not someone acted in a way that God would approve of		Likert 6 relevance	MFQ	PURITY
MFQ Teil 2 Instruktion	Bitte lesen Sie die folgenden Aussagen durch und geben Sie an, wie sehr Sie den Aussagen zustimmen.					

[5] Not used as an attention check as participants might use maths performance as a proxy for soundness of mind.

MFQ2_HARM_COMPASSION_1	Mitgefühl für die, die leiden, ist die wichtigste Tugend.	Compassion for those who are suffering is the most crucial virtue.		Likert 6 agreement	MFQ	HARM
MFQ2_FAIRNESS_FAIRLY_2	Wenn die Regierung Gesetze erlässt, sollten diese immer so sein, dass jeder fair behandelt wird.	When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.		Likert 6 agreement	MFQ	FAIRNESS
MFQ2_LIBERTYECO_SOCIETY_3	Eine Gesellschaft funktioniert am besten, wenn sie das Individuum Verantwortung für sein eigenes Leben übernehmen lässt, ohne ihm zu sagen, was es zu tun hat.	Society works best, when it lets individuals take responsibility for their own lives without telling them what to do.		Likert 6 agreement	MFQ	ECONOMIC LIBERTY
MFQ2_INGROUP_HISTORY_4	Ich bin stolz auf die Geschichte meines Landes.	I am proud of my country's history.		Likert 6 agreement	MFQ	INGROUP
MFQ2_AUTHORITY_KIDRESPECT_5	Alle Kinder sollten Respekt gegenüber Autoritäten lernen.	Respect for authority is something all children need to learn.		Likert 6 agreement	MFQ	AUTHORITY
MFQ2_PURITY_HARMLESSDG_6	Menschen sollten keine Dinge tun, die eklig sind, auch wenn keiner dabei gestört oder verletzt wird.	People should not do things that are disgusting, even if no one is harmed.		Likert 6 agreement	MFQ	PURITY
MFQ2_GOOD_7	Es ist besser gute Dinge zu tun, als schlechte.	It is better to do good than to do bad.		Likert 6 agreement	MFQ	Attention check failed for agreement values 0, 1 or 2.
MFQ2_LIBERTYECO_INFER_8	Die Regierung mischt sich viel zu sehr in unser alltägliches Leben ein.	The government infers far too much in our everyday lives.		Likert 6 agreement	MFQ	ECONOMIC LIBERTY
MFQ2_HARM_ANIMAL_9	Ein wehrloses Tier zu verletzten ist eines der schlimmsten Dinge, die ein Mensch tun kann.	One of the worst things a person could do is hurt a defenseless animal.		Likert 6 agreement	MFQ	HARM
MFQ2_FAIRNESS_JUSTICE_10	Gerechtigkeit ist der wichtigste Grundstein für eine Gesellschaft.	Justice is the most important requirement for a society.		Likert 6 agreement	MFQ	FAIRNESS
MFQ2_INGROUP_FAMILY_11	Menschen sollten ihren Familienmitgliedern gegenüber loyal sein, auch wenn sie etwas Falsches getan haben.	People should be loyal to their family members, even when they have done something wrong.		Likert 6 agreement	MFQ	INGROUP
MFQ2_LIBERTYECO_WEALTH_12	Personen, sie wirtschaftlichen Erfolg haben, sollten ihren Wohlstand genießen können, wie sie wollen.	People who are successful in business have a right to enjoy their wealth as they see fit.		Likert 6 agreement	MFQ	ECONOMIC LIBERTY
MFQ2_AUTHORITY_SEXROLES_13	Männer und Frauen nehmen in der Gesellschaft verschiedene Rollen ein.	Men and women each have different roles to play in society.		Likert 6 agreement	MFQ	AUTHORITY

MFQ2_PURITY_UNNATURAL_14	Ich würde bestimte Taten falsch finden, weil sie unnatürlich sind.	I would call some acts wrong on the grounds that they are unnatural.		Likert 6 agreement	MFQ	PURITY
MFQ2_LIBERTYECO_COMMONGOOD_15	Die Regierung sollten mehr für das Gemeinwohl unternehmen, auch wenn dies eine Einschränkung der individuellen Freiheit bedeutet.	The government should do more to advance the common good, even if that means limiting the freedom and choices of individuals		Likert 6 agreement	MFQ	ECONOMIC LIBERTY
MFQ2_HARM_KILL_16	Es kann niemals richtig sein, einen Menschen zu töten.	It can never be right to kill a human being.		Likert 6 agreement	MFQ	HARM
MFQ2_FAIRNESS_RICH_17	Ich finde es moralisch verwerflich, dass reiche Kinder viel Geld erben, während arme Kinder nichts erben.	I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing.		Likert 6 agreement	MFQ	FAIRNESS
MFQ2_LIBERTYECO_PROPERTY_18	Grundbesitzer (Landbesitzer) sollten ihre Häuser und ihr Land so verwalten dürfen, wie sie wollen, solange sie ihre Nachbarn dabei nicht gefährden.	Property owners should be allowed to develop their land or build their homes in any way they choose, as long as they don't endanger their neighbours.		Likert 6 agreement	MFQ	ECONOMIC LIBERTY
MFQ2_INGROUP_TEAM_19	Es ist wichtiger ein guter Teamspieler zu sein, als sich selbst zu verwirklichen.	It is more important to be a team player than to express oneself.		Likert 6 agreement	MFQ	INGROUP
MFQ2_LIBERTYLIFE_TRADITION_20	Personen sollten frei entscheiden können, welchen Traditionen oder Gruppen-Normen sie folgen wollen.	People should be free to decide what group norms or traditions they themselves want to follow.		Likert 6 agreement	MFQ	LIFESTLYE LIBERTY
MFQ2_AUTHORITY_SOLDIER_21	Wenn ich als Soldat mit den Befehlen meines Vorgesetzten nicht einverstanden wäre, würde ich sie aus Dienstpflicht dennoch befolgen.	If I were a soldier and disagreed with my commanding officer's orders, I would obey anyway because that is my duty.		Likert 6 agreement	MFQ	AUTHORITY
MFQ2_PURITY_CHASTITY_22	Keuschheit (sexuelle Enthaltsamkeit) ist eine wertvolle Tugend.	Chastity is an important and valuable virtue.		Likert 6 agreement	MFQ	PURITY
MFQ2_LIBERTYLIFE_CHOICE_23	Jeder sollte frei sein zu tun, was man will, solange man dabei nicht die gleiche Freiheit bei anderen Personen einschränkt.	I think everyone should be free to do as they choose, so long as they don't infringe upon the equal freedom of others.		Likert 6 agreement	MFQ	LIFESTYLE LIBERTY
Einleitungstext VCI	Soweit die Fragen zu ihren persönlichen Werten. Nun geht es um Fragen zu Impfungen im Allgemeinen. Geben Sie bitte an, wie sehr Sie diesen Aussagen zustimmen.					
VCI_SAFETY_1	Impfungen werden von den Herstellern nicht ausreichend auf Sicherheit geprüft.	Vaccines have not been adequately tested for safety.		Likert 5 Agreement	VCI	unsafe/unnatural
VCI_PARENTSRIGHT_2	Eltern sollten das Recht haben frei zu entscheiden, ob sie ihre Kinder impfen wollen oder nicht.	People should be able to decide whether or not to vaccinate their children.		Likert 5 Agreement	VCI	freedom
VCI_OVERWHELM_3	Impfungen überfordern das schwache Immunsystem eines Kindes.	Vaccines overwhelm a child's undeveloped immune system.		Likert 5 Agreement	VCI	unsafe/unnatural
VCI_PROTECTOTHERS_4	Impfungen helfen dabei, jene Personen zu schützen, welche selbst nicht geimpft werden können.	Getting vaccinated helps protect those who are unable to be vaccinated against disease.	R	Likert 5 Agreement	VCI	ineffective
VCI_ALLERGIES_5	Impfungen können Allergien verursachen oder verschlimmern.	Vaccines can cause or worsen allergies.		Likert 5 Agreement	VCI	unsafe/unnatural

VCI_LIV-INGSTAND-ARDS_6	Nicht Impfungen, sondern verbesserte Lebensstandards haben zum allgemeinen Rückgang von Infektionskrankheiten beigetragen.	Improved living standards, not vaccination have reduced infectious diseases.		Likert 5 Agreement	VCI	redun-dant
VCI_DECISION_7	Es ist wichtig, dass Personen ihre eigenen Entscheidungen bezüglich Impfungen treffen.	It is important that people are able to make their own decisions about vaccination.		Likert 5 Agreement	VCI	freedom
VCI_PHARMA_8	Pharmakonzerne verheimlichen absichtlich Informationen über die Sicherheit von Impfungen.	Pharmaceutical companies purposefully conceal information about the safety of vaccines.		Likert 5 Agreement	VCI	conspir-acy
VCI_NOT-NEEDED_9	Es gibt kaum noch Infektionskrankheiten, Impfungen sind daher überflüssig.	Infectious diseases are virtually eliminated so vaccination is not needed.		Likert 5 Agreement	VCI	ineffec-tive
VCI_COMPUL-SORY_10	Impfen sollte für alle Kinder verpflichtend sein.	It should be compulsory for all children to be vaccinated.	R	Likert 5 Agreement	VCI	freedom
VCI_CAUSEDIS-EASE_11	Impfungen verursachen jene Krankheiten, welche sie eigentlich verhindern sollen.	Vaccines cause the diseases they are supposed to prevent.		Likert 5 Agreement	VCI	ineffec-tive
VCI_CON-CEAL_12	Die Regierung verheimlicht Informationen über die Sicherheit von Impfungen.	The government conceals information about the safety of vaccines.		Likert 5 Agreement	VCI	conspir-acy
VCI_ALTERNA-TIVE_13	Homöopathische Medizin sind eine effektive Alternative zu Impfungen.	Homeopathic medicines are an effective alternative to conventional vaccines.		Likert 5 Agreement	VCI	redun-dant
VCI_TOXINS_14	Impfungen führen dem Körper unnatürliche Gifte zu.	Vaccines introduce unnatural toxins into the body.		Likert 5 Agreement	VCI	un-safe/un-natural
VCI_PROTECT-ALL_15	Je mehr Menschen geimpft werden, desto besser wird der Schutz gegen Krankheiten.	The more people who get vaccinated the greater the protection against disease.	R	Likert 5 Agreement	VCI	ineffec-tive
VCI_NATU-RALLY_16	Eine Immunisierung über natürlichen Kontakt mit einer Krankheit sorgt für einen besseren Schutz als sich gegen die Krankheit impfen zu lassen.	Building immunity by naturally fighting off a disease is better protection than getting a vaccine.		Likert 5 Agreement	VCI	redun-dant
VCI_EXEMPT_17	Es sollte Personen erlaubt sein, sich aus persönlichen oder moralischen Gründen gegen eine Impfung zu entscheiden.	It is okay for people to be exempt from vaccination for moral or personal reasons.		Likert 5 Agreement	VCI	freedom
VCI_INEFFEC-TIVE_18	Pharmakonzerne produzieren ineffektive Impfungen, um ihren Profit zu maximieren.	Pharmaceutical companies create ineffective vaccines in order to make high profit.		Likert 5 Agreement	VCI	conspir-acy
Einleitungstext BVIS	Wie wahrscheinlich ist es, dass Sie ein zukünftiges eigenes Kind impfen lassen würden gegen … ?	How propable are you to vaccinate your child against				
BVIS_HEPATI-TISB_1	Hepatitis B	Hepatitis B		Likert 6 probability	BVIS	
BVIS_HPV_2	HPV, Humane Papillomviren	Human papillomavirus (HPV)		Likert 6 probability	BVIS	
BVIS_MEASELS_3	Masern	Measels		Likert 6 probability	BVIS	
BVIS_MENINGO-COCCAL_4	Meningokokken	Meningococcal disease		Likert 6 probability	BVIS	
BVIS_PERTUS-SIS_5	Keuchhusten (Pertussis)	Pertussis (whoping cough)		Likert 6 probability	BVIS	
BVIS_MUMPS_6	Mumps	Mumps		Likert 6 probability	BVIS	
BVIS_POLIO_7	Polio (Poliomyelitis)	Poliomyelitis, Polio		Likert 6 probability	BVIS	

BVIS_ROTA-VIRUS_8	Rotavirus	Rotavirus		Likert 6 probability	BVIS	
BVIS_RUBELLA_9	Röteln (Rubeola)	Rubella		Likert 6 probability	BVIS	
BVIS_TETA-NUS_10	Tetanus	Tetanus		Likert 6 probability	BVIS	
BVIS_CHICKEN-POX_11	Windpocken (Wasserpocken, Varizella)	Vericella (Chickenpox)		Likert 6 probability	BVIS	
Einleitungstext CoVCI	Soweit die Fragen zu Impfungen im Allgemeinen. Nun geht es um Fragen zu Impfungen gegen Covid-19 im Speziellen.	These were questions about vaccination in general. Now you will be asked about vaccination against Covid-19 specifically				
COVCI_COVIDINF ECTION_1	Wurde bei Ihnen bis zum jetzigen Zeitpunkt schon einmal eine Erkrankung mit Covid-19 nachgewiesen?	Have you tested positive for Covid-19 until now?		1 = Ja 2 = Nein 3 = Weiß nicht		
COVCI_VAC-CINATED_2	Sind Sie zum aktuellen Zeitpunkt bereits gegen Covid-19 geimpft? (Wenn sie zwischen zwei Impfterminen stehen, geben Sie bitte "Ja" an)	Are you at the present moment already inoculated against Covid-19? (If you have received one shot but not the second, please indicate “yes”.)		1 = Ja 2 = Nein		
COVCI_NO_CHA NCE_3	Ich hatte bereits die Gelegenheit mich impfen zu lassen und habe abgelehnt	I already had the opportuny to be vaccinated but decided against it.		1 = Ja 2 = Nein		
COVCI_NO_IN-TENTION_4	Ich beabsichtige mich gegen Covid-19 impfen zu lassen.	I intend to vaccinate against Covid-19		Likert 5 Agreement		
COVCI_NO_ASAP _5	Ich möchte mich gegen Covid-19 impfen lassen, sobald ich die Chance dazu habe.	I want to vaccinate against Covid-19 as soon as I have the chance to do so.		Likert 5 Agreement		
COVCI_NO_DE-CIDE_6	Ich möchte mich frei entscheiden können, ob ich mich gegen Covid-19 impfen lasse oder nicht.	I want to freely decide whether to vaccinate against Covid-19 or not.		Likert 5 Agreement		
COVCI_NO_IM-PORTANCE_7	Mir ist es wichtig, gegen Covid-19 geimpft zu sein.	For me, it is important to be vaccinated against Covid-19		Likert 5 Agreement		
COVCI_NO_THOU GHTFUL_8	Ich möchte mich erst dann gegen Covid-19 impfen lassen, wenn stärker gefährdete Personen bereits geimpft sind.	I only want to vaccinate against Covid-19 after persons with higher priority are already vaccinated.		Likert 5 Agreement		
COVCI_NO_SIDE EFFECTS_9	Nebenwirkungen der Covid-19 Impfstoffe wären gesundheitsschädlich für mich.	Side effects of Covid-19 vaccines would endanger my health.		Likert 5 Agreement		
COVCI_NO_IN-FECTION_10	Eine Infektion mit Covid-19 wäre gesundheitsschädlich für mich.	An infection with Covid-19 would be dangerous for my health.		Likert 5 Agreement		
COVCI_NO_JOB-LOSS_11	Ich möchte mich gegen Covid-19 impfen lassen, weil ich sonst meine Arbeit verliere.	I want to vaccinate against Covid-19 because otherwise I will loose my job.		Likert 5 Agreement		
COVCI_NO_DIS-ADVANTAGE_12	Ich möchte mich gegen Covid-19 impfen lassen, weil ich sonst gesellschaftliche Nachteile habe.	I want to vaccinate against Covid-19 because otherwise I will have disadvantages in social live.		Likert 5 Agreement		
COVCI_NO_TRUS T_13	Ich vertraue den Informationen des Robert-Koch-Instituts bezüglich Covid-19.	I trust information about Covid-19 provided by the Robert-Koch-Institute.		Likert 5 Agreement		
COVCI_NO_RO-COMMENDA-TION_14	Ich richte mich bezüglich der Covid-19 Impfungen nach der STIKO (Ständige Impfkomission).	I follow vaccination advice from the STIKO.		Likert 5 Agreement		
COVCI_NO_PRO-TECTME_15	Ich möchte mich gegen Covid-19 impfen lassen, um mich selbst zu schützen.	I want to vaccinate against Covid-19 in order to protect myself.		Likert 5 Agreement		
COVCI_NO_PRO-TECTOTHERS_16	Ich möchte mich gegen Covid-19 impfen lassen, um andere Personen zu schützen.	I want to vaccinate against Covid-19 in order to protect others.		Likert 5 Agreement		
COVCI_NO_DUTY _17	Ich erfülle mit einer Covid-19 Impfung meine gesellschaftliche Pflicht.	I fulfil my public duty with a vaccination against Covid-19.		Likert 5 Agreement		

COVCI_NO_CHOOSEVACCINE_18	Ich möchte den Covid-19 Impfstoff gerne frei auswählen.	I want to freely choose the type of vaccine against Covid-19.		Likert 5 Agreement		
COVCI_NO_ANYVACCINE_19	Ich würde mich mit jedem zugelassenen Covid-19 Impfstoff impfen lassen.	I would accept any approved vaccine against Covid-19.		Likert 5 Agreement		
COVCI_NO_UNNATURAL_20	Eine Impfung gegen Covid-19 ist unnatürlich.	Vaccination against Covid-19 is unnatural.		Likert 5 Agreement		
COVCI_NO_WAIT_21	Ich möchte mit der Covid-19 Impfung warten, bis der Impfstoff länger erprobt ist.	I want to wait with a vaccination against Covid-19 until the vaccines are further tested.		Likert 5 Agreement		
COVCI_NO_INFORMED_22	Ich kenne mich gut mit den verschiedenen Covid-19 Impfstoffen aus.	I know a lot about the different vaccines against Covid-19.		Likert 5 Agreement		
COVCI_NO_PROTECTGENERALLY_23	Wer sich gegen Covid-19 impfen lässt, schützt damit andere Personen.	Persons who vaccinate against Covid-19 protect other people.		Likert 5 Agreement		
	Angenommen, Sie hätten die freie Wahl über den Impfstoff. Ihnen wird eine sofortige Impfung angeboten. Wie wahrscheinlich ist es, dass Sie sich mit den folgenden Impfstoffen impfen lassen würden?	Assuming you could freely choose the vaccine. How probable would you choose the following vaccines:				
COVCI_NO_ASTRAZENECA_24	AstraZeneca	AstraZeneca		Likert 6 Probability		
COVCI_NO_BIONTECH_25	Pfizer/Biontech	Pfizer/Biontech		Likert 6 Probability		
COVCI_NO_MODERNA_26	Moderna	Moderna		Likert 6 Probability		
COVCI_NO_JOHNSON_27	Johnson & Johnson	Johnson & Johnson		Likert 6 Probability		
COVCI_NO_SPUTNIK_28	Sputnik V	Sputnik V		Likert 6 Probability		
COVCI_NO_APPOINTMENT_29	Haben Sie sich auf einen Impftermin beworben?	Have you already applied for a vaccination appointment?		1 = Ja 2 = Nein, ich habe es noch vor 3 = Nein, und das werde ich nicht machen.		
COVCI_OPEN_30	Gibt es noch etwas, das Sie uns bezüglich des Themas der Umfrage mitteilen wollen? Wenn nicht, klicken Sie dazu einfach auf "weiter".	Is there anything else which you want to tell about the topic of this survey? If not, please click “next”.		Offenes Textfeld ohne Zeichenbegrenzung		
COVCI_YES_ASAP_31	Ich habe mich gegen Covid-19 impfen lassen, sobald ich die Chance dazu hatte.	I vaccinated against Covid-19 as soon as I had the chance to do so.		Likert 5 Agreement		
COVCI_YES_DECIDE_32	Ich konnte mich frei entscheiden, ob ich mich gegen Covid-19 impfen lasse oder nicht.	I could freely decide whether to vaccinate against Covid-19 or not.		Likert 5 Agreement		
COVCI_YES_IMPORTANCE_33	Mir ist es wichtig, gegen Covid-19 geimpft zu sein.	It is important for me to be vaccinated against Covid-19.		Likert 5 Agreement		
COVCI_YES_FREEDECISION_34	Mir ist eine freie Entscheidung über meine Covid-19 Impfung wichtig.	It is important for me that the my decision about vaccinating against Covid-19 is free.		Likert 5 Agreement		
COVCI_YES_THOUGHFUL_35	Ich habe mich erst dann gegen Covid-19 impfen lassen, als stärker gefährdete Personen bereits geimpft waren.	I waited to vaccinate against Covid-19 until persons with higher priority were already vaccinated.		Likert 5 Agreement		
COVCI_YES_SIDEEFFECTS_36	Nebenwirkungen der Covid-19 Impfstoffe wären gesundheitsschädlich für mich.	Side effects of vaccination against Covid-19 would be dangerous for my health.		Likert 5 Agreement		
COVCI_YES_INFECTION_37	Eine Infektion mit Covid-19 wäre gesundheitsschädlich für mich.	An infection with Covid-19 would be dangerous for my health.		Likert 5 Agreement		
COVCI_YES_JOBLOSS_38	Ich habe mich gegen Covid-19 impfen lassen, weil ich sonst meine Arbeit verloren hätte.	I vaccinated against Covid-19 because I would have lost my job otherwise.		Likert 5 Agreement		

COVCI_YES_DISADVANTAGE_39	Ich habe mich gegen Covid-19 impfen lassen, weil ich sonst gesellschaftliche Nachteile gehabt hätte.	I vaccinated against Covid-19 because otherwise I would have had disandvantages in public live..		Likert 5 Agreement		
COVCI_YES_TRUST_40	Ich vertraue den Informationen des Robert-Koch-Instituts bezüglich Covid-19.	I trust information about Covid-19 provided by the Robert-Koch-Institute.		Likert 5 Agreement		
COVCI_YES_RECOMMENDATION_41	Ich richte mich bezüglich der Covid-19 Impfungen nach der STIKO (Ständige Impfkomission).	I follow vaccination advice from the STIKO.		Likert 5 Agreement		
COVCI_YES_PROTECTME_42	Ich habe mich gegen Covid-19 impfen lassen, um mich selbst zu schützen.	I vaccinated against Covid-19 in order to protect myself.		Likert 5 Agreement		
COVCI_YES_PROTECTOTHERS_43	Ich habe mich gegen Covid-19 impfen lassen, um andere Personen zu schützen.	I vaccinated against Covid-19 in order to protect others.		Likert 5 Agreement		
COVCI_YES_DUTY_44	Ich habe mit meiner Impfung gegen Covid-19 meine gesellschaftliche Pflicht erfüllt.	I fulfiled my public duty with a vaccination against Covid-19.		Likert 5 Agreement		
COVCI_YES_CHOOSEVACCINE_45	Ich hätte den Covid-19 Impfstoff gerne frei ausgewählt.	I would have wanted to freely choose the type of vaccine against Covid-19.		Likert 5 Agreement		
COVCI_YES_ANYVACCINE_46	Ich hätte mich mit jedem zugelassenen Covid-19 Impfstoff impfen lassen.	I would have accepted any approved vaccine against Covid-19.		Likert 5 Agreement		
COVCI_YES_UNNATURAL_47	Eine Impfung gegen Covid-19 ist unnatürlich.	Vaccination against Covid-19 is unnatural.		Likert 5 Agreement		
COVCI_YES_WAIT_48	Ich hätte gerne mit der Covid-19 Impfung gewartet, bis der Impfstoff länger erprobt ist.	I would have wanted to wait with a vaccination against Covid-19 until the vaccines are further tested.		Likert 5 Agreement		
COVCI_YES_INFORMED_49	Ich kenne mich gut mit den verschiedenen Covid-19 Impfstoffen aus.	I know a lot about the different vaccines against Covid-19.		Likert 5 Agreement		
COVCI_YES_PROTECTGENERALLY_50	Wer sich gegen Covid-19 impfen lässt, schützt damit andere Personen.	Persons who vaccinate against Covid-19 protect other people.		Likert 5 Agreement		